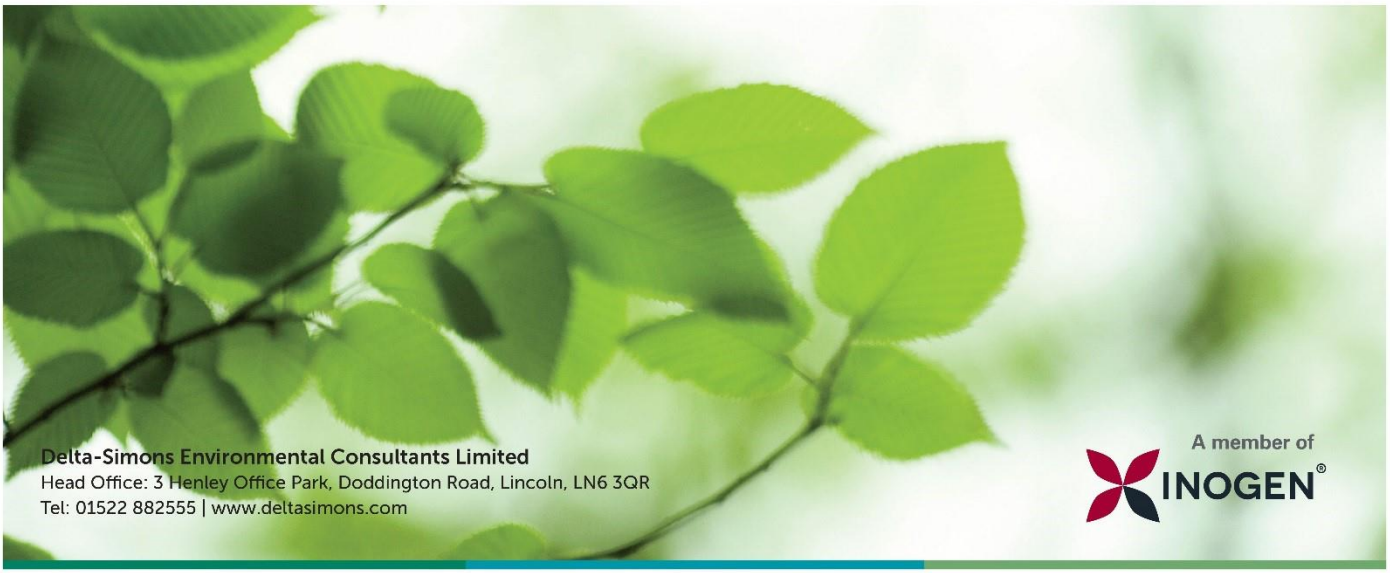
Preliminary Geo-Environmental Risk Assessment

Plots A, B and C, Image Business Park, Acornfield Road, Knowsley

Presented to **Knowsley (Image Business Park) Limited**

Issued: August 2019

Delta-Simons Project No. 19-0654.01



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Report Details

Client	Knowsley (Image Business Park) Limited
Report Title	Preliminary Geo-Environmental Risk Assessment
Site Address	Plots A, B and C, Image Business Park, Acornfield Road, Knowsley L33 7UF
Project No.	19-0654.01
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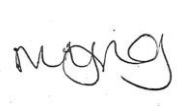
Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1	**Final**	**8th August 2019**				
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About us

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Executive Summary

Brief	Delta-Simons was instructed by Knowsley (Image Business Park) Limited to prepare a Preliminary Geo-Environmental Risk Assessment for an industrial property located off Acornfield Road, within the Image Business Park estate, in Knowsley L33 7UF. The Site is proposed for redevelopment which is to include the construction of new light industrial/commercial units within the existing business park.
Site Use & Surrounding Area	The Site is approximately L-shaped and comprises three distinct development areas; Plot A, Plot B and Plot C. Plot A consists of a vacant plot where the former building has been recently demolished to slab level and Plot B comprises a rectangular-shaped open field. Plot C comprises disused buildings formerly associated with Kodak Ltd (photochemical manufacturers) together with an electrical substation and a waste-water treatment plant.
Environmental Setting	The Site is likely to be underlain by a sequence of Topsoil and/or Made Ground (in locations of former/current buildings and infilled ground) underlain by Shirdley Hill Sand Formation (Secondary A aquifer) and Glacial Till (Secondary Undifferentiated aquifer), and bedrock of the Chester Formation (Principal Aquifer). The Site is located within a designated groundwater Source Protection Zone (Zone III – Total Catchment) and there are fifteen licensed abstraction records from groundwater located within 1 km of the Site. The nearest surface water feature is a drain located approximately 20 m to the south of the Site.
Contamination Potential Sources	Plot C was in industrial use (photochemical manufacturing facility) from the 1960's until 2006. Activities were reported to include photochemical manufacture (including storage and usage), a silver nitrate recovery plant licensed by the Environment Agency and a small research facility with small-scale laboratories in Plot A. Plot B has remained largely undeveloped; however, anecdotal evidence suggests that it (and parts of Plot C) was partly used to bury waste material by Kodak Ltd. Given the nature and thickness of Made Ground beneath the Site, it is considered that there is significant potential for a range of common contaminants including heavy metals, PAH, petroleum hydrocarbons, VOC, SVOC and ACM to be present beneath the Site. Previous investigations undertaken at the Site have identified the presence of contaminants within soil/groundwater.
Development Considerations	Remedial works have been previously undertaken within the Plot C area; however, there remains the potential for as yet undiscovered contamination of soils/groundwater. On the basis of the available information, gross contamination beneath Plot A and Plot B is considered unlikely. The preliminary risk assessment has identified a Moderate risk of soil/groundwater contamination and hazardous ground gas at the Site. Asbestos is confirmed as present within buildings and may also be present within the Made Ground. The ground conditions are likely to comprise variable thicknesses/compositions of Made Ground, including the possibility of buried obstructions associated with current built development together with an area of deeper Made Ground associated with the former marl pit in Plot B and; therefore, the use of traditional foundations may not be feasible unless either very deep foundations are utilised, or the foundations are designed to span the areas of deeper Made Ground. Pad foundations taken into competent strata could be considered. Alternatively, consideration would need to be given to piling or ground improvement.
Recommendations	It is recommended that an intrusive Site investigation is undertaken to assess the potential for contamination and ground gases to impact on the proposed development. The investigation will also refine the Site-specific ground model and groundwater regime and enable an assessment of foundation and engineering solutions to be made.
This is intended as a summary only. Further detail and the limitations of the assessment is provided within the main body of the Report.	

Table of Contents

1.0 INTRODUCTION 1
1.1 Appointment 1
1.2 Context & Purpose 1
1.3 Scope of Works 1
1.4 Limitations 2
2.0 SITE CONTEXT & DATA REVIEW 3
2.1 Site information 3
2.2 Environmental Setting 6
2.3 Historical Use of the Site & Surrounding Area 8
2.4 Environmental Database Review 9
2.5 Planning Review / Regulatory Enquiries 10
2.6 Previous Reports 11
3.0 CONCEPTUAL SITE MODEL 16
3.1 Introduction 16
3.2 Potential Contamination Sources 16
3.3 Potential Receptors 16
3.4 Potential Pathways 17
4.0 PRELIMINARY GROUND ENGINEERING APPRAISAL 21
4.1 Preliminary Ground Model 21
4.2 Plausible Geohazards 21
5.0 DEVELOPMENT CONSIDERATIONS 23
5.1 Geo-Environmental Considerations 23

Figures

Figure 1 Site Location Plan

Figures 2a-2c Photograph Location Plans

Appendices

Appendix A Limitations

Appendix B Proposed Development Plans

Appendix C Site Photographs

Appendix D Landmark Envirocheck Report

Appendix E Planning Information

Appendix F Previous Reports

Appendix G Risk Definitions

1.0 Introduction

1.1 Appointment

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Knowsley (Image Business Park) Limited (the "Client") to prepare a Preliminary Geo-Environmental Risk Assessment for an industrial property located off Acornfield Road, within the Image Business Park estate, in Knowsley, L33 7UF (the "Site"). A Site Location Plan is included as Figure 1.

1.2 Context & Purpose

The aim of this report is to identify likely environmental and geotechnical issues associated with soil and groundwater conditions that may affect the proposed development of the Site. This report is designed in accordance with 'the Model Procedures for the Management of Land Contamination (CLR 11)', the relevant requirements of the National Planning Policy Framework 2019 (NPPF) (paragraphs 170 & 178-180)[1] and the Planning Practice Guidance (Land Affected by Contamination)[2].

The Site is proposed for redevelopment which is to include the construction of new light industrial/commercial units within the existing business park.

1.3 Scope of Works

- Review of the environmental setting of the Site, including the current use/status of the Site and surrounding area, and review of the geology, hydrogeology and hydrology;
- Review of the historical activities of the Site and surrounding area;
- Review of regulatory information relating to the Site;
- Review of the online planning records for the Site;
- Consult and review information from the Local Authority in relation to Part 2A of the 1990 Environmental Protection Act;
- Complete a Site reconnaissance by undertaking a visual inspection of readily accessible areas of the Site;
- Complete an interview with a Site representative;
- Review of provided relevant third-party reports relating to the Site or surrounding area;
- Develop an outline Conceptual Site Model and undertake a Preliminary Risk Assessment with respect to potential contamination focussed on the proposed land use;
- Identify potential contamination risks and/or liabilities associated with the proposed redevelopment of the Site; and
- Provide commentary on potential land contamination and geotechnical constraints in the context of the proposed development.

In completing this Assessment, Delta-Simons has utilised the following data sources and third-party information:

- Current and Historical Ordnance Survey (OS) maps;
- British Geological Survey (BGS) data;
- Environment Agency (EA) online data;
- Coal Authority (CA) online data;
- Landmark Envirocheck Report for the Site (Ref. 207456127_1_1, dated June 2019); and
- Historical Maps included as part of the Envirocheck Report.

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf
[2] https://www.gov.uk/guidance/land-affected-by-contamination

1.4 Limitations

The standard limitations associated with this assessment are presented in Appendix A. In addition, there are the following specific limitations that apply to this assessment:

- Many of the buildings covering the Plot C area were confirmed to contain asbestos and therefore, internal access was not permitted and/or restricted during the Site reconnaissance.

2.0 Site Context & Data Review

2.1 Site information

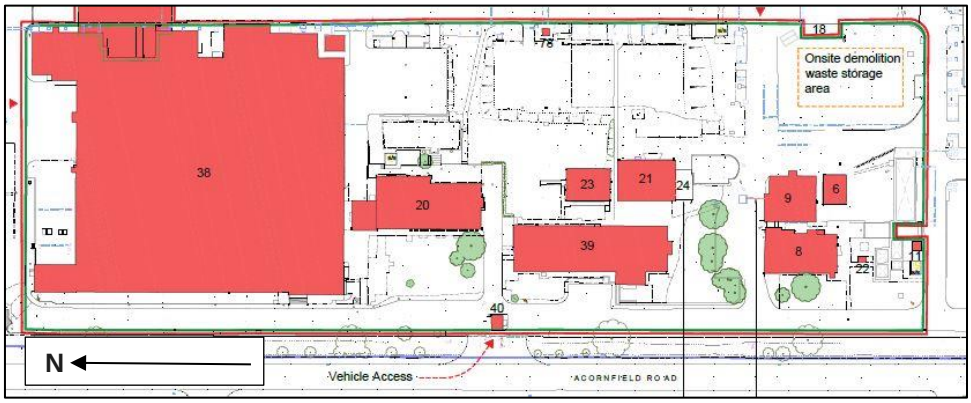
Co-ordinates	Centred approximately at National Grid reference 343840, 398790.	**Elevation**	Approx. 41-45 m AOD
		Area	5.94 Ha
Site Location	The Site is located off Acornfield Road within Image Business Park in Knowsley, approximately 9 miles east of Liverpool.		
Proposed Development Description	The Site is to be redeveloped with industrial/commercial units including hard surfacing for car parking, yard areas and access. It is assumed that there will be limited areas of soft landscaping. A proposed development plan is included in Appendix B.		
Current Site Use	The Site is approximately L-shaped and comprises three distinct development areas; Plot A, Plot B and Plot C within Image Business Park. The plot boundaries are shown on the proposed development plan in Appendix B.		
Site Reconnaissance	Delta-Simons conducted a Site visit on 18th June 2019 and conducted an interview with the Facilities Manager. It is understood that the Site was formerly in use for photochemical manufacturing (Kodak Ltd), a silver nitrate recovery plant (Ames Goldsmith) and offices/laboratories (Eastman Chemicals Ltd). These activities had largely ceased by 2006-2007. Relevant Photograph Location Plans are included as Figures 2a – 2c and Site photographs are included in Appendix C. Pertinent information that was observed or reported on-Site is summarised under the following headings: <u>Plot A</u> ▲ Plot A is accessed via an estate road, known as North Street, which runs along the southern boundary, dividing Plot A from Plot C to the south (Photos 1-2). The former building (Offices and Research Facility) in the central and southern part of Plot A was recently demolished to slab level (Photos 3-4). The building formerly housed offices and a small-scale laboratory where small quantities of chemical were reportedly stored/used; ▲ Much of the central and southern part of Plot A remains covered with the former building slab and associated hardstanding (concrete and tarmac); ▲ An open water pit was present in the south-eastern corner of Plot A covered with protective nets (Photos 5-6); ▲ The remainder of Plot A is grass-covered (Photos 9-12); ▲ Plot A slopes down gently from a topographic high of approximately 44.0 m AOD in the east to a topographic low of 41.5 m AOD in the west towards Acornfield Road. The Plot A western boundary slopes down by approximately 1.5 m along the western and north-western boundary which is adjacent to an off-site electrical sub-station; (Photo 11); and ▲ A small transformer remains in the central part of Plot A (Photo 13).		

Plot B

- Plot B comprises an approximately rectangular-shaped open field (formerly used as playing fields). Anecdotal evidence suggests that the playing fields were formerly used as a waste disposal/burning location during the 1950s-1970s by Kodak Ltd;
- North Street forms the southern boundary whilst the eastern boundary is formed by a fence between Plot B the adjacent Plot A (Photo 15);
- Plot B is fairly flat-lying, with levels falling gently by approximately 1 m from east (44.8 m AOD) to west (44.0 m AOD). The western part of Plot B lies approximately 1 m higher in elevation than North Street along the southern part of the plot (Photo 15) and there are minor undulations across the surface;
- The plot is predominantly grass-covered with areas of brambles and localised reeds (Photos 17-21);
- Mature trees line the northern and western Site boundaries (Photo 18);
- Manhole covers were evident in the southern part of the plot adjacent to North Street (Photo 22); and
- The Facilities Manager indicated that during WWII, the Site was associated with Royal Ordnance Factory (ROF) Kirkby – and that munitions were discarded and possibly buried beneath the Plot B area.

Plot C

- Plot C comprises several buildings formerly associated with Kodak Ltd. Plot C levels are fairly flat-lying, at approximately 41. 5 m AOD. The majority of external areas are formed by concrete or tarmac hardstanding. Areas of soft landscaping are present along the building frontages in the western part of the Site;
- Asbestos containing materials (ACM) are located at several locations within most buildings in Plot C. An Asbestos Register was located on-Site. Delta-Simons was informed that the register is reviewed on an annual basis and maintenance/ removal work is carried out as necessary. Access was not permitted to areas that were deemed to be impacted with ACM;
- For ease of reference, an extract of the building layout plan is presented below:



- Building 38 is the largest and northern-most building within Plot C. It comprises a one to three storey warehouse with office facilities. The building was formerly used for photochemical processing during 1961 and 2006. Various production and holding tanks were reported to have been located within the building. Loading bays were present in the south-western corner (Photo 25);
- Concrete plinths were observed along the northern elevation of the building (Photo 29) assumed to formerly house storage tanks and an above ground fuel storage tank was evident in a plant room (Photo 30), although access was not permitted. As a

<table>
<tr><td></td><td colspan="2">result, the content and dimensions are unknown. Other tanks may also be present throughout the building in areas which were not accessible;
▲ A small area of concrete-surfaced car parking, used by the adjacent businesses, is located to the south-east of Building 38 (Photos 33-34);
▲ At present, Building 38 is largely empty (Photos 35-38). A processing pit was observed in the south-western corner of Building 38 (Photo 37). It is understood that recent occupants (since 2006/2007) included tenants storing soap powder, tyres and window frame components. No contaminative processes were reported to have been undertaken since that time;
▲ An electrical sub-station is present to the south of Building 38 (Photo 39);
▲ Building 20 comprises a single-storey, former canteen block and social club;
▲ Building 39 is a three-storey office block. Access was restricted due to the presence of asbestos (Photo 40). The offices were generally empty with the exception of some discarded office equipment;
▲ An estate road known was West Avenue forms the western part of Plot C (Photos 42-45). South Street forms the southern boundary of Plot C;
▲ Building 66 has been demolished and much of the central part of Plot C comprised uneven vegetated land (Photo 48);
▲ Building 23 was a former boiler house and latterly used as a store. Gas oil tanks were removed in the early 1980s;
▲ It is understood that the original synthetic chemicals manufacture took place in Buildings 15 (now demolished) and 23. Building 15 was demolished and tanks (shown on historical mapping) had been removed since 2006. Building 15 formerly housed silver nitrate recovery plant and was historically licensed and monitored by the Environment Agency. Five above ground fuel storage tanks were required for the process in Building 15, comprising two 90,000l waste tanks, two 1,000l sulphuric acid tanks and an additional 16,000l tank. The exact details of demolition/tank removal are unknown. The area currently consists of rough ground (Photos 49-50); and
▲ Building 8 housed a small-scale laboratory located in the south-western corner of Plot C and consists of a two-storey building. Building 9 is the former laundry used by Kodak Ltd employees;
▲ Building 21 is the telephone exchange and it is understood that this building is to remain on Site as part of the proposed redevelopment; and
▲ Waste-water treatment pits/tanks are located in the south-western corner. The tanks were partially water-filled and covered with protective netting (Photos 51-55).</td></tr>
<tr><td rowspan="4">Current Surrounding Area</td><td>North</td><td>Sewage Pumping Station and electrical sub-station within Knowsley Industrial Park.</td></tr>
<tr><td>East</td><td>Perimeter Road and open fields beyond.</td></tr>
<tr><td>South</td><td>Image Business Park with Charley Wood beyond.</td></tr>
<tr><td>West</td><td>Acornfield Road and Knowsley Industrial Park beyond.</td></tr>
</table>

2.2 Environmental Setting

Published Geology	From published British Geological Survey mapping (1:50,000 Sheet Number 84, Wigan), the Site is indicated as being underlain by superficial deposits of the Shirdley Hill Sand Formation and Glacial Till. The underlying bedrock is recorded as the Chester Formation of Triassic Age. The Envirocheck Report indicates the presence of Made Ground across the entire Site.
Specific Ground Conditions	There are seven BGS borehole records located within Plot B and Plot C. No records are available for the Plot A area. The findings of these logs are summarised below: <u>Plot B</u> ▲ Two window sampler boreholes (SJ49NW990 and SJ49NW991), one cable percussion borehole (SJ49NW1021) and one rotary open borehole (SJ49NW1022) were drilled in 2003; ▲ These boreholes identified Made Ground from surface to depths of between 1.5 and 4.5 m below ground level (bgl); ▲ Boulder Clay (Glacial Till) was encountered beneath the Made Ground to a maximum proven depth of 9.8 m bgl and generally consisted of firm clay; ▲ Boulder Clay was underlain by red brown sandstone to a maximum depth of 25 m bgl (maximum depth of investigation); and ▲ Groundwater was encountered at two locations during drilling; within Made Ground at 0.6 m bgl and at the Boulder Clay/Sandstone interface at 9.8 m bgl. <u>Plot C</u> ▲ Three window sampler boreholes (SJ49NW1000, SJ49NW1001 and SJ49NW102) were drilled in 2003; ▲ Made Ground was encountered in all locations to a maximum proven depth of 2.6 m bgl. Solvent odours, hydrocarbon odours and black streaks were observed within the Made Ground. A maximum PID reading of 211 ppm was detected in the borehole near the waste-water treatment plant in the southern part of Plot C; ▲ Made Ground was underlain by natural sand and clay to depths greater than 3 m bgl; and ▲ Groundwater was encountered during drilling at “shallow” depth in one borehole and a depth of 1.2 m bgl in another. Several phases of intrusive investigation have been undertaken at the Site. It is also understood that remedial works have been undertaken at the Site. Available site investigation reports are summarised in Section 2.6 and copies are included in Appendix G.
Hydrogeology	The EA classify the Shirdley Hill Sand Formation as a Secondary A aquifer and the Glacial Till as a Secondary Undifferentiated aquifer. The underlying bedrock (Chester Formation) is classified as Principal Aquifer strata. The EA data also indicates that the Site is located within a designated groundwater Source Protection Zone (Zone III – Total Catchment). According to the Envirocheck Report, there are fifteen licensed groundwater abstraction records located within 1 km of the Site. Five of these abstraction wells are located on Site; three are associated with general cooling and two are for general use (industrial/commercial/public use) associated with the former Kodak Ltd and Ames Goldsmith operations.

	The available BGS borehole information indicated that perched groundwater is present within the Made Ground and a deeper groundwater body lies at the interface between the superficial deposits and the underlying solid geology.
Hydrology	A water feature is mapped in the southern portion of the Site; although it appears this record actually relates to the waste-water treatment plant. The nearest surface water feature is a drain located approximately 20 m to the south of the Site and there are several drains located within 100 m of the eastern Site boundary. There is one discharge consent within 250 m of the Site. This is located approximately 190m to the south-east of the Site and relates to sewage discharges (final/treated effluent) being discharged into the Simonswood Brook by White Moss Peat Co. Ltd. According to the Envirocheck Report, there are two licensed abstraction records from surface water located within 1 km of the Site.
Coal Mining	Reference to the Coal Authority on-line viewer indicates that the Site is not with a Coal Mining Reporting Area. Consequently, a Coal Mining Risk Assessment (CMRA) is unlikely to be required under the planning regime. The Envirocheck report indicates that 'inconclusive coal mining' may have occurred in the eastern part of Plot B. However, there is no other evidence which corroborates this.
Radon Gas	The Site lies within an area where less than 1% of homes are above the National Radiological Protection Board (NRPB) recommended "action level" for radon. BRE211 (2007) indicates that no radon protective measures are necessary in the construction of new buildings at the Site.
Unexploded Ordnance (UXO)	According to the Zetica website, the Site is at low risk from UXO associated with bombing during WWII. Further enquiries were made with First Line Defence, a UXO specialist, who provided additional information/advice as summarised below: ▲ The Site was reportedly located within the Royal Ordnance Factory (ROF Kirkby) during the war, which was a large factory filling munitions from 1940-1946. Unused/faulty ammunition would often be buried within the ROF factories themselves, and it is not possible to rule out the risk of Allied Military Ordnance remaining on site within most former Royal Ordnance Factories; ▲ Given this use of the site of the site during the war, the risk from Allied Military Ordnance is considered to be present; and ▲ UXO support has been recommended for any intrusive works (trial pits) undertaken at the Site.
Ecological Receptors	It is understood from information provided within the Envirocheck Report, there are no statutory ecological receptors located within 500 m of the Site. An Extended Phase I Habitat survey of the site was undertaken by Clarkson & Woods in June 2018, including building inspections for bats and nesting birds. No bat roosts were found within Buildings 8, 9, 20 and 39 and; therefore, no further bat surveys were recommended. A pit in Plot A tested positive for great crested newt eDNA. Careful demolition of buildings in Plot C was recommended during winter. Vegetation removal and demolition should avoid the bird breeding season or be subject to a pre-works inspection by an experienced Ecologist.
Environmental Sensitivity	The Site is considered to be of high environmental sensitivity given the presence of Secondary A and Principal Aquifer strata underlying the Site, the presence of a

	groundwater SPZ and associated abstractions on-Site and within 1 km. The potentially significant thicknesses of contaminated Made Ground, and the historical industrial use of the Site and surrounding area represent possible risks to environmental detriment.

2.3 Historical Use of the Site & Surrounding Area

Approach	The historical development of the Site and surrounding area has been assessed through a review of available historical OS maps and Google Earth historical satellite imagery. A summary of the key historical Site uses and developments in the surrounding area is presented below. Copies of pertinent historical maps are included as Appendix E.
Historical Features On-Site	The Site appears to have been in agricultural use from as early as 1850. At this time a small building (presumably a house) with a well was mapped in the north-eastern corner of Plot B. A marl pit with a small pond was also mapped in the north-eastern corner of Plot B (extending outside the northern Site boundary) whilst the remainder of the Site was undeveloped. The marl pit was shown to have expanded by 1908 and by 1921 the building in the north-east of the Site was no longer recorded. No significant changes were observed until the 1950's when several small buildings were recorded in the southern part of the Site which is now known as Plot C. The former marl pit appears to have been infilled by this time. Site contours shown on the historical maps dated 1909 to 1966 indicate the possibility that some material was cut from the Plot B area which could have been used to infill this feature. Additional buildings were recorded by the early 1970's and the Plot C area was largely covered with built development associated with a 'Photographic Material Factory' which extended further outside of the Site boundary to the south and east. Several tanks and filter beds were recorded in the Plot C area. A building was also recorded in the southern part of Plot A at the same time. The Site was labelled 'Knowsley Industrial Park' in 1993. It is understood that Kodak Ltd occupied the Site until the early 2000's and manufactured photochemicals. The building in Plot A was extended by 1994 and an electrical substation was recorded in the north-western corner of Plot A on the 1994 map. The Site has remained approximately in its current configuration since that time. It is understood that the Site was part of Kirkby Royal Ordnance Factory during WWII; however, this is not evident from the historical mapping. The historical activities at the Site represent potential sources of contamination. These include the following: ▲ Infilling of former marl pit; ▲ Manufacture of photochemicals; ▲ Tanks and filter beds; and ▲ Electrical sub-stations.
Potentially Contaminative Historical Features Off-Site	Potential sources of contamination within 500 m of the Site include: ▲ Wider 'Photographic Material Factory' to the south and east; and ▲ Wider Kirkby Industrial Estate to the west.

2.4 Environmental Database Review

Approach	The Landmark Envirocheck Report provides a database of environmental information held by various statutory bodies including the EA, Local Authority (LA), Health & Safety Executive (HSE) and HPA amongst others. A full copy of the Envirocheck Report is provided in Appendix E and the most relevant information is summarised below.
Features On-Site	The Landmark Envirocheck Report lists the following entries at the Site: <u>Plot A</u> ▲ Control of Major Accident Hazard Site (COMAH) – associated with Kodak Ltd referenced 1022988. The COMAH site is classified as 'Lower Tier' and listed as 'Active'; ▲ Planning Hazardous Substance Consent – the consent was granted; however no further details have been provided other than it was associated with Kodak Ltd; ▲ There are eighteen Integrated Pollution Controls (IPC) all associated with Kodak Ltd involving acid processes within the chemical industry, inorganic chemical processes, processes involving halogens and combustion processes; all entries have been revoked, superseded or deemed exempt; ▲ There are three Integrated Pollution Prevention and Controls (IPPC) associated with Future Industrial Services Limited, Ames Goldsmith (UK) Ltd and Kodak Ltd in relation to other waste disposal of oils and hazardous waste, use of inorganic chemicals (halogens, halogen/oxygen compounds), and organic compounds). All entries are listed as 'superseded'; and ▲ Two Integrated Pollution Prevention and Control (IPCC) Registered Waste Sites – both associated with Kodak Ltd involving recovery processes within the waste industry. One of the entries has been revoked and the other is at application stage. <u>Plot B</u> ▲ Potentially infilled land (non-water) – northern part of Plot B and recorded to have been infilled by 1990. The entry appears to be coincident with a former marl pit recorded on historical maps; and ▲ Potentially infilled land (water) - northern part of Plot B and recorded to have been infilled by 1850. The entry also appears to in the vicinity of a former marl pit recorded on historical maps. <u>Plot C</u> ▲ Five groundwater abstractions – three of which are associated with Ames Goldsmith (UK) Ltd and two with Kodak Ltd. Abstracted groundwater is reportedly used for general cooling and industrial/commercial public services; ▲ Licenced waste management facility – associated with Kodak Ltd involving Physico-chemical treatment facilities. The facility was licenced in 2001, no further details have been provided; and ▲ Registered waste treatment or disposal site – associated with Kodak Ltd involving incineration. The licence dated May 1977 is now defunct. Authorised waste reportedly included waste solvents. Two contemporary trade directories are registered at the site; Kodak Ltd and Eastman Co (UK) Ltd both associated with chemicals and allied products. Both entries are inactive. Three points of interest (manufacturing or production) are registered at the site; all are associated with tanks. No further details have been provided.

Potentially Contaminative Features Off-Site	Pertinent entries included within the Landmark Envirocheck Report located within 100 m of the Site include nine Contemporary Trade Directory Entries associated with commercial cleaning services, chemical manufacturers, carbon products, hardware, pallets, crates and packing cases, engineers, materials handling equipment and industrial services. There are seventeen former Integrated Pollution Controls (IPCs) located approximately 170 m to the south-west on Knowsley Industrial Park North associated with Baker Petrolite (petrochemical manufacture). These IPCs have all been revoked or superseded by Integrated Pollution Prevention and Controls (IPPCs). There are twenty four IPPCs located within 250 m of the Site; the nearest effective IPPC is approximately 10 m to the south associated with Future Industrial Services Limited at Acorn Road Waste Management Centre. Two pollution incidents are recorded on the Substantiated Pollution Incident Register within 250m of the Site boundary. The nearest incident occurred approximately 5 m to the south-west of the Site in November 2004. The incident involved organic chemicals and was reported to have a significant impact on air. No impacts on water or land were reported. There is one LA recorded landfill within 250 m of the Site, located 190 m to the south-east, on Perimeter Road, Charley Wood which is reported to be closed. The landfill reportedly accepted household waste, road sweepings and sludges (inert – processed (oily)). This is also registered as a historical landfill site which operated between 1965 and 1975, receiving inert, industrial, commercial, household waste and liquid sludge. There are no BGS or EA registered landfill sites on or within 250 m of the Site. However, anecdotal information suggests that landfilling activities occurred during the 1950s / 1960s in two parts of the site; the north-eastern corner (Plot B) and the south-eastern corner (Plot C). There are two records of potentially infilled land (water) approximately 150 m to the north-west, both of these features were mapped in 1850 and appear to be associated with ponds shown on historical mapping.
Implications for Land Contamination Risk	On-Site sources of contamination have been identified and will be considered in the preliminary risk assessment.

2.5 Planning Review / Regulatory Enquiries

On-line Planning Portal	Knowsley Council	**Date Accessed**	24/07/2019
Findings	There are several planning applications relating to Kodak Ltd, Ames Goldsmith and Eastman Company. A full list of planning applications associated with the Site are included in Appendix F. Planning applications lodged within the last year included the following: ▲ Demolition of Vacant Industrial Buildings - Plot C, Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 18/00698/DEMCON – November 2018; and ▲ Demolition of three storey office building - Eastman Company UK Ltd Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7BJ, Ref. No: 18/00434/DEMCON – July 2018.		

Part 2A of the Environmental Protection Act (EPA) 1990	The Contaminated Land Officer (CLO) at Knowsley Council was contacted on 25th July 2019. At the time of reporting, a response was yet to be received.

2.6 Previous Reports

List of Reports	Delta-Simons has obtained previous reports prepared by others relating to the Site; a full list is provided in Appendix G. Pertinent information relating to ground conditions is summarised below. Copies of the reports, together with brief summaries, are included in Appendix G.
Key Findings – Phase II Environmental Assessment. Playing Field Area by Conestoga-Rovers & Associates (UK) Ltd dated January 2005 (Plot B)	The Phase II Environmental Assessment was carried out to assess whether historical activities carried out on the eastern section of the playing field (Plot B) may have impacted the underlying soil and groundwater. A total of twenty two probe holes using a truck mounted membrane interface probe, to a maximum depth of 6 m below ground level (bgl), was used to detect the presence of volatile organic compounds (VOC), semi-volatile organic compounds (SVOC) and petroleum hydrocarbons in the shallow soil beneath Plot B. The results of the mounted interface probe survey were used to identify areas which were most likely to have contamination beneath the surface and shallow soil boring was then undertaken to 3 m bgl to obtain samples for laboratory testing. Ground conditions reportedly comprised a thin layer of turf and sandy topsoil overlying Made Ground (1-2 m thick), a thin peaty layer and Boulder Clay. Concentrations of metals and cyanide in soils were below the relevant assessment criteria. Trace concentrations of benzene, toluene, ethylbenzene and xylene (BTEX), SVOC and polycyclic aromatic hydrocarbons (PAH) were identified. Elevated concentrations of diesel range organics (DRO) were identified at one location, all other results were below the assessment criteria. Groundwater samples were also obtained from monitoring wells installed in Plot B. Laboratory analysis indicated that groundwater had not been significantly impacted beneath this area of the Site.
Key Findings – Ground Contamination Review and Remediation Action Plan, Former Kodak Chemicals Ltd Site by WSP dated April 2007 (whole Site)	WSP were commissioned to undertake an environmental assessment of the entire business park to inform a remediation action plan, in relation to a continued commercial/industrial use. Ground conditions reportedly comprised: ▲ Made Ground between 1 and 3 m thickness (maximum 7 m thickness in area of historical landfilling); ▲ Shirdley Hill Sand (a thin discontinuous sand horizon up to 1 m thick) and Glacial Till (predominantly clay horizon); ▲ The solid geology (Sherwood Sandstone) was encountered at depths of between 2.5 and 14 m; ▲ Two separate groundwater bodies were identified; one perched within the Made Ground/Shirdley Hill Sand and a deeper groundwater body within the Sherwood Sandstone. Various parts of the Site were reportedly underlain with soils and groundwater impacted with solvents and traces of chlorinated hydrocarbons as a result of the historical photochemical manufacture process. The main area of impact was beneath the original

	chemical manufacturing plant, which was demolished and replaced in the 1980's together with an area identified as solvent storage. WSP concluded the Site posed a low risk to human health (for continued use) but contamination in the underlying aquifer appeared to have been "derived from or exacerbated by activities undertaken by Kodak Ltd". WSP designed a remediation strategy to mitigate pollutant linkages between impacted soils/groundwater and the underlying aquifers. These proposals included the removal of impacted soils, in-situ treatment of soils, on site treatment of soils impacted with organic compounds, containment of PCB affected soils, with limited removal of mobile phase hydrocarbon liquids. The proposals also included collection, pre-treatment, and discharge of the shallow groundwater in the vicinity of excavations and installation of perched groundwater management to divert impacted shallow groundwater into above ground treatment infrastructure. The implementation of Monitored Natural Attenuation (MNA) programme within the shallow and deep aquifers with a target of a negotiated end point within 12 years was also recommended.
Key Findings – Former Kodak Chemicals Ltd Site, Voluntary Remediation Strategy by WSP dated December 2007 (Plot C)	At the time of the report, ownership was changing from Kodak Ltd to Acorn Developments Ltd and a small part of the wider site remained operational. As part of the due diligence process, a scope of voluntary remediation works was identified prior to purchase. The remediation works were designed by WSP to manage/mitigate a pollutant linkage between shallow soil and groundwater contaminants via leaching and vertical migration to deep groundwater. The main objective of the proposed remediation works was to mitigate the pollutant linkage to the satisfaction of the EA and Local Authority and to prevent future migration of petroleum hydrocarbons and polychlorinated biphenyls (PCB) contamination in the former toner area (which lies within Plot C). Within the Site, localised areas of impacted soils and perched groundwater were identified. The proposed remediation included a combination of reduction in site contaminant load and contaminant containment management. Total contaminant removal was considered by WSP to entail excessive cost and not considered necessary.
Key Findings – Factual Report on Ground Investigation, Former Kodak Site, Kirkby by WSP dated April 2008 (Plot C)	The aim of the investigation was to assess the presence and extent of contaminants of concern within the strata underlying several buildings including Building 21 and a Calamity Pit both located within Zone 5 (Plot C). Seven exploratory holes were drilled in Building 21 and three around the Calamity Pit. *Building 21* Made Ground was encountered in all exploratory holes to depths of between 0.4 and 0.8 m bgl and comprised black sandy gravel or gravelly sand with gravel identified as ash clinker, brick concrete and limestone. Underlying the Made Ground interbedded sands and clays were encountered to a maximum depth of 4 m bgl. Visual/olfactory evidence of contamination was observed within the Made Ground and the glacial deposits. *Calamity Pit* Made Ground was encountered in all exploratory holes to depths of between 0.5 m and 1.9 m bgl and comprised sandy gravel (brick, concrete and limestone). Underlying the Made Ground, interbedded sand and clay was encountered to a maximum depth of 4.5 m bgl. No visual/olfactory evidence of contamination was observed in this area. No elevated contaminants of concern in soils/groundwater were identified from the intrusive investigation undertaken in Building 21 and the Calamity Pit and therefore; no further investigation was considered necessary.

Key Findings - Zone 5 Remediation Validation (groundwater), Former Kodak Site by WSP dated September 2009 (Plot C)	Groundwater monitoring identified 'new contamination' within the Zone 5 area (of a separate contaminant profile to the historical contamination). Validation data collected from the eleven sumps and window samples following the completion of the Zone 5 Soils remediation works demonstrated that all contaminants of concern post remedial works were significantly below the agreed criteria. By comparison with original site investigation data, it was demonstrated that general betterment of the shallow groundwater occurred as a result of the soils remediation works, particularly with respect to BTEX compounds. As such it was the opinion of WSP Remediation that notwithstanding any potential future works required as a result of 'new contamination', no further works were required with respect to historical contamination of the shallow groundwater within Zone 5.
Key Findings – Zone 5 Remediation Validation (soils), Former Kodak Site by WSP dated September 2009 (Plot C)	WSP was commissioned to design, undertake and validate voluntary remediation works upon soil and shallow groundwater at the Site in order to discharge potential future liabilities resulting from historic contamination. The voluntary remediation works were identified during the due diligence process in order to manage/mitigate environmental liabilities relating to historic near surface soil and shallow groundwater contamination. Four particular areas of concern were identified, including the subject of these works, the Former Synchem area in Plot C. Quantitative Risk Assessment was undertaken to evaluate risks to human health and controlled waters, from which remedial targets were derived to validate the remediation of the Former Synchem area (amongst others). Further to the demolition of residual buildings and the removal of surface concrete, remedial works were subsequently undertaken to address issues associated with the Former Synchem area within Plot C. These included soil excavation, on site treatment, passive perched water removal, validation, and reinstatement with treated soils. The works included two excavations to the north and south respectively. Approximately 1,937 m^3 of soils were excavated and treated from the northern excavation with 1,308 m^3 of soils excavated and treated from the southern excavation. In addition, 1,594m^3 of surface concrete was broken out and 278 Tonnes of material disposed of off-site as non-hazardous waste. The works were completed and the remediated area was considered suitable for future development for a continued industrial or commercial end use.
Key Findings – Zone 5 Remediation Validation (groundwater), Former Kodak Site by WSP dated September 2009 (Plot C)	The EA commented that all of the post-remediation groundwater concentrations of BTEX and solvents were below the agreed remedial targets for perched groundwater and no further work was required regarding historical contamination in Zone 5 (Plot C).
Key Findings – Zone 5 Remediation Validation (soils), Former Kodak Site by WSP dated September 2009 (Plot C)	The EA were satisfied that remediation of historically contaminated soils in Zone 5 (Plot C) was carried out in accordance with the previously agreed method statement and remedial targets. The EA also highlighted a contamination event due to a leak of effluent from a drain which had contaminated water in Zone 5 (Plot C).

Key Findings – Sherwood Sandstone Condition Report by WSP dated August 2010 (Whole Site)	WSP undertook a desk-based assessment of the condition of the Sherwood Sandstone beneath the site, using chemical testing data obtained over an 8-year period. The review included consideration of potential sources of contaminants of concern and the undertaking of a detailed quantitative risk assessment (DQRA) to determine potential for migration and risks to wider groundwater quality. The review of data identified two contaminants of concern; 1,1,2,2 tetrachloroethane and tricholorethene (both chlorinated aliphatic hydrocarbons (CAH)). Both exhibit similar distributions within the aquifer and are present in the south-western corner of Plot C in the area of the Silver Nitrate Plant and the former Effluent Treatment Plant. Both were identified as historical sources. According to WSP, there was no evidence suggesting that contamination sources to the north of South Street have impacted the groundwater quality, including the four areas that have been remediated. Following a detailed review of unsaturated zone chemical data, WSP concluded that there were no significant residual shallow sources of contamination and the residual contaminants rest solely in the underlying aquifer. Potential unknown historical release to the underlying aquifer (of a small quantity of solvent) could have been accelerated by the absence of cohesive superficial deposits in the south-western corner of the site. Off-site sources of contamination may also contribute to the observed chlorinated hydrocarbon impacts within the Sherwood Sandstone aquifer. Changing groundwater flow patterns, resulting from reductions in groundwater abstraction in the region, may contribute to the observed fluctuations in the contaminant profile within the Sherwood Sandstone aquifer. Lines of evidence confirm that chlorinated hydrocarbon are attenuated within the Sherwood Sandstone aquifer and biodegradation is taking place. Utilising site-specific contamination distribution data, WSP calibrated the 2008 DQRA and provided a site-specific predictive model of CAH migration off-site in the Sherwood Sandstone aquifer. The revised DQRA indicates that both 1,1,2,2 tetrachloroethane and trichloroethene will be significantly below UK Drinking Water Standards at the previously agreed hypothetical receptor some 250 m off site. On the basis of the likely age of the CAH contamination, the apparently stable contaminant plume geometry and the predictions of the calibrated DQRA, no significant risks to controlled water resources are evident and natural attenuation processes are considered to be operating effectively to limit off-site migration. WSP developed a site remediation strategy designed to ensure that conditions within the Sherwood Sandstone aquifer beneath the site were maintained through the removal of shallow contamination sources identified within soils and perched groundwater around historical site operations and, in particular, to prevent the ongoing release of List 1 hazardous substances to the Sherwood Sandstone aquifer. This detailed review of the comprehensive chemical data set that exists on the site for soils, perched groundwater and deep groundwater, confirms that shallow sources of contamination have been adequately characterised and addressed by the WSP remediation works. No evidence of residual sources of contamination has been identified within the shallow soil and perched groundwater horizons and it is concluded that the observed CAH contamination is residual within the Sherwood Sandstone aquifer only. On this basis no further remediation works were proposed for the shallow soil and perched groundwater horizons. The evidence of impact to the Sherwood Sandstone to the south of South Street highlights the vulnerability of the aquifer in this area and sensitivity to activities conducted at the surface. It is therefore recommended that all current and future activities be subjected to an appropriate level of care and scrutiny to effectively manage the risk of future pollution.

Key Findings – Letter CL6/KN/1051/sfc from Environment Agency to WSP Remediation dated 25th October 2010 (Plot C)	The EA letter was in response to submission of WSP's Sherwood Sandstone Condition Report. The EA concluded that on the basis of all ground investigation undertaken to date and other lines of evidence, the Sherwood Sandstone contamination in the south-west corner of the Site is due to an off-site source which is outside the control and responsibility of Acorn Developments Ltd. The EA also commented that the Ames Goldsmith abstraction well appeared to be unaffected. Additional historical sources associated with Kodak Ltd may have attributed to elevated concentrations of some contaminants. The EA commented that the Sherwood Sandstone dips in a north-westerly direction and may have contributed to the observed dense non-aqueous phase liquid (DNAPL) spill on land adjacent to Site to have directed contamination towards the Site. The EA were satisfied that the Remedial Targets Methodology risk assessment that has been carried out for the chlorinated hydrocarbons and there appeared to be no unacceptable risk to the aquifer at the compliance point. No further action was required with respect of chlorinated hydrocarbons in the Sherwood Sandstone aquifer beneath the Site.
Key Findings – Summary Report on Land Quality Considerations, Image Business Park, Knowsley by Qallida Consulting dated December 2017 (Plot C)	The report states that the Site is considered suitable for redevelopment for a commercial/industrial end use, although further remediation works are likely to be required. Risks to development "Plot A" (which includes Plot A and Plot B) are considered to be low due to its historical use as playing fields. It is understood that "Plot B" (Plot C) is to be decommissioned, cleared of asbestos and demolished down to slab level as part of a future development, but poor geotechnical conditions and residual ground contamination will need to be addressed during the development stage. Existing buildings on Site are known to contain significant quantities of asbestos containing materials.
Delta-Simons comments	The third-party reports reviewed indicate that works have been undertaken in order to provide betterment of the Site and in particular Plot C through soil removal and treatment or off-site disposal and removal of perched groundwater. Given the date of the reports, these are now too old to gain legal reliance upon. The works undertaken by WSP appear to have been completed with appropriate liaison with the regulating authorities. No information about the decommissioning and removal of previous tanks and infrastructure has been provided.

3.0 Conceptual Site Model

3.1 Introduction

A Conceptual Site Model (CSM) represents the relationships between contaminant sources, pathways and receptors, to support the identification and assessment of Possible Pollutant Linkages (PPL).

3.2 Potential Contamination Sources

Identified potential contamination sources are presented in the following table:

Reference	Source	Location	Dates Present	Potential Associated Contaminants of Concern
S1	On-Site Made Ground (locally deep) associated with historical industrial land use	Site-wide	1960 to present	Asbestos, heavy metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAH), Volatile and Semi-Volatile Organic Compounds (VOC/SVOC), lubricating and mineral oils, sulphates and ground gases/vapours.
S2	Asbestos Containing Materials within existing buildings	Plot A, Plot C	1960 to present	Asbestos
S3	Warehouses with plant rooms, boiler rooms and electrical equipment	Plot A, Plot B	1960 to present	Asbestos, heavy metals, Polychlorinated Biphenyls (PCB), PAH, petroleum hydrocarbons.
S4	Former tanks, storage of chemicals, chemical manufacture, silver recovery, etc	Plot A, Plot C	1960 to present	Heavy metals, PAHs, petroleum hydrocarbons, VOC, SVOC, unknown chemicals and liquids being stored in bulk volumes. Ground gases/vapours.
S5	Infilled ground (former marl pit)	Northern part of Plot B	1850 to present	Hazardous ground gases/vapours.
S6	Industrial land uses	Off-Site	1960 to present	Heavy metals, PAH and petroleum hydrocarbons.

* Based on UK Department of the Environment Industry Profiles

3.3 Potential Receptors

Relevant potential receptors are considered to include:

- R1 - Construction workers.
- R2 - Third parties during construction (adjacent Site users)
- R3 - Future Site users and maintenance workers.
- R4 – Adjacent water courses.

- R5 - The underlying aquifers / abstraction wells.
- R6 - The Built Environment (new buildings and infrastructure / utilities).

3.4 Potential Pathways

The potential pathways are considered to be as follows:

- P1 - Direct contact, ingestion or inhalation of soil bound contaminants / dust during or following redevelopment.
- P2 - Inhalation of organic vapours associated with contamination.
- P3 - Migration of ground gas/vapours into on-site buildings causing asphyxiation or risk of explosion.
- P4 - Leaching of contamination into groundwater followed by migration of groundwater to the wider groundwater environment or discharge to surface waters.
- P5 - Direct contact between aggressive ground conditions and new infrastructure.

Source(s)	Pathway(s)	Receptor(s)	Risk Rating	Justification & Mitigation (if required)
S1/S2/S3/S4 Made Ground and Current and Historic Industrial Land Use Asbestos Containing Materials within existing buildings Warehouses with plant rooms, boiler rooms and electrical equipment Former tanks, storage of chemicals, chemical manufacture	P1/P2 Inhalation/ingestion/ dermal contact / direct contact.	Future Site users. Groundworkers during the redevelopment or during any sub-surface maintenance works. Adjacent Site users	**Moderate Risk**	The majority of the Site was in industrial use from the 1960's until 2006. Activities reported on-Site primarily within Plot C, included photochemical manufacture (including storage and usage), a silver nitrate recovery plant licensed by the Environment Agency and a small research facility with small-scale laboratories (Plot A). Given the nature and thickness of Made Ground beneath the Site, it is considered that there is significant potential for a range of common contaminants including heavy metals, PAH, petroleum hydrocarbons, VOC, SVOC and ACM to be present beneath the Site. Remedial works have been previously undertaken by others in the Plot C area; however, there remains the potential for gross contamination of soils/groundwater where the main photochemical manufacture and silver nitrate recovery was understood to have taken place. Tanks and pits were known to have been located on Site and one above ground fuel tank was identified within the Plot C area during Site reconnaissance. There is potential for other tanks, pits, etc to be present. Concentrations of hydrocarbons, VOC and SVOC may be present in areas associated with the fuel tanks, refuelling points, chemical storage and via vehicle leaks in loading/parking areas, etc. Additionally, PCB may also be located within electrical equipment. It is considered that the underlying strata would be protected to some extent by the presence of tarmac/concrete surfacing across much of the Site. However, below ground structures, drainage, service conduits, etc may provide a pathway for contaminants to migrate towards and impact the underlying strata/groundwater. Widespread ACM has been identified within the majority of the buildings within the Plot C area and also within the building in Plot A (now demolished). A Pre-Demolition Asbestos Survey is recommended prior to the demolition of the current buildings that occupy Plot C and any asbestos identified to be removed by a licenced contractor to an approved disposal facility. A geo-environmental investigation is recommended at the Site prior to redevelopment to advise on soil and groundwater quality beneath the Site to inform a Remediation Strategy, together with obtaining information for foundation design. At this stage, it is considered likely that remedial works will be required to facilitate the proposed development. These works may include the removal of tanks/storage facilities, grubbing out of below ground structures and pits together with any grossly impacted soil/groundwater for off-Site disposal. Localised in-situ/ex-situ treatment of soil/groundwater may also be required. A clean layer of certified suitable for use topsoil will be required for all landscaped areas.

Source(s)	Pathway(s)	Receptor(s)	Risk Rating	Justification & Mitigation (if required)
				Groundworkers should use appropriate personal protective equipment (PPE), including respiratory protective equipment, if required, and maintain good standards of hygiene to be protected from any soil/groundwater contamination that may be present.
	P3 Lateral migration and subsequent indoor inhalation of volatile gases/vapours.	Future Site users Groundworkers during the redevelopment or during any sub-surface maintenance works.	**Moderate Risk**	Made Ground deposits have the potential for ground gas/vapour generation and migration. It is recommended that a ground gas risk assessment is undertaken at the time of any environmental assessment.
	P4 Leaching of contamination into groundwater.	Controlled waters.	**Moderate Risk**	The Site is underlain by Secondary A aquifer (Shirdley Hill Sand Formation) and Principal Aquifer strata (Chester Formation) and there are surface water features within close proximity to the Site (20 m south and 100 m east). The Site is located within a groundwater SPZ and there are several groundwater abstractions on-Site within 1 km of the Site. It is acknowledged that no contaminative activities have been undertaken at the Site since 2006 and; therefore, there is no on-going replenishment of the source of contamination. Significant concentrations of mobile contaminants may be present beneath the Site and; therefore, the risk of migration to controlled waters is considered to be Moderate. Risks to controlled waters should be assessed as part of the geo-environmental investigation.
	P5 Direct infiltration in water supply pipes. Direct contact of buried concrete and potentially aggressive ground.	Buried pipes and services Buried concrete	**Moderate Risk**	Hydrocarbon testing of the shallow soils will be required at the time of any environmental investigation to provide recommendations for the upgrading of any potable service pipes. The Local Water Authority should be consulted to advise on this matter. Aggressive ground chemistry may attack buried concrete and; therefore, there may be a requirement for protection measures to be put in place at the Site. Risks to service pipes and buried concrete should be assessed as part of the geo-environmental investigation.
S5	P3	Future Site users	**Moderate Risk**	The infilled land within Plot B represents a potential ground gas risk. It is recommended that a ground gas risk assessment is undertaken at the time of any environmental assessment.

Source(s)	Pathway(s)	Receptor(s)	Risk Rating	Justification & Mitigation (if required)
Infilled Ground	Lateral migration and subsequent indoor inhalation of ground gases			
S6 Surrounding Industrial Land	P4 Leaching of contamination into groundwater.	Groundwater beneath the Site and current and future Site users.	**Moderate Risk**	The proximity and/or nature of the potential sources to the Site means risk from contaminant migration is moderate. An off-site source is known to have impacted groundwater beneath the south-western part of the Site.

4.0 Preliminary Ground Engineering Appraisal

4.1 Preliminary Ground Model

Based on the available information, the following ground conditions are anticipated:

Plot A - sequence of topsoil and Made Ground (generally 1 m thick) overlying thin layer of Shirdley Hill Sand Formation and/or Glacial Till. The solid geology comprises the Chester Formation. This Plot has generally remained outside of the main photochemical manufacturing facilities and therefore, widespread, significant contamination is not anticipated.

Plot B – sequence of topsoil and Made Ground (generally 1 – 2 m thick) overlying thin layer of Shirdley Hill Sand Formation and/or Glacial Till. The solid geology comprises the Chester Formation. Deep Made Ground (up to 7 m) is anticipated in the vicinity of the former marl pit in the northern part of the plot. The southern part of the plot was formerly associated with the wider photochemical manufacturing facility and localised contaminants have been identified in previous investigations. Contamination may also be present within the former marl pit associated with backfilled materials.

Plot C – majority of area covered with Made Ground (generally 1- 3 m thick) overlying Glacial Till (Shirdley Hill Sand Formation absent). The solid geology comprises the Chester Formation. Plot C comprises buildings and structures associated with the main photochemical manufacturing process and silver recovery, etc. Contamination has been confirmed to be present in shallow soils and groundwater during previous phases of intrusive investigation. Remedial works have been undertaken on a localised basis; however, potential for as yet undiscovered contamination still exists.

4.2 Plausible Geohazards

The geohazards listed below have been identified to follow guidance presented in the HA document HD22/08 ‘Managing Geotechnical Risk’ (2008) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

All potential ground stability records within the Envirocheck report are deemed to be very low or no hazard. These include:

- Collapsible Ground;
- Compressible Ground;
- Ground Dissolution;
- Landslides; and
- Shrinking or Swelling Clay.

The potential for Running Sands is deemed to be very low to low.

Reference to the Coal Authority on-line viewer indicates that the Site is not with a Coal Mining Reporting Area. However, the Envirocheck Report indicates that Coal Mining is ‘inconclusive’.

The following geohazards are considered to be substantial ground related risks associated with the proposed development. A substantial risk is defined by Delta-Simons in Appendix A.

- Made Ground -the Site is likely to comprise widespread areas of significant thicknesses of Made Ground associated with former/current development. Made Ground is typically variable in nature and strength with a potentially low bearing capacity and unacceptable levels of total/differential settlement may occur.
- Infilled ground/former marl pit – significant thicknesses (up to 7 m) of variable Made Ground have been reported in the vicinity of the historical marl pit. Potential for low bearing capacity, unacceptable levels of total/differential settlement and potential for ground gas generation.
- Basements / relict structures / obstructions – given the age and type of the former/existing development, there is a possibility of former basements, foundations, and other buried obstructions beneath the Site.

- With reference to ground investigation undertaken by others, the near-surface natural ground conditions may comprise shrinkable soils and appropriate foundation precautions may be required. This should be considered as part of the geo-environmental investigation of the Site.

Potential solutions and further steps to address the aforementioned issues are discussed in Section 5.0.

5.0 Development Considerations

5.1 Geo-Environmental Considerations

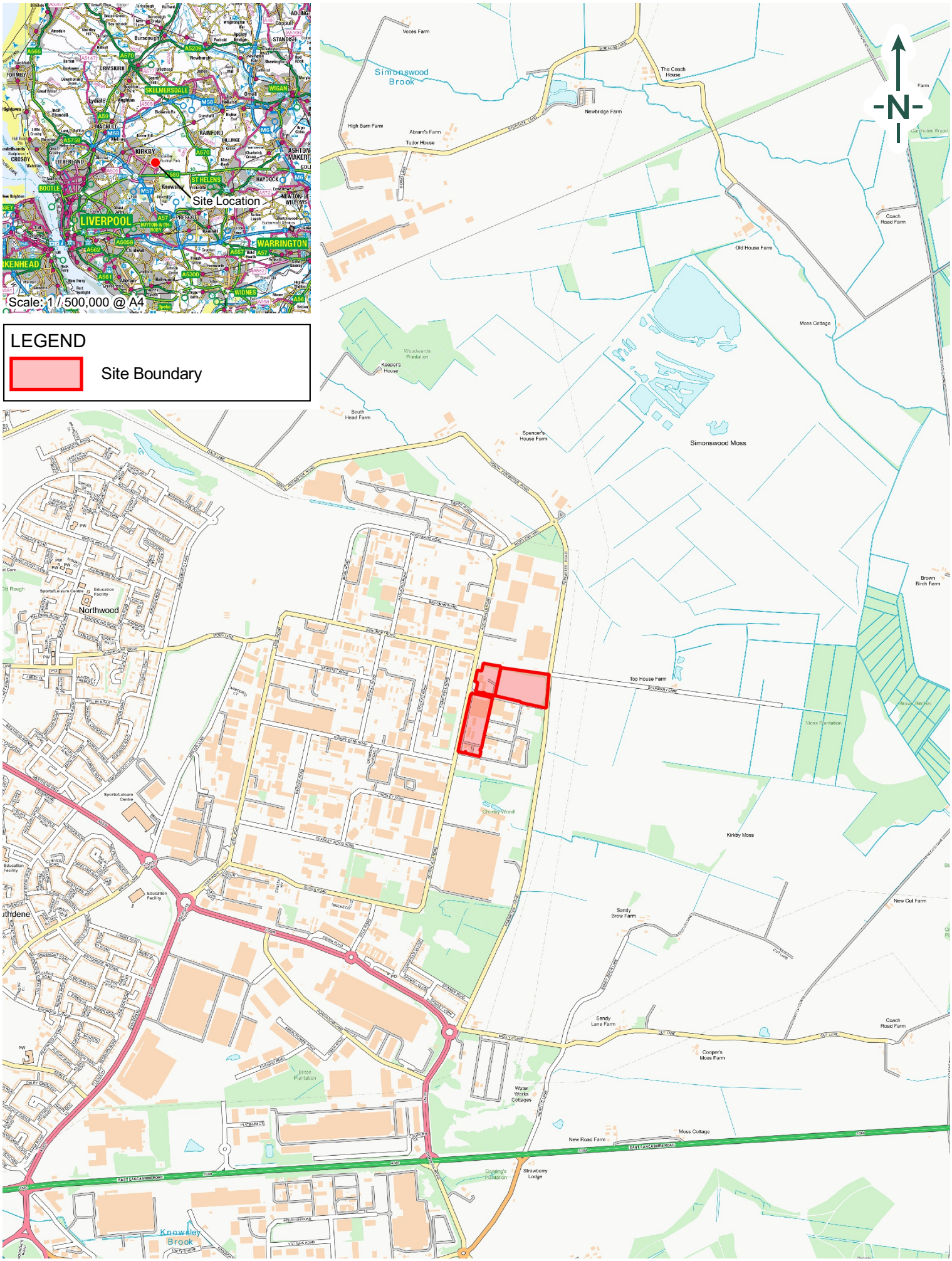
Summary	The Site is approximately L-shaped and comprises three distinct development areas; Plot A, Plot B and Plot C within Image Business Park. Plot A consists of a vacant plot where the former building has been recently demolished to slab level and Plot B comprises a rectangular-shaped open field. Plot C comprises buildings formerly associated with Kodak Ltd (photochemical manufacturers) together with an electrical substation and a waste-water treatment plant. It is understood that the Site was formerly in use as a photochemical manufacturing facility (Kodak Ltd), a silver nitrate plant (Ames Goldsmith) and offices and laboratories (Eastman Chemicals Ltd). These activities ceased in 2006-2007. Potential on-Site contaminative sources are associated with the historical photochemical manufacturing processes mainly undertaken within the Plot C area.
Soils	The risk of the Site requiring widespread remediation to protect end users is considered to be Moderate. Remedial measures are likely be required to facilitate the proposed redevelopment of the Site. A geo-environmental investigation is recommended at the Site prior to redevelopment to advise on the soil and groundwater quality beneath the Site to inform a remediation strategy, together with obtaining information for foundation design. If contamination and/or ACMs are identified, then this may have an impact on waste disposal costs.
Groundwater	The Site is located above a Secondary A and Principal Aquifer strata and within a groundwater Source Protection Zone. There are several surface water features (predominantly drains) within 100 m of the Site boundary. On this basis, the Site is considered to be within an area of high sensitivity with respect to controlled waters. The historical use of the Site provides a significant source of contamination and; therefore, risks to controlled waters should be assessed as part of the geo-environmental investigation.
Ground Gas	It is considered possible that a ground gas risk exists given the current and historic uses of the Site, particularly in the area of infilling. It is recommended that a ground gas risk assessment is undertaken at the time of any environmental assessment.
Building Fabric & Services	Services are recommended to be placed in clean corridors. A drinking water pipeline assessment may be required following soils chemical results. Aggressive ground chemistry may attack buried concrete and therefore there may be a requirement for protection measures to be put in place at the Site. Risks should be assessed as part of the geo-environmental investigation.
Foundations	The ground conditions are likely to comprise variable thicknesses/compositions of Made Ground, including the possibility of buried obstructions associated with current built development together with an area of deeper Made Ground associated with the former marl pit in Plot B. Made Ground is not considered suitable for founding purposes. Foundations would need to extend through these materials into underlying competent natural strata.

	The use of traditional foundations may not be feasible unless either very deep foundations are utilised, or the foundations are designed to span the areas of deeper Made Ground. Pad foundations taken into competent strata could be considered. Alternatively, consideration would need to be given to piling or ground improvement.
Recommendations and Development Abnormals	Delta-Simons recommends that an intrusive ground investigation be undertaken to investigate the nature and thickness of the Made Ground deposits, the identified potential contamination sources presence and to assess the potential geotechnical constraints. The scope of the intrusive investigation should assess the following; ▲ Presence, concentrations and leachability of substances of concern in shallow soils (including Made Ground) on-Site; ▲ Presence of substances of concern in any perched water or shallow groundwater beneath Site; ▲ Likelihood of significant ground gas and/or soil vapour intrusion into future on-Site buildings; and ▲ Geotechnical parameters to assist with detailed foundation design. Other potential constraints could include the following: ▲ Ecological support prior to and during Site clearance; ▲ Asbestos surveys of on-Site buildings; ▲ Presence of live buried and above ground utilities servicing the wider Image Business Park are to remain in-situ within the existing Plots A, B and C boundaries. Existing foul/chemical drainage runs should be assessed and maintained as part of the proposed development; and ▲ Decommissioning and removal of remnant below ground infrastructure.

Figure 1 – Site Location Plan

LEGEND

Site Boundary



Scale: 1:20000 @ A4

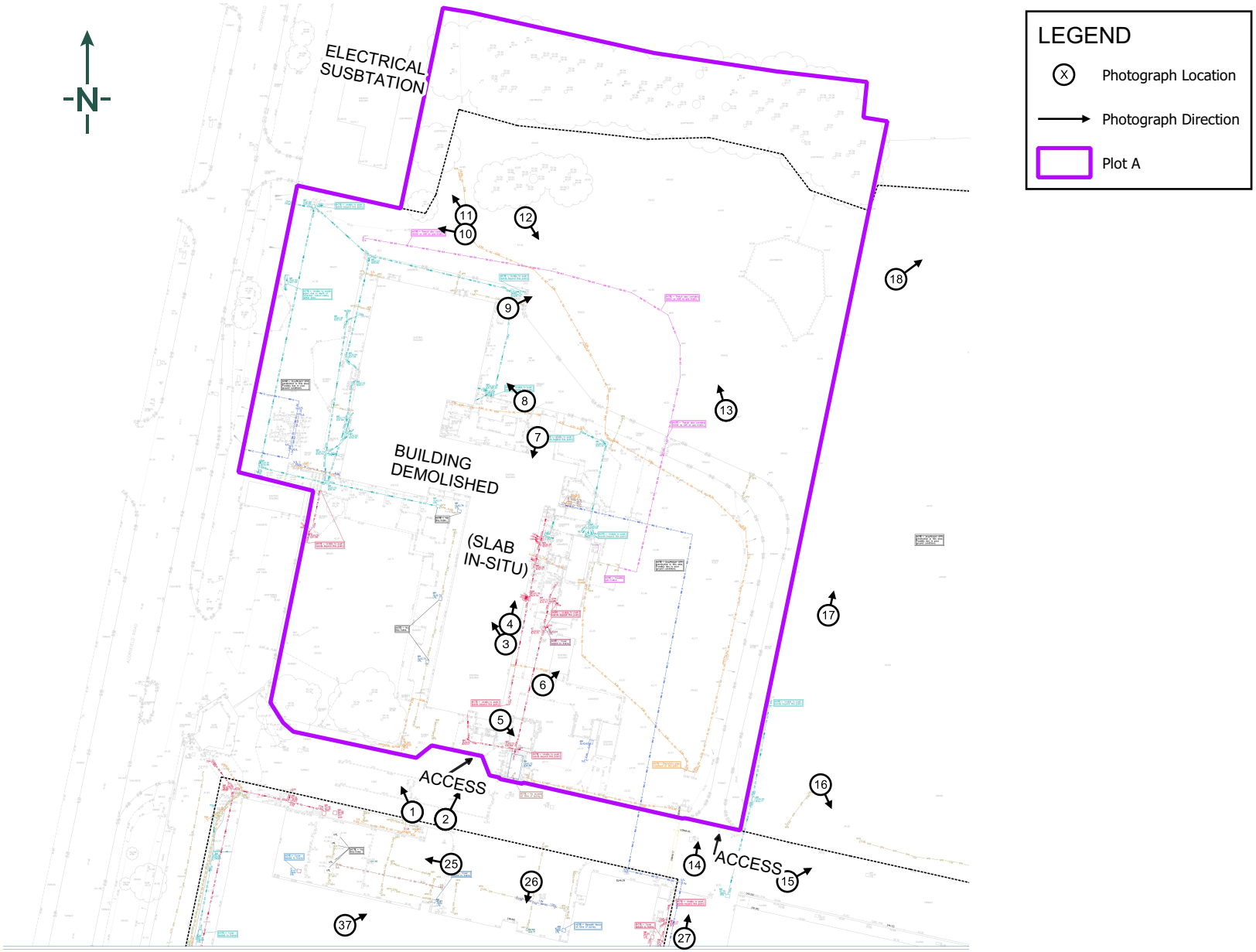
Service Layer Credits: Contains OS data @ Crown Copyright and Database Right 2019

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Site Location Map
Image Business Park
Knowsley

DRAWN BY:	SCALE (@A4):	PROJECT NO:
RB	1:20000	19-0654.01
CHECKED BY:	REVISION:	FIGURE NO:
MY	-	1
DATE:		
31 July 2019		

Figures 2a – 2c – Photograph Location Plans



Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Photograph Location Plan
Image Business Park
Knowsley

DRAWN BY: RB	SCALE (@A4): -	PROJECT NO: 19-0654.01	
CHECKED BY: MY	REVISION: -	FIGURE NO: **2a**	
DATE: 30 July 2019			

Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Photograph Location Plan
Image Business Park
Knowsley

DRAWN BY:	SCALE (@A4):	PROJECT NO:
RB	-	19-0654.01
CHECKED BY:	REVISION:	FIGURE NO:
MY	-	**2b**
DATE:		
30 July 2019		

Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Photograph Location Plan
Image Business Park
Knowsley

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30 July 2019		

Appendix A – Limitations

Limitations

The recommendations contained in this Report represent Delta-Simons professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Delta-Simons does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Delta-Simons obtained, reviewed and evaluated information in preparing this Report from the Client and others. Delta-Simons conclusions, opinions and recommendations has been determined using this information. Delta-Simons does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Delta-Simons has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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Appendix B – Risk Definitions

Contaminated Land Risk Definitions

The following methodology is based on the methodology presented in CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice 2001. It requires the classification of the:

- Magnitude of the potential consequence (severity) of the Risk occurring: and
- Magnitude of the Probability (likelihood) of the Risk occurring.

The classifications are then compared to indicate the risk presented by each pollutant linkage.

Consequence to Receptor Definition Matrix

	Human Health	Controlled Waters	Buildings/Services
Severe Consequence	Acute or chronic permanent impact on human health.	Sensitive controlled water pollution ongoing, or just about to occur.	Catastrophic collapse
Medium Consequence	Chronic permanent impact on human health	Gradual pollution of sensitive controlled water	Degradation of materials
Mild Consequence	Chronic temporary impact on human health	Gradual pollution of non-sensitive controlled water	Damage to building rendering it unsafe.to occupy (eg foundation damage resulting in instability).
Minor Consequence	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc).	Slight discoloration of water	Easily repairable effects of damage to buildings, structures and services, i.e discoloration of concrete

Probability Definitions

Probability	Definition in Context
Higher	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution. Positive evidence of source, pathway and receptor.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. Suspect source, pathway, and receptor
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term No evidence of hazard, pathway, and receptor

Standard Risk Matrix

		Consequence/ Magnitude of impact			
		Severe	Medium	Mild	Minor
Probability	**High**	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/low	Low
	Low Likelihood	Moderate	Moderate/low	Low	Very Low
	Unlikely	Moderate/low	Low	Very Low	Very Low

Classified risks and likely action

Significance Level	**Definition/Comments**
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required. Demonstrable contaminated land situation, highest threat & liability level, urgent action recommended.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term. Likely contaminated land situation, risk assessment and action recommended.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, if is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. Plausible contaminated land situation, risk assessment and possible action recommended.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Unlikely contaminated land situation, possible risk assessment and possible action.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. Negligible risk, no action recommended except vigilance for changes in conditions.

Geotechnical Risk Classification

The geohazards listed in the report within Section 4 follow guidance presented in Clayton, C.R.I. (2001) *Managing Geotechnical Risk*, Thomas Telford and the Highways Agency document HD22/08 '*Managing Geotechnical Risk*' (2008) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

For each geohazard the probability of the hazard occurring (P) has been considered together with the impact it would have (I) if it were to happen to calculate the risk rating between 1 and 25.

Risks that fall within Moderate, Significant and Severe categories below are considered to be ***substantial*** and are therefore listed within the report.

Probability	**(P)**
Very Likely (VLk)	5
Likely (Lk)	4
Plausible (P)	3
Unlikely (U)	2
Very Unlikely (VU)	1

X

Impact	**(I)**
Very High (VH)	5
High (H)	4
Medium (M)	3
Low (L)	2
Very Low (VL)	1

=

(R)	**Risk**
20 – 25	Severe
15 – 19	Substantial
10 – 14	Moderate
5 – 9	Minor
1 – 4	Negligible

Appendix B – Proposed Development Plan

Disclaimer
Subject to survey

Notes
KEY

- Image Business Park
- Plot A (2.64 acres / 1.06 hectars)
- Plot B (7 acres / 2.82 hectares)
- Plot C (5.84 acres / 2.36 hectares)

AREA SCHEDULE (GIA)

Plot A	
UNIT 1(GIA)	**45,000ft²**
Warehouse (Incl. GF Undercroft)	42,500ft²
Office (FF Only)	2,500ft²
Car Parking Spaces	*54*
Total Plot A	**45,000ft²**
Plot B	
UNIT 1(GIA)	**151,500ft²**
Warehouse (Incl. GF Undercroft)	144,750ft²
Office (FF & SF Only)	6,750ft²
Car Parking Spaces	*121*
Total Plot B	**151,000ft²**
Plot C	
B1 ;	
UNIT 1(GIA)	**37,500ft²**
Warehouse (Incl. GF Undercroft)	34,750ft²
Office (FF Only)	2,750ft²
Car Parking Spaces	*33*
B2 ;	
UNIT 1(GIA)	**11,000ft²**
Warehouse (Incl. GF Undercroft)	9,730ft²
Office (FF Only)	1,270ft²
Car Parking Spaces	*10*
UNIT 2(GIA)	**11,000ft²**
Warehouse (Incl. GF Undercroft)	9,730ft²
Office (FF Only)	1,270ft²
Car Parking Spaces	*10*
UNIT 3(GIA)	**6,500ft²**
Car Parking Spaces	*05*
UNIT 4(GIA)	**11,000ft²**
Warehouse (Incl. GF Undercroft)	9,730ft²
Office (FF Only)	1,270ft²
Car Parking Spaces	*10*
UNIT 5(GIA)	**9,000ft²**
Warehouse (Incl. GF Undercroft)	7,780ft²
Office (FF Only)	1,220ft²
Car Parking Spaces	*10*
UNIT 6(GIA)	**5,000ft²**
Car Parking Spaces	*05*
UNIT 7(GIA)	**9,000ft²**
Warehouse (Incl. GF Undercroft)	7,780ft²
Office (FF Only)	1,220ft²
Car Parking Spaces	*10*
B2 ;	
UNIT 8(GIA)	**19,500ft²**
Warehouse (Incl. GF Undercroft)	17,690ft²
Office (FF Only)	1,810ft²
Car Parking Spaces	*20*
UNIT 9(GIA)	**12,000ft²**
Warehouse (Incl. GF Undercroft)	10,710ft²
Office (FF Only)	1,290ft²
Car Parking Spaces	*17*
Total Plot B	**121,000ft²**

Rev	Notes:	Date:	Dwn	Ike
A	Plot Names changed	16.02.18	HT	HA

Client
SEYBOURNE

hale
ARCHITECTURE | DESIGN MANAGEMENT
19Ba Providence Square, Jacob Street, London SE1 2DZ

Project
Acornfield Road
Knowsley

Drawing Title:
Masterplan -
Plots A, B & C

Project No:	Scale @ A1/A3
18051	1:1000/ 1:2000

Drawing No:	Revision
SK2015	A

Appendix C – Site Photographs

Site Photographs – Plot A

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

Photograph 7

Photograph 8

Photograph 9

Photograph 10

Photograph 11

Photograph 12

Photograph 13

Photograph 14

Site Photographs – Plot B

Photograph 15

Photograph 16

Photograph 17

Photograph 18

Photograph 19

Photograph 20

Photograph 21

Photograph 22

Photograph 23

Photograph 24

Site Photographs – Plot C

Photograph 25

Photograph 26

Photograph 27

Photograph 28

Photograph 29

Photograph 30

Photograph 31

Photograph 32

Photograph 33

Photograph 34

Photograph 35

Photograph 36

Photograph 37

Photograph 38

Photograph 39

Photograph 40

Photograph 41

Photograph 42

Photograph 43

Photograph 44

Photograph 45

Photograph 46

Photograph 47

Photograph 48

Photograph 49

Photograph 50

Photograph 51

Photograph 52

Photograph 53

Photograph 54

Photograph 55

Appendix D– Landmark Envirocheck® Report

Envirocheck® Report:

Datasheet

Order Details:

Order Number:
207456127_1_1

Customer Reference:
19-0654.01

National Grid Reference:
343840, 398790

Slice:
A

Site Area (Ha):
5.94

Search Buffer (m):
1000

Site Details:

Image Business Park
Acornfield Road
Knowsley Industrial Park
KIRKBY
L33 7UF

Client Details:

Mr A Howells
Delta Simons
3 Henley Office Park
Doddington Road
Lincoln
LN6 3QR

Contents

Report Section	Page Number
Summary	-
Agency & Hydrological	1
Waste	68
Hazardous Substances	92
Geological	98
Industrial Land Use	103
Sensitive Land Use	171
Data Currency	172
Data Suppliers	178
Useful Contacts	179

Introduction

The Environment Act 1995 has made site sensitivity a key issue, as the legislation pays as much attention to the pathways by which contamination could spread, and to the vulnerable targets of contamination, as it does the potential sources of contamination.
For this reason, Landmark's Site Sensitivity maps and Datasheet(s) place great emphasis on statutory data provided by the Environment Agency/Natural Resources Wales and the Scottish Environment Protection Agency; it also incorporates data from Natural England (and the Scottish and Welsh equivalents) and Local Authorities; and highlights hydrogeological features required by environmental and geotechnical consultants. It does not include any information concerning past uses of land. The datasheet is produced by querying the Landmark database to a distance defined by the client from a site boundary provided by the client.
In this datasheet the National Grid References (NGRs) are rounded to the nearest 10m in accordance with Landmark's agreements with a number of Data Suppliers.

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Report Version v53.0

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Agency & Hydrological					
BGS Groundwater Flooding Susceptibility	pg 1	Yes		Yes	n/a
Contaminated Land Register Entries and Notices					
Discharge Consents	pg 1		1		5
Prosecutions Relating to Controlled Waters			n/a	n/a	n/a
Enforcement and Prohibition Notices	pg 2			1	
Integrated Pollution Controls	pg 2	18	17	12	35
Integrated Pollution Prevention And Control	pg 16	3	24	12	9
Local Authority Integrated Pollution Prevention And Control	pg 35				1
Local Authority Pollution Prevention and Controls	pg 35			6	19
Local Authority Pollution Prevention and Control Enforcements	pg 39				14
Nearest Surface Water Feature	pg 40	Yes			
Pollution Incidents to Controlled Waters	pg 41			3	11
Prosecutions Relating to Authorised Processes	pg 43				3
Registered Radioactive Substances					
River Quality					
River Quality Biology Sampling Points					
River Quality Chemistry Sampling Points					
Substantiated Pollution Incident Register	pg 43		2		6
Water Abstractions	pg 44	5	2	7	3 (*8)
Water Industry Act Referrals	pg 50				2
Groundwater Vulnerability Map	pg 51	Yes	n/a	n/a	n/a
Groundwater Vulnerability - Soluble Rock Risk			n/a	n/a	n/a
Groundwater Vulnerability - Local Information		1	n/a	n/a	n/a
Bedrock Aquifer Designations	pg 52	Yes	n/a	n/a	n/a
Superficial Aquifer Designations	pg 52	Yes	n/a	n/a	n/a
Source Protection Zones	pg 52	1			1
Extreme Flooding from Rivers or Sea without Defences				n/a	n/a
Flooding from Rivers or Sea without Defences				n/a	n/a
Areas Benefiting from Flood Defences				n/a	n/a
Flood Water Storage Areas				n/a	n/a
Flood Defences				n/a	n/a
OS Water Network Lines	pg 52		18	19	100

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Waste					
BGS Recorded Landfill Sites	pg 68			1	1
Historical Landfill Sites	pg 68		1		1
Integrated Pollution Control Registered Waste Sites	pg 68	2			
Licensed Waste Management Facilities (Landfill Boundaries)	pg 69				1
Licensed Waste Management Facilities (Locations)	pg 69	1	5	6	16
Local Authority Landfill Coverage	pg 75	2	n/a	n/a	n/a
Local Authority Recorded Landfill Sites	pg 76		1		3
Potentially Infilled Land (Non-Water)	pg 76	1		1	5
Potentially Infilled Land (Water)	pg 76	1	2	12	51
Registered Landfill Sites	pg 80				1
Registered Waste Transfer Sites	pg 80			2	7
Registered Waste Treatment or Disposal Sites	pg 83	4	3	2	12
Hazardous Substances					
Control of Major Accident Hazards Sites (COMAH)	pg 92	1		8	4
Explosive Sites					
Notification of Installations Handling Hazardous Substances (NIHHS)	pg 93			2	1
Planning Hazardous Substance Consents	pg 93	1		15	7
Planning Hazardous Substance Enforcements					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Geological					
BGS 1:625,000 Solid Geology	pg 98	Yes	n/a	n/a	n/a
BGS Estimated Soil Chemistry	pg 98	Yes	Yes	Yes	Yes
BGS Recorded Mineral Sites	pg 101				3
BGS Urban Soil Chemistry					
BGS Urban Soil Chemistry Averages					
CBSCB Compensation District			n/a	n/a	n/a
Coal Mining Affected Areas			n/a	n/a	n/a
Mining Instability	pg 102	Yes	n/a	n/a	n/a
Man-Made Mining Cavities					
Natural Cavities					
Non Coal Mining Areas of Great Britain				n/a	n/a
Potential for Collapsible Ground Stability Hazards	pg 102	Yes		n/a	n/a
Potential for Compressible Ground Stability Hazards	pg 102	Yes	Yes	n/a	n/a
Potential for Ground Dissolution Stability Hazards				n/a	n/a
Potential for Landslide Ground Stability Hazards	pg 102	Yes		n/a	n/a
Potential for Running Sand Ground Stability Hazards	pg 102	Yes		n/a	n/a
Potential for Shrinking or Swelling Clay Ground Stability Hazards				n/a	n/a
Radon Potential - Radon Affected Areas			n/a	n/a	n/a
Radon Potential - Radon Protection Measures			n/a	n/a	n/a
Industrial Land Use					
Contemporary Trade Directory Entries	pg 103	2	59	116	282
Fuel Station Entries	pg 145				2
Points of Interest - Commercial Services	pg 145		11	22	51
Points of Interest - Education and Health					
Points of Interest - Manufacturing and Production	pg 152	3	71	44	84
Points of Interest - Public Infrastructure	pg 169		2		8
Points of Interest - Recreational and Environmental					
Gas Pipelines					
Underground Electrical Cables					

Data Type	Page Number	On Site	0 to 250m	251 to 500m	501 to 1000m (*up to 2000m)
Sensitive Land Use					
Ancient Woodland					
Areas of Adopted Green Belt	pg 171		2		
Areas of Unadopted Green Belt					
Areas of Outstanding Natural Beauty					
Environmentally Sensitive Areas					
Forest Parks					
Local Nature Reserves	pg 171				1
Marine Nature Reserves					
National Nature Reserves					
National Parks					
Nitrate Sensitive Areas					
Nitrate Vulnerable Zones	pg 171	1			
Ramsar Sites					
Sites of Special Scientific Interest					
Special Areas of Conservation					
Special Protection Areas					
World Heritage Sites					

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A13NW (N)	0	1	343840 398800
	BGS Groundwater Flooding Susceptibility Flooding Type: Limited Potential for Groundwater Flooding to Occur	A14NW (E)	307	1	344350 398950
1	**Discharge Consents** Operator: White Moss Peat Co Ltd Property Type: FARMS (NOT HOUSE)/CROP + ANIMAL REARING/PLANT NURSERY Location: North Perimeter Road Kirkby, Simonswood, Kirkby, Merseyside Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 016992206 Permit Version: 1 Effective Date: 26th April 1990 Issued Date: Not Supplied Revocation Date: Not Supplied Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Simonswood Brook **Status:** **Post National Rivers Authority Legislation where issue date > 31/08/1989** Positional Accuracy: Located by supplier to within 100m	A13SE (SE)	194	2	344000 398600
2	**Discharge Consents** Operator: Suez Recycling & Recovery Uk Limited Property Type: GROUNDWATER REMEDIATION SITES/CIVIL ENGINEERING Location: Knowsley Rail Transfer Loading Stn Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7uz Authority: Environment Agency, North West Region Catchment Area: Not Supplied Reference: Eprcb3995vz Permit Version: 1 Effective Date: 14th September 2015 Issued Date: 14th September 2015 Revocation Date: 13th June 2016 Discharge Type: Trade Discharge - Process Water Discharge Environment: Freshwater Stream/River Receiving Water: 2 Outlets 2 Watercourses **Status:** **Revoked under EPR 2010** Positional Accuracy: Located by supplier to within 10m	A22SE (N)	956	2	343470 399883
3	**Discharge Consents** Operator: Knowsley Metropolitan Borough Council Property Type: WWTW (NOT WATER CO) (NOT STP AT A PRIVATE PREMISES) Location: Depot Rd, Kirkby Ind Est, Kirkby, Merseyside Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 016991209 Permit Version: 1 Effective Date: Not Supplied Issued Date: Not Supplied Revocation Date: 1st October 1996 Discharge Type: Sewage Discharges - Final/Treated Effluent - Not Water Company Discharge Environment: Freshwater Stream/River Receiving Water: Trib Simonswood Brook **Status:** **Lapsed (under Environment Act 1995, Schedule 23)** Positional Accuracy: Manually corrected supplier location	A19NE (NE)	961	2	344600 399700
4	**Discharge Consents** Operator: United Utilities Water Plc Property Type: Sewerage Network - Sewers - Water Company Location: Kirkby 72 Inch Outfall, Kirby I.E., Kirby Ind Est, Merseyside Authority: Environment Agency, North West Region Catchment Area: Alt Reference: 01knw0031 Permit Version: 2 Effective Date: 1st January 1995 Issued Date: 1st January 1995 Revocation Date: 1st January 1995 Discharge Type: Discharge Of Other Matter-Surface Water Discharge Environment: Freshwater Stream/River Receiving Water: Unknown **Status:** **Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A16SE (W)	972	2	342801 399162

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
4	**Discharge Consents** Operator: United Utilities Water Limited Property Type: STORM TANK/CSO ON SEWERAGE NETWORK (WATER COMPANY) Location: Kirkby 72 Outfall, Kirby I.E., Kirby Ind Est, Merseyside Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 0166/296 Permit Version: 1 Effective Date: 29th June 1968 Issued Date: 29th June 1968 Revocation Date: Not Supplied Discharge Type: Trade Discharges - Site Drainage (Contam Surface Water, Not Tips) Discharge Environment: Freshwater Stream/River Receiving Water: To Kirby Brook **Status: Pre National Rivers Authority Legislation where issue date < 01/09/1989** Positional Accuracy: Located by supplier to within 100m	A16SE (W)	972	2	342801 399162
4	**Discharge Consents** Operator: United Utilities Water Plc Property Type: Sewerage Network - Sewers - Water Company Location: Kirkby 72 Inch Outfall, Kirby I.E., Kirby Ind Est, Merseyside Authority: Environment Agency, North West Region Catchment Area: Not Given Reference: 01knw0031 Permit Version: 1 Effective Date: 1st April 1991 Issued Date: Not Supplied Revocation Date: 31st December 1994 Discharge Type: Trade Discharges - Process Effluent - Water Company (Wtw) Discharge Environment: Unknown Receiving Water: Not Supplied **Status: Authorisation revoked** Positional Accuracy: Located by supplier to within 10m	A16SE (W)	972	2	342801 399162
5	**Prosecutions Relating to Controlled Waters** Location: Kirkby Brook, Moss Lane, Knowsley Industrial Park, Kirkby, Merseyside, L33 Prosecution Text: White Wax Emulsion Overflowed From A Surface Water Catchpit Into The Nearby Watercourse Due To Negligence Of Said Catchpit Prosecution Act: Wra91 S85(1) & S85(6) Hearing Date: 2nd October 2003 Verdict: Guilty Fine: 37500 Cost: 3150 Positional Accuracy: Manually positioned within the geographical locality	A17SW (NW)	932	2	342941 399425
6	**Enforcement and Prohibition Notices** Location: Ashcroftroad, Knowsley Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7TS Permit Reference: AI3755 Enforcement Date: 8th June 1994 Details: 2 notices; Failure to use BATNEEC to prevent release of ammonia to environment and release of sulphuric acid; under EPA90. Positional Accuracy: Unknown	A12NE (NW)	472	2	343300 399100
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: Bi9766 Dated: 15th August 2000 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: BF9298 Dated: 1st February 2000 Process Type: IPC major (substantial) variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Chemical Manufacturing, Acornfield Road, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: BC7426 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (F) Acid processes within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: BE0163 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AZ1060 Dated: 16th October 1997 Process Type: IPC major (substantial) variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AX3860 Dated: 3rd December 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AV6060 Dated: 20th May 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AU1291 Dated: 29th November 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (F) Acid processes within the Chemical Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398864
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AT9696 Dated: 23rd November 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AS2688 Dated: 13th July 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AP8608 Dated: 17th March 1995 Process Type: IPC major (substantial) variation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AO4526 Dated: 2nd September 1994 Process Type: Application since found to be exempt from IPC Description: 4.5 A (H) Inorganic Chemical processes within the Chemical Industry **Status: Application since found to be exempt from IPC** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398869
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AL6778 Dated: 14th July 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.3 A (F) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343776 398879
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AL6760 Dated: 29th June 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.3 A (C) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AN3702 Dated: 25th May 1994 Process Type: Application since found to be exempt from IPC Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Application since found to be exempt from IPC** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AL6751 Dated: 3rd May 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.3 A (F) Acid processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398879
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AL8126 Dated: 28th January 1994 Process Type: Withdrawn IPC application Description: 4.4 A (A) processes involving Halogens within the Chemical Industry **Status: Application deemed withdrawn** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343776 398874
7	**Integrated Pollution Controls** Name: Kodak Ltd Location: Kirby Technical Centre, Acornfield Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AI2023 Dated: 23rd July 1993 Process Type: IPC new application Description: 1.3 A (C) Combustion processes within the Fuel & Power Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343781 398874
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BE1526 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.1 A (C) Petrochemical processes within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	172	2	343506 398618
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BE4886 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	172	2	343506 398623
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BF9301 Dated: 6th October 1999 Process Type: IPC major (substantial) variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	173	2	343506 398628

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (North), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AX5960 Dated: 22nd January 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	174	2	343506 398633
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (north), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BD5321 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	177	2	343501 398618
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AK6004 Dated: 4th February 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	177	2	343501 398623
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AS6870 Dated: 23rd November 1995 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	178	2	343501 398628
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AT5356 Dated: 21st September 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.1 A (C) Petrochemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	179	2	343501 398633
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (north), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BD8223 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	182	2	343496 398618

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AK5946 Dated: 3rd February 1994 Process Type: IPC new application Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	182	2	343496 398623
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (north), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BE7303 Dated: 25th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	183	2	343496 398628
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AK6012 Dated: 2nd February 1994 Process Type: IPC new application Description: 4.1 A (C) Petrochemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	183	2	343496 398628
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AV0541 Dated: 6th March 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	184	2	343496 398633
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (north), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BB5851 Dated: 17th November 1998 Process Type: IPC new application Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	187	2	343491 398618
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BB3760 Dated: 8th June 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	187	2	343491 398623

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park (North), LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AZ8765 Dated: 21st October 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.1 A (C) Petrochemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	188	2	343491 398628
8	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: AV0550 Dated: 6th March 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	189	2	343491 398633
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Bradman Road, Kirkby Industrial Park North, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: BE2107 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	344	2	343516 399218
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Bradman Road, Kirkby Industrial Park North, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: AQ2664 Dated: 6th June 1995 Process Type: IPC new application Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	347	2	343516 399223
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Bradman Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: Bu1741 Dated: 1st September 2003 Process Type: IPC major (substantial) variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Bradman Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: Bl3749 Dated: 6th September 2001 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228
9	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Bradman Road, Knowsley Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: BE2115 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (D) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation certificate surrendered by operator** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
9	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Bradman Road, Knowsley Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: BA1567 Dated: 12th December 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (D) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228
9	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Bradman Road, Knowsley Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: AZ4433 Dated: 14th August 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (D) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228
9	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Bradman Road, Knowsley Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: AO1241 Dated: 30th November 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.5 A (D) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	2	343516 399228
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Production Division, Bradman Road, Kirkby Industrial Park North, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: BA1559 Dated: 28th November 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	354	2	343511 399228
9	**Integrated Pollution Controls** Name: Bradman Road Manufacturing Ltd Location: Bradman Road, Kirkby Industrial Park North, Kirkby, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: AV6043 Dated: 20th May 1996 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	355	2	343516 399233
10	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road,Knowsley Industrial Park (North), Liverpool, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: Bi9111 Dated: 6th July 2000 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SE (W)	384	2	343298 398659

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
10	**Integrated Pollution Controls** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: BI5768 Dated: Not Supplied Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status:** **Application received by the EA but is not yet authorised** Positional Accuracy: Automatically positioned to the address	A12SE (W)	384	2	343298 398659
11	**Integrated Pollution Controls** Name: Kidde Products Ltd Location: Ashcroft Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: AO0229 Dated: 1st November 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	541	2	343230 399107
11	**Integrated Pollution Controls** Name: Kidde Products Ltd Location: Ashcroft Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: BC9321 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status:** **Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	543	2	343230 399112
11	**Integrated Pollution Controls** Name: Kidde Products Ltd Location: Ashcroft Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: BD1547 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status:** **Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	544	2	343230 399117
11	**Integrated Pollution Controls** Name: Kidde Products Ltd Location: Ashcroft Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: AI3755 Dated: 26th July 1993 Process Type: IPC new application Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	546	2	343225 399107
11	**Integrated Pollution Controls** Name: Kidde Products Ltd Location: Ashcroft Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: AR5235 Dated: 6th June 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.5 A (M) Inorganic Chemical processes within the Chemical Industry **Status:** **Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	548	2	343225 399112

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
12	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7uz Authority: Environment Agency, North West Region Permit Reference: Bs7226 Dated: 31st March 2003 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Manually positioned to the road within the address or location	A18NW (NW)	576	2	343541 399505
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: AK8104 Dated: 13th September 1994 Process Type: IPC new application Description: 4.7 A Pesticide production within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned in the proximity of the address	A12SW (W)	600	2	343080 398656
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: Bm2462 Dated: 19th December 2002 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.7 A Pesticide production within the Chemical Industry **Status: Authorisation certificate surrendered by operator** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: BD9424 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.7 A Pesticide production within the Chemical Industry **Status: Application has been authorised and any conditions apply to the operator** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: BE0848 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: AZ5464 Dated: 14th August 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: AY6481 Dated: 22nd July 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.7 A Pesticide production within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: AQ8140 Dated: 26th July 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.7 A Pesticide production within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	2	343072 398626
13	**Integrated Pollution Controls** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: AK6691 Dated: 18th March 1994 Process Type: IPC new application Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned in the proximity of the address	A12SW (W)	605	2	343075 398661
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AX6346 Dated: 13th January 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	627	2	343420 399501
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AY3016 Dated: 30th April 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	632	2	343420 399506
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AH1471 Dated: 21st April 1993 Process Type: IPC new application Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	633	2	343410 399501
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AQ2125 Dated: 21st February 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	634	2	343415 399506

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BC3145 Dated: Not Supplied Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Application refused** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	634	2	343415 399506
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AT5500 Dated: 21st September 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	635	2	343405 399501
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BD2985 Dated: 25th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	637	2	343410 399506
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AK9216 Dated: 9th December 1993 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	637	2	343410 399506
14	**Integrated Pollution Controls** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BC7779 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.4 A (D) processes involving Halogens within the Chemical Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	638	2	343415 399511
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AR0713 Dated: 4th May 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	638	2	343415 399511

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Integrated Pollution Controls** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AS2220 Dated: 1st August 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.4 A (D) processes involving Halogens within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	640	2	343405 399506
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, LIVERPOOL, MERSEYSIDE, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BE7931 Dated: 17th February 1999 Process Type: IPC major (substantial) variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	641	2	343409 399510
14	**Integrated Pollution Controls** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BD1822 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.4 A (D) processes involving Halogens within the Chemical Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	641	2	343410 399511
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AQ8131 Dated: 18th April 1995 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	641	2	343410 399511
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BD9068 Dated: 24th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	643	2	343415 399516
14	**Integrated Pollution Controls** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AL8231 Dated: 15th September 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.4 A (D) processes involving Halogens within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	644	2	343405 399511

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: BE7001 Dated: 20th November 1998 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	645	2	343410 399516
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AN1106 Dated: 11th July 1994 Process Type: IPC new application Description: 4.2 A (D) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	645	2	343410 399516
14	**Integrated Pollution Controls** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park North, Kirby, LIVERPOOL, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: AO5328 Dated: 2nd November 1994 Process Type: IPC application for process that was regulated by HMIP for air releases under previous legislation Description: 4.4 A (D) processes involving Halogens within the Chemical Industry **Status: Authorisation superseded by a substantial or non substantial variation** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	648	2	343405 399516
14	**Integrated Pollution Controls** Name: Organic Intermediates Ltd Location: Woodward Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7uz Authority: Environment Agency, North West Region Permit Reference: Bs7269 Dated: 31st March 2003 Process Type: IPC minor (non-substantial) variation to previous variation Description: 4.2 A (A) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Revoked - Now IPPC** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	667	2	343399 399535
15	**Integrated Pollution Controls** Name: Igm International Ltd (Dissolved) Location: Webber Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7SW Authority: Environment Agency, North West Region Permit Reference: BF9751 Dated: 9th July 1999 Process Type: IPC new application Description: 4.2 A (C) Manufacture and use of Organic Chemicals within the Chemical Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A12SW (W)	634	2	343043 398602

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
16	**Integrated Pollution Prevention And Control** Name: Future Industrial Services Limited Location: Future Industrial Services Limited, Acornfield Road Waste Management Centre, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: UP3830KX Original Permit Ref: Vp3936ug Effective Date: 14th April 2010 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) (A) Activity Description: Other Waste Disposal; Hazardous Waste Greater Than 10T/D Primary Activity: Y Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A13NW (NW)	0	2	343780 398870
16	**Integrated Pollution Prevention And Control** Name: Ames Goldsmith (Uk) Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Authority: Environment Agency, North West Region Permit Reference: XP3334MT Original Permit Ref: Xp3334mt Effective Date: 5th December 2008 **Status: Superseded By Variation** Application Type: Transfer App. Sub Type: Part without Fit and Proper Person Positional Accuracy: Automatically positioned to the address Activity Code: 4.2 A(1) (A) (VI) Activity Description: Inorganic Chemicals; Halogens Etc Or Halogen/Oxygen Compounds Etc Primary Activity: Y	A13NW (NW)	0	2	343781 398874
16	**Integrated Pollution Prevention And Control** Name: Kodak Ltd Location: Kodak Ltd, Chemical Manufacturing Division, Acornfield Road, Kirkby, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: Bu5607im Original Permit Ref: Bu5607im Effective Date: 7th September 2006 **Status: Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: Y Activity Code: 5.3 A(1) (C) (I) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Biological Treatment Primary Activity: N Activity Code: 4.2 A(1) (A) (VI) Activity Description: Inorganic Chemicals; Halogens Etc Or Halogen/Oxygen Compounds Etc Primary Activity: N	A13NW (NW)	0	2	343781 398874
17	**Integrated Pollution Prevention And Control** Name: Tradebe Minerals Recycling Limited Location: Minerals Resource Management Epr/Cp3690le, Acornfield Road, Knowsley Industrial Park,,, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: PP3039CR Original Permit Ref: Jp3837hx Effective Date: 30th January 2012 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Manually positioned to the road within the address or location Activity Code: 5.4 A(1) (C) (III) Activity Description: Recovery Of Waste; Hazardous Waste Greater Than 10T/D By Recycling Inorganics (Not Metals) Primary Activity: Y	A13SW (SW)	10	2	343679 398660

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
17	**Integrated Pollution Prevention And Control** Name: Minerals Resource Management Ltd Location: Minerals Resource Management Epr/Cp3690le, Acornfield Road, Knowsley Industrial Park,,, Liverpool, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: JP3837HX Original Permit Ref: Jp3837hx Effective Date: 21st November 2011 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Manually positioned to the road within the address or location Activity Code: 5.4 A(1) (C) (III) Activity Description: Recovery Of Waste; Hazardous Waste Greater Than 10T/D By Recycling Inorganics (Not Metals) Primary Activity: Y	A13SW (W)	13	2	343691 398729
17	**Integrated Pollution Prevention And Control** Name: Future Industrial Services Limited Location: Future Industrial Services Limited, Acornfield Road Waste Management Centre, Acornfield Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: VP3936UG Original Permit Ref: Vp3936ug Effective Date: 19th September 2008 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Manually positioned to the road within the address or location Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) (A) Activity Description: Other Waste Disposal; Hazardous Waste Greater Than 10T/D Primary Activity: Y	A13SW (SW)	14	2	343684 398704

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Integrated Pollution Prevention And Control** Name: Future Industrial Services Limited Location: Acornfield Road Waste Management Centre, Acornfield Road Waste Management Centre, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: UP3931AP Original Permit Ref: Vp3936ug Effective Date: 26th October 2015 **Status:** **Effective** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: Y Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: N Activity Code: 5.3 A(1) a) (iii) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING BLENDING OR MIXING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N	A13SW (S)	13	2	343788 398641

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Integrated Pollution Prevention And Control** Name: Future Indistrial Services Limited Location: Acornfield Road Waste Management Centre, Acornfield Road Waste Management Centre, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: BP3531WR Original Permit Ref: Vp3936ug Effective Date: 23rd March 2015 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (iii) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING BLENDING OR MIXING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N	A13SW (S)	13	2	343788 398641

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Integrated Pollution Prevention And Control** Name: Future Industrial Services Limited Location: Acornfield Road Waste Management Centre, Acornfield Road Waste Management Centre, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: XP3333WW Original Permit Ref: Vp3936ug Effective Date: 12th September 2014 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Simple Standard Variation Positional Accuracy: Automatically positioned to the address Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: N Activity Code: 5.3 A(1) a) (iii) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING BLENDING OR MIXING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A13SW (S)	13	2	343788 398641

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
18	**Integrated Pollution Prevention And Control** Name: Future Industrial Services Limited Location: Future Industrial Services Limited, Acornfield Road Waste Management Centre, Acornfield Road Waste Management Centre, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: BP3038EU Original Permit Ref: Vp3936ug Effective Date: 7th February 2014 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (iii) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING BLENDING OR MIXING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N	A13SW (S)	13	2	343788 398641
19	**Integrated Pollution Prevention And Control** Name: Ames Goldsmith Uk Limited Location: Kirkby Silver Nitrate Manufacturing, Ames Goldsmith Ltd, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: DP3937FP Original Permit Ref: Xp3334mt Effective Date: 19th December 2012 **Status: Effective** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 10m Activity Code: 4.2 A(1) (A) (VI) Activity Description: Inorganic Chemicals; Halogens Etc Or Halogen/Oxygen Compounds Etc Primary Activity: Y	A13SW (SW)	36	2	343720 398550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**Integrated Pollution Prevention And Control** Name: Mulberry Waste Limited Location: Knowsley Waste Facility Epr/Zp3439rm, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: VP3834DK Original Permit Ref: Zp3439rm Effective Date: 22nd November 2016 **Status:** **Effective** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (iv) (A) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A13NW (W)	165	2	343550 398800
20	**Integrated Pollution Prevention And Control** Name: Mulberry Waste Limited Location: Knowsley Waste Facility Epr/Zp3439rm, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: GP3637RT Original Permit Ref: Zp3439rm Effective Date: 26th April 2016 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (iv) (A) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N	A13NW (W)	165	2	343550 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**Integrated Pollution Prevention And Control** Name: Mulberry Waste Limited Location: Knowsley Waste Facility Epr/Zp3439rm, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: ZP3439RM Original Permit Ref: Zp3439rm Effective Date: 2nd October 2015 **Status:** **Superseded By Variation** Application Type: Transfer App. Sub Type: Whole with Fit and Proper Person Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (iv) (A) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N	A13NW (W)	165	2	343550 398800
20	**Integrated Pollution Prevention And Control** Name: Hydrodec (Uk) Limited Location: Knowsley Waste Facility Epr/Sp3130ek, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: GP3637WN Original Permit Ref: Sp3130ek Effective Date: 17th April 2015 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.3 A(1) a) (iv) (A) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N	A13NW (W)	165	2	343550 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**Integrated Pollution Prevention And Control** Name: Hydrodec (Uk) Limited Location: Knowsley Waste Facility Epr/Sp3130ek, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: DP3734VX Original Permit Ref: Sp3130ek Effective Date: 15th May 2014 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N	A13NW (W)	165	2	343550 398800
20	**Integrated Pollution Prevention And Control** Name: Hydrodec (Uk) Limited Location: Knowsley Waste Facility Epr/Sp3130ek, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: WP3331EA Original Permit Ref: Sp3130ek Effective Date: 23rd January 2014 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N	A13NW (W)	165	2	343550 398800
20	**Integrated Pollution Prevention And Control** Name: Hydrodec (Uk) Limited Location: Knowsley Waste Facility, Knowsley Waste Facility, Stockpit Road,,Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: GP3037WS Original Permit Ref: Sp3130ek Effective Date: Not Supplied **Status:** **Valid** Application Type: Surrender App. Sub Type: Part Positional Accuracy: Located by supplier to within 100m Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A13NW (W)	165	2	343550 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
20	**Integrated Pollution Prevention And Control** Name: Oss Group Ltd Location: Knowsley Waste Facility, Oss Group, Knowsley, Stockpit Road,Knowsley Industrial Park,, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: JP3831CZ Original Permit Ref: Ep3930us Effective Date: 8th August 2012 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: Y	A13SW (W)	173	2	343534 398766
20	**Integrated Pollution Prevention And Control** Name: Oss Group Ltd Location: Oss Knowsley, Oss Group, Knowsley, Stockpit Road,Knowsley Industrial Park,, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: VP3230CF Original Permit Ref: Ep3930us Effective Date: 31st May 2012 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: Y	A13SW (W)	173	2	343534 398766
20	**Integrated Pollution Prevention And Control** Name: Oss Group Ltd Location: Oss Knowsley, Oss Group, Knowsley, Stockpit Road,Knowsley Industrial Park,, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: FP3636KQ Original Permit Ref: Ep3930us Effective Date: 3rd September 2010 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Simple Standard Variation Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: Y	A13SW (W)	173	2	343534 398766
20	**Integrated Pollution Prevention And Control** Name: Oss Group Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: EP3930US Original Permit Ref: Ep3930us Effective Date: 26th September 2007 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: Y	A13SW (W)	173	2	343534 398766
21	**Integrated Pollution Prevention And Control** Name: Tradebe Minerals Recycling Limited Location: Minerals Resource Management Epr/Cp3690le, Image Business Park, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: LP3030AR Original Permit Ref: Jp3837hx Effective Date: 16th February 2015 **Status:** **Effective** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: Y	A13SE (SE)	165	2	343933 398591

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
21	**Integrated Pollution Prevention And Control** Name: Tradebe Minerals Recycling Limited Location: Minerals Resource Management Epr/Cp3690le, Image Business Park, Acornfield Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: XP3231EW Original Permit Ref: Jp3837hx Effective Date: 15th January 2014 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (vi) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING RECYCLING OR RECLAMATION OF INORGANIC MATERIALS OTHER THAN METALS OR METAL COMPOUNDS Primary Activity: Y	A13SE (SE)	165	2	343933 398591
22	**Integrated Pollution Prevention And Control** Name: Hydrodec (Uk) Limited Location: Knowsley Waste Facility Epr/Sp3130ek, Oss Group, Knowsley, Stockpit Road,Knowsley Industrial Park,, Knowsley, Merseyside, L33 7TQ Authority: Environment Agency, North West Region Permit Reference: SP3130EK Original Permit Ref: Sp3130ek Effective Date: 8th October 2013 **Status:** **Superseded By Variation** Application Type: Transfer App. Sub Type: Whole with Fit and Proper Person Positional Accuracy: Located by supplier to within 10m Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: Y	A12SE (W)	180	2	343520 398730
23	**Integrated Pollution Prevention And Control** Name: Avanti Environmental Group Limited Location: Avanti Treatment And Transfer Centre Epr/Xp3038hx, Knowsley Industrial Park North, Charleywood Road,,Knowsley, Liverpool, Merseyside, L33 7SG Authority: Environment Agency, North West Region Permit Reference: XP3131QL Original Permit Ref: Xp3038hx Effective Date: 23rd November 2018 **Status:** **Effective** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Located by supplier to within 100m Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A12SE (SW)	203	2	343500 398500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
23	**Integrated Pollution Prevention And Control** Name: Avanti Environmental Group Limited Location: Avanti Treatment And Transfer Centre Epr/Xp3038hx, Knowsley Industrial Park North, Charleywood Road,,Knowsley, Liverpool, Merseyside, L33 7SG Authority: Environment Agency, North West Region Permit Reference: GP3831FZ Original Permit Ref: Xp3038hx Effective Date: 20th April 2012 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Located by supplier to within 100m Activity Code: 5.3 A(1) (A) Activity Description: Other Waste Disposal; Hazardous Waste Greater Than 10T/D Primary Activity: Y Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: N Activity Code: 5.3 A(1) (C) (II) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Physico-Chemical Treatment Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A12SE (SW)	203	2	343500 398500
24	**Integrated Pollution Prevention And Control** Name: Baker Hughes Ltd Location: Baker Petrolite, Kirkby, Kirkby Bank Road, Knowsley Industrial Park (nort, Liverpool, L33 7SY Authority: Environment Agency, North West Region Permit Reference: Bu4589iz Original Permit Ref: Bu4589iz Effective Date: 8th October 2004 **Status: Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (C) Activity Description: Organic Chemicals; Polymerising Etc Unsaturated Hydrocarbons Greater Than 50T/12 Months Primary Activity: N Activity Code: 4.1 A(1) (A) (VII) Activity Description: Organic Chemicals; Organometallic Compounds Eg Lead Alkyls Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: Y Activity Code: 5.3 A(1) (C) (I) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Biological Treatment Primary Activity: N Activity Code: 4.1 A(1) (A) (III) Activity Description: Organic Chemicals; Sulphur Containing Compounds Eg Sulphides Primary Activity: N Activity Code: 4.1 A(1) (A) (V) Activity Description: Organic Chemicals; Phosphorus Containing Compounds Eg Substituted Phosphines Primary Activity: N	A12SE (W)	255	2	343429 398662

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
24	**Integrated Pollution Prevention And Control** Name: Baker Hughes Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Authority: Environment Agency, North West Region Permit Reference: SP3737LW Original Permit Ref: Bu4589iz Effective Date: 10th May 2007 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (VII) Activity Description: Organic Chemicals; Organometallic Compounds Eg Lead Alkyls Primary Activity: N Activity Code: 4.1 A(1) (A) (III) Activity Description: Organic Chemicals; Sulphur Containing Compounds Eg Sulphides Primary Activity: N Activity Code: 4.1 A(1) (C) Activity Description: Organic Chemicals; Polymerising Etc Unsaturated Hydrocarbons Greater Than 50T/12 Months Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 4.1 A(1) (A) (V) Activity Description: Organic Chemicals; Phosphorus Containing Compounds Eg Substituted Phosphines Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: Y Activity Code: 5.3 A(1) (C) (I) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Biological Treatment Primary Activity: N	A12SE (W)	256	2	343429 398662
24	**Integrated Pollution Prevention And Control** Name: Baker Hughes Limited Location: Baker Petrolite, Kirkby. Cost Code 350815050, Baker Hughes Limited, Kirkby Bank Road,,, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency, North West Region Permit Reference: QP3733NT Original Permit Ref: Bu4589iz Effective Date: 11th November 2013 **Status:** **Effective** Application Type: Variation App. Sub Type: Standard Positional Accuracy: Located by supplier to within 10m Activity Code: 4.1 A(1) (A) (V) Activity Description: Organic Chemicals; Phosphorus Containing Compounds Eg Substituted Phosphines Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) (C) (I) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Biological Treatment Primary Activity: N Activity Code: 4.1 A(1) (A) (VII) Activity Description: Organic Chemicals; Organometallic Compounds Eg Lead Alkyls Primary Activity: N Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (III) Activity Description: Organic Chemicals; Sulphur Containing Compounds Eg Sulphides Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: Y Activity Code: 4.1 A(1) (C) Activity Description: Organic Chemicals; Polymerising Etc Unsaturated Hydrocarbons Greater Than 50T/12 Months Primary Activity: N	A12SE (W)	264	2	343420 398660

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
25	**Integrated Pollution Prevention And Control** Name: Srcl Limited Location: Srcl Knowsley Treatment And Transfer Station, Srcl Knowsley Treatment And Transfer Station, Bradman Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: KP3436NL Original Permit Ref: Kp3436nl Effective Date: 16th December 2013 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Located by supplier to within 10m Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A18SW (N)	270	2	343750 399240
25	**Integrated Pollution Prevention And Control** Name: Srcl Limited Location: Srcl Knowsley Treatment And Transfer Station, Srcl Knowsley Treatment And Transfer Station, Bradman Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: NP3439DS Original Permit Ref: Kp3436nl Effective Date: 9th August 2016 **Status:** **Effective** Application Type: Variation App. Sub Type: Substantial Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N	A18SW (N)	273	2	343743 399243
25	**Integrated Pollution Prevention And Control** Name: Srcl Limited Location: Srcl Knowsley Treatment And Transfer Station, Srcl Knowsley Treatment And Transfer Station, Bradman Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7UR Authority: Environment Agency, North West Region Permit Reference: NP3537RN Original Permit Ref: Kp3436nl Effective Date: 9th June 2016 **Status:** **Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y	A18SW (N)	273	2	343743 399243

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	**Integrated Pollution Prevention And Control** Name: Syntor Fine Chemicals Ltd Location: Kirkby Intermediates, Knowsley Industrial Park, Acornfield Road,Kirkby,Knowsley, Liverpool, Merseyside, L33 7UG Authority: Environment Agency, North West Region Permit Reference: TP3633HM Original Permit Ref: Bu4376is Effective Date: 14th July 2011 **Status: Surrender Effective** Application Type: Surrender App. Sub Type: Whole Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: N Activity Code: 4.1 A(1) (A) (X) Activity Description: Organic Chemicals; Dyes And Pigments Primary Activity: N Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y	A18SW (N)	380	2	343804 399346
26	**Integrated Pollution Prevention And Control** Name: Syntor Fine Chemicals Ltd Location: Kirkby Intermediates, Knowsley Industrial Park, Acornfield Road,Kirkby,Knowsley, Liverpool, Merseyside, L33 7UG Authority: Environment Agency, North West Region Permit Reference: CP3633TQ Original Permit Ref: Bu4376is Effective Date: 22nd March 2010 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y Activity Code: 4.1 A(1) (A) (X) Activity Description: Organic Chemicals; Dyes And Pigments Primary Activity: N Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: N	A18SW (N)	380	2	343804 399346

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
26	**Integrated Pollution Prevention And Control** Name: Syntor Fine Chemicals Ltd Location: Kirkby Intermediates, Knowsley Industrial Park, Acornfield Road,Kirkby,Knowsley, Liverpool, Merseyside, L33 7UG Authority: Environment Agency, North West Region Permit Reference: CP3235XQ Original Permit Ref: Bu4376is Effective Date: 4th February 2009 **Status: Superseded By Variation** Application Type: Surrender App. Sub Type: Part Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: N Activity Code: 4.1 A(1) (A) (X) Activity Description: Organic Chemicals; Dyes And Pigments Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N	A18SW (N)	380	2	343804 399346
27	**Integrated Pollution Prevention And Control** Name: Syntor Fine Chemicals Ltd Location: Organic Intermediates Ltd, Woodward Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: UP3634MC Original Permit Ref: Bu4376is Effective Date: Not Supplied **Status: Valid** Application Type: Transfer App. Sub Type: Whole without Fit and Proper Person Positional Accuracy: Manually positioned within the geographical locality Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y Activity Code: 4.1 A(1) (A) (X) Activity Description: Organic Chemicals; Dyes And Pigments Primary Activity: N Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: N	A18SW (N)	409	2	343643 399364

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
28	**Integrated Pollution Prevention And Control** Name: Syntor Fine Chemicals Ltd Location: Organic Intermediates Ltd, Woodward Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: Jp3933ba Original Permit Ref: Bu4376is Effective Date: 24th June 2005 **Status:** **Superseded By Variation** Application Type: Transfer App. Sub Type: Whole without Fit and Proper Person Positional Accuracy: Located by supplier to within 10m Activity Code: 4.1 A(1) (A) (X) Activity Description: Organic Chemicals; Dyes And Pigments Primary Activity: N Activity Code: 4.1 A(1) (B) Activity Description: Organic Chemicals; Any Other Organic Compounds (Not Described 4.1 A(1)(A) Primary Activity: N Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N	A18SW (N)	462	2	343710 399430
28	**Integrated Pollution Prevention And Control** Name: Organic Intermediates Ltd Location: Organic Intermediates Ltd, Woodward Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7UZ Authority: Environment Agency, North West Region Permit Reference: Bu4376is Original Permit Ref: Bu4376is Effective Date: 17th December 2003 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (VI) Activity Description: Organic Chemicals; Halogen Containg Compounds Eg Halocarbons Primary Activity: Y Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: N Activity Code: 4.1 A(1) (A) (II) Activity Description: Organic Chemicals; Oxygen Containing Compounds Eg Alcohols Primary Activity: N	A18SW (N)	465	2	343717 399434
29	**Integrated Pollution Prevention And Control** Name: Kidde Products Ltd Location: Kirkby Firefighting Allophanate Plant, Kerr Frefighting Chemicals, Ashcroft Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: KP3839EK Original Permit Ref: Bu5518iu Effective Date: 14th February 2014 **Status:** **Surrender Effective** Application Type: Surrender App. Sub Type: Whole Positional Accuracy: Automatically positioned to the address Activity Code: 4.7 A(1) (B) Activity Description: Carbon Disulphide Or Ammonia; Ammonia Release To Air (Any Chemical Manufacture Not Refridgerant Use) Primary Activity: Y	A17SE (NW)	547	2	343225 399112
29	**Integrated Pollution Prevention And Control** Name: Kidde Products Ltd Location: Kirkby Firefighting Allophanate Plant, Ashcroft Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TS Authority: Environment Agency, North West Region Permit Reference: Bu5518iu Original Permit Ref: Bu5518iu Effective Date: 4th February 2005 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Manually positioned to the address or location Activity Code: 4.7 A(1) (B) Activity Description: Carbon Disulphide Or Ammonia; Ammonia Release To Air (Any Chemical Manufacture Not Refridgerant Use) Primary Activity: Y	A17SE (NW)	547	2	343225 399111

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**Integrated Pollution Prevention And Control** Name: Avanti Environmental Group Limited Location: Avanti Treatment And Transfer Centre Epr/Xp3038hx, Knowsley Industrial Park North, Charleywood Road,,Knowsley, Liverpool, Merseyside, L33 7SG Authority: Environment Agency, North West Region Permit Reference: SP3538EK Original Permit Ref: Xp3038hx Effective Date: 10th January 2014 **Status: Superseded By Variation** Application Type: Variation App. Sub Type: Minor Positional Accuracy: Automatically positioned to the address Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) a) (ii) Activity Description: DISPOSAL OR RECOVERY OF HAZARDOUS WASTE WITH A CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: Y Activity Code: 5.6 A(1) a) Activity Description: TEMPORARY STORAGE OF HAZ WASTE NOT UNDER S 5.2 PENDING ACTIVITIES LISTED IN S 5.1, 5.2, 5.3 AND PARAGRAPH (B) OF THIS SECTION WITH A TOTAL CAPACITY > 50 TONNES, EXCL TEMP STORAGE WHERE GENERATED Primary Activity: N Activity Code: 5.4 A(1) a) (ii) Activity Description: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Primary Activity: N Activity Code: 5.3 A(1) a) (iv) Activity Description: DISPOSAL OR RECOVERY OF HAZ WASTE WITH CAPACITY EXCEEDING 10 TONNES PER DAY INVOLVING REPACKAGING PRIOR TO SUBMISSION TO ANY OF THE OTHER ACTIVITIES LISTED IN THIS SECTION OR IN SECTION 5.1 Primary Activity: N	A7NE (SW)	561	2	343402 398110
30	**Integrated Pollution Prevention And Control** Name: Avanti Environmental Group Ltd Location: Neston Tank Cleaners, Knowsley Industrial Park North, Charleywood Road,,Knowsley, Liverpool, Merseyside, L33 7SG Authority: Environment Agency, North West Region Permit Reference: XP3038HX Original Permit Ref: Xp3038hx Effective Date: 16th November 2010 **Status: Superseded By Variation** Application Type: Transfer App. Sub Type: Whole limited change in management Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: N Activity Code: 5.3 A(1) (C) (II) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Physico-Chemical Treatment Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) (A) Activity Description: Other Waste Disposal; Hazardous Waste Greater Than 10T/D Primary Activity: Y	A7NE (SW)	561	2	343402 398110

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
30	**Integrated Pollution Prevention And Control** Name: Fourway Management Ltd Location: Neston Tank Cleaners, Knowsley Industrial Park North, Charleywood Road,,Knowsley, Liverpool, Merseyside, L33 7SG Authority: Environment Agency, North West Region Permit Reference: Ap3137sa Original Permit Ref: Ap3137sa Effective Date: 31st July 2006 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.3 A(1) (A) Activity Description: Other Waste Disposal; Hazardous Waste Greater Than 10T/D Primary Activity: Y Activity Code: 5.3 A(1) (C) (II) Activity Description: Other Waste Disposal; Non-Hazardous Waste >50T/D By Physico-Chemical Treatment Primary Activity: N Activity Code: 0.0 Associated Process Activity Description: Associated Process Primary Activity: N Activity Code: 5.3 A(1) (B) Activity Description: Other Waste Disposal; Waste Oils Greater Than 10T/Day Primary Activity: N	A7NE (SW)	561	2	343402 398110
31	**Integrated Pollution Prevention And Control** Name: Rentokil Initial Uk Ltd Location: Webber Road, Knowsley Industrial Park, Kirkby, Liverpool, Merseyside, L33 7SR Authority: Environment Agency, North West Region Permit Reference: BU5623IJ Original Permit Ref: Bu5623ij Effective Date: 30th March 2007 **Status:** **Effective** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (IV) Activity Description: Organic Chemicals; Nitrogen Containing Compounds Eg Amines Primary Activity: Y	A12SW (W)	605	2	343072 398626
32	**Integrated Pollution Prevention And Control** Name: Faci Uk Chemicals Limited Location: Knowsley Stearate Plant, Faci Uk Ltd, Ashcroft Road,,Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7TW Authority: Environment Agency, North West Region Permit Reference: RP3935WL Original Permit Ref: Rp3935wl Effective Date: 21st October 2014 **Status:** **Effective** Application Type: Transfer App. Sub Type: Whole limited change in management Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (VII) Activity Description: Organic Chemicals; Organometallic Compounds Eg Lead Alkyls Primary Activity: Y	A17SW (NW)	714	2	343059 399135
32	**Integrated Pollution Prevention And Control** Name: Faci Uk Ltd Location: Woodland Works, Ashcroft Road, Knowsley Industrial Park, LIVERPOOL, L33 7TW Authority: Environment Agency, North West Region Permit Reference: ZP3839LX Original Permit Ref: Zp3839lx Effective Date: 8th December 2006 **Status:** **Superseded By Variation** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 4.1 A(1) (A) (VII) Activity Description: Organic Chemicals; Organometallic Compounds Eg Lead Alkyls Primary Activity: Y	A17SW (NW)	714	2	343059 399135

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
33	**Integrated Pollution Prevention And Control** Name: White Moss Horticulture Limited Location: Simonswood Moss Epr/Cp3398sk, Simonswood Moss, North Perimeter Road,Kirkby,, Liverpool, L33 3AN Authority: Environment Agency, North West Region Permit Reference: FP3735AZ Original Permit Ref: Fp3735az Effective Date: 14th June 2016 **Status:** **Effective** Application Type: Application App. Sub Type: New Positional Accuracy: Automatically positioned to the address Activity Code: 5.4 A(1) b) (i) Activity Description: RECOVERY OR A MIX OF RECOVERY AND DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING BIOLOGICAL TREATMENT Primary Activity: Y	A23SW (N)	942	2	343857 399906
34	**Local Authority Integrated Pollution Prevention And Control** Name: Sonae (Uk) Ltd Location: Moss Lane, Liverpool, L33 7XQ Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: A2/0603/6.1/1 Dated: Not Supplied Process Type: Other Activities Description: 6/4 Manufacture of particleboard and fibreboard **Status:** **Permit Issued** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	877	3	342990 399400
35	**Local Authority Pollution Prevention and Controls** Name: North West Fencing Products Location: Bradman Road, Knowsley Industrial Estate, KIRKBY, L33 7UL Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0104/3.1/1 Dated: 30th April 2004 Process Type: Local Authority Pollution Prevention and Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Permitted** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (NW)	315	3	343578 399231
35	**Local Authority Pollution Prevention and Controls** Name: Boundary Plant Ltd Location: Bradman Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7yb Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/1092/6.4/3 Dated: 15th December 1992 Process Type: Local Authority Pollution Prevention and Control Description: PG6/34 Respraying of road vehicles **Status:** **Permitted** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (NW)	349	3	343532 399239
36	**Local Authority Pollution Prevention and Controls** Name: Cubis Location: Units 3-5 Yardley Road, Knowsley Industrial Park, Knowsley, L33 7ss Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0808/4.1/1 Dated: 21st January 2009 Process Type: Local Authority Pollution Prevention and Control Description: PG4/2 Processes for the manufacture of fibre reinforced plastics **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	324	3	343437 398382
37	**Local Authority Pollution Prevention and Controls** Name: Tarmac Topmix Location: Yardley Road, KIRKBY, Merseyside, L32 2DW Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B2/0392/3.1/06 Dated: 1st March 1992 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	364	3	343361 398418

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
38	**Local Authority Pollution Prevention and Controls** Name: New Plan Furniture Ltd Location: Charley Wood Road, KIRKBY, Merseyside, L33 7SG Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B1/0991/6.7/03 Dated: 1st September 1991 Process Type: Local Authority Air Pollution Control Description: PG6/2 Manufacture of timber and wood-based products **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	497	3	343454 398155
38	**Local Authority Pollution Prevention and Controls** Name: New Plan Furniture Ltd Location: Charley Wood Road, KIRKBY, Merseyside, L33 7SG Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B1/0992/6.5/15 Dated: 1st September 1992 Process Type: Local Authority Air Pollution Control Description: PG6/33 Wood coating **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	498	3	343456 398153
38	**Local Authority Pollution Prevention and Controls** Name: New Plan Furniture Ltd Location: Charley Wood Road, KIRKBY, Merseyside, L33 7SG Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B1/0991/6.7/03 Dated: 1st September 1991 Process Type: Local Authority Air Pollution Control Description: PG1/12 Combustion of fuel manufactured from/or comprised of, solid waste in appliances between 0.4-3MW thermal input **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	530	3	343469 398112
39	**Local Authority Pollution Prevention and Controls** Name: Thomas Hardie Commercials Location: Newstet Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7TJ Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 04/02024/Epa Dated: 31st March 1993 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A12NE (W)	513	3	343215 398898
40	**Local Authority Pollution Prevention and Controls** Name: Old Time Reproductions Ltd Location: Kirkby Bank Road, Orchard Works Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B1/0292/6.7/08 Dated: 1st February 1992 Process Type: Local Authority Air Pollution Control Description: PG6/2 Manufacture of timber and wood-based products **Status: Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	547	3	343130 398578
41	**Local Authority Pollution Prevention and Controls** Name: Dams Furniture Ltd Location: Gores Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7XS Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0192/6.6/1 Dated: Not Supplied Process Type: Local Authority Pollution Prevention and Control Description: PG1/12 Combustion of fuel manufactured from/or comprised of, solid waste in appliances between 0.4-3MW thermal input **Status: Permitted** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	585	3	343487 398046

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
42	**Local Authority Pollution Prevention and Controls** Name: Mersey Castings Eng Co Location: Marl Road, Cornhill Works, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UH Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B2/0892/2.1/08 Dated: 1st August 1992 Process Type: Local Authority Air Pollution Control Description: PG2/4 Iron, steel and non-ferrous metal foundry processes **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A17SW (NW)	652	3	343175 399270
43	**Local Authority Pollution Prevention and Controls** Name: Orion Paints Ltd Location: Unit 22 Manor Works, Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 04/02004/Epa Dated: 6th January 1998 Process Type: Local Authority Air Pollution Control Description: PG6/10 Coating manufacturing **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	655	3	343037 398740
43	**Local Authority Pollution Prevention and Controls** Name: Basiswork Ltd Location: Unit 21, Manor Works Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B3/1294/6.6/25 Dated: 1st December 1994 Process Type: Local Authority Air Pollution Control Description: PG6/10 Coating manufacturing **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	670	3	343024 398749
43	**Local Authority Pollution Prevention and Controls** Name: Orion Paints Ltd Location: Manor Works, Kirkby Bank Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SY Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 04/02004/EPA Dated: 1st September 1992 Process Type: Local Authority Air Pollution Control Description: PG6/10 Coating manufacturing **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	680	3	343010 398731
44	**Local Authority Pollution Prevention and Controls** Name: North West Fencing Products Location: 8a Webber Road, Knowsley Industrial Park, KIRKBY, Merseyside, L33 7SW Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 00/03790/Epa Dated: 3rd July 2000 Process Type: Local Authority Air Pollution Control Description: PG3/1Blending, packing, loading and use of bulk cement **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	710	3	343008 398360
45	**Local Authority Pollution Prevention and Controls** Name: Dams International Ltd Location: Marls Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7uh Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0306/6.6/1 Dated: 1st January 1992 Process Type: Local Authority Pollution Prevention and Control Description: PG1/12 Combustion of fuel manufactured from/or comprised of, solid waste in appliances between 0.4-3MW thermal input **Status:** **Authorisation certificate surrendered by operator** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	757	3	343231 399517

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
46	**Local Authority Pollution Prevention and Controls** Name: Eldapoint Ltd Location: Charleywood Road, Knowsley Industrial Park, KIRKBY, L33 7SG Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0204/6.4/1 Dated: 1st September 2004 Process Type: Local Authority Pollution Prevention and Control Description: PG6/23 Coating of metal and plastic **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	783	3	342985 398232
46	**Local Authority Pollution Prevention and Controls** Name: Stackright Building Systems Location: Stackright House, Charleywood Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SG Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/1092/6.4/4 Dated: 1st October 1992 Process Type: Local Authority Pollution Prevention and Control Description: PG6/23 Coating of metal and plastic **Status:** **Permitted** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	783	3	342985 398233
47	**Local Authority Pollution Prevention and Controls** Name: Rockfield Engineering Location: Gale Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7YE Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: KBC/LAPPC/B/1.1/001 Dated: 30th September 2003 Process Type: Local Authority Pollution Prevention and Control Description: PG1/1Waste oil burners, less than 0.4MW net rated thermal input **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	806	3	343322 397876
47	**Local Authority Pollution Prevention and Controls** Name: Rockfield Engineering Location: Gale Road, Knowsley Industrial Park, Kirkby, L33 7ye Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: 04/01995/Epa Dated: 29th July 1994 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	806	3	343322 397876
47	**Local Authority Pollution Prevention and Controls** Name: Tom England & Sons Ltd Location: Gale Road, KIRKBY, Merseyside, L32 8ZB Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B3/0992/6.5/11 Dated: 1st September 1992 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status:** **Authorisation revoked** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	840	3	343278 397860
47	**Local Authority Pollution Prevention and Controls** Name: Littlewoods Garage Location: Gale Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7YB Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B3/0992/6.5/14 Dated: 1st September 1992 Process Type: Local Authority Air Pollution Control Description: PG6/34 Respraying of road vehicles **Status:** **Authorised** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	840	3	343294 397852

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
48	**Local Authority Pollution Prevention and Controls** Name: Texaco (Robert Herbert Garage) Location: Gale Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7YB Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/1198/1.11 Dated: 29th January 1999 Process Type: Local Authority Pollution Prevention and Control Description: PG1/14 Petrol filling station **Status:** **Permitted** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	835	3	343325 397842
49	**Local Authority Pollution Prevention and Controls** Name: Sonae (Uk) Ltd Location: Moss Lane, Kirkby Industrial Park North, Kirkby, Liverpool, Merseyside, L33 7xq Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: EPAIB/0100/6.7/6/4 Dated: 13th January 2000 Process Type: Local Authority Pollution Prevention and Control Description: PG6/4 Processes for the manufacture of particleboard and fibreboard **Status:** **Transferred to LAIPPC** Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	877	3	342990 399400
50	**Local Authority Pollution Prevention and Controls** Name: Dams Furniture Ltd Location: Gores Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7YB Authority: Knowsley Metropolitan Borough Council, Environmental Health and Consumer Protection Division Permit Reference: B/0192/6.6/1 Dated: 1st January 1992 Process Type: Local Authority Pollution Prevention and Control Description: PG6/2 Manufacture of timber and wood-based products **Status:** **Permitted** Positional Accuracy: Manually positioned to the address or location	A7SW (SW)	905	3	342995 398004
51	**Local Authority Pollution Prevention and Control Enforcements** Location: Kirkby Bank Road, Knowsley Industrial Estate, Kirkby, L33 7sy Type: Air Pollution Control Enforcement Notice Reference: 04/02004/EPA Date Issued: 31st October 1994 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A12SW (W)	680	3	343010 398731
52	**Local Authority Pollution Prevention and Control Enforcements** Location: Charleywood Road, Knowsley Industrial Park, Kirkby, L33 7SG Type: Air Pollution Control Enforcement Notice Reference: 04/01996/EPA Date Issued: 20th August 1999 Enforcement Date: Not Supplied Details: Second Notice Positional Accuracy: Manually positioned to the road within the address or location	A7NW (SW)	747	3	343022 398239
52	**Local Authority Pollution Prevention and Control Enforcements** Location: Charleywood Road, Knowsley Industrial Park, Kirkby, L33 7SG Type: Air Pollution Control Enforcement Notice Reference: B/1092/6.4/4 Date Issued: 20th August 1999 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Automatically positioned to the address	A7NW (SW)	784	3	342984 398232
52	**Local Authority Pollution Prevention and Control Enforcements** Location: Stackright House, Charleywood Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SG Type: Air Pollution Control Enforcement Notice Reference: B3/1092/6.5/19 Date Issued: 25th January 1994 Enforcement Date: Not Supplied Details: N/A Positional Accuracy: Manually positioned to the address or location	A7NW (SW)	784	3	342985 398230
53	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: 04/02010/EPA Date Issued: 23rd May 2002 Enforcement Date: Not Supplied Details: Second Notice Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	811	3	342993 399250

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
53	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPA IB/0100/6.7/6\4 Date Issued: 23rd May 2002 Enforcement Date: Not Supplied Details: Section 13. Enforcement Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	811	3	342993 399250
53	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: 04/02010/EPA Date Issued: 23rd May 2002 Enforcement Date: Not Supplied Details: Fourth Notice Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	811	3	342993 399250
53	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: 04/02010/EPA Date Issued: 23rd May 2002 Enforcement Date: Not Supplied Details: Fifth Notice Positional Accuracy: Manually positioned to the address or location	A17SW (NW)	811	3	342993 399250
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPAIB/0100/6.7/6.4 Date Issued: 11th June 2004 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Kirkby Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPAIB/0100/6.7/6.4 Date Issued: 11th June 2004 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Kirkby Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPAIB/0100/6.7/6.4 Date Issued: 20th May 2004 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPAIB/0100/6.7/6.4 Date Issued: 6th April 2004 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Moss Lane, Knowlsey Industrial Park, Kirkby, L33 1aa Type: Air Pollution Control Enforcement Notice Reference: EPAIB/0100/6.7/6.4 Date Issued: 21st October 2003 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
54	**Local Authority Pollution Prevention and Control Enforcements** Location: Cusson Road, Knowsley Industrial Park, Kirkby, L33 7UD Type: Air Pollution Control Enforcement Notice Reference: B/0993/6.4/5 Date Issued: 18th March 2003 Enforcement Date: Not Supplied Details: Section 13 Enforcement Positional Accuracy: Manually positioned to the address or location	A16SE (NW)	980	3	342829 399295
	Nearest Surface Water Feature	A13SW (SW)	0	-	343724 398597

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
55	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Fire water / Foam Note: Not Supplied Incident Date: 19th February 1995 Incident Reference: 95440031 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Fire Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A12NE (NW)	377	2	343400 399100
56	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Oils - Other Oil Note: Medium Grade Fuel Oil Incident Date: 25th February 1993 Incident Reference: 93450019 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	416	2	343500 399300
57	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Oils - Unknown Note: Not Supplied Incident Date: 31st December 1993 Incident Reference: 93450147 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	484	2	343400 399300
58	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Merseyside Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Fire water / Foam Note: None Affected; Fire Water Incident Date: 12th December 1996 Incident Reference: 96440178 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Fire Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	563	2	343200 398300
59	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Chemicals - Unknown Note: Contaminated Surface Water Incident Date: 9th May 1995 Incident Reference: 95440078 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Other Incident/Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	588	2	343500 399500
60	**Pollution Incidents to Controlled Waters** Property Type: Spillage; Accident - Static Site Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Chemicals - Acid Note: Kirkby Brook; Hydrochloric Acid Incident Date: 13th November 1995 Incident Reference: 95440195 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Accidental Spillage/Leakage Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	637	2	343400 399500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
61	**Pollution Incidents to Controlled Waters** Property Type: Chemical industry Location: Megret , KNOWSLEY, Merseyside Authority: Environment Agency, North West Region Pollutant: Chemicals - Other Inorganic Note: Not Supplied Incident Date: 29th September 1998 Incident Reference: CE980936 Catchment Area: Alt Receiving Water: Groundwater Cause of Incident: Poor Operational Practice Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A17NE (NW)	723	2	343400 399600
62	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Industrial Effluent Note: Simonswood Brook; Waste Paint Incident Date: 14th July 1993 Incident Reference: 93450097 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18NW (N)	740	2	343605 399695
62	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Industrial Effluent Note: Simonswood Brook; Waste Paint Residues Incident Date: 14th July 1993 Incident Reference: 93450095 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18NW (N)	741	2	343600 399695
62	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Oils - Waste Oil Note: Simonswood Brook Incident Date: 20th April 1993 Incident Reference: 93450058 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A18NW (N)	746	2	343600 399700
63	**Pollution Incidents to Controlled Waters** Property Type: Connection To Surface Drains Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Other Note: Kirkby Brook; Industrial Effluent Incident Date: 15th November 1993 Incident Reference: 93450137 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 100m	A16SE (W)	975	2	342805 399195
63	**Pollution Incidents to Controlled Waters** Property Type: Not Given Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Miscellaneous - Fire water / Foam Note: Kirkby Brook Incident Date: 7th August 1995 Incident Reference: 95440122 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Fire Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A16SE (W)	976	2	342805 399200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
63	**Pollution Incidents to Controlled Waters** Property Type: Spillage; Accident - Static Site Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Chemicals - Acid Note: Kirkby Brook; Arsenic Acid Incident Date: 15th January 1993 Incident Reference: 93450007 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 1 - Major Incident Positional Accuracy: Located by supplier to within 100m	A16SE (W)	980	2	342800 399195
63	**Pollution Incidents to Controlled Waters** Property Type: Private Sewage (Non-PLC): Sewerage Systems Location: Location Description Not Available Authority: Environment Agency, North West Region Pollutant: Unknown Sewage Note: Kirkby Brook Incident Date: 2nd September 1992 Incident Reference: 92440124 Catchment Area: Alt Receiving Water: Not Given Cause of Incident: Unknown Incident Severity: Category 3 - Minor Incident Positional Accuracy: Located by supplier to within 100m	A16SE (W)	981	2	342800 399200
64	**Prosecutions Relating to Authorised Processes** Location: Webber Road, Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 7SW Prosecution Text: Environment Action Issue 25 (July 2000), Illegally Carrying Out An Industrial Process (By Manufacturing Zirconium Propionate, A Glue Product) For About 18 Months Without The Appropriate Authorisation From The Ea. (First Case Of Its Kind.) Prosecution Act: EPA91 Hearing Date: Not Supplied Verdict: Guilty Fine: 5000 Costs: 3417 Positional Accuracy: Manually positioned to the road within the address or location	A12SW (W)	658	2	343029 398486
65	**Prosecutions Relating to Authorised Processes** Location: Knowsley Industrial Park North, Kirkby, L33 Prosecution Text: Failure to comply with packaging waste regulations Prosecution Act: Pro97 Hearing Date: 5th January 2007 Verdict: Guilty Fine: 4200 Costs: 940 Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	700	2	343434 397943
66	**Prosecutions Relating to Authorised Processes** Location: Land at Unit 7 Webber Road, Knowlsey Industrial Park North, LIVERPOOL, Merseyside, L33 7SW Prosecution Text: Unlicensed Site Used To Dump Waste Prosecution Act: Epa90 S33(1)(A) & S33(6) Hearing Date: 27th June 2002 Verdict: Guilty Fine: 9000 Costs: 2073 Positional Accuracy: Manually positioned to the address or location	A12SW (W)	719	2	342961 398537
67	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 6th November 2014 Incident Reference: 1298083 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Inorganic Chemicals : Other	A13SW (SW)	6	2	343681 398649
68	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 27th September 2016 Incident Reference: 1479097 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Inorganic Chemicals : Other	A13SE (S)	78	2	343863 398680

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
69	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 23rd April 2007 Incident Reference: 488545 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Atmospheric Pollutants and Effects: Fumes	A7NE (SW)	519	2	343229 398337
70	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 17th July 2002 Incident Reference: 92300 Water Impact: Category 4 - No Impact Air Impact: Category 4 - No Impact Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable : Other	A18NE (N)	526	2	343883 399481
71	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 8th November 2002 Incident Reference: 119566 Water Impact: Category 4 - No Impact Air Impact: Category 2 - Significant Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: Atmospheric Pollutants and Effects: Smoke	A18NW (N)	602	2	343557 399539
72	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 8th January 2013 Incident Reference: 1076188 Water Impact: Category 4 - No Impact Air Impact: Category 3 - Minor Incident Land Impact: Category 2 - Significant Incident Positional Accuracy: Located by supplier to within 10m Pollutant: Inert : Construction / Demolition Material Pollutant: Asbestos Waste Pollutant: Specific Waste Materials: Tyres	A12NW (W)	610	2	343098 398810
73	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 23rd October 2002 Incident Reference: 116277 Water Impact: Category 1 - Major Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable : Natural Organic Material	A16SE (W)	973	2	342801 399166
73	**Substantiated Pollution Incident Register** Authority: Environment Agency - North West Region, South Area Incident Date: 8th November 2002 Incident Reference: 119583 Water Impact: Category 2 - Significant Incident Air Impact: Category 3 - Minor Incident Land Impact: Category 4 - No Impact Positional Accuracy: Located by supplier to within 10m Pollutant: General Biodegradable : Natural Organic Material	A16SE (W)	974	2	342800 399165
74	**Water Abstractions** Operator: Ames Goldsmith Uk Ltd Licence Number: 2569031089 Permit Version: 102 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land & Premises At Kodak Ltd,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 26th July 2016 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NW (W)	0	2	343800 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
74	**Water Abstractions** Operator: Ames Goldsmith Uk Ltd Licence Number: 2569031089 Permit Version: 101 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: General Use (Medium Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land & Premises At Kodak Ltd,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th November 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NW (W)	0	2	343800 398800
74	**Water Abstractions** Operator: Ames Goldsmith Uk Ltd Licence Number: 2569031089 Permit Version: 101 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land & Premises At Kodak Ltd,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th November 2006 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NW (W)	0	2	343800 398800
74	**Water Abstractions** Operator: Kodak Ltd Licence Number: 2569031089 Permit Version: 100 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: General Use (Medium Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 341 Yearly Rate (m3): 90920 Details: Land & Premises At Kodak Ltd,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th January 1990 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NW (W)	0	2	343800 398800
74	**Water Abstractions** Operator: Kodak Ltd Licence Number: 2569031089 Permit Version: 100 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Chemicals: General Cooling (Existing Licences Only) (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 341 Yearly Rate (m3): 90920 Details: Land & Premises At Kodak Ltd,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 10th January 1990 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NW (W)	0	2	343800 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
75	**Water Abstractions** Operator: Pilkington Brothers Ltd Licence Number: 2569031011 Permit Version: 100 Location: Borehole At Kirkby Industrial Estatekirkby, Merseyside Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: General Cooling (Existing Licences Only) (Low Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 5237 Yearly Rate (m3): 1591100 Details: Cowley Hill Works,St. Helens Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th January 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A13NE (N)	57	2	343900 399000
75	**Water Abstractions** Operator: Pilkington Brothers Ltd Licence Number: 2569031011 Permit Version: 100 Location: Borehole At Kirkby Industrial Estatekirkby, Merseyside Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Cowley Hill Works,St. Helens Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th January 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A13NE (N)	57	2	343900 399000
76	**Water Abstractions** Operator: Baker Hughes Limited Licence Number: 2569031090 Permit Version: 101 Location: Borehole At Kirkby Industrial Estate Authority: Environment Agency, North West Region Abstraction: Petrochemicals: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Premises At Birchill Road,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th March 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SE (W)	292	2	343400 398700
76	**Water Abstractions** Operator: Baker Hughes Limited Licence Number: 2569031090 Permit Version: 101 Location: Borehole At Kirkby Industrial Estate Authority: Environment Agency, North West Region Abstraction: Petrochemicals: Boiler Feed Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Premises At Birchill Road,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 18th March 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SE (W)	292	2	343400 398700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
76	**Water Abstractions** Operator: Baker Hughes Limited Licence Number: 2569031090 Permit Version: 101 Location: Borehole At Kirkby Industrial Estate Authority: Environment Agency, North West Region Abstraction: Petrochemicals: Drinking, Cooking, Sanitary, Washing, (Small Garden) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Premises At Birchill Road,Kirkby Authorised Start: 01 January Authorised End: 31 March Permit Start Date: 18th March 2011 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SE (W)	292	2	343400 398700
76	**Water Abstractions** Operator: Petrolite Ltd Licence Number: 2569031090 Permit Version: 100 Location: Borehole At Kirkby Industrial Estate Authority: Environment Agency, North West Region Abstraction: Petrochemicals: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 818 Yearly Rate (m3): 250030 Details: Premises At Birchill Road,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st January 1989 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SE (W)	292	2	343400 398700
76	**Water Abstractions** Operator: Petrolite Ltd Licence Number: 2569031090 Permit Version: 100 Location: Borehole At Kirkby Industrial Estate Authority: Environment Agency, North West Region Abstraction: Petrochemicals: Boiler Feed Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 818 Yearly Rate (m3): 250030 Details: Premises At Birchill Road,Kirkby Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st January 1989 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	292	2	343400 398700
77	**Water Abstractions** Operator: Berry Brothers Farms Ltd Licence Number: 2569031068 Permit Version: Not Supplied Location: Unnamed Tributary Of Simonswood Brook At, Kirkby Authority: Environment Agency, North West Region Abstraction: Agricultural Spray Irrigation (Summer) Abstraction Type: Not Supplied Source: Surface Daily Rate (m3): 1000 Yearly Rate (m3): 45460 Details: Additional Purpose: Licence Status: Cancelled Authorised Start: Not Supplied Authorised End: Not Supplied Permit Start Date: Not Supplied Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A14NW (NE)	315	2	344300 399100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
78	**Water Abstractions** Operator: Berry Bros Farms Ltd Licence Number: 2569031068 Permit Version: 100 Location: Unnamed Tributary Of Simonswood Brook At Kirkby Authority: Environment Agency, North West Region Abstraction: General Agriculture: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a river or stream reach, or a row of wellpoints Source: Surface Daily Rate (m3): 1000 Yearly Rate (m3): 45460 Details: Top House Farm, Kirkby Authorised Start: 01 March Authorised End: 30 September Permit Start Date: 14th June 1984 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18SE (NE)	487	2	344100 399400
79	**Water Abstractions** Operator: Sonae (Uk) Limited Licence Number: 2569031146 Permit Version: 1 Location: Sonae Borehole, Knowsley, Merseyside Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Dust Suppression Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th October 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	842	2	342984 399310
79	**Water Abstractions** Operator: Sonae (Uk) Limited Licence Number: 2569031146 Permit Version: 1 Location: Sonae Borehole, Knowsley, Merseyside Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Process Water Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th October 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	842	2	342984 399310
79	**Water Abstractions** Operator: Sonae (Uk) Limited Licence Number: 2569031146 Permit Version: 1 Location: Sonae Borehole, Knowsley, Merseyside Authority: Environment Agency, North West Region Abstraction: Other Industrial/Commercial/Public Services: Non-Evaporative Cooling Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 17th October 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SW (NW)	842	2	342984 399310

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Liverpool Football Club Soccer Academy Licence Number: 2569031131 Permit Version: 1 Location: Borehole B At Kirkby Authority: Environment Agency, North West Region Abstraction: General Agriculture; General Use (Medium Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th September 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (W)	1217	2	342460 398570
	Water Abstractions Operator: Liverpool Football Club Soccer Academy Licence Number: 2569031131 Permit Version: 1 Location: Borehole B At Kirkby Authority: Environment Agency, North West Region Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th September 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (W)	1217	2	342460 398570
	Water Abstractions Operator: Liverpool Football Club Soccer Academy Licence Number: 2569031131 Permit Version: 1 Location: Borehole A At Kirkby Authority: Environment Agency, North West Region Abstraction: General Agriculture; General Use (Medium Loss) Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th September 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (W)	1227	2	342450 398580
	Water Abstractions Operator: Liverpool Football Club Soccer Academy Licence Number: 2569031131 Permit Version: 1 Location: Borehole A At Kirkby Authority: Environment Agency, North West Region Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 28th September 1999 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (W)	1227	2	342450 398580

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Water Abstractions Operator: Liverpool Football Club & Athletic Grounds Limited Licence Number: 2569031131 Permit Version: 2 Location: Borehole At Kirkby Authority: Environment Agency, North West Region Abstraction: Sports Grounds/Facilities: Spray Irrigation - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Liverpool Way, Kirkby Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 23rd October 2014 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	A11SW (W)	1232	2	342445 398610
	Water Abstractions Operator: United Utilities Water Ltd Licence Number: 2569031016 Permit Version: 102 Location: Well Borehole And Wells And Boreholes X 2 At Knowsley Authority: Environment Agency, North West Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Not Supplied Authorised Start: 01 April Authorised End: 31 March Permit Start Date: 26th November 2018 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A3SE (S)	1495	2	344000 397100
	Water Abstractions Operator: United Utilities Water Ltd Licence Number: 2569031016 Permit Version: 100 Location: Well Borehole And Wells And Boreholes X 2 At Knowsley Authority: Environment Agency, North West Region Abstraction: Public Water Supply: Potable Water Supply - Direct Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): 7500 Yearly Rate (m3): 1659326 Details: Well Borehole And Wells And Boreholes (2) Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 16th March 1966 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 100m	A3SE (S)	1495	2	344000 397100
	Water Abstractions Operator: City Centre Commercials Ltd Licence Number: 2569031137 Permit Version: 1 Location: Permo Triassic Sandstone At Simonswood Authority: Environment Agency, North West Region Abstraction: Construction: Dust Suppression Abstraction Type: Water may be abstracted from a single point Source: Groundwater Daily Rate (m3): Not Supplied Yearly Rate (m3): Not Supplied Details: Land At Simonswood Authorised Start: 01 January Authorised End: 31 December Permit Start Date: 1st April 2008 Permit End Date: Not Supplied Positional Accuracy: Located by supplier to within 10m	(N)	1890	2	343750 400860
80	**Water Industry Act Referrals** Name: Fourways Management Ltd Location: CHARLEYWOOD ROAD, KNOWSLEY, PRESCOT, MERSEYSIDE, L33 7SG Authority: Environment Agency, North West Region Permit Reference: Bu6450 Dated: 21st March 2003 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations **Status: Application received by the EA but is not yet authorised** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	530	2	343353 398180

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
81	**Water Industry Act Referrals** Name: Liver Plating Plc (Dissolved) Location: LIVER PLATING PLC (DISSOLVED), GLADESWOOD, LEES ROAD, KNOWSLEY INDUSTRIAL PARK NORTH, LEES ROAD, LIVERPOOL, LIVERPOOL, L33 7SA Authority: Environment Agency, North West Region Permit Reference: AW9447 Dated: 10th October 1996 Process Type: Permissions or amendments to discharge under the Water Industry Act 1991 Description: Processes which result in the discharge of Special Category effluents under The Trade Effluents (Prescribed Processes and Substances) Regulations **Status: Application received by the EA but is not yet authorised** Positional Accuracy: Located by supplier to within 100m	A12SW (W)	684	2	343000 398500
	Groundwater Vulnerability Map Combined Classification: Principle Bedrock Aquifer - Low Vulnerability Combined Vulnerability: Low Combined Aquifer: Productive Bedrock Aquifer, Unproductive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: High	A13NW (E)	0	4	343840 398787
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: High	A13NE (N)	0	4	343877 398926
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - High Vulnerability Combined Vulnerability: High Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: High Bedrock Flow: Mixed Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: High	A13NW (N)	0	4	343839 398802
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - Medium Vulnerability Combined Vulnerability: Medium Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Intermediate Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: Low	A13NE (NE)	0	4	344000 398913

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	Groundwater Vulnerability Map Combined Classification: Secondary Superficial Aquifer - Medium Vulnerability Combined Vulnerability: Medium Combined Aquifer: Productive Bedrock Aquifer, Productive Superficial Aquifer Pollutant Speed: Intermediate Bedrock Flow: Well Connected Fractures Dilution: 300-550 mm/year Baseflow Index: >70% Superficial Patchiness: >90% Superficial Thickness: 3-10m Superficial Recharge: Low	A13NE (E)	0	4	344000 398787
	Groundwater Vulnerability - Soluble Rock Risk None				
	Bedrock Aquifer Designations Aquifer Designation: Principal Aquifer	A13NW (E)	0	4	343840 398787
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - A	A13NW (N)	0	4	343839 398802
	Superficial Aquifer Designations Aquifer Designation: Secondary Aquifer - Undifferentiated	A13NE (N)	0	4	343877 398926
	Superficial Aquifer Designations Aquifer Designation: Unproductive Strata	A13NW (E)	0	4	343840 398787
82	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone III (Total Catchment): The total area needed to support the discharge from the protected groundwater source.	A13NW (E)	0	2	343840 398787
83	**Source Protection Zones** Name: Not Supplied Source: Environment Agency, Head Office Reference: Not Supplied Type: Zone II (Outer Protection Zone): Either 25% of the source area or a 400 day travel time whichever is greater.	A3NE (S)	991	2	343933 397599
	Extreme Flooding from Rivers or Sea without Defences None				
	Flooding from Rivers or Sea without Defences None				
	Areas Benefiting from Flood Defences None				
	Flood Water Storage Areas None				
	Flood Defences None				
84	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1084.4 Watercourse Level: Not Supplied Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (SW)	87	5	343635 398522
85	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 61.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SW (S)	90	5	343787 398489

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
86	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 98.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (S)	91	5	343762 398484
87	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.9 Watercourse Level: Underground Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (S)	92	5	343762 398483
88	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 19.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SW (S)	95	5	343785 398480
89	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (S)	97	5	343766 398479
90	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 39.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (S)	99	5	343768 398477
91	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 76.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SW (S)	99	5	343789 398479
92	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SW (S)	121	5	343838 398481
93	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 114.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SW (S)	124	5	343842 398480
94	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 40.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A13SW (S)	138	5	343763 398438

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
95	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8NW (S)	175	5	343770 398400
96	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NW (S)	175	5	343770 398400
97	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8NW (S)	178	5	343769 398398
98	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 38.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NW (S)	180	5	343781 398397
99	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 30.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8NW (S)	187	5	343776 398389
100	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 180.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A13SE (SE)	192	5	344049 398601
101	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 74.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NW (S)	204	5	343815 398379
102	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.9 Watercourse Level: Underground Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NE (S)	261	5	343878 398341
103	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NW (NE)	282	5	344284 399063

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
104	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NE (S)	304	5	343892 398301
105	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 1.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8NE (S)	324	5	343903 398284
106	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 62.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NE (S)	324	5	343903 398284
107	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.2 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8NE (S)	326	5	343903 398282
108	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 140.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SW (E)	357	5	344352 398633
109	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SW (E)	357	5	344366 398679
110	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 198.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SW (E)	357	5	344367 398682
111	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 42.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	365	5	344322 399153
112	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 274.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	365	5	344288 399192

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
113	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 21.4 Watercourse Level: Underground Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NE (S)	366	5	343964 398270
114	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 308.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A8NE (S)	378	5	343985 398271
115	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	378	5	344356 399130
116	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NW (E)	381	5	344424 398872
117	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 67.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NW (E)	389	5	344431 398872
118	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 367.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	419	5	344222 399295
119	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 125.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NW (NE)	440	5	344447 399094
120	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 141.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18SE (NE)	466	5	344155 399368
121	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 112.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	531	5	344576 398910

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
122	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	531	5	344576 398908
123	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 322.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SE (E)	532	5	344548 398679
124	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 53.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SE (E)	541	5	344538 398615
125	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	552	5	344570 399085
126	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 371.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14SW (E)	554	5	344531 398562
127	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	556	5	344591 399021
128	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 153.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	556	5	344591 399021
129	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	559	5	344068 399479
130	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 61.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	559	5	344068 399479

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
131	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 314.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	566	5	344584 399086
132	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 181.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	574	5	344043 399499
133	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 208.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SE (S)	589	5	343941 398015
134	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 98.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	610	5	343715 397967
135	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 184.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	612	5	344324 399459
136	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9NW (SE)	613	5	344263 398222
137	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 138.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A9NW (SE)	613	5	344263 398222
138	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	614	5	343623 397978
139	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	615	5	343619 397978

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
140	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 99.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SW (S)	615	5	343752 397960
141	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 13.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	616	5	343717 397962
142	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 22.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SW (S)	618	5	343737 397958
143	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 34.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	619	5	344089 399537
144	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 217.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	620	5	344513 399321
145	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 9.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	620	5	344513 399321
146	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.7 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	621	5	344520 399315
147	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 118.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SW (NE)	622	5	344523 399312
148	**OS Water Network Lines** Watercourse Form: Lake Watercourse Length: 12.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	627	5	343722 397950

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
149	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SW (S)	631	5	343835 397949
150	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SW (S)	632	5	343841 397949
151	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 37.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	637	5	343714 397940
152	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 8.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	638	5	343586 397962
153	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 3.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SE (S)	640	5	343870 397945
154	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 14.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SE (S)	641	5	343873 397945
155	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 56.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	643	5	343591 397956
156	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 145.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SE (S)	645	5	344072 398010
157	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 272.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	645	5	343893 399600

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
158	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 31.6 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A8SE (S)	646	5	343887 397942
159	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 12.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SE (NE)	652	5	344615 399232
160	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 264.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NE (N)	653	5	344100 399569
161	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 93.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SE (S)	657	5	343918 397937
162	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 63.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A19SE (NE)	665	5	344627 399236
163	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SE (NE)	665	5	344627 399236
164	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	669	5	343695 397911
165	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 27.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	673	5	343692 397907
166	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.8 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	678	5	343608 397916

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
167	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	678	5	343611 397915
168	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 56.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	700	5	343682 397880
169	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	700	5	343682 397880
170	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.4 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	702	5	343690 397878
171	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 97.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	703	5	343694 397876
172	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 349.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A9NW (SE)	707	5	344398 398190
173	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 399.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A19SE (NE)	727	5	344687 399257
174	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SE (S)	734	5	343877 397850
175	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 4.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	734	5	343785 397842

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
176	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 56.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	736	5	343789 397840
177	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	755	5	343661 397828
178	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 49.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	765	5	343660 397817
179	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 172.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A18NW (N)	766	5	343659 399730
180	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 557.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19SE (NE)	776	5	344764 399205
181	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 15.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (N)	780	5	344208 399678
182	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 435.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	783	5	344474 399570
183	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 32.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A18NE (N)	785	5	344117 399701
184	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 7.9 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	792	5	344219 399687

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
185	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	797	5	344226 399691
186	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 35.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A19NW (NE)	802	5	344231 399695
187	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 50.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	802	5	344231 399695
188	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 30.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A8SW (S)	812	5	343638 397773
189	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 249.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A14NE (E)	814	5	344854 398828
190	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 6.5 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A18NE (N)	814	5	344137 399726
191	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 10.1 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A19NW (N)	817	5	344203 399717
192	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 66.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A18NE (N)	820	5	344141 399731
193	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 115.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NE (NE)	835	5	344591 399548

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
194	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 133.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NE (NE)	839	5	344592 399551
195	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 312.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	855	5	344309 399728
196	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (NE)	855	5	344309 399728
197	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 65.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15NW (E)	862	5	344892 399075
198	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 145.7 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A15NW (E)	862	5	344892 399075
199	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 139.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A20SW (E)	874	5	344890 399140
200	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 441.1 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NW (N)	883	5	344247 399775
201	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 300.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15SW (E)	905	5	344916 398622
202	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 578.6 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A23SW (N)	906	5	343538 399850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
203	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 11.3 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15NW (E)	908	5	344946 398804
204	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 90.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15NW (E)	908	5	344947 398816
205	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 96.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 2	A15SW (E)	915	5	344897 398509
206	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 80.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15NW (E)	919	5	344957 398802
207	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 123.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A24SW (N)	942	5	344201 399844
208	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 166.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A23SE (N)	948	5	344132 399863
209	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 284.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A23SE (N)	954	5	344138 399868
210	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 349.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A16SE (W)	966	5	342807 399162
211	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 82.3 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NE (NE)	967	5	344697 399629

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
212	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 78.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A19NE (NE)	977	5	344641 399689
213	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 102.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9NE (SE)	979	5	344812 398202
214	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 281.9 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9NE (SE)	979	5	344848 398257
215	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 102.0 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9NE (SE)	987	5	344743 398103
216	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 2.8 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9NE (SE)	987	5	344791 398167
217	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 143.2 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9SW (SE)	990	5	344380 397802
218	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 171.5 Watercourse Level: On ground surface Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A9SE (SE)	997	5	344731 398085
219	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 316.4 Watercourse Level: On ground surface Permanent: True Watercourse Name: Kirkby Brook Catchment Name: Alt Primacy: 1	A9SE (SE)	997	5	344731 398085
220	**OS Water Network Lines** Watercourse Form: Inland river Watercourse Length: 5.0 Watercourse Level: Underground Permanent: True Watercourse Name: Not Supplied Catchment Name: Alt Primacy: 1	A15NW (E)	1000	5	345037 398792

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
221	**BGS Recorded Landfill Sites** Site Name: Perimeter Road Tip Location: Kirkby, NR LIVERPOOL, Merseyside Authority: British Geological Survey, National Geoscience Information Service Ground Water: No threat to ground water Surface Water: No threat to surface water Geology: N/A Positional Accuracy: Positioned by the supplier Boundary Accuracy: Moderate	A13SE (SE)	307	-	344180 398525
222	**BGS Recorded Landfill Sites** Site Name: White Moss Peat Co Location: Kirkby Moss, KIRKBY, Merseyside Authority: British Geological Survey, National Geoscience Information Service Ground Water: Potential threat to ground water Surface Water: No threat to surface water Geology: Tip on 8 ft Boulder Clay over 1000 ft Bunter Positional Accuracy: Positioned by the supplier Boundary Accuracy: Moderate	A9NW (SE)	707	-	344485 398253
223	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Perimeter Road, Kirkby Moss, Kirkby, Knowsley, Merseyside Name: Kirkby Moss Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD06984 First Input Date: 31st December 1965 Last Input Date: 31st December 1975 Specified Waste Type: Deposited Waste included Inert, Industrial, Commercial and Household Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: 705 Other Ref: K1/17/051, GDO 051	A13SE (SE)	191	2	344041 398601
224	**Historical Landfill Sites** Licence Holder: Not Supplied Location: Kirkby Moss, Kirkby, Merseyside Name: White Moss Peat Company Limited Operator Location: Not Supplied Boundary Accuracy: As Supplied Provider Reference: EAHLD32107 First Input Date: 31st August 1971 Last Input Date: Not Supplied Specified Waste Type: Deposited Waste included Inert and Industrial Waste, and Liquid Sludge EA Waste Ref: 0 Regis Ref: Not Supplied WRC Ref: Not Supplied BGS Ref: 816 Other Ref: Not Supplied	A9NW (SE)	707	2	344486 398254
225	**Integrated Pollution Control Registered Waste Sites** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AY2320 Dated: 6th March 1997 Process Type: IPC minor (non-substantial) variation to previous variation Description: 5.2 A Recovery processes within the Waste Disposal Industry **Status: Application has met the requirements for authorisation (but not yet authorised)** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343771 398884
225	**Integrated Pollution Control Registered Waste Sites** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7UF Authority: Environment Agency, North West Region Permit Reference: AG7750 Dated: 30th March 1993 Process Type: IPC new application Description: 5.2 A Recovery processes within the Waste Disposal Industry **Status: Authorisation revoked** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	2	343786 398864

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
226	**Licensed Waste Management Facilities (Landfill Boundaries)** Name: Marl Road/Wood Ward Road Inert Landfill Licence Number: 54257 Location: Land/premises At, Marl Roadw/woodward Road, Simonswood, Kirkby, Merseyside, L33 7UH Licence Holder: Knowsley Metropolitan Borough Council Authority: Environment Agency - North West Region, South Area Site Category: Landfills Taking Non-biodegradeable Wastes (Not Construction) Max Input Rate: Not Supplied **Licence Status:** **Issued** Issued: 24th June 1992 Positional Accuracy: Positioned by the supplier Boundary Accuracy: As Supplied	A17NE (NW)	769	2	343242 399543
227	**Licensed Waste Management Facilities (Locations)** Licence Number: 54332 Location: Acornfield Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UF Operator Name: Kodak Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Physico-chemical Treatment Facilities **Licence Status:** **To PPC** Issued: 29th June 2001 Last Modified: 8th December 2003 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: BU5607IM Positional Accuracy: Located by supplier to within 100m	A13NW (W)	0	2	343800 398800
228	**Licensed Waste Management Facilities (Locations)** Licence Number: 101607 Location: Acornfield Road, Knowsley Ind Est, Kirkby, Merseyside, L33 7UF Operator Name: Future Industrial Services Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status:** **To PPC** Issued: 14th April 2010 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: UP3931AP Positional Accuracy: Located by supplier to within 100m	A13SW (S)	32	2	343800 398600
228	**Licensed Waste Management Facilities (Locations)** Licence Number: 100668 Location: The Image Business Park, Acornfield Road, Knowlsey Ind Est, Liverpool, Merseyside, L33 7UF Operator Name: Tradebe Minerals Recycling Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Physico-chemical Treatment Facilities **Licence Status:** **Modified** Issued: 9th April 2009 Last Modified: 13th February 2015 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: LP3030AR Positional Accuracy: Located by supplier to within 100m	A13SW (S)	32	2	343800 398600
229	**Licensed Waste Management Facilities (Locations)** Licence Number: 54502 Location: Stockpit Road, Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Operator Name: O S S Group Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Not Supplied **Licence Status:** **To PPC** Issued: 28th July 2008 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: EP3930US Positional Accuracy: Manually positioned to the address or location	A13NW (W)	165	2	343569 398890

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
230	**Licensed Waste Management Facilities (Locations)** Licence Number: 54241 Location: Knowsley Waste Facility, Stockpit Road, Knowsley Industrial Park, Knowsley, Merseyside, L33 7TQ Operator Name: Mulberry Waste Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Special Waste Transfer Stations **Licence Status: Modified** Issued: 31st January 1990 Last Modified: 22nd November 2016 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SE (W)	194	2	343500 398700
231	**Licensed Waste Management Facilities (Locations)** Licence Number: 54487 Location: Knowsley Industrial Park North, Charleywood Road, Knowsley, Liverpool, Merseyside, L33 7SG Operator Name: Fourway Management Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Co-disposal Landfill Sites **Licence Status: To PPC** Issued: 31st July 2006 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: AP3137SA Positional Accuracy: Located by supplier to within 100m	A12SE (SW)	203	2	343500 398500
232	**Licensed Waste Management Facilities (Locations)** Licence Number: 400611 Location: Knowsley Healthcare Waste Treatment And Transfer Station, Bradman Road, Knowsley Ind Park, Liverpool, Merseyside, L33 7UR Operator Name: S R C L Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Clinical Waste Transfer Stations **Licence Status: Modified** Issued: 16th December 2013 Last Modified: 9th August 2016 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18SW (N)	270	2	343759 399240
233	**Licensed Waste Management Facilities (Locations)** Licence Number: 401692 Location: Aschroft Road, Knowsley Industrial Park, Kirkby, Merseyside, L33 7TW Operator Name: Triton (North West) Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Vehicle Depollution Facility <5000 tps **Licence Status: Issued** Issued: 18th September 2014 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17SE (NW)	323	2	343471 399126

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
234	**Licensed Waste Management Facilities (Locations)** Licence Number: 54249 Location: Avanti Treatment And Transfer Centre, Charley Wood Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SG Operator Name: Avanti Environmental Group Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Special Waste Transfer Stations **Licence Status: Expired** Issued: 21st September 1990 Last Modified: 20th April 2012 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12NE (W)	332	2	343400 398900
235	**Licensed Waste Management Facilities (Locations)** Licence Number: 54261 Location: Rentokil Initial U K Ltd, Bradman Road, Knowsley Ind Park, Liverpool, Merseyside, L33 7UR Operator Name: Rentokil Initial 1927 Plc Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Special Waste Transfer Stations **Licence Status: Surrendered** Issued: 9th October 1992 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 18th December 2012 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A17SE (NW)	343	2	343500 399200
236	**Licensed Waste Management Facilities (Locations)** Licence Number: 54250 Location: Unit 10, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SY Operator Name: Kirkby Skips Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Transferred** Issued: 30th April 1991 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	451	2	343228 398639
237	**Licensed Waste Management Facilities (Locations)** Licence Number: 402074 Location: Kirkby Skips Limited, Birchill Road, Kirkby Industrial Estate, Liverpool, Merseyside, L33 7TD Operator Name: Kirkby Skips Limited Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Inert & excavation Waste TS + treatment **Licence Status: Issued** Issued: 4th March 2015 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SE (W)	457	2	343239 398738

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
238	**Licensed Waste Management Facilities (Locations)** Licence Number: 54468 Location: 2 Yardley Road, Kirkby, Liverpool, Merseyside, L33 7SS Operator Name: Howard Philip Frederick Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Expired** Issued: 7th November 2006 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7NE (SW)	508	2	343237 398345
239	**Licensed Waste Management Facilities (Locations)** Licence Number: 54268 Location: Kirkby H W R C, Depot Road, Kirkby, Knowsley, Merseyside, L33 3AR Operator Name: Veolia Environmental Services Merseyside & Halton Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Surrendered** Issued: 21st August 1995 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: 3rd April 2013 IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18NW (N)	532	2	343800 399500
240	**Licensed Waste Management Facilities (Locations)** Licence Number: 100341 Location: Avanti Treatment And Transfer Station, Charleywood Road, Knowsley, Liverpool, Merseyside, L33 7SG Operator Name: Avanti Environmental Group Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Special Waste Transfer Stations **Licence Status: Part Transferred** Issued: 5th August 2008 Last Modified: 20th April 2012 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7SE (SW)	558	2	343450 398090
241	**Licensed Waste Management Facilities (Locations)** Licence Number: 54260 Location: Avanti Treatment And Transfer Centre, Charleywood Road, Knowsley Ind Park North, Liverpool, Merseyside, L33 7SG Operator Name: Avanti Environmental Group Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Special Waste Transfer Stations **Licence Status: Expired** Issued: 9th May 1994 Last Modified: 20th April 2012 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A7NE (SW)	571	2	343400 398100

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
242	**Licensed Waste Management Facilities (Locations)** Licence Number: 54262 Location: Knowsley Industrial Park, Webber Road, Kirkby, Merseyside, L33 7SY Operator Name: Rentokil Initial 1927 Plc Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Special Waste Transfer Stations **Licence Status: Issued** Issued: 9th October 1992 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SW (W)	577	2	343100 398600
243	**Licensed Waste Management Facilities (Locations)** Licence Number: 54244 Location: Unit 1, Webber Road, Knowsley Industrial Park, North Kirkby, Merseyside, L33 7SW Operator Name: Mr D Delaney Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Metal Recycling Sites (Vehicle Dismantlers) **Licence Status: Expired** Issued: 12th September 1988 Last Modified: Not Supplied Expires: 9th April 2001 Suspended: Not Supplied Revoked: 1st January 2002 Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SW (W)	585	2	343100 398500
244	**Licensed Waste Management Facilities (Locations)** Licence Number: 54485 Location: Garden Works, Charley Wood Road, Knowsley Ind Park, Liverpool, Merseyside, L33 7SG Operator Name: Low Michael Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Special Waste Transfer Stations **Licence Status: Issued** Issued: 1st July 2007 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A7NW (SW)	622	2	343185 398218
245	**Licensed Waste Management Facilities (Locations)** Licence Number: 54251 Location: Clarence House, Kirkby Bank Road, Liverpool, Merseyside, L33 7SY Operator Name: Frederick Oldham Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Issued** Issued: 24th May 1991 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SW (W)	636	2	343041 398595

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
246	**Licensed Waste Management Facilities (Locations)** Licence Number: 54257 Location: Land/premises At, Marl Roadw/woodward Road, Simonswood, Kirkby, Merseyside, L33 7UH Operator Name: Knowsley Metropolitan Borough Council Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Landfills Taking Non-biodegradeable Wastes (Not Construction) **Licence Status: Issued** Issued: 24th June 1992 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	655	2	343326 399466
247	**Licensed Waste Management Facilities (Locations)** Licence Number: 54324 Location: North Perimeter Road, Kirkby, Liverpool, Merseyside, L33 3AN Operator Name: Stephen Washington Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Physical Treatment Facilities **Licence Status: Modified** Issued: 31st January 2001 Last Modified: 8th December 2003 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A18NE (N)	684	2	344100 399600
247	**Licensed Waste Management Facilities (Locations)** Licence Number: 54394 Location: Simonswood Moss, North Perimeter Road, Kirkby, Liverpool, Merseyside, L33 3AN Operator Name: White Moss Horticulture Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, North Area Site Category: Composting **Licence Status: Modified** Issued: 3rd September 2004 Last Modified: 14th June 2016 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A18NE (N)	730	2	344104 399646
248	**Licensed Waste Management Facilities (Locations)** Licence Number: 103676 Location: Kirkby H W R C, Depot Road, Knowsley Ind Park, Knowsley, Merseyside Operator Name: Veolia E S Merseyside & Halton Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Non-hazardous & hazardous HWA Site **Licence Status: Issued** Issued: 15th December 2011 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Manually corrected supplier location	A17NE (N)	741	2	343522 399674

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
249	**Licensed Waste Management Facilities (Locations)** Licence Number: 100363 Location: 3 Webber Road, Knowsley Ind Est, Knowsley, Merseyside, L33 7SW Operator Name: North West Tyre Collections Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Material Recycling Treatment Facilities **Licence Status: Revoked** Issued: 22nd September 2008 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: 29th March 2011 Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A12SW (W)	749	2	342944 398444
250	**Licensed Waste Management Facilities (Locations)** Licence Number: 54258 Location: Unit 22, Kirkby Bank Road, Kirkby, Liverpool, Merseyside, L33 7SY Operator Name: Orion Paints Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Special Waste Transfer Stations **Licence Status: Issued** Issued: 30th July 1992 Last Modified: Not Supplied Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12NW (W)	765	2	343000 399100
251	**Licensed Waste Management Facilities (Locations)** Licence Number: 54336 Location: Lees Road, Knowsley Industrial Park, Knowsley, Merseyside, L33 7SE Operator Name: W M Fibres Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Physical Treatment Facilities **Licence Status: Expired** Issued: 24th July 2001 Last Modified: Not Supplied Expires: 18th February 2003 Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 100m	A12SW (W)	777	2	342900 398600
252	**Licensed Waste Management Facilities (Locations)** Licence Number: 102932 Location: Knowsley Rail T L S, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UZ Operator Name: Suez Recycling And Recovery U K Ltd Operator Location: Not Supplied Authority: Environment Agency - North West Region, South Area Site Category: Household, Commercial And Industrial Transfer Stations **Licence Status: Modified** Issued: 12th March 2012 Last Modified: 13th May 2016 Expires: Not Supplied Suspended: Not Supplied Revoked: Not Supplied Surrendered: Not Supplied IPPC Reference: Not Supplied Positional Accuracy: Located by supplier to within 10m	A17NE (NW)	890	2	343200 399667
	Local Authority Landfill Coverage Name: Knowsley Metropolitan Borough Council - Has supplied landfill data		0	6	343840 398787
	Local Authority Landfill Coverage Name: Merseyside Waste Disposal Authority - Has supplied landfill data		0	7	343840 398787
	Local Authority Landfill Coverage Name: West Lancashire District Council - Has supplied landfill data		25	8	344064 398932
	Local Authority Landfill Coverage Name: Lancashire County Council - Had landfill data but passed it to the relevant environment agency		25	9	344064 398932

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
253	**Local Authority Recorded Landfill Sites** Location: Kirkby Moss, Perimeter Road, Charley Wood, Chasley Wood, Coopers Moss Reference: GDO051 Authority: Knowsley Metropolitan Borough Council **Last Reported Status:** **Closed** Types of Waste: Household, Road Sweepings, Sludges (Inert - Processed/Oily) Date of Closure: 28/02/1975 Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate	A13SE (SE)	191	6	344033 398600
254	**Local Authority Recorded Landfill Sites** Location: Kirkby Moss, Knowsley Reference: K004 Authority: Merseyside Waste Disposal Authority **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	A9NW (SE)	614	7	344500 398400
255	**Local Authority Recorded Landfill Sites** Location: Marl Road, Woodward Road, Simonswood Reference: WLDC/085 Authority: West Lancashire District Council, Environmental Health Department **Last Reported Status:** **Closed** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Located by supplier to within 100m Boundary Quality: Not Applicable	A17NW (NW)	908	8	343100 399600
255	**Local Authority Recorded Landfill Sites** Location: Ashcrofts Plantation, Marl Road And Woodward Road, Knowsley Reference: K015 Authority: Merseyside Waste Disposal Authority **Last Reported Status:** **Unknown** Types of Waste: Not Supplied Date of Closure: Not Supplied Positional Accuracy: Manually positioned within the geographical locality Boundary Quality: Not Applicable	A17NW (NW)	910	7	343098 399601
256	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A13NE (NE)	0	-	343896 398903
257	**Potentially Infilled Land (Non-Water)** Bearing Ref: NE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A18SE (NE)	372	-	344094 399284
258	**Potentially Infilled Land (Non-Water)** Bearing Ref: SW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A7NW (SW)	769	-	342957 398330
259	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A9SW (SE)	808	-	344313 397985
260	**Potentially Infilled Land (Non-Water)** Bearing Ref: SE Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A9SW (SE)	860	-	344358 397955
261	**Potentially Infilled Land (Non-Water)** Bearing Ref: E Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1980	A15NW (E)	927	-	344972 398933
262	**Potentially Infilled Land (Non-Water)** Bearing Ref: NW Use: Unknown Filled Ground (Pit, quarry etc) Date of Mapping: 1990	A17SW (NW)	933	-	342867 399261
263	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A13NE (NE)	0	-	343971 398917

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
264	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A13NW (NW)	148	-	343603 398969
265	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A13NW (NW)	154	-	343603 399001
266	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1928	A12SE (SW)	273	-	343421 398504
267	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A14NW (NE)	286	-	344294 399056
268	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NE (W)	296	-	343415 398793
269	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NE (W)	401	-	343305 398782
270	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A19SW (NE)	405	-	344334 399198
271	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18SW (NW)	436	-	343554 399358
272	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12SE (W)	440	-	343242 398663
273	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1928	A12SE (W)	441	-	343240 398656
274	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NE (W)	445	-	343279 398875
275	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18SE (N)	477	-	344072 399395
276	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	498	-	343678 398085
277	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NE (W)	499	-	343243 398965
278	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	502	-	343612 398096
279	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	509	-	343647 398080
280	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	520	-	343622 398075
281	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	525	-	343260 399149
282	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NE (W)	538	-	343188 398890
283	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SE (S)	548	-	343866 398037
284	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	558	-	343741 398018

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
285	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NW (N)	565	-	343616 399518
286	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SE (S)	567	-	343940 398038
287	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NW (W)	571	-	343153 398883
288	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	578	-	343214 399179
289	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A7NE (SW)	578	-	343363 398114
290	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NW (W)	580	-	343150 398917
291	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NE (N)	590	-	344000 399524
292	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	599	-	343207 399213
293	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SE (NW)	602	-	343350 399416
294	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SW (NW)	616	-	343184 399203
295	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SW (S)	659	-	343554 397949
296	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SE (S)	659	-	343953 397945
297	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NW (N)	666	-	343587 399614
298	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12SW (W)	667	-	343010 398619
299	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1894	A17NE (NW)	669	-	343339 399495
300	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1894	A17NE (NW)	671	-	343314 399476
301	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NE (N)	674	-	343981 399613
302	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A7SE (SW)	689	-	343476 397940
303	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A7SE (S)	694	-	343520 397923
304	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12SW (W)	705	-	342987 398743
305	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NE (N)	708	-	343865 399669

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
306	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A7SE (S)	708	-	343492 397916
307	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NE (N)	735	-	343899 399690
308	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12NW (W)	749	-	343010 399074
309	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A12SW (W)	762	-	342929 398749
310	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A18NW (N)	763	-	343834 399729
311	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17NW (NW)	796	-	343124 399458
312	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SW (NW)	796	-	343102 399427
313	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1894	A17NE (NW)	819	-	343202 399575
314	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A8SE (S)	843	-	343990 397763
315	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A23SE (N)	857	-	343952 399805
316	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SW (W)	867	-	342908 399159
317	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A3NE (S)	871	-	343986 397734
318	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A7NW (SW)	873	-	342855 398303
319	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A23SW (N)	903	-	343567 399853
320	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A11SE (W)	904	-	342784 398741
321	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A11SE (W)	908	-	342784 398763
322	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A17SW (NW)	939	-	342889 399336
323	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A3NE (S)	944	-	343977 397657
324	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A22SE (N)	957	-	343477 399886
325	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A4NW (S)	960	-	344266 397758
326	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A6NE (W)	967	-	342739 398363

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
327	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1850	A11NE (W)	979	-	342740 398901
328	**Potentially Infilled Land (Water)** Use: Unknown Filled Ground (Pond, marsh, river, stream, dock etc) Date of Mapping: 1894	A22SE (NW)	992	-	343335 399870
329	**Registered Landfill Sites** Licence Holder: Knowsley M.B.C. Contract Services Dept. Licence Reference: 30372 (372/01 Site Location: Marl Road / Woodward Road, Simonswood, Kirkby, Liverp Licence Easting: 343070 Licence Northing: 399600 Operator Location: Stretton Way, Huyton Industrial Estate, Huyton, Liverpool, Merseyside, L36 6jf Authority: Environment Agency - North West Region, Central Area Site Category: Landfill - Railway cutting Max Input Rate: Large (Equal to or greater than 75,000 and less than 250,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Status: Site dormant Dated: 24th June 1992 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Accuracy: Not Applicable Authorised Waste: Max.Waste Permitted By Licence-Stated Other Inert Materials Spoil, Soils,Clays, Stone, Concrete Waste Ex Highways Maintenance Incl- Prohibited Waste: Biodegradable Materials Clinical Wastes Household + Commercial Waste Industrial Wastes (Other Than Excav'N) Liquid/Sludge Wastes Malodorous Wastes Special Wastes	A17NW (NW)	930	2	343070 399600
330	**Registered Waste Transfer Sites** Licence Holder: Rentokil Group Plc Licence Reference: 30400 (400/01 Site Location: Bradman Road, Knowsley Industrial Park North, Kirkby, Knowsley, Merseyside, L33 7ur Operator Location: Felcourt, EAST GRINSTEAD, West Sussex, RH19 2JY Authority: Environment Agency - North West Region, Central Area Site Category: Transfer Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: Some restriction on source of waste Licence Status: Site dormant (licence suspended)Site Dormant Dated: 9th October 1992 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Max.Storage In Licence Max.Waste Permitted By Licence Waste From Timber Preserving Process Prohibited Waste: Waste N.O.S.	A17SE (NW)	343	2	343500 399200

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
331	**Registered Waste Transfer Sites** Licence Holder: James Burke Licence Reference: 176/01 Site Location: Unit 4 Orchard Works, Kirkby Industrial Estate, Knowsley, Merseyside Operator Location: 112 Holmefield Road, LIVERPOOL, Merseyside, L19 3PQ Authority: Environment Agency - North West Region, South Area Site Category: Transfer Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st November 1986 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Positioned by the supplier Boundary Quality: Moderate Authorised Waste: Construction Ind. Wastes Hard Bonded Asbestos Prohibited Waste: Fibrous Or Dust Asbestos Liquids & Sludges Malodorous Waste Special Wastes	A12SE (SW)	441	2	343240 398537
332	**Registered Waste Transfer Sites** Licence Holder: John Milner Licence Reference: 172/01 Site Location: 7 & 8 Orchard Works, Kirkby Industrial Estate, Kirkb Operator Location: 26 Bidston Lane, LIVERPOOL, Merseyside, L4 7XS Authority: Environment Agency - North West Region, Central Area Site Category: Transfer Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 1st August 1986 Preceded By Licence: Not Given Superseded By Licence: 330/01 Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Construction And Demolition Wastes Hard/Bonded/Cement Asbestos Max.Storage Permitted By Licence Prohibited Waste: Commercial Waste Household Waste Special Wastes	A12SW (W)	529	2	343150 398550
332	**Registered Waste Transfer Sites** Licence Holder: A Tomkins Licence Reference: 174A/01 Site Location: Unit 10 Orchard Works, Kirkby Industrial Estate, Knowsley, Merseyside, L33 7sy Operator Location: 28 Moss Way, LIVERPOOL, Merseyside, L11 Authority: Environment Agency - North West Region, South Area Site Category: Transfer Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 1st November 1986 Preceded By Licence: Not Given Superseded By Licence: 30324 (324/01 Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Bonded Asbestos To Be < 10% Vol./Load Max.Storage Permitted By Licence Solid Construction Ind. Wastes Prohibited Waste: Domestic Waste Fibrous Or Dust Asbestos Ind. Non-Haz. Waste Liquids & Sludges Malodorous Waste Special Wastes	A12SW (W)	579	2	343100 398550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
333	**Registered Waste Transfer Sites** Licence Holder: Mersey Waste Holdings Ltd Licence Reference: 30467 (467/01 Site Location: Kirkby W.R.C, Depot Road, Kirkby, Liverpool, Merseyside Operator Location: Royal Liverpool Building - 2nd Floor, Pier Head, Liverpool, Merseyside, L3 1by Authority: Environment Agency - North West Region, Central Area Site Category: Civic Amenity Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 21st August 1995 Preceded By Licence: R30 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Cfcs, Glass, H'Hold Incl Small Quants Special Waste, Mat'L For Recycling Incl., Max.Waste Permitted By Licence, Oils, Paper, Textiles Prohibited Waste: Clinical Wastes, Constr'N With > 10%Vol Bonded Asb., Liquid Waste (Except Oil From H'Holder, Malodorous Waste, Special Wastes (Except Del.By H'Holder, Veterinary Wastes, Waste From Business Or Contractors, Waste N.O.S.	A18NE (N)	543	2	343870 399500
333	**Registered Waste Transfer Sites** Licence Holder: Merseyside W.D.A. Licence Reference: R30 Site Location: Kirkby Depot, Depot Road, Kirkby, Liverpool, Merseyside Operator Location: Steers House, Canning Place, LIVERPOOL, Merseyside, L1 8JW Authority: Environment Agency - North West Region, South Area Site Category: Civic Amenity Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 1st January 1988 Preceded By Licence: Not Given Superseded By Licence: 30467 (467/01 Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Household Waste, Waste Oils Prohibited Waste: Business/Contractors Waste, Hazardous Wastes	A18NE (N)	543	2	343870 399500
334	**Registered Waste Transfer Sites** Licence Holder: P.C.B. Services Ltd Licence Reference: 30317 (317/01 Site Location: Unit 11a Courtyard Works, Newstet Road, Kirkby, Liverpool, Merseyside Operator Location: Unit 11a Courtyard Works, Newstet Road, Kirkby, Knowsley, Merseyside Authority: Environment Agency - North West Region, Central Area Site Category: Transfer Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st May 1991 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Max.Waste Permitted By Licence, Pcb'S And Equipment Contam.With Pcb	A12NE (W)	554	2	343190 398980

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
335	**Registered Waste Transfer Sites** Licence Holder: Fourway Management Ltd Licence Reference: 30315 (315/01 Site Location: Unit 4 Chorleywood Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sg Operator Location: 4 The Meander, LIVERPOOL, Merseyside, L12 0AB Authority: Environment Agency - North West Region, Central Area Site Category: Transfer Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Licence Status: Record supersededSuperseded Dated: 21st September 1990 Preceded By Licence: Not Given Superseded By Licence: 30315 (315/01) Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Aqueous Tank Washings Max.Storage In Working Plan Max.Waste Permitted By Licence Petrol Tank Washings Prohibited Waste: Special Wastes Except Petrol Tank Wash	A7SE (SW)	562	2	343520 398060
336	**Registered Waste Transfer Sites** Licence Holder: Rentokil Group Plc Licence Reference: 30404 (404/01 Site Location: Rentokil Management; Webber Road, Knowsley Industr Operator Location: Felcourt, EAST GRINSTEAD, West Sussex, RH19 2JY Authority: Environment Agency - North West Region, Central Area Site Category: Transfer Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Licence Status: Site dormant (licence suspended)Site Dormant Dated: 9th October 1992 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Contaminated Packaging Incl. Special Wastes Max.Storage Of Aqueous Waste Max.Storage Of Dry Solid Waste Max.Storage Of Solvent Waste Max.Waste Permitted By Licence Redundant Products Of The Company	A12SW (W)	629	2	343050 398650
337	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kodak Ltd Licence Reference: Eawml54332 Site Location: Kodak Ltd, Acornfield Road, Kirkby, Liverpool, Merseyside, L33 7uf Operator Location: Acornfield Road, Kirkby, Liverpool, Merseyside, L33 7uf Authority: Environment Agency - North West Region, Central Area Site Category: Treatment Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 29th June 2001 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Industrial Wastes (Inferred From Regis Listing) New Licence, Wastes Not To Hand	A13NW (NW)	0	2	343800 398850

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
337	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kodak Ltd Licence Reference: 034/01 Site Location: Acornfield Road, Kirkby, LIVERPOOL, Merseyside, L33 7UF Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Incineration Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 30th May 1977 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Waste Solvents	A13NW (W)	0	2	343800 398800
338	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kodak Ltd Licence Reference: 406A/01 Site Location: Acornfield Road, Knowsley Industrial Park, Kirkby, Knowsley, Merseyside, L33 7uf Operator Location: PO Box 6, Station Road, HEMEL HEMPSTEAD, Hertfordshire, HP1 1JU Authority: Environment Agency - North West Region, South Area Site Category: Transfer - with treatment Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Site exempt from licenceExempt Dated: 1st August 1992 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Anticipated Throughput In State.Intent Max. Drum Storage In Licence Max. Storage In Tr'T Plant Returned Products & Intermediates Used Photographic Chemicals Prohibited Waste: Waste N.O.S.	A13SW (SW)	0	2	343700 398700
338	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kodak Ltd Licence Reference: 140/01 Site Location: Acornfield Road, Knowsley Industrial Park, Kirkby, Knowsley, Merseyside, L33 7uf Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Baling - Compaction Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: Waste produced/controlled by licence holder Licence Status: Site exempt from licenceExempt Dated: 1st November 1984 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Canteen Waste General Factory Waste(Inc. Sweepings) Packaging Prohibited Waste: Asbestos Special Wastes	A13SW (SW)	0	2	343700 398700

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
339	**Registered Waste Treatment or Disposal Sites** Licence Holder: Kodak Ltd Licence Reference: 033/01 Site Location: Acornfield Road, Knowsley Industrial Park, Kirkby, Knowsley, Merseyside, L33 7uf Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Incineration Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st May 1977 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Contam. Empty Used Containers House. + Com. Untreated Waste	A13SW (SW)	13	2	343800 398700
340	**Registered Waste Treatment or Disposal Sites** Licence Holder: Waste Oils Ltd Licence Reference: 30210 (210/01 Site Location: Stockpit Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7tq Operator Location: As Site Address Authority: Environment Agency - North West Region, Central Area Site Category: Recovery - Oil Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 31st January 1990 Preceded By Licence: Not Given Superseded By Licence: 30210 (210/02) Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Automotive Oil Filters Max.Storage Permitted By Licence Max.Waste Permitted By Licence Mineral & Other Oils Other Oils Suitable For Conv'N To Fuel Prohibited Waste: Malodorous/Odorous/Perfumed Waste Oils With Chlorine > 0.03% & Sulph.>1% Oils/Solvents With Flash Pt < 30 C Special Wastes Waste N.O.S. Waste Oils That Are Pcbs/Pcts Wastes React Adversely When Mixed	A13SW (W)	165	2	343540 398750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
341	**Registered Waste Treatment or Disposal Sites** Licence Holder: Waste Oils Ltd Licence Reference: 30210 (210/02) Site Location: Stockpit Road, Knowsley Industrial Park North, Know Operator Location: As Site Address Authority: Environment Agency - North West Region, Central Area Site Category: Recovery - Oil Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 2nd March 2000 Preceded By Licence: 30210 (210/01 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Antifreeze & Coolant Batteries Bumpers Cellulose Wastes (Natural/Synthetic) Contaminated Fuel Contaminated Waste From Garages Maximum Storage In Licence Mixed Solvents Paint Waste Printing Industry Wastes/Ink Tyres Used Oil Filters Waste Oils Prohibited Waste: Other Waste/Waste Not Otherwise Specified	A13NW (NW)	196	2	343560 399000
342	**Registered Waste Treatment or Disposal Sites** Licence Holder: Henry Bath & Son Licence Reference: 207/01 Site Location: Acornfield Road, Knowsley Industrial Park North, Kirkby, Knowsley, Merseyside, L33 7ug Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Scrapyard Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st September 1988 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Scrap Metal Vehicles White Goods	A18SW (N)	392	2	343850 399350
343	**Registered Waste Treatment or Disposal Sites** Licence Holder: Frederick Oldham Ltd Licence Reference: 330/01 Site Location: Units 7/8 Knowsley Ind. Park North, Kirkby, Liverp Operator Location: Unity Works, Kirkby Bank Road, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency - North West Region, Central Area Site Category: Scrapyard Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Record supersededSuperseded Dated: 24th May 1991 Preceded By Licence: 172/01 Superseded By Licence: 30330 (330/01 Positional Accuracy: Manually positioned within the geographical locality Boundary Quality: Not Supplied Authorised Waste: Ferrous & Non-Ferrous Scrap Metals Scrap Vehicles Solid Construction Ind. Wastes White Goods	A12SE (SW)	487	2	343200 398500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
344	**Registered Waste Treatment or Disposal Sites** Licence Holder: Waste Management Ltd Licence Reference: 004/01 Site Location: 8A Hammond Road, Kirkby, LIVERPOOL, Merseyside, L33 7UL Operator Location: Rixton Old Hall, Manchester Road, Rixton, WARRINGTON, Cheshire, WA3 6EW Authority: Environment Agency - North West Region, South Area Site Category: Transfer - with Baling(compaction) Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 29th April 1977 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste Ind. Non-Haz. Waste Environment Agency must give specific authorisation for this waste to be acceptedWaste requires prior approval Ind. Non-Haz. Waste	A17SE (NW)	521	2	343460 399400
345	**Registered Waste Treatment or Disposal Sites** Licence Holder: Frederick Oldham Ltd Licence Reference: 30330 (330/01 Site Location: Units 7/8 Orchard Works, Kirkby Bank Road, Knowsley Operator Location: Unity Works, Kirkby Bank Road, LIVERPOOL, Merseyside, L33 7SY Authority: Environment Agency - North West Region, Central Area Site Category: Scrapyard - with Transfer Station Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 1st January 1995 Preceded By Licence: 330/01 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste Construction Ind. Wastes Ferrous Metal Scrap Max.Waste Permitted By Licence Non-Ferrous Metal Scrap Scrap Vehicles White Goods Prohibited Waste Clinical Wastes Commercial Waste Constr'N Waste With > 10%Vol/Ld Asbest Household Waste Liquid/Sludge Wastes Malodorous Wastes Putrescible Waste Special Wastes Waste N.O.S.	A12SW (W)	529	2	343150 398550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
345	**Registered Waste Treatment or Disposal Sites** Licence Holder: D Delaney - Starline Motors Licence Reference: 30251 (251/01 Site Location: Unit 1 Orchard Works, Kirkby Industrial Estate, Huyton, Liverpool, Merseyside Operator Location: As Site Address Authority: Environment Agency - North West Region, Central Area Site Category: Scrapyard Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence not applicable (partially revoked)Partially Revoked Dated: 12th September 1988 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Max.Waste Permitted By Licence Scrap Metal Vehicles White Goods	A12SW (W)	577	2	343100 398580
345	**Registered Waste Treatment or Disposal Sites** Licence Holder: G D Lewis t/a Busy Bee Recovery Licence Reference: 262/01 Site Location: Unit 1a Orchard Works, Kirkby Industrial Estate, Huyton, Liverpool, Merseyside Operator Location: As Site Address Authority: Environment Agency - North West Region, South Area Site Category: Scrapyard Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st September 1988 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Scrap Metal Vehicles White Goods	A12SW (W)	577	2	343100 398590
345	**Registered Waste Treatment or Disposal Sites** Licence Holder: M W Groves t/a Kirkby Skips Licence Reference: 30324 (324/01 Site Location: Unit 10 Kirkby Bank Road, Knowsley Industrial Park Operator Location: As Site Address Authority: Environment Agency - North West Region, Central Area Site Category: Scrapyard - with Transfer Station Max Input Rate: Medium (Equal to or greater than 25,000 and less than 75,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 30th May 1991 Preceded By Licence: 174A/01 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Ferrous & Non-Ferrous Scrap Metals Max.Waste Permitted By Licence Scrap Vehicles Solid Construction Ind. Wastes White Goods	A12SW (W)	579	2	343100 398550

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
346	**Registered Waste Treatment or Disposal Sites** Licence Holder: D A Webster (Drum Collection Service) Licence Reference: 30395 (395/01 Site Location: Charleywood Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sg Operator Location: 33 Leeside Avenue, Southdene, Kirkby, KNOWSLEY, Merseyside, L32 9QU Authority: Environment Agency - North West Region, Central Area Site Category: Transfer - with treatment Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 9th September 1994 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Max.Waste Permitted By Licence Used Or Contam. Drums & Containers Prohibited Waste: Drums Contam. With Malodorous Subs. Drums Contam. With Prescribed Subs. Drums Contam.W/Subs.React Vig.W/Water	A7NE (SW)	539	2	343440 398115
347	**Registered Waste Treatment or Disposal Sites** Licence Holder: Fourway Management Ltd Licence Reference: 30315 (315/01) Site Location: Unit 4 Chorleywood Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sg Operator Location: 4 The Meander, LIVERPOOL, Merseyside, L12 0AB Authority: Environment Agency - North West Region, Central Area Site Category: Transfer - with treatment Max Input Rate: Small (Equal to or greater than 10,000 and less than 25,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 17th April 2000 Preceded By Licence: 30315 (315/01 Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the address or location Boundary Quality: Not Supplied Authorised Waste: Degradable Commercial Waste (As In Post'98 E.A.Lics & Equivalent To 22.09.02) Degradable Industrial Waste (As In Post'98 E.A.Lics & Equivalent To 22.09.03) Inert Materials (As In Post'98 E.A.Lics And Equivalent To 21.00.00) Maximum Waste Permitted By Licence Metal Waste/Scrap Metal (As In Post'98 E.A.Lics And Equivalent To 23.00.00) Special Waste (As In Epa 1990:S62 Of 1996 Regs) Prohibited Waste: Bulk Waste (Loose/Unpackaged) Degradable Household Waste (As In Post'98 E.A.Lics & Equivalent To 22.09.01) Material With Haz.Code H 9 - Infectious Other Waste/Waste Not Otherwise Specified Skip Waste	A7SE (SW)	562	2	343520 398060
348	**Registered Waste Treatment or Disposal Sites** Licence Holder: M.T.M. Pharmaceuticals Ltd Licence Reference: 286/01 Site Location: Woodward Road, Knowsley Industrial Park, Knowsley, Merseyside, L33 7uz Operator Location: Rudby Hall, Hutton Rudby, YARM, Cleveland, TS15 0SN Authority: Environment Agency - North West Region, South Area Site Category: Recovery - Solvent Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Site exempt from licenceExempt Dated: 1st June 1989 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Max.Storage Permitted By Licence Waste Solvents Incl. Special Wastes)	A18NW (N)	568	2	343550 399500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
349	**Registered Waste Treatment or Disposal Sites** Licence Holder: Chemicon Ltd Licence Reference: 285/01 Site Location: Webber Road, Knowsley Industrial Park, Knowsley, Merseyside, L33 7sk Operator Location: 32 High Street, CREWE, Cheshire, CW2 7BU Authority: Environment Agency - North West Region, South Area Site Category: Recovery - Solvent Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Licence lapsed/cancelled/defunct/not applicable/surrenderedCancelled Dated: 1st June 1989 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: Max.Storage Permitted By Licence Waste Solvents (Incl.Special Wastes)	A12SW (W)	684	2	343000 398500
350	**Registered Waste Treatment or Disposal Sites** Licence Holder: A M Gilby & J Hamer Licence Reference: 30382 (382/01 Site Location: Woodlands Estate, Unit 9 Ashcroft Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7tw Operator Location: 22 Beech Road, AUGHTON, Lancashire, L39 6SJ Authority: Environment Agency - North West Region, Central Area Site Category: Transfer - with treatment Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Site Closed Dated: 30th July 1992 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: Max.Storage In Licence Max.Waste Permitted By Licence Waste Paints, Varnishes & Resins Waste Solvents/Thinners Prohibited Waste: Waste N.O.S.	A12NW (W)	765	2	343000 399100
351	**Registered Waste Treatment or Disposal Sites** Licence Holder: W M Fibres Ltd Licence Reference: 54336 Site Location: Lees Road, Knowsley Industrial Estate, Knowsley, Merseyside, L33 7se Operator Location: 215-217 Lord Street, Southport, Merseyside, Pr8 1pf Authority: Environment Agency - North West Region, Central Area Site Category: Treatment Max Input Rate: Undefined Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 24th July 2001 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Manually positioned to the road within the address or location Boundary Quality: Not Supplied Authorised Waste: New Licence, Wastes Not To Hand Ukw 22.00.00 General & Biodegradable Waste - Including Ukw 22.04.05 Gen/Biodeg - Synthetic Textiles Ukw 22.04.06 Gen/Biodeg - Mixed/Unidentified Textiles	A12NW (W)	850	2	342850 398800

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
352	**Registered Waste Treatment or Disposal Sites** Licence Holder: White Moss Horticulture Ltd Licence Reference: Eawml54324 Site Location: North Perimeter Road, Kirkby, Liverpool, Merseyside, L33 3an Operator Location: North Perimeter Road, Kirkby, Liverpool, Merseyside, L33 3an Authority: Environment Agency - North West Region, Central Area Site Category: Treatment Max Input Rate: Very Small (Less than 10,000 tonnes per year) Waste Source Restrictions: No known restriction on source of waste Licence Status: Operational as far as is knownOperational Dated: 31st January 2001 Preceded By Licence: Not Given Superseded By Licence: Not Given Positional Accuracy: Approximate location provided by supplier Boundary Quality: Not Supplied Authorised Waste: New Licence, Wastes Not To Hand Ukw 22.01.01 Gen/Biodeg - Uncontaminated Topsoil	A23SW (N)	872	2	343800 399840

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
353	**Control of Major Accident Hazards Sites (COMAH)** Name: Kodak Limited Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Reference: 1022988 Type: Lower Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	10	343781 398874
354	**Control of Major Accident Hazards Sites (COMAH)** Name: Petrolite Limited Location: Kirkby Bank Road, Kirkby Industrial Estate, Kirkby, LIVERPOOL, Merseyside, L33 7TD Reference: Not Supplied Type: Upper Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Automatically positioned to the road within the address	A12SE (SW)	252	10	343459 398472
355	**Control of Major Accident Hazards Sites (COMAH)** Name: Baker Hughes Limited Location: Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Reference: Not Supplied Type: Upper Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (W)	256	10	343429 398662
356	**Control of Major Accident Hazards Sites (COMAH)** Name: Rentokil Initial Uk Ltd Location: Bradman Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UR Reference: 1024662 Type: Lower Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	10	343516 399228
357	**Control of Major Accident Hazards Sites (COMAH)** Name: P K Marine Freight Services Limited Location: Knowsley Industrial Park, LIVERPOOL, Merseyside, L33 3AY Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	10	344057 399335
358	**Control of Major Accident Hazards Sites (COMAH)** Name: W H Bowker Limited Location: Knowsley Industrial Park, Charleywood Road, Knowsley, Liverpool, Merseyside, L33 7sg Reference: Not Supplied Type: Upper Tier **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A8NW (SW)	421	10	343586 398188
359	**Control of Major Accident Hazards Sites (COMAH)** Name: Henry Diaper & Co Ltd Location: P.O. Box 25, Knowsley Industrial Park, Lees Road, KNOWSLEY, Merseyside, L33 7SD Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Manually positioned within the geographical locality	A12SE (W)	422	10	343279 398759
360	**Control of Major Accident Hazards Sites (COMAH)** Name: Syntor Fine Chemicals Limited Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Reference: Not Supplied Type: Lower Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (N)	465	10	343717 399434
361	**Control of Major Accident Hazards Sites (COMAH)** Name: Alta Gas Plc Location: Orchard Works, Webber Road, KNOWSLEY INDUSTRIAL PARK NORTH, Liverpool, L33 7SW Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Automatically positioned to the address	A12SE (W)	485	10	343194 398561

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
362	**Control of Major Accident Hazards Sites (COMAH)** Name: Potter Logistics Ltd Location: Rail Freight Terminal, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Reference: Not Supplied Type: Upper Tier **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	602	10	343557 399539
363	**Control of Major Accident Hazards Sites (COMAH)** Name: Mersey Gas Location: Orchard Works, Webber Road, Knowsley Industrial Park North, LIVERPOOL, Merseyside, L33 7SR Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Automatically positioned to postcode unit of the address	A12SW (W)	606	10	343074 398660
364	**Control of Major Accident Hazards Sites (COMAH)** Name: Clariant (Lsm) Uk Ltd Location: Woodward Road, LIVERPOOL, Merseyside, L33 7UZ Reference: Not Supplied Type: Lower Tier **Status: Record Ceased To Be Supplied Under COMAH Regulations** Positional Accuracy: Manually positioned to the address or location	A17NE (NW)	638	10	343415 399511
365	**Control of Major Accident Hazards Sites (COMAH)** Name: Henry Diaper & Co Ltd Location: Knowsley Industrial Estate North, Depot Road, Knowsley, Merseyside, L33 3AR Reference: Not Supplied Type: Lower Tier **Status: Active** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	882	10	342796 398636
366	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: Petrolite Limited Location: Birchill Road, Kirkby Industrial Estate, Kirkby, LIVERPOOL, Merseyside, L33 7TD **Status: Not Active** Positional Accuracy: Automatically positioned to the road within the address	A12NE (W)	419	10	343293 398809
367	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: Alta Gas (Donovan T/As) Location: Orchard Works, Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SW **Status: Not Active** Positional Accuracy: Automatically positioned to the address	A12SE (W)	484	10	343194 398561
368	**Notification of Installations Handling Hazardous Substances (NIHHS)** Name: Rentokil Limited Bradman Road Location: Bradman Road, Kirkby Industrial Estate, LIVERPOOL, Merseyside, L33 7SR **Status: Not Active** Positional Accuracy: Automatically positioned in the proximity of the address	A12SW (W)	605	10	343075 398656
369	**Planning Hazardous Substance Consents** Name: Kodak Ltd Location: Acornfield Road, Knoslwey Industrial Park, Kirkby, Knowsley, L33 7uf Authority: Knowsley Metropolitan Borough Council Application Ref: 99/00703/HSC Hazardous Substance: Unknown at time of report Maximum Quantity: 0 Application date: 20th October 1999 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	0	6	343781 398874
370	**Planning Hazardous Substance Consents** Name: Baker Hughes Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: 13/00256/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 32 Application date: 7th May 2013 **Decision: Withdrawn** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	255	6	343429 398662

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
370	**Planning Hazardous Substance Consents** Name: Baker Hughes Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: 12/00733/HAZ Hazardous Substance: Toxic Maximum Quantity: 30 Application date: 20th December 2012 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	255	6	343429 398662
370	**Planning Hazardous Substance Consents** Name: Baker Petrolite Ltd Location: Birchill Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7td Authority: Knowsley Metropolitan Borough Council Application Ref: 94/00024/HSC Hazardous Substance: Ethylene oxide Maximum Quantity: 136 Application date: 14th January 1994 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	281	6	343414 398713
370	**Planning Hazardous Substance Consents** Name: Baker Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, Kirkby, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: 09/00333/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 14th July 2009 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	298	6	343390 398685
370	**Planning Hazardous Substance Consents** Name: Baker Petrolite Location: Kirkby Bank Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7rg Authority: Knowsley Metropolitan Borough Council Application Ref: 99/00705/HSC Hazardous Substance: Unknown at time of report Maximum Quantity: 0 Application date: 20th October 1999 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A12SE (W)	306	6	343385 398697
371	**Planning Hazardous Substance Consents** Name: Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: K/Hsc/5 Hazardous Substance: Part B, Highly Reactive and Explosive Substance, Propylene oxide, where amount held is greater than or equal to 5 tonnes Maximum Quantity: 90 Application date: 21st October 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Manually positioned to the road within the address or location	A12SE (W)	267	6	343410 398612
371	**Planning Hazardous Substance Consents** Name: Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: K/Hsc/5 Hazardous Substance: Part C, Flammable Substance (Not in Parts A&B), Liquefied petroleum gas held at >1.4 bar where amount held is greater than or equal to 25 tonnes Maximum Quantity: 40 Application date: 21st October 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Manually positioned to the road within the address or location	A12SE (W)	267	6	343410 398612

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
371	**Planning Hazardous Substance Consents** Name: Petrolite Ltd Location: Kirkby Bank Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sy Authority: Knowsley Metropolitan Borough Council Application Ref: K/Hsc/5 Hazardous Substance: Part B, Highly Reactive and Explosive Substance, Ethylene oxide, where amount held is greater than or equal to 5 tonnes Maximum Quantity: 50 Application date: 21st October 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Manually positioned to the road within the address or location	A12SE (W)	267	6	343410 398612
372	**Planning Hazardous Substance Consents** Name: Bradman Manufacturing Ltd Location: Bradman Road, Knowsley Industrial Park, Kirkby, Knowsley, Merseyside, L33 7ur Authority: Knowsley Metropolitan Borough Council Application Ref: 02/00761/Haz Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 1507 Application date: 12th August 2002 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A18SW (NW)	316	6	343544 399206
372	**Planning Hazardous Substance Consents** Name: Rentokil Ltd Location: Bradman Road, Kirkby Industrial Estate, Kirby, Liverpool, Merseyside, L33 7ur Authority: Knowsley Metropolitan Borough Council Application Ref: K/Hsc/1 Hazardous Substance: Part A, Toxic Substance, Arsenic trioxide, Arsenious (III) acid and salts, where amount held is greater than or equal to 1tonne Maximum Quantity: 650 Application date: 4th August 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (NW)	317	6	343577 399233
373	**Planning Hazardous Substance Consents** Name: Syntor Fine Chemicals Location: Acornfield Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7ug Authority: Knowsley Metropolitan Borough Council Application Ref: 09/00546/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 13th August 2009 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	385	6	343725 399354
373	**Planning Hazardous Substance Consents** Name: Syntor Fine Chemicals Location: Acornfield Road, Knowsley Industrial Park, Kirby, Knowsley, L33 7ug Authority: Knowsley Metropolitan Borough Council Application Ref: 14/00544/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 30th July 2014 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	398	6	343710 399365
374	**Planning Hazardous Substance Consents** Name: Potter Logistics Location: Charley Wood Road, Knowsley Industrial Park, Kirby, Knowsley, L33 7sg Authority: Knowsley Metropolitan Borough Council Application Ref: 15/00332/HAZ Hazardous Substance: Dangerous for the environment (very toxic to aquatic organisms) Maximum Quantity: 220 Application date: 11th May 2015 **Decision: Unknown at time of reportUnknown** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	434	6	343504 398201

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
374	**Planning Hazardous Substance Consents** Name: Potter Logistics Location: Charley Wood Road, Knowsley Industriall Park, Kirby, Knowsley, L33 7sg Authority: Knowsley Metropolitan Borough Council Application Ref: 14/00045/HAZ Hazardous Substance: Dangerous for the environment (very toxic to aquatic organisms) Maximum Quantity: 220 Application date: 4th February 2014 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	438	6	343503 398198
375	**Planning Hazardous Substance Consents** Name: Archimica Ltd Location: Woodward Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7uz Authority: Knowsley Metropolitan Borough Council Application Ref: 99/00672/HSC Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 4th October 1999 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned within the geographical locality	A18SW (N)	476	6	343688 399441
376	**Planning Hazardous Substance Consents** Name: Mersey Gas Location: Orchard Works, Webber Road, Knowsley Industrial Park North, Knowsley, Merseyside, L33 7sr Authority: Knowsley Metropolitan Borough Council Application Ref: K/Hsc/6 Hazardous Substance: Part C, Flammable Substance (Not in Parts A&B), Liquefied petroleum gas held at >1.4 bar where amount held is greater than or equal to 25 tonnes Maximum Quantity: 206.5 Application date: 24th November 1992 **Decision: Deemed consent granted between June 1992 and November 1992Granted** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	525	6	343152 398587
377	**Planning Hazardous Substance Consents** Name: Not Supplied Location: Knowsley Rail Freight Terminal, Knowsley Industrial Park, Kirkby, Knowsley, L33 7uz Authority: Knowsley Metropolitan Borough Council Application Ref: 07/00065/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 25th January 2007 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	604	6	343558 399541
377	**Planning Hazardous Substance Consents** Name: The Potter Group Ltd Location: Knowsley Rail Freight Terminal, Knowsley Industrial Park, Knowsley, L33 7uz Authority: Knowsley Metropolitan Borough Council Application Ref: 06/00470/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 13830 Application date: 22nd May 2006 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	604	6	343558 399541
378	**Planning Hazardous Substance Consents** Name: Rentokil Initial Supplies Location: Webber Road, Knowsley Industrial Park, Kirkby, Knowsley, L33 7sr Authority: Knowsley Metropolitan Borough Council Application Ref: 99/00693/HSC Hazardous Substance: Liquefied extremely flammable gas (including LPG) and natural gas (whether liquefied or not) Maximum Quantity: 0 Application date: 19th October 1999 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	605	6	343072 398626

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
379	**Planning Hazardous Substance Consents** Name: Henry Diaper Location: Depot Road, Knowsley Indsutrial Park, LIVERPOOL, Merseyside, L33 Authority: Leeds City Council, Planning and Development Application Ref: 00/00617/Haz Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 325 Application date: 18th October 2000 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the road within the address or location	A18NW (N)	679	11	343686 399645
380	**Planning Hazardous Substance Consents** Name: Henry Diaper Location: Lees Road, Knowlsey Industrial Park, LIVERPOOL, Merseyside, L33 7SE Authority: Knowsley Metropolitan Borough Council Application Ref: 00/00617/Haz Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 345 Application date: 18th October 2000 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	955	6	342727 398503
380	**Planning Hazardous Substance Consents** Name: Henry Diaper Location: Depot Road, Knowsley Industrial Park, Kirkby, Knowsley Authority: Knowsley Metropolitan Borough Council Application Ref: 00/00616/HAZ Hazardous Substance: Combination of Dangerous Substances Maximum Quantity: 0 Application date: 22nd September 2000 **Decision: Deemed Consent GrantedGranted** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	955	6	342727 398503

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS 1:625,000 Solid Geology Description: Triassic Rocks (Undifferentiated)	A13NW (E)	0	1	343840 398787
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 120 - 180 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (N)	0	1	343877 398926
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (N)	0	1	343839 398802
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NW (E)	0	1	343840 398787
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: 15 - 30 mg/kg	A13NE (NE)	75	1	344000 399000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14NW (E)	409	1	344445 399000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14NW (E)	455	1	344500 398787

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 300 - 600 mg/kg Nickel Concentration: 15 - 30 mg/kg	A14NW (E)	463	1	344500 399000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 300 - 600 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19SW (NE)	530	1	344500 399186
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 300 - 600 mg/kg Nickel Concentration: 15 - 30 mg/kg	A18NE (N)	567	1	344000 399500
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: <15 mg/kg	A8SW (S)	576	1	343840 398000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17NE (NW)	588	1	343500 399500
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7SE (SW)	698	1	343290 398018

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 25 - 35 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: 15 - 30 mg/kg	A19NW (NE)	705	1	344472 399479
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 120 - 180 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7NW (SW)	734	1	343035 398244
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 300 - 600 mg/kg Nickel Concentration: <15 mg/kg	A14NE (E)	807	1	344849 399000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: <15 mg/kg	A14NE (E)	809	1	344856 398957
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: <15 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: <100 mg/kg Nickel Concentration: 15 - 30 mg/kg	A7SW (SW)	904	1	343000 398000
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: 1.8 - 2.2 mg/kg Chromium Concentration: 90 - 120 mg/kg Lead Concentration: 200 - 300 mg/kg Nickel Concentration: 15 - 30 mg/kg	A17NW (NW)	922	1	343000 399500

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: <1.8 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 100 - 200 mg/kg Nickel Concentration: <15 mg/kg	A15SW (E)	954	1	344935 398500
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: 1.8 - 2.2 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 300 - 600 mg/kg Nickel Concentration: <15 mg/kg	A15NW (E)	955	1	345000 398787
	BGS Estimated Soil Chemistry Source: British Geological Survey, National Geoscience Information Service Soil Sample Type: Rural Soil Arsenic Concentration: 15 - 25 mg/kg Cadmium Concentration: 2.2 - 3.0 mg/kg Chromium Concentration: 60 - 90 mg/kg Lead Concentration: 600 - 1200 mg/kg Nickel Concentration: <15 mg/kg	A15NW (E)	959	1	345000 399000
381	**BGS Recorded Mineral Sites** Site Name: Simonswood Moss Peat Workings Location: Kirkby, Liverpool, Merseyside Source: British Geological Survey, National Geoscience Information Service Reference: 227010 Type: Opencast **Status: Dormant** Operator: White Moss Horticulture Ltd Operator Location: Not Supplied Periodic Type: Quaternary Geology: Peat Commodity: Peat Positional Accuracy: Located by supplier to within 10m	A19SE (NE)	824	1	344800 399245
382	**BGS Recorded Mineral Sites** Site Name: Simonswood Moss Peat Workings Location: Kirkby, Liverpool, Merseyside Source: British Geological Survey, National Geoscience Information Service Reference: 227008 Type: Opencast **Status: Dormant** Operator: White Moss Horticulture Ltd Operator Location: Not Supplied Periodic Type: Quaternary Geology: Peat Commodity: Peat Positional Accuracy: Located by supplier to within 10m	A19NW (NE)	945	1	344515 399735
383	**BGS Recorded Mineral Sites** Site Name: Simonswood Moss Peat Workings Location: Kirkby, Liverpool, Merseyside Source: British Geological Survey, National Geoscience Information Service Reference: 227009 Type: Opencast **Status: Dormant** Operator: White Moss Horticulture Ltd Operator Location: Not Supplied Periodic Type: Quaternary Geology: Peat Commodity: Peat Positional Accuracy: Located by supplier to within 10m	A19NE (NE)	976	1	344855 399460
	BGS Measured Urban Soil Chemistry No data available				

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
	BGS Urban Soil Chemistry Averages No data available				
	Coal Mining Affected Areas In an area that might not be affected by coal mining				
	Mining Instability Mining Evidence: Inconclusive Coal Mining Source: Ove Arup & Partners Boundary Quality: As Supplied	A13NE (E)	0	-	344000 398787
	Non Coal Mining Areas of Great Britain No Hazard				
	Potential for Collapsible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Potential for Collapsible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	89	1	344066 398711
	Potential for Compressible Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	0	1	344030 398787
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Potential for Compressible Ground Stability Hazards Hazard Potential: High Source: British Geological Survey, National Geoscience Information Service	A13SE (E)	89	1	344066 398711
	Potential for Compressible Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13SE (SE)	208	1	344041 398584
	Potential for Ground Dissolution Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Potential for Landslide Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Very Low Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Potential for Running Sand Ground Stability Hazards Hazard Potential: Low Source: British Geological Survey, National Geoscience Information Service	A13NE (E)	0	1	344030 398787
	Potential for Shrinking or Swelling Clay Ground Stability Hazards Hazard Potential: No Hazard Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Radon Potential - Radon Affected Areas Affected Area: The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787
	Radon Potential - Radon Protection Measures Protection Measure: No radon protective measures are necessary in the construction of new dwellings or extensions Source: British Geological Survey, National Geoscience Information Service	A13NW (E)	0	1	343840 398787

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
384	**Contemporary Trade Directory Entries** Name: Kodak Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	-	343781 398874
384	**Contemporary Trade Directory Entries** Name: Eastman Co (Uk) Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	0	-	343781 398874
385	**Contemporary Trade Directory Entries** Name: Future Industrial Services Location: Image Business Park, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (S)	13	-	343788 398641
386	**Contemporary Trade Directory Entries** Name: Ames Goldsmith Uk Ltd Location: Ames Goldsmith UK Ltd, Image Business Park, Acornfield Road, Kirkby, L33 7UF Classification: Chemical Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	36	-	343701 398556
387	**Contemporary Trade Directory Entries** Name: Surface Transforms Location: 33 Acornfield Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UF Classification: Carbon Products **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13NW (E)	39	-	343859 398792
388	**Contemporary Trade Directory Entries** Name: P S L Weir Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Hardware **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	52	-	343713 399002
388	**Contemporary Trade Directory Entries** Name: P S L Weir Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Hardware **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	52	-	343713 399002
389	**Contemporary Trade Directory Entries** Name: Mersey Pallet Co Location: Kirkby Bank Road, Knowsley Industrial Park, LIVERPOOL, L33 7SY Classification: Pallets, Crates & Packing Cases **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	72	-	343606 398585
389	**Contemporary Trade Directory Entries** Name: Metalbuild M C E Ltd Location: Unit 12, Draw Well Road, Knowsley Industrial Park, Liverpool, L33 7BJ Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	72	-	343610 398632
390	**Contemporary Trade Directory Entries** Name: Cargo Pak (Uk) Ltd Location: Draw Well Road, Knowsley Industrial Park, Liverpool, L33 7BJ Classification: Materials Handling Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	72	-	343611 398636
391	**Contemporary Trade Directory Entries** Name: Future Industrial Services Location: Image Business Park, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Classification: Industrial Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (S)	78	-	343863 398680

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
392	**Contemporary Trade Directory Entries** Name: Acclaim Furniture Components Location: 2, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TH Classification: Kitchen Furniture Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	101	-	343723 399066
393	**Contemporary Trade Directory Entries** Name: Maximum Lift Trucks Ltd Location: Unit 11, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Fork Lift Trucks **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	136	-	343550 398550
393	**Contemporary Trade Directory Entries** Name: P & S (Northern) Location: Unit 7,Capitol Trading Pk,Kirkby Bank Rd, Knowsley Ind Pk, Liverpool, L33 7SY Classification: Distribution Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13SW (SW)	162	-	343544 398506
394	**Contemporary Trade Directory Entries** Name: Brazilian Joinery Ltd Location: Kirkby, L33 7BJ Classification: Joinery Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (W)	142	-	343553 398701
394	**Contemporary Trade Directory Entries** Name: Croft Bros Location: Unit 8, Draw Well Road, Kirkby, Liverpool, L33 7BJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	146	-	343548 398694
394	**Contemporary Trade Directory Entries** Name: Hydrodec Uk Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TQ Classification: Oil Recycling & Disposal Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13SW (W)	155	-	343548 398742
394	**Contemporary Trade Directory Entries** Name: Cases For Industry Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Pallets, Crates & Packing Cases **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	156	-	343534 398678
394	**Contemporary Trade Directory Entries** Name: Engineering Projects Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	156	-	343534 398678
395	**Contemporary Trade Directory Entries** Name: Sefton Logistics Co Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	150	-	343612 399020
395	**Contemporary Trade Directory Entries** Name: Lancashire Wood Design Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Joinery Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	167	-	343583 398966
395	**Contemporary Trade Directory Entries** Name: Advanced Enamelling Location: Stockpit Rd,Knowsley Ind Park North, Knowsley Ind Park, Liverpool, Merseyside, L33 7TQ Classification: Blast Cleaning **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	169	-	343584 398982

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
395	**Contemporary Trade Directory Entries** Name: Waste Oils Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Oil Recycling & Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	169	-	343584 398983
395	**Contemporary Trade Directory Entries** Name: Waste Oils Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Waste Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	169	-	343584 398983
395	**Contemporary Trade Directory Entries** Name: Merseyside Precision Engineering Location: Stockpit Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TQ Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	169	-	343584 398983
395	**Contemporary Trade Directory Entries** Name: A Bolton & Son Location: Stockpit Rd,Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Commercial Vehicle Bodybuilders & Repairers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A13NW (NW)	169	-	343584 398982
395	**Contemporary Trade Directory Entries** Name: Dart Office Supplies Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	179	-	343566 398947
396	**Contemporary Trade Directory Entries** Name: Apex Location: Draw Well Road, Knowsley Industrial Park, Liverpool, L33 7BJ Classification: Door Manufacturers - Industrial **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	151	-	343591 398930
396	**Contemporary Trade Directory Entries** Name: Dec Industrial Equipment Ltd Location: Draw Well Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7BJ Classification: Materials Handling Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	151	-	343591 398930
396	**Contemporary Trade Directory Entries** Name: Slicker Recycling Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TQ Classification: Oil Recycling & Disposal Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13NW (W)	165	-	343569 398890
397	**Contemporary Trade Directory Entries** Name: Lancashire Wood Design Location: Stockpit Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TQ Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A13NW (W)	161	-	343555 398806
397	**Contemporary Trade Directory Entries** Name: Ribble Fuel Oils Location: Stockpit Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TQ Classification: Fuel Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (W)	173	-	343534 398766
398	**Contemporary Trade Directory Entries** Name: Sharp Fabrications Location: Ashcroft House, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Machine Shops **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	166	-	343728 399134

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
398	**Contemporary Trade Directory Entries** Name: Merseyprint Ltd Location: Ashcroft House, Ashcroft Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TW Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18SW (N)	166	-	343728 399134
398	**Contemporary Trade Directory Entries** Name: Floorcoverings Location: Eagle House, Unit 3, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Floorcoverings - Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	166	-	343728 399134
398	**Contemporary Trade Directory Entries** Name: Knowsley Cases & Pallets Location: Eagle House, Unit 3, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Pallets, Crates & Packing Cases **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	166	-	343728 399134
399	**Contemporary Trade Directory Entries** Name: Knowsley Commercial Motors Location: Acornfield Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7RD Classification: Garage Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A13SW (SW)	166	-	343608 398449
399	**Contemporary Trade Directory Entries** Name: Transland International Uk Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7RD Classification: Freight Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SW (SW)	166	-	343608 398449
400	**Contemporary Trade Directory Entries** Name: Tradebe Location: Image Business Park, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Classification: Recycling Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13SE (SE)	166	-	343932 398581
401	**Contemporary Trade Directory Entries** Name: Trident Solutions Ltd Location: Stockpit Road, Knowsley Industrial Park, LIVERPOOL, L33 7TQ Classification: Industrial Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A13NW (W)	173	-	343555 398863
401	**Contemporary Trade Directory Entries** Name: Express Dairies Location: Stockpit Rd,Knowsley Industrial Park, Liverpool, L33 7TQ Classification: Dairies **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A13NW (W)	200	-	343526 398856
402	**Contemporary Trade Directory Entries** Name: Offset Technical Services Location: Unit 19, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, LIVERPOOL, L33 7SY Classification: Printing Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	190	-	343490 398569
402	**Contemporary Trade Directory Entries** Name: Caldan Solutions Location: Unit 21, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	202	-	343477 398571
402	**Contemporary Trade Directory Entries** Name: Comsec Location: Unit 22, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Electrical Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	208	-	343471 398572

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
402	**Contemporary Trade Directory Entries** Name: Riley Precision Engineering Location: Unit 25, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	226	-	343452 398577
402	**Contemporary Trade Directory Entries** Name: S K Print Location: Unit 36, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	226	-	343452 398577
403	**Contemporary Trade Directory Entries** Name: R J Edwards & Co Engineers Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Ornamental Metalwork **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	215	-	343579 399096
403	**Contemporary Trade Directory Entries** Name: Emform Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TP Classification: Electronic Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A13NW (NW)	215	-	343579 399096
404	**Contemporary Trade Directory Entries** Name: Cubic 3 Design & Engineering Ltd Location: Unit 35, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	218	-	343507 398462
404	**Contemporary Trade Directory Entries** Name: Cubic 3 Design & Engineering Ltd Location: Unit 35, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Plant & Machinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	218	-	343507 398462
404	**Contemporary Trade Directory Entries** Name: R S Eyre & Co Location: Unit 35, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	218	-	343507 398462
404	**Contemporary Trade Directory Entries** Name: Nurock Mixers Ltd Location: Unit 35, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Plant & Machinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	218	-	343509 398460
405	**Contemporary Trade Directory Entries** Name: M R Hydraulics Location: 4, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Hydraulic Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	221	-	343693 399182
406	**Contemporary Trade Directory Entries** Name: Tradeteam Ltd Location: Knowsley Depot, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7RN Classification: Distribution Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SE (N)	234	-	343870 399186
407	**Contemporary Trade Directory Entries** Name: Adamson Group Service Location: Acornfield Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7YX Classification: Frozen Food Processors & Distributors **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (N)	241	-	343792 399208

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
407	**Contemporary Trade Directory Entries** Name: Mac Logistics Location: Acornfield Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UG Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (N)	248	-	343794 399214
408	**Contemporary Trade Directory Entries** Name: M S E E Fabrications Location: Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Machinery - Industrial & Commercial **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	248	-	343460 398478
408	**Contemporary Trade Directory Entries** Name: White Arrow Express Location: 1-3, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7EJ Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	250	-	343440 398519
408	**Contemporary Trade Directory Entries** Name: Rentokil Pest Control Location: 1-3, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7EJ Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	250	-	343440 398519
408	**Contemporary Trade Directory Entries** Name: Javalin Uk Ltd Location: Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	280	-	343425 398477
409	**Contemporary Trade Directory Entries** Name: Maktar Asphalt Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Asphalt & Coated Macadam Laying Contractors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	249	-	343516 399044
409	**Contemporary Trade Directory Entries** Name: H S G Packing Cases Ltd Location: Ashcroft Rd,Knowsley Industrial Park, Liverpool, L33 7TW Classification: Boxes & Cartons **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NE (NW)	254	-	343519 399068
409	**Contemporary Trade Directory Entries** Name: Kirkby Precision Engineering Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	281	-	343478 399021
409	**Contemporary Trade Directory Entries** Name: Bespoke Fireplaces Ltd Location: Unit 6a, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Fireplaces & Mantelpieces **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	283	-	343481 399047
410	**Contemporary Trade Directory Entries** Name: Northway Trading & Export Ltd Location: Megamid House, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Agricultural Machinery - Sales & Service **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	250	-	343638 399191
410	**Contemporary Trade Directory Entries** Name: Press 2 Dress Location: Unit 4,Bradman Rd, Liverpool, Merseyside, L32 7UR Classification: Ironing & Home Laundry Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18SW (NW)	283	-	343621 399220

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
411	**Contemporary Trade Directory Entries** Name: Ascot Architectural Glazing Ltd Location: Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Aluminium Fabricators **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	255	-	343498 398418
411	**Contemporary Trade Directory Entries** Name: Javelin Location: Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	255	-	343498 398418
411	**Contemporary Trade Directory Entries** Name: Efes Meat Suppliers Location: Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Meat - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	255	-	343498 398418
411	**Contemporary Trade Directory Entries** Name: Abbey Home Improvements Location: Unit 20,New Capitol Trading Park, Knowsley Industrial Park, Liverpool, Merseyside, L33 7EU Classification: Engineering Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	259	-	343485 398425
411	**Contemporary Trade Directory Entries** Name: Merseyside Dairies Ltd Location: Unit 4A, Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7RT Classification: Dairies **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	278	-	343460 398426
411	**Contemporary Trade Directory Entries** Name: Coley Instruments Location: Yardley Rd,Knowsley Industrial Park North, Liverpool, L33 7SS Classification: Gauge Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	279	-	343490 398392
411	**Contemporary Trade Directory Entries** Name: Biofuel Location: Yardley Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SS Classification: Oil Fuel Distributors **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	281	-	343488 398392
411	**Contemporary Trade Directory Entries** Name: Leather Chairs Location: Unit 1C,Yardley Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SS Classification: Leather Garments & Products **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	285	-	343480 398394
411	**Contemporary Trade Directory Entries** Name: Premier Cases Location: Yardley Rd,Knowsley Ind Parknorth, Knowsley Ind Park, Liverpool, Merseyside, L33 7SS Classification: Pallets, Crates & Packing Cases **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	286	-	343478 398394
411	**Contemporary Trade Directory Entries** Name: Fielding Transport (Nw) Ltd Location: Russell House, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	324	-	343437 398382
411	**Contemporary Trade Directory Entries** Name: Cleanrite Site Services Ltd Location: Unit 3-5, Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Hygiene & Cleansing Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	324	-	343437 398382

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
412	**Contemporary Trade Directory Entries** Name: Baker Hughes Location: Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (W)	256	-	343429 398662
413	**Contemporary Trade Directory Entries** Name: Faci Uk Chemicals Ltd Location: Unit 7, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	268	-	343513 399088
413	**Contemporary Trade Directory Entries** Name: P S L Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TW Classification: Hardware **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NE (NW)	285	-	343499 399098
413	**Contemporary Trade Directory Entries** Name: Big Amplification Location: Ashcroft Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TW Classification: Musical Instrument - Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NE (NW)	298	-	343476 399077
413	**Contemporary Trade Directory Entries** Name: A1 X-Press Windows Location: Unit 2, Prestige Complex, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Window Frame Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	304	-	343479 399101
413	**Contemporary Trade Directory Entries** Name: Ashcroft M O T Centre Location: Kirkby, L33 7TW Classification: Mot Testing Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	308	-	343481 399114
413	**Contemporary Trade Directory Entries** Name: Connaught Environmental Ltd Location: Ashcroft Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TW Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NE (NW)	326	-	343448 399084
414	**Contemporary Trade Directory Entries** Name: E P L Ltd Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Plastics - Welding **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	308	-	343507 398343
414	**Contemporary Trade Directory Entries** Name: E P Moulding Ltd Location: Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Plastics - Injection Moulding **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	308	-	343507 398343
414	**Contemporary Trade Directory Entries** Name: Cache Designs Ltd Location: Unit 1/B, Yardley Centre, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Soft Furnishings - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	342	-	343497 398308
415	**Contemporary Trade Directory Entries** Name: Eros Engineering Location: Unit 5, 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	309	-	343540 399193

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
415	**Contemporary Trade Directory Entries** Name: J S A Precision Engineering Location: Bradman House, 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Precision Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	309	-	343540 399192
415	**Contemporary Trade Directory Entries** Name: Universal Bags & Packaging Location: Bradman House, 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Paper & Cardboard Products & Packaging - Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	309	-	343540 399192
415	**Contemporary Trade Directory Entries** Name: Rentokil Initial Plc Location: 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Timber Preservation Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	309	-	343540 399193
415	**Contemporary Trade Directory Entries** Name: Rentokil Pest Control Location: Bradman Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18SW (NW)	309	-	343540 399193
415	**Contemporary Trade Directory Entries** Name: Rentokil Pest Control Location: Bradman Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18SW (NW)	309	-	343540 399193
415	**Contemporary Trade Directory Entries** Name: Kirkby Jig & Tool Co Ltd Location: Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Precision Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	-	343516 399228
415	**Contemporary Trade Directory Entries** Name: Rentokill Location: Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	-	343516 399228
415	**Contemporary Trade Directory Entries** Name: Rentokil Location: Brightfide Building,4 Bradman Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17SE (NW)	351	-	343516 399228
415	**Contemporary Trade Directory Entries** Name: Rentokil Property Care Location: Bradman Road, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UR Classification: Damp & Dry Rot Control **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	351	-	343516 399228
416	**Contemporary Trade Directory Entries** Name: Colloids Location: Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Plastic Products - Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SE (SW)	317	-	343360 398580
417	**Contemporary Trade Directory Entries** Name: The Abbey Group Location: Unit 4 Manor Complex,Kirkby Bank Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SY Classification: Engineers - General **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A12SE (SW)	335	-	343349 398529

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
418	**Contemporary Trade Directory Entries** Name: Caldeira Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7RD Classification: Textile Manufacturing **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A8NW (SW)	342	-	343533 398289
419	**Contemporary Trade Directory Entries** Name: C D I Location: The Morgan Brightside Building, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	342	-	343574 399261
419	**Contemporary Trade Directory Entries** Name: Sovereign Transport Services Location: The Morgan Brightside Building, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Road Haulage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (NW)	354	-	343606 399292
420	**Contemporary Trade Directory Entries** Name: C I S E Location: Unit 14 Lodge Works Ashcroft rd, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TW Classification: Control Panels **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A12NE (NW)	343	-	343415 399026
420	**Contemporary Trade Directory Entries** Name: Premier Fabrications Location: Unit 2 Lodge Works,Birchill Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TD Classification: Wrought Ironwork **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NE (NW)	348	-	343410 399027
420	**Contemporary Trade Directory Entries** Name: Knowsley Instrument Services Location: 11, Lodge Works, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Industrial Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	351	-	343413 399051
420	**Contemporary Trade Directory Entries** Name: Ajm Joinery Location: Unit 12, Lodge Works, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Shop Fittings Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	388	-	343368 399018
420	**Contemporary Trade Directory Entries** Name: Northwest Transit Spares Location: Units 2,,3 & 4,Lodge Works,Birchill Rd, Knowsley Ind Park, Liverpool, Merseyside, L33 7TD Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12NE (NW)	389	-	343367 399018
420	**Contemporary Trade Directory Entries** Name: Kirby Vans Location: Units 2,3 & 4,Lodge Works,Birchill Rd, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Commercial Vehicle Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12NE (NW)	389	-	343367 399018
421	**Contemporary Trade Directory Entries** Name: Omnibob Ltd Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Glass Fibre - Moulding **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	360	-	343422 398345

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
421	**Contemporary Trade Directory Entries** Name: Kt Pallets & Cases Ltd Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Pallets, Crates & Packing Cases **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	401	-	343381 398329
422	**Contemporary Trade Directory Entries** Name: Lewis & Raby Engineers Ltd Location: Birchill Road, Knowsley Industrial Park, LIVERPOOL, L33 7TG Classification: Precision Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (W)	369	-	343351 398847
422	**Contemporary Trade Directory Entries** Name: Lewis & Raby Engineers Ltd Location: Birchill Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TG Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	369	-	343351 398847
423	**Contemporary Trade Directory Entries** Name: Ashcroft Glass Ltd Location: Eclipse Glass, The Ashcroft Centre, Ashcroft Road, Kirkby, L33 7TW Classification: Glass Products - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	369	-	343417 399121
424	**Contemporary Trade Directory Entries** Name: Stewart Buchanan Gauges Ltd Location: Yardley Rd,Knowsley Industrial Park North, Liverpool, L33 7SS Classification: Gauge Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	378	-	343342 398423
424	**Contemporary Trade Directory Entries** Name: Ennis Location: Yardley rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SS Classification: Powder Coatings **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	390	-	343328 398426
424	**Contemporary Trade Directory Entries** Name: Paramount Contract Cleaning Services Ltd Location: Yardley Road, Knowsley Ind Park, Liverpool, Merseyside, L33 7SS Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	424	-	343297 398410
424	**Contemporary Trade Directory Entries** Name: Innerflow Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Mechanical Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	425	-	343297 398410
425	**Contemporary Trade Directory Entries** Name: Scrap Cars Vans Caravans Buyer Location: Acornfield Road, Liverpool, Merseyside, l33 7ug Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18SW (N)	397	-	343860 399354
426	**Contemporary Trade Directory Entries** Name: T C R Associates Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Classification: Woodworking Machinery **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SE (N)	401	-	344053 399322
426	**Contemporary Trade Directory Entries** Name: Green Shield Cowie Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	-	344056 399335

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
426	**Contemporary Trade Directory Entries** Name: The Knight Line Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	-	344056 399335
426	**Contemporary Trade Directory Entries** Name: F T S Haulage Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	-	344056 399335
426	**Contemporary Trade Directory Entries** Name: Green Shields Cowie & Co Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 3BA Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	-	344056 399335
426	**Contemporary Trade Directory Entries** Name: Greenshields Cowie Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SE (N)	415	-	344056 399335
426	**Contemporary Trade Directory Entries** Name: Goldstar Transport Ltd Location: 1, Perimeter Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 3AY Classification: Road Haulage Services **Status: Active** Positional Accuracy: Manually positioned to the address or location	A18SE (N)	415	-	344057 399335
426	**Contemporary Trade Directory Entries** Name: Gold Start Transport Location: 1, Perimeter Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 3AY Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18SE (N)	415	-	344057 399335
426	**Contemporary Trade Directory Entries** Name: Green Shields Cowie & Co Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 3BA Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18SE (N)	415	-	344056 399335
427	**Contemporary Trade Directory Entries** Name: M I R K Location: Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	404	-	343449 399234
427	**Contemporary Trade Directory Entries** Name: Geoscope Location: Hammond Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UL Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	433	-	343424 399250
427	**Contemporary Trade Directory Entries** Name: Sip Build Location: Unit 1 The Bond, Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Insulation Materials **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	441	-	343427 399266
427	**Contemporary Trade Directory Entries** Name: Hales Location: Hammond Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UL Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	447	-	343430 399278

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
428	**Contemporary Trade Directory Entries** Name: Mikes Auto Repairs Location: Birchill Rd, Knowsley Ind Pk, Liverpool, L33 7TD Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NE (W)	419	-	343308 398882
429	**Contemporary Trade Directory Entries** Name: Stephens Location: Birchill Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TD Classification: Salvage Dealers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NE (NW)	419	-	343333 399004
429	**Contemporary Trade Directory Entries** Name: Pallet & Case Services Ltd Location: Bradman House, 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Classification: Pallets, Crates & Packing Cases **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	444	-	343310 399018
429	**Contemporary Trade Directory Entries** Name: Miller Specialist Joinery Ltd Location: Birchill Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TD Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	444	-	343310 399018
429	**Contemporary Trade Directory Entries** Name: G N Fabrication Location: Unit 4, Bradman House, 6, Bradman Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UR Classification: Insulation Materials **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	444	-	343310 399018
429	**Contemporary Trade Directory Entries** Name: Haighs Engineering Location: Unit 2,3,Birchill Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TD Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NE (NW)	444	-	343310 399018
429	**Contemporary Trade Directory Entries** Name: Autocare Location: Derby Works, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	446	-	343308 399019
429	**Contemporary Trade Directory Entries** Name: Seaforth Haulage Location: Unit 6/A, Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	479	-	343274 399012
429	**Contemporary Trade Directory Entries** Name: Newstet Motors Location: Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	490	-	343266 399031
430	**Contemporary Trade Directory Entries** Name: O'Connell Metal Recycling Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Scrap Metal Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	419	-	343365 399128
430	**Contemporary Trade Directory Entries** Name: Port Of Liverpool Logistics Ltd Location: Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	420	-	343364 399126

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
431	**Contemporary Trade Directory Entries** Name: M P E Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Filter Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	422	-	343523 399324
431	**Contemporary Trade Directory Entries** Name: Boundary Plant Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Car Body Repairs **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	422	-	343523 399324
431	**Contemporary Trade Directory Entries** Name: Rj Scrap Yard Cars Vans Wanted Location: Hammond Road, Liverpool, Merseyside, l33 7ul Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	423	-	343523 399324
431	**Contemporary Trade Directory Entries** Name: Bangers Wanted Cash Liverpool Location: Hammond Road, Liverpool, Merseyside, l33 7ul Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	423	-	343523 399324
432	**Contemporary Trade Directory Entries** Name: Rentokil Specialist Hygiene Location: Kirkby Bank Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SY Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12SE (W)	426	-	343251 398597
432	**Contemporary Trade Directory Entries** Name: J E T Industrial Services Location: Unit 6 Kirkby Bank Rd,Knowsley Industrial Park, Liverpool, L33 7SY Classification: Electric Motor Sales & Service **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12SE (W)	429	-	343250 398642
433	**Contemporary Trade Directory Entries** Name: O'Connell Site Services Location: Drawell House, Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Scrap Metal Merchants **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	426	-	343466 399284
433	**Contemporary Trade Directory Entries** Name: Auto Screw Products Location: Hammond Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UL Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	460	-	343436 399302
433	**Contemporary Trade Directory Entries** Name: Ancorra Environmental Services Ltd Location: Ancorra House,Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Commercial Cleaning Services **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	464	-	343437 399309
433	**Contemporary Trade Directory Entries** Name: Muni-Serv (Northern) Ltd Location: Hammond Rd,Knowsley Industrial Park, Liverpool, L33 7UL Classification: Commercial Vehicle Breakdown & Recovery Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	476	-	343442 399330
433	**Contemporary Trade Directory Entries** Name: Quality Concrete Products Location: Hammond Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UL Classification: Garden Ornament Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17SE (NW)	482	-	343443 399338

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
434	**Contemporary Trade Directory Entries** Name: Potter Logistics Location: Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	435	-	343495 398205
435	**Contemporary Trade Directory Entries** Name: Uk Renewable Fuels Location: Acornfield Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SX Classification: Oil Fuel Distributors **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	443	-	343332 398322
436	**Contemporary Trade Directory Entries** Name: John Turners Log Burners Location: Kiam House, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Woodburning Stoves **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Equip2garden Location: Kiam House, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Wolf Creek Tools Location: Kiam House, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Kiam Power Products Location: Kiam House, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Thoroughbred D D P Ltd Location: Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Haigh Engineering North West Ltd Location: Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: J R Webster & Co Ltd Location: Birchill Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TD Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	451	-	343315 399074
436	**Contemporary Trade Directory Entries** Name: Equip 2 Clean Location: Kiam House, Birchill Road, Knowsley Industrial Park, Liverpool, L33 7TD Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (NW)	454	-	343313 399078
437	**Contemporary Trade Directory Entries** Name: Top Moor Engineering Ltd Location: Yardley Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SS Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12SE (SW)	454	-	343252 398438
438	**Contemporary Trade Directory Entries** Name: Glass Decor Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Glass Engravers & Decorators **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (N)	461	-	343731 399430

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
438	**Contemporary Trade Directory Entries** Name: Artist In Lead Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Leaded Lights & Windows **Status: Active** Positional Accuracy: Automatically positioned to the address	A18SW (N)	461	-	343731 399430
438	**Contemporary Trade Directory Entries** Name: Organic Intermediates Location: Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UZ Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	465	-	343717 399434
438	**Contemporary Trade Directory Entries** Name: Millenium Mower & Plant Repairs Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	465	-	343717 399434
439	**Contemporary Trade Directory Entries** Name: R & R Joinery Ltd Location: Unit 1c,Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Joinery Manufacturers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	482	-	343239 398397
439	**Contemporary Trade Directory Entries** Name: Wheelie Bin Solutions Location: Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Reclamation Centres **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A7NE (SW)	482	-	343239 398397
439	**Contemporary Trade Directory Entries** Name: Doors 4 Yours Location: Unit 2, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Door Manufacturers - Industrial **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	495	-	343214 398424
439	**Contemporary Trade Directory Entries** Name: Best Bi Folding Doors Location: Unit 2, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Door Manufacturers - Industrial **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	495	-	343214 398424
439	**Contemporary Trade Directory Entries** Name: M C Products Uk Ltd Location: Unit 1-2, Yardley Centre, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Bags, Belts & Accessories - Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	506	-	343210 398405
439	**Contemporary Trade Directory Entries** Name: Djk Catering Equipment Engineers Location: Unit 3/4, Yardley Centre, Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7NE (SW)	507	-	343201 398424
439	**Contemporary Trade Directory Entries** Name: Liverpool Caravan Breakers Location: Unit 5/A, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	526	-	343178 398431
440	**Contemporary Trade Directory Entries** Name: Denver Motors Location: Orchard Works, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SE (W)	485	-	343194 398561

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
441	**Contemporary Trade Directory Entries** Name: R J Scrap Yard Location: Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Car Breakers & Dismantlers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	486	-	343470 399364
441	**Contemporary Trade Directory Entries** Name: G & S Transport Ltd Location: Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UL Classification: Road Haulage Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	486	-	343470 399364
442	**Contemporary Trade Directory Entries** Name: Maguire Trading Location: Charleywood Rd, Knowsley Ind Pk, Liverpool, L33 7SG Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7NE (SW)	492	-	343470 398153
442	**Contemporary Trade Directory Entries** Name: Knowsley Transport International Location: Charleywood Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SG Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	530	-	343421 398135
442	**Contemporary Trade Directory Entries** Name: Davies Pallets Location: Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Pallets, Crates & Packing Cases **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	532	-	343464 398112
442	**Contemporary Trade Directory Entries** Name: Knowsley Transport International Location: Charleywood Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SG Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	532	-	343465 398112
443	**Contemporary Trade Directory Entries** Name: Apollo Cutting Tools Ltd Location: Unit 7, Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Cutting Tools & Machinery **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (W)	499	-	343247 398983
443	**Contemporary Trade Directory Entries** Name: Kirkby Car Clinic Location: Unit 10, Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	548	-	343200 398996
444	**Contemporary Trade Directory Entries** Name: George Allinson Transport Ltd Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18SW (N)	507	-	343579 399446
444	**Contemporary Trade Directory Entries** Name: J Hughes Transport Ltd Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (NW)	547	-	343540 399473
444	**Contemporary Trade Directory Entries** Name: Clariant L S M Ltd Location: Woodward Rd, Knowsley Ind Pk, Liverpool, L33 7UZ Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A18NW (NW)	576	-	343542 399506

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
445	**Contemporary Trade Directory Entries** Name: Flextech Hydraulics Location: Unit 76, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Hydraulic Equipment & Accessories - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	512	-	343800 399479
445	**Contemporary Trade Directory Entries** Name: Aaron Design Location: Unit 75,North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Upholstery Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	513	-	343782 399482
445	**Contemporary Trade Directory Entries** Name: North West Fertilisers Location: Unit 79,North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, L33 7UZ Classification: Fertilisers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	514	-	343840 399476
445	**Contemporary Trade Directory Entries** Name: D C S 2 Way Radio Ltd Location: North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Radio Communication Equipment **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	521	-	343772 399490
445	**Contemporary Trade Directory Entries** Name: Dunmore Location: Unit 78, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Toiletries **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	528	-	343804 399496
445	**Contemporary Trade Directory Entries** Name: Alphatec 2000 Ltd Location: Unit 78, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Printing Engineering Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	529	-	343798 399497
445	**Contemporary Trade Directory Entries** Name: Window World Blinds Location: Unit 73, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	531	-	343787 399500
446	**Contemporary Trade Directory Entries** Name: Thomas Hardie Commercials Ltd Location: Newstet Road, Knowsley Industrial Park, LIVERPOOL, L33 7TJ Classification: Commercial Vehicle Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NE (W)	513	-	343215 398898
447	**Contemporary Trade Directory Entries** Name: Knowsley Precision Engineering Location: Unit 71, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Precision Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	525	-	343745 399495
448	**Contemporary Trade Directory Entries** Name: Merseyside Auto Transport Location: Unit 115,North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	528	-	343687 399494

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
448	**Contemporary Trade Directory Entries** Name: Exclusive Freight Ltd Location: 109-111 North Mersey Business Centre,Woodward Rd, Knowsley Indust Pk, Liverpool, L33 7UY Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	529	-	343688 399495
448	**Contemporary Trade Directory Entries** Name: Nationwide Contract Hire And Leasing Location: Unit 100, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Commercial Vehicle Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	530	-	343688 399496
448	**Contemporary Trade Directory Entries** Name: Melocoton Office Interiors Location: Unit 122, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Furniture Manufacturers - Home & Office **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	530	-	343688 399496
448	**Contemporary Trade Directory Entries** Name: C J Finishing Location: Unit 131, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Metal Finishing Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	532	-	343683 399497
449	**Contemporary Trade Directory Entries** Name: Onestop Coatings Location: Unit 3-4, Yardley Centre, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Powder Coatings **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	534	-	343169 398435
450	**Contemporary Trade Directory Entries** Name: Veolia Location: Depot Road, Liverpool, L33 3AR Classification: Waste Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	537	-	343850 399498
451	**Contemporary Trade Directory Entries** Name: Kerr Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TS Classification: Firefighting Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	547	-	343225 399112
451	**Contemporary Trade Directory Entries** Name: A B V Lawnmower & Plant Repairs Ltd Location: Abbeyview Gmls, 10, Ashcroft Road, Kirkby, L33 7TW Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	556	-	343231 399159
452	**Contemporary Trade Directory Entries** Name: J & B Autos Location: Unit 4, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A12NE (W)	550	-	343190 398963
452	**Contemporary Trade Directory Entries** Name: Knowsley Metal Fabrication Co Location: Unit 13c, Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Metal Products - Fabricated **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NE (W)	552	-	343188 398959
452	**Contemporary Trade Directory Entries** Name: Containers Direct Location: Manor Yards Newstet Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TJ Classification: Container Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NW (W)	569	-	343172 398968

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
452	**Contemporary Trade Directory Entries** Name: J & M Location: 6a Newstet Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TJ Classification: Metal Products - Fabricated **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A12NW (W)	569	-	343172 398968
452	**Contemporary Trade Directory Entries** Name: Forresters Pressure Washer Services Ltd Location: Unit 12, Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Steam Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	570	-	343172 398968
452	**Contemporary Trade Directory Entries** Name: N J C Thermal Covers Location: Unit 2,Newstet Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TJ Classification: Insulation Materials **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	574	-	343162 398942
452	**Contemporary Trade Directory Entries** Name: The Grab Co Location: King House,Newstet Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TJ Classification: Waste Disposal Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	588	-	343148 398946
452	**Contemporary Trade Directory Entries** Name: Kirkby Hydraulics Location: Newstet Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TJ Classification: Hydraulic Equipment & Accessories - Sales & Service **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	592	-	343144 398946
452	**Contemporary Trade Directory Entries** Name: Fast Wheels Transport Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	595	-	343148 398980
453	**Contemporary Trade Directory Entries** Name: Avanti Waste Management Location: Avanti Waste Management, Charley Wood Road, Kirkby, L33 7SG Classification: Chemical Recycling & Disposal Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	553	-	343403 398119
453	**Contemporary Trade Directory Entries** Name: Avanti Waste Management Location: Avanti Waste Management, Charley Wood Road, Kirkby, L33 7SG Classification: Chemical Recycling & Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	553	-	343403 398119
453	**Contemporary Trade Directory Entries** Name: Avanti Ltd Location: Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Reclaiming - Waste Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	561	-	343402 398110
453	**Contemporary Trade Directory Entries** Name: Webster Drum Collection Services Location: Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Waste Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	561	-	343402 398110
454	**Contemporary Trade Directory Entries** Name: Mersey Gas Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Gas Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	558	-	343120 398566

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
455	**Contemporary Trade Directory Entries** Name: Hiway Transport Location: Hammond Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7RP Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	560	-	343468 399451
455	**Contemporary Trade Directory Entries** Name: C N W Architectural Ltd Location: Unit 1, Hammond Road, Kirkby, L33 7UZ Classification: Powder Coatings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	579	-	343455 399467
455	**Contemporary Trade Directory Entries** Name: Scrap Yard In Liverpool Htt Location: Unit 2, Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	588	-	343457 399478
455	**Contemporary Trade Directory Entries** Name: The Bed Factory Location: Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7RP Classification: Bed & Mattress Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	599	-	343446 399484
455	**Contemporary Trade Directory Entries** Name: The Bed Factory Ltd Location: Hammond Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7RP Classification: Bed & Mattress Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	599	-	343446 399484
455	**Contemporary Trade Directory Entries** Name: Universal Shop Equipment Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Shop Fittings Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	623	-	343415 399493
455	**Contemporary Trade Directory Entries** Name: K M C Packaging & Business Products Ltd Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Packaging Materials Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	626	-	343427 399504
456	**Contemporary Trade Directory Entries** Name: Techcare Electronics Location: Unit 10, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Electronic Engineers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	568	-	343152 398383
456	**Contemporary Trade Directory Entries** Name: Dipsticks Location: Unit 6c, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	592	-	343134 398362
456	**Contemporary Trade Directory Entries** Name: Yardley Motors Location: Unit 5c,Custom Complex,Yardley Rd, Knowsley Ind Pk, Liverpool, L33 7SS Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7NW (SW)	606	-	343109 398388
457	**Contemporary Trade Directory Entries** Name: Merseyside Castings & Engineering Co Location: Unit 3, Cornhill Works, Marl Road, Knowsley Industrial Park, LIVERPOOL, L33 7UH Classification: Foundries **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	570	-	343276 399280

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
458	**Contemporary Trade Directory Entries** Name: Marl Coatings Location: Old Lamplight Works, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Paint Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	571	-	343216 399163
458	**Contemporary Trade Directory Entries** Name: Tint Wizard Location: Unit 4, Marl Road Business Centre, 1, Marl Road, Kirkby, L33 7UH Classification: Window Tinting **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	593	-	343201 399185
458	**Contemporary Trade Directory Entries** Name: Ceramic Tiles Kirkbys Location: Deepdale Motor Caravans, Marl Road, Kirkby, L33 7UH Classification: Ceramic Manufacturers, Supplies & Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	596	-	343199 399188
459	**Contemporary Trade Directory Entries** Name: Powerpoint Distributors Ltd Location: Unit 35, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Catering Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	572	-	343671 399536
459	**Contemporary Trade Directory Entries** Name: M R Hydraulics Location: Unit 35, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Engineering Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	572	-	343671 399536
459	**Contemporary Trade Directory Entries** Name: C J Finishing Ltd Location: Unit 77 North Mersey Business Centre, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Metal Finishing Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	576	-	343666 399539
459	**Contemporary Trade Directory Entries** Name: Bluesat Solutions Ltd Location: North Mersey Business Centre,Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Radio Communication Equipment **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	576	-	343666 399539
459	**Contemporary Trade Directory Entries** Name: Cambraco Travel Location: Unit 104,North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Bus & Coach Operators & Stations **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	576	-	343666 399539
459	**Contemporary Trade Directory Entries** Name: Total Office Integration Ltd Location: Sephton House,North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Photocopiers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	576	-	343666 399539
459	**Contemporary Trade Directory Entries** Name: Print Media Ltd Location: Unit 36, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	576	-	343666 399539

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
459	**Contemporary Trade Directory Entries** Name: Carcom Location: Unit 41 North Mersey Business Centre,Woodward Rd, Knowsley Industrial Park Nort, Liverpool, L33 7UZ Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	586	-	343648 399546
459	**Contemporary Trade Directory Entries** Name: Knowsley Garden Machinery Location: Unit 39, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Lawnmowers & Garden Machinery - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	587	-	343648 399547
459	**Contemporary Trade Directory Entries** Name: Pure Filtration Services Location: Unit 39, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Oil Recycling & Disposal Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	587	-	343648 399547
459	**Contemporary Trade Directory Entries** Name: K D Packaging Ltd Location: North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, L33 7UY Classification: Packaging Materials Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	618	-	343646 399578
459	**Contemporary Trade Directory Entries** Name: Actuation Valve & Controls Ltd Location: Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UZ Classification: Valve Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	618	-	343647 399578
459	**Contemporary Trade Directory Entries** Name: Office Concept Location: Unit 51, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Photocopiers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	618	-	343647 399578
459	**Contemporary Trade Directory Entries** Name: Direct Sameday Ltd Location: NORTH MERSEY BUSINESS CENTRE,WOODWARD RD, Knowsley Ind Pk, Liverpool, L33 7UZ Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	618	-	343646 399578
459	**Contemporary Trade Directory Entries** Name: K D Packaging Ltd Location: North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Packaging Materials Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	618	-	343646 399578
459	**Contemporary Trade Directory Entries** Name: Environmental Cleaning Technologies Ltd Location: Unit 65, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	618	-	343647 399578
459	**Contemporary Trade Directory Entries** Name: Office Concept Location: Unit 51, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Office Equipment Servicing & Maintenance **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	618	-	343647 399578

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
459	**Contemporary Trade Directory Entries** Name: Klenz Location: Unit 63, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	633	-	343630 399591
459	**Contemporary Trade Directory Entries** Name: J W Ray & Co Liverpool Ltd Location: Unit 87, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Marine Engineering Equipment Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	642	-	343669 399606
459	**Contemporary Trade Directory Entries** Name: Ray Location: Unit 87, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Marine Equipment & Supplies **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	642	-	343669 399606
459	**Contemporary Trade Directory Entries** Name: Underwater Vision Location: Unit 88, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Engineering Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	647	-	343660 399610
459	**Contemporary Trade Directory Entries** Name: Klenz Ltd Location: Unit 91-92, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, LIVERPOOL, L33 7UY Classification: Glove Manufacturers & Wholesalers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	660	-	343641 399620
460	**Contemporary Trade Directory Entries** Name: Restfull Nights Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Homefurnishings - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	575	-	343220 398250
460	**Contemporary Trade Directory Entries** Name: H Rollet Co Ltd Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7YS Classification: Hose, Tubing & Fittings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NE (SW)	575	-	343220 398250
461	**Contemporary Trade Directory Entries** Name: Mercury Digital Systems Location: North Mersey Business Centre,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Classification: Photocopiers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	579	-	343606 399530
461	**Contemporary Trade Directory Entries** Name: Compass Renewable Solutions Ltd Location: Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UZ Classification: Boilers - Servicing, Replacements & Repairs **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A18NW (N)	602	-	343557 399539
461	**Contemporary Trade Directory Entries** Name: The Potter Group Ltd Location: Rail Freight Terminal, Woodward Road, Knowsley Industrial Park, LIVERPOOL, L33 7UZ Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	602	-	343557 399539
462	**Contemporary Trade Directory Entries** Name: Blok N Mesh Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Classification: Fencing Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	585	-	343392 399429

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
463	**Contemporary Trade Directory Entries** Name: D A M S International Ltd Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	585	-	343487 398046
463	**Contemporary Trade Directory Entries** Name: Dams International Ltd Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Furniture Manufacturers - Home & Office **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	585	-	343487 398046
463	**Contemporary Trade Directory Entries** Name: Dams International Ltd Location: Gores Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7XS Classification: Office Furniture & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	585	-	343487 398046
464	**Contemporary Trade Directory Entries** Name: Alpha Machine Tool Company Location: Unit 16, Webber Estates, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SQ Classification: Machine Tools - Manufacturers & Distributors **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (SW)	593	-	343106 398438
464	**Contemporary Trade Directory Entries** Name: Aegean Sea Ltd Location: Unit 19, Webber Estates, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SQ Classification: Builders' Tools & Equipment Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (SW)	614	-	343081 398451
465	**Contemporary Trade Directory Entries** Name: Isocal Uk Ltd Location: Unit 4, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Testing, Inspection & Calibration Equipment Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	594	-	343713 399563
465	**Contemporary Trade Directory Entries** Name: Graphic Advertising Location: 7, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UZ Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	594	-	343713 399563
465	**Contemporary Trade Directory Entries** Name: Deep Klean Service Location: Unit 6, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Vacuum Cleaners - Sales & Service **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	594	-	343713 399563
465	**Contemporary Trade Directory Entries** Name: O & M Northwest Location: Unit 1, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Electricity Companies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	594	-	343713 399563
465	**Contemporary Trade Directory Entries** Name: Uk Waste & Recycling Ltd Location: Unit 4, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Waste Processing Machinery **Status: Active** Positional Accuracy: Automatically positioned to the address	A18NW (N)	594	-	343713 399563
466	**Contemporary Trade Directory Entries** Name: Universal Chemicals Location: Headland Development Site, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	595	-	343168 398291

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
466	**Contemporary Trade Directory Entries** Name: Surecrete Precast Location: Headland Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Concrete Products **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	611	-	343167 398264
467	**Contemporary Trade Directory Entries** Name: Kirkby Blinds Direct Ltd Location: Unit 1, Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	602	-	343242 399288
467	**Contemporary Trade Directory Entries** Name: Kentech Location: 2,Marl Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UH Classification: Car Paint & Lacquer Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A17SE (NW)	603	-	343242 399288
467	**Contemporary Trade Directory Entries** Name: Kirkby Blinds Direct Ltd Location: Unit 1, Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Blinds, Awnings & Canopies **Status: Active** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	629	-	343213 399291
467	**Contemporary Trade Directory Entries** Name: Knowsley Transport Location: Cornhill Works, Marl Road, Kirkby, Liverpool, L33 7UH Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	629	-	343213 399291
467	**Contemporary Trade Directory Entries** Name: Window World Blinds Ltd Location: Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	629	-	343213 399291
467	**Contemporary Trade Directory Entries** Name: Kirkby Blinds Direct Ltd Location: Unit 1, Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	629	-	343213 399291
467	**Contemporary Trade Directory Entries** Name: Hallmark Engineering Ltd Location: Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UH Classification: Gate Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	629	-	343213 399291
468	**Contemporary Trade Directory Entries** Name: Autopaint International Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Paint Spraying Equipment & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	603	-	343214 399239
468	**Contemporary Trade Directory Entries** Name: Window World Wholesale Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Blinds, Awnings & Canopies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	603	-	343214 399239
468	**Contemporary Trade Directory Entries** Name: Autopaint International Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Paint Spraying Equipment & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	603	-	343214 399239

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
468	**Contemporary Trade Directory Entries** Name: Bed Factory Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Bed & Mattress Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	603	-	343214 399239
468	**Contemporary Trade Directory Entries** Name: The Bed Factory Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Bed & Mattress Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SE (NW)	612	-	343205 399240
469	**Contemporary Trade Directory Entries** Name: Rentokil Specialist Hygiene Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Classification: Commercial Cleaning Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	-	343072 398626
469	**Contemporary Trade Directory Entries** Name: Rentokil Initial Supplies Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	-	343072 398626
469	**Contemporary Trade Directory Entries** Name: Rentokil Pest Control Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Classification: Pest & Vermin Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	-	343072 398626
469	**Contemporary Trade Directory Entries** Name: Rentokil Initial Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Classification: Pest & Vermin Control **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	-	343072 398626
469	**Contemporary Trade Directory Entries** Name: Rentokil Property Care Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Classification: Damp & Dry Rot Control **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	605	-	343072 398626
470	**Contemporary Trade Directory Entries** Name: Merseyside Engineering Location: Unit 6, Webber Estates, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SQ Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	611	-	343072 398516
470	**Contemporary Trade Directory Entries** Name: P W B Power Services Ltd Location: Unit 2, Webber Estates, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SQ Classification: Electrical Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	638	-	343043 398523
471	**Contemporary Trade Directory Entries** Name: Riverside Truck Rental Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Commercial Vehicle Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	613	-	343120 398932
471	**Contemporary Trade Directory Entries** Name: Kr Cars Location: Manor Yards,Newstet Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TJ Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12NW (W)	654	-	343084 398960

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
472	**Contemporary Trade Directory Entries** Name: St Fabrications Ltd Location: Unit 5, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Stainless Steel Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	645	-	343081 398353
472	**Contemporary Trade Directory Entries** Name: Celsius Home Improvements Ltd Location: Unit 5, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Door Manufacturers - Domestic **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	645	-	343081 398353
472	**Contemporary Trade Directory Entries** Name: Falcon Lift Trucks Location: Unit 5, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Fork Lift Trucks **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	645	-	343081 398353
472	**Contemporary Trade Directory Entries** Name: Eco Tyre Shredders Location: Unit 5, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Classification: Tyre Disposal **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	645	-	343081 398353
472	**Contemporary Trade Directory Entries** Name: Custom Design & Develop Ltd Location: Unit 5, Custom Complex, Yardley Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SS Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	645	-	343081 398353
473	**Contemporary Trade Directory Entries** Name: Shield N W Location: Unit 15, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, LIVERPOOL, L33 7UY Classification: Door Manufacturers - Domestic **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	647	-	343705 399615
473	**Contemporary Trade Directory Entries** Name: Marine Container Consultants Ltd Location: Unit 12-13, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Container Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	647	-	343705 399615
473	**Contemporary Trade Directory Entries** Name: Gsh International Location: Unit 19, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A18NW (N)	647	-	343705 399615
474	**Contemporary Trade Directory Entries** Name: Adc Line Location: 14, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	653	-	343046 398431
474	**Contemporary Trade Directory Entries** Name: Bold The Key People Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	680	-	343023 398414

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
474	**Contemporary Trade Directory Entries** Name: Millennium Fork Trucks Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Fork Lift Trucks **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	704	-	343009 398377
474	**Contemporary Trade Directory Entries** Name: Premier Forktrucks Location: 10, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Fork Lift Trucks **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	704	-	343009 398377
475	**Contemporary Trade Directory Entries** Name: Starmine Ltd Location: Webber Rd, Knowsley Ind Pk, Liverpool, L33 7SW Classification: Chemical Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A12SW (W)	653	-	343024 398576
476	**Contemporary Trade Directory Entries** Name: J & J Auto Repairs Location: Unit 8, Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	656	-	343323 399465
477	**Contemporary Trade Directory Entries** Name: G & R E Motoring Location: Unit 8 Venture Works,Charleywood Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SG Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	664	-	343107 398259
478	**Contemporary Trade Directory Entries** Name: P S L Restorations Location: Unit 67, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	671	-	343658 399634
478	**Contemporary Trade Directory Entries** Name: C & C Metals Location: Unit 69, North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Classification: Scrap Metal Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A18NW (N)	672	-	343659 399635
479	**Contemporary Trade Directory Entries** Name: Kop-E-Kat Clothing Manufacturers Location: Unit 6, Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Clothing & Fabrics - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	691	-	343067 398276
479	**Contemporary Trade Directory Entries** Name: Cd Joinery Location: CD Joinery, Venture Works, Charley Wood Road, Kirkby, L33 7SG Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	693	-	343055 398293
479	**Contemporary Trade Directory Entries** Name: Globe Heat Treatment Services Ltd Location: Unit 3-5, Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Classification: Tungsten Tool Manufacturers & Distributors **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	713	-	343047 398265
480	**Contemporary Trade Directory Entries** Name: Orion Colour Centre Location: Unit 7, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Painting & Decorating Supplies **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	695	-	342997 398744

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
481	**Contemporary Trade Directory Entries** Name: Bio Fuel Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Fuel Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	699	-	343052 399031
481	**Contemporary Trade Directory Entries** Name: Alpine Stairs Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Staircase, Balustrade & Handrail Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	702	-	343050 399031
481	**Contemporary Trade Directory Entries** Name: Muni-Serv Hire Ltd Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	747	-	343007 399048
482	**Contemporary Trade Directory Entries** Name: Truckmend Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	703	-	342976 398551
482	**Contemporary Trade Directory Entries** Name: Discount Car Paint Location: Unit 10,Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SW Classification: Car Paint & Lacquer Manufacturers & Suppliers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A12SW (W)	738	-	342939 398573
482	**Contemporary Trade Directory Entries** Name: M & J Lever Ltd Location: Shield Works, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Meat - Wholesale **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	738	-	342940 398572
482	**Contemporary Trade Directory Entries** Name: Sanchem Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Chemicals & Allied Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	755	-	342924 398537
482	**Contemporary Trade Directory Entries** Name: Purcell Transport Services Location: 7, Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SW Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	755	-	342924 398537
483	**Contemporary Trade Directory Entries** Name: Prentondell Ltd Location: 8, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Classification: Asphalt & Coated Macadam Laying Contractors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17NE (NW)	706	-	343318 399525
483	**Contemporary Trade Directory Entries** Name: A1 Firtrade Windows & Doors Ltd Location: Unit 8,Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UZ Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A17NE (NW)	706	-	343317 399524
484	**Contemporary Trade Directory Entries** Name: Techniflex Hygenic Location: Unit 1, Woodlands Works, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Classification: Hose, Tubing & Fittings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A17SW (NW)	714	-	343059 399135

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
485	**Contemporary Trade Directory Entries** Name: Abbey Engineering Location: Unit 4, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	715	-	342979 398757
485	**Contemporary Trade Directory Entries** Name: Delta Location: Unit 1, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Fork Lift Trucks **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	723	-	342969 398745
485	**Contemporary Trade Directory Entries** Name: Tubular Access Services Ltd Location: Unit 6, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Scaffolding & Work Platforms **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: Crosby Reclaimed Plastic Location: Unit 6, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Recycling Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: Comsec Location: Unit 11, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SY Classification: Telecommunications Equipment & Systems **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: Ideal Knowsley Ltd Location: Unit 10, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Laundries & Launderettes **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: Centre Force Location: Unit 22, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Fasteners & Fixing Devices **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: W L P C Ltd Location: Unit 19, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Powder Coatings **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: Datum Engineering Of Liverpool Ltd Location: Unit 2, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758
485	**Contemporary Trade Directory Entries** Name: K Kitchens (Uk) Ltd Location: Unit 1, Manor Complex, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Classification: Kitchen Furniture Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	746	-	342948 398758

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
485	**Contemporary Trade Directory Entries** Name: Print Inc Ltd Location: Unit 14,Manor Complex,Kirkby Bank Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SY Classification: Printers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	747	-	342947 398758
486	**Contemporary Trade Directory Entries** Name: Kingsway Location: 8, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Fencing Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	721	-	343002 398347
486	**Contemporary Trade Directory Entries** Name: Quality Concrete Products Ltd Location: 8, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Concrete Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	721	-	343002 398347
486	**Contemporary Trade Directory Entries** Name: Quality Concrete Products North West Ltd Location: 8, Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Classification: Concrete Products **Status: Active** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	723	-	343006 398329
487	**Contemporary Trade Directory Entries** Name: Mbm Products Location: Marl Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UH Classification: Powder Coatings **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A17NE (NW)	724	-	343214 399453
488	**Contemporary Trade Directory Entries** Name: Gale Building Supplies Location: Gale Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7YB Classification: Builders' Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	726	-	343379 397938
489	**Contemporary Trade Directory Entries** Name: Wkh International Ltd Location: Unit C,Gores Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7XS Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	748	-	343253 397983
489	**Contemporary Trade Directory Entries** Name: Cleanex Location: Gores Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7XS Classification: Tank Cleaning & Repairing **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	750	-	343252 397982
489	**Contemporary Trade Directory Entries** Name: Pt Plastics Location: Unit P,Gores Rd, Knowsley Ind Pk, Liverpool, L33 7XS Classification: Recycling Centres **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	754	-	343241 397984
490	**Contemporary Trade Directory Entries** Name: Neston Environmental Services Location: Mayfield House,Charleywood Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SG Classification: Waste Disposal Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A7NW (SW)	756	-	343074 398144
491	**Contemporary Trade Directory Entries** Name: Actuation Valve & Controls Location: Unit F,Gores Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7XS Classification: Valve Manufacturers & Suppliers **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	761	-	343223 397989

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
491	**Contemporary Trade Directory Entries** Name: Steve Gray Ltd Location: Gores Rd, Knowsley Ind Pk, Liverpool, L33 7XS Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	776	-	343191 397994
492	**Contemporary Trade Directory Entries** Name: Wrace Technology Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Reclaiming - Waste Products **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	761	-	342918 398664
493	**Contemporary Trade Directory Entries** Name: Kelleys Cars & Vans Location: Amberon Ltd Unit 1, 7, Webber Road, Kirkby, L33 7SW Classification: Garage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	766	-	342918 398495
493	**Contemporary Trade Directory Entries** Name: North West Fencing Location: Knowsley Industrial Estate,8 Webber Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SW Classification: Fencing Manufacturers **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A12SW (W)	777	-	342912 398463
493	**Contemporary Trade Directory Entries** Name: Kirby Clutch Centre Location: Unit 12, Highgrove Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7HT Classification: Brake & Clutch Service Centres **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	813	-	342876 398463
494	**Contemporary Trade Directory Entries** Name: D & G Autos Location: Gale Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7YB Classification: Car Engine Tuning & Diagnostic Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	766	-	343308 397928
494	**Contemporary Trade Directory Entries** Name: Ip Truck Parts Location: 7 Gale Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7YB Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SE (SW)	807	-	343296 397888
495	**Contemporary Trade Directory Entries** Name: Uk Bio Fuels Location: Colourstyle House, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SA Classification: Fuel Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	785	-	342892 398569
495	**Contemporary Trade Directory Entries** Name: Estate Tyre Services Location: 30, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	807	-	342872 398541
495	**Contemporary Trade Directory Entries** Name: Estate Tyre Services Location: 30, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Tyre Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12SW (W)	807	-	342872 398541
495	**Contemporary Trade Directory Entries** Name: Esteam Cleaning Location: 30, Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Steam Cleaning Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A12SW (W)	807	-	342872 398541

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
495	**Contemporary Trade Directory Entries** Name: Oakbay Windows Ltd Location: Unit 30,Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Window Frame Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	808	-	342871 398541
495	**Contemporary Trade Directory Entries** Name: Fortress Scaffolding N W Ltd Location: 30, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Scaffolding & Work Platforms **Status: Active** Positional Accuracy: Automatically positioned to the address	A12SW (W)	808	-	342871 398541
495	**Contemporary Trade Directory Entries** Name: Young & Cunningham (Liverpool) Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Valve Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	839	-	342839 398554
495	**Contemporary Trade Directory Entries** Name: Vpfs Nationwide Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Printers **Status: Active** Positional Accuracy: Automatically positioned to the address	A11SE (W)	839	-	342839 398554
496	**Contemporary Trade Directory Entries** Name: N J C Thermal Covers Uk Ltd Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Insulation Materials **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	786	-	342962 399022
496	**Contemporary Trade Directory Entries** Name: Stella Ice Cream Location: Newstet Road, Knowsley Industrial Park, LIVERPOOL, L33 7TJ Classification: Ice Cream Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	786	-	342962 399022
496	**Contemporary Trade Directory Entries** Name: Koolfood Packers Ltd Location: Newstet Road, Knowsley Industrial Park, LIVERPOOL, L33 7TJ Classification: Cheese Makers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	786	-	342962 399022
496	**Contemporary Trade Directory Entries** Name: Stella Ice Cream Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Ice Cream Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	825	-	342926 399043
496	**Contemporary Trade Directory Entries** Name: Stella Icecream Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Classification: Ice Cream Manufacturers & Suppliers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	825	-	342926 399043
497	**Contemporary Trade Directory Entries** Name: Shand Higson & Co Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Boxes & Cartons **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A12NW (W)	796	-	342916 398852
497	**Contemporary Trade Directory Entries** Name: Shand Higson & Co Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Packaging Materials Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	819	-	342890 398839
498	**Contemporary Trade Directory Entries** Name: Gale Building Supplies Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Classification: Builders' Merchants **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	806	-	343324 397875

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
498	**Contemporary Trade Directory Entries** Name: First Choice Commercials Location: Rockfield House, Gale Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7YE Classification: Commercial Vehicle Bodybuilders & Repairers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	806	-	343322 397876
498	**Contemporary Trade Directory Entries** Name: Sdc Trailers Location: Rockfield House, Gale Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7YE Classification: Trailers & Towing Equipment **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	806	-	343322 397876
498	**Contemporary Trade Directory Entries** Name: Rockfield Engineering Location: Ritson House,Gale Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7YE Classification: Engineers - General **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	807	-	343321 397875
498	**Contemporary Trade Directory Entries** Name: Gale Building Supplies Ltd Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Classification: Builders' Merchants **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	834	-	343325 397843
498	**Contemporary Trade Directory Entries** Name: Bethell Fleet Services Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	834	-	343325 397843
498	**Contemporary Trade Directory Entries** Name: Texaco Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Classification: Petrol Filling Stations **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	838	-	343309 397847
499	**Contemporary Trade Directory Entries** Name: Dams Furniture Ltd Location: The Brambles, Lees Road, Kirkby, L33 7RW Classification: Office Furniture & Equipment **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	812	-	342910 398903
499	**Contemporary Trade Directory Entries** Name: R W G Engineering Ltd Location: Unit 4-5, The Brambles, Lees Road, Knowsley Industrial Park, Liverpool, L33 7RW Classification: Engineers - General **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	813	-	342911 398912
499	**Contemporary Trade Directory Entries** Name: Traditional Lift Products Ltd Location: Unit 1, The Brambles, Lees Road, Knowsley Industrial Park, Liverpool, L33 7RW Classification: Lift Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A12NW (W)	818	-	342914 398951
500	**Contemporary Trade Directory Entries** Name: Body Coat Location: 2, Gladeswood Road, Knowsley Industrial Park North, Liverpool, L33 7BB Classification: Metal Finishing Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7NW (SW)	824	-	342893 398347
501	**Contemporary Trade Directory Entries** Name: M & R Joinery Services Ltd Location: Unit H Centro Park,Beckett Close, Liverpool, Merseyside, L33 7DF Classification: Joinery Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	839	-	343190 397916

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
501	**Contemporary Trade Directory Entries** Name: B & M Wireworks Location: M and r Joinery Services Unit H, Beckett Close, Kirkby, L33 7DF Classification: Wire Products - Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	839	-	343190 397916
501	**Contemporary Trade Directory Entries** Name: L B S Logistics Ltd Location: Unit I, Beckett Close, Liverpool, L33 7DF Classification: Road Haulage Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	857	-	343155 397920
502	**Contemporary Trade Directory Entries** Name: Cheetah Distribution Location: Unit 1, Highgrove Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7HT Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	839	-	342846 398483
502	**Contemporary Trade Directory Entries** Name: Mccormick Vehicle Repairs Location: 30, Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	863	-	342817 398520
502	**Contemporary Trade Directory Entries** Name: Store It Uk Location: Po 60,Lees Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SE Classification: Distribution Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A11SE (W)	864	-	342817 398520
502	**Contemporary Trade Directory Entries** Name: Scrap My Car Now For Money Liverpool Kws Location: Acorn House, Liverpool, Merseyside, L33 7SE Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A11SE (W)	864	-	342817 398520
502	**Contemporary Trade Directory Entries** Name: C & E Structures Location: 34 Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Scaffolding & Work Platforms **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A11SE (W)	864	-	342817 398520
502	**Contemporary Trade Directory Entries** Name: North West Wiper Co Location: Unit 6 Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Cleaning Materials & Equipment **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A11SE (W)	864	-	342817 398520
502	**Contemporary Trade Directory Entries** Name: North Mersey Tipper Hire Location: 34 Lees Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SE Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A11SE (W)	886	-	342792 398550
503	**Contemporary Trade Directory Entries** Name: Filtercare Ltd Location: Carlton House,Gores Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7XS Classification: Tank Cleaning & Repairing **Status: Active** Positional Accuracy: Manually positioned to the road within the address or location	A7SW (SW)	848	-	343054 398024
504	**Contemporary Trade Directory Entries** Name: M T C Northwest Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Commercial Vehicle Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	851	-	343105 397970

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
505	**Contemporary Trade Directory Entries** Name: Kolor Range Location: Colourstyle House, Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Car Body Repairs **Status:** **Inactive** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	853	-	342824 398598
505	**Contemporary Trade Directory Entries** Name: Williams Electrical Contractors Ltd Location: Colourstyle House, Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Electrical Engineers **Status:** **Inactive** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	853	-	342824 398598
505	**Contemporary Trade Directory Entries** Name: S P Freight Ltd Location: Colourstyle House, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Freight Forwarders **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	853	-	342824 398598
505	**Contemporary Trade Directory Entries** Name: Colour Range Location: Unit 8,Colourstyle House,Lees Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SE Classification: Car Body Repairs **Status:** **Inactive** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	853	-	342824 398598
506	**Contemporary Trade Directory Entries** Name: Kennedy Packaging Location: Unit 9,Lees Rd, Knowsley Ind Pk, Liverpool, L33 7SE Classification: Packaging Materials Manufacturers & Suppliers **Status:** **Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A11SE (W)	856	-	342832 398738
507	**Contemporary Trade Directory Entries** Name: Cleanex Location: Gores Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7XS Classification: Commercial Cleaning Services **Status:** **Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SW (SW)	870	-	343018 398032
507	**Contemporary Trade Directory Entries** Name: N J H Engineering Ltd Location: Gores Road, (Crown Construction Building)/, Liverpool, Merseyside, L33 7XS Classification: Gate Manufacturers **Status:** **Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SW (SW)	889	-	342988 398038
507	**Contemporary Trade Directory Entries** Name: Standard Fuel Oils Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Oil Companies **Status:** **Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	905	-	342995 398004
507	**Contemporary Trade Directory Entries** Name: Carlton Fuels Ltd Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Oil Fuel Distributors **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	905	-	342995 398004
507	**Contemporary Trade Directory Entries** Name: North West Express Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Road Haulage Services **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	905	-	342995 398004
507	**Contemporary Trade Directory Entries** Name: Carlton Fuels Location: Gores Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7XS Classification: Oil Fuel Distributors **Status:** **Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	905	-	342995 398004

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
507	**Contemporary Trade Directory Entries** Name: Rowilco Fuels Location: Gores Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7XS Classification: Fuel Dealers **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A7SW (SW)	905	-	342995 398004
508	**Contemporary Trade Directory Entries** Name: European Vehicle Specialists Location: Lees Road, Liverpool, Merseyside, L33 7SA Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A11SE (W)	881	-	342801 398697
508	**Contemporary Trade Directory Entries** Name: North Liverpool Printing Co Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SA Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	881	-	342801 398697
508	**Contemporary Trade Directory Entries** Name: Metalbuild Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SA Classification: Engineers - General **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	881	-	342801 398697
508	**Contemporary Trade Directory Entries** Name: Quick Tyres Ltd Location: Unit 4 Rowehill Business Centre,Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7AA Classification: Tyre Dealers **Status: Active** Positional Accuracy: Automatically positioned to the address	A11SE (W)	881	-	342805 398729
508	**Contemporary Trade Directory Entries** Name: Dams International (Office Equipment) Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SA Classification: Office Equipment Manufacturers & Distributors **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	881	-	342801 398697
508	**Contemporary Trade Directory Entries** Name: Catercool Nw Ltd Location: Unit 2 Rowehill Business Centre,Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7AA Classification: Refrigerators & Freezers - Servicing & Repairs **Status: Active** Positional Accuracy: Automatically positioned to the address	A11SE (W)	881	-	342804 398718
508	**Contemporary Trade Directory Entries** Name: Liverprint Location: Rowehill Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7AA Classification: Printers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	882	-	342803 398713
509	**Contemporary Trade Directory Entries** Name: Landbridge Shipping Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	882	-	342796 398641
510	**Contemporary Trade Directory Entries** Name: Selwood Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SA Classification: Pumps - Sales, Servicing & Repairs **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	883	-	342817 398800
510	**Contemporary Trade Directory Entries** Name: Concept Hygiene Location: 3a, Arbour Court, Kirkby, Liverpool, L33 7XE Classification: Hygiene & Cleansing Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	923	-	342774 398793

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
510	**Contemporary Trade Directory Entries** Name: Home 2 Office Water Coolers Ltd Location: Unit 3b Arbour Court,Arbour Lane, Kirkby, Liverpool, Merseyside, L33 7XE Classification: Water Coolers **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	941	-	342757 398796
511	**Contemporary Trade Directory Entries** Name: Massey Coldbeck Location: Gladeswood Road, Knowsley Industrial Park North, Liverpool, L33 7BB Classification: Air Conditioning Equipment & Systems **Status: Active** Positional Accuracy: Automatically positioned to the address	A6NE (W)	887	-	342806 398429
511	**Contemporary Trade Directory Entries** Name: Massey Coldbeck Location: Gladeswood Road, Knowsley Industrial Park North, Liverpool, L33 7BB Classification: Air Conditioning Equipment & Systems **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A6NE (W)	887	-	342806 398429
511	**Contemporary Trade Directory Entries** Name: Tapes For Industry Ltd Location: Kenneth House, Gladeswood Road, Knowsley Industrial Park North, Liverpool, L33 7BB Classification: Packaging & Wrapping Equipment & Supplies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A6NE (W)	887	-	342806 398429
511	**Contemporary Trade Directory Entries** Name: Ww Lens Solutions Location: 4, Lees Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SE Classification: Optical Goods - Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A11SE (W)	894	-	342794 398463
511	**Contemporary Trade Directory Entries** Name: Euro Car Mats Ltd Location: Unit 5, Acorn Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SL Classification: Car Accessories Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	897	-	342791 398454
512	**Contemporary Trade Directory Entries** Name: Vic Davies Location: Gladeswood Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7BB Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A6NE (W)	892	-	342816 398368
513	**Contemporary Trade Directory Entries** Name: Goulding Freight Services Location: Lees Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7SE Classification: Freight Forwarders **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A11SE (W)	908	-	342777 398480
514	**Contemporary Trade Directory Entries** Name: Knowsley Car & Commercial Location: 2 Gores Rd, Knowsley Ind Pk, Liverpool, L33 7XS Classification: Commercial Vehicle Servicing, Repairs, Parts & Accessories **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SW (SW)	914	-	342928 398076
515	**Contemporary Trade Directory Entries** Name: Privilege Transport Location: 1, Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Classification: Car Dealers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SE (SW)	914	-	343261 397786
515	**Contemporary Trade Directory Entries** Name: Britanic Distribution Ltd Location: 40/42, Admin Buildings, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TX Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned in the proximity of the address	A7SE (SW)	927	-	343244 397780

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
516	**Contemporary Trade Directory Entries** Name: Inpro Electric (Uk) Ltd Location: Admin Buildings, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TX Classification: Automation Systems & Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A2NE (SW)	921	-	343334 397744
516	**Contemporary Trade Directory Entries** Name: Severn Control Systems Location: Unit 19, Business Resource Centre, Admin Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7TX Classification: Control Panels **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A2NE (SW)	921	-	343334 397744
516	**Contemporary Trade Directory Entries** Name: Ikover Ltd Location: Unit 7-9, Business Resource Centre, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TX Classification: Soft Furnishings - Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A2NE (SW)	921	-	343334 397744
516	**Contemporary Trade Directory Entries** Name: Excel Housekeeping Services Ltd Location: Unit 6,Business Resource Centre,Admin Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TX Classification: Cleaning Services - Domestic **Status: Inactive** Positional Accuracy: Manually positioned within the geographical locality	A2NE (SW)	922	-	343334 397744
516	**Contemporary Trade Directory Entries** Name: Khakis Blues Location: Business Resource Centre,Admin Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TX Classification: Manufacturers **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A2NE (SW)	922	-	343334 397744
517	**Contemporary Trade Directory Entries** Name: L K Valves & Controls Ltd Location: Unit 4, Arbour Place, Arbour Lane, Kirkby, Liverpool, L33 7XG Classification: Valve Manufacturers & Suppliers **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	921	-	342818 398992
517	**Contemporary Trade Directory Entries** Name: Elite Auto Care Centre Location: Unit 1, Arbour Place, Arbour Lane, Kirkby, Liverpool, L33 7XG Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11NE (W)	967	-	342775 399012
518	**Contemporary Trade Directory Entries** Name: Pegasus Hydraulics Ltd Location: Unit 5, Arbour Place, Arbour Lane, Kirkby, Liverpool, L33 7XG Classification: Hydraulic Equipment & Accessories - Sales & Service **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	927	-	342801 398942
518	**Contemporary Trade Directory Entries** Name: Stroud Engineering Supplies Location: Unit 8, Arbour Place, Arbour Lane, Kirkby, Liverpool, L33 7XG Classification: Engineering Materials **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11NE (W)	966	-	342765 398958
519	**Contemporary Trade Directory Entries** Name: Abacus Panel Products Ltd Location: Unit 2, The Web Complex, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TA Classification: Furniture Manufacturers - Home & Office **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: Semper Products Ltd Location: Polymer House, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TZ Classification: Laboratory Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
519	**Contemporary Trade Directory Entries** Name: Abele Ltd Location: Unit 8, The Web Complex, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TA Classification: Laboratory Equipment, Instruments & Supplies **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: Lab Uk (Furniture) Ltd Location: Unit 8, The Web Complex, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TA Classification: Laboratory Equipment **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: J P M Manufacturing Ltd Location: 4, Admin Road, Knowsley Industrial Park, LIVERPOOL, L33 7TX Classification: Cabinet Makers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: Opul Ltd Location: Unit 10, The Web Complex, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TA Classification: Furniture Manufacturers - Home & Office **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: Eros Aluminium Systems Location: Polymer House, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TZ Classification: Aluminium Fabricators **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	934	-	343127 397845
519	**Contemporary Trade Directory Entries** Name: Howdens Joinery Co Location: Unit 5, The Web Complex, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TA Classification: Joinery Manufacturers **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	946	-	343150 397814
520	**Contemporary Trade Directory Entries** Name: A & B Taxis Location: Unit 7 Deltic Way, Kirkby, Liverpool, Merseyside, L33 7BA Classification: Garage Services **Status: Active** Positional Accuracy: Manually positioned within the geographical locality	A7SW (SW)	934	-	342946 398018
521	**Contemporary Trade Directory Entries** Name: Glenn Freight (North West) Ltd Location: Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Classification: Distribution Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	935	-	342745 398529
521	**Contemporary Trade Directory Entries** Name: E B Freight Service Location: Diaper, 11, Lees Road, Kirkby, L33 7SA Classification: Road Haulage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11SE (W)	949	-	342735 398484
522	**Contemporary Trade Directory Entries** Name: T P Fay Ltd Location: 57, Admin Road, Knowsley Industrial Park, Liverpool, L33 7TX Classification: Electrical Goods Sales, Manufacturers & Wholesalers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A2NE (SW)	940	-	343377 397708
523	**Contemporary Trade Directory Entries** Name: Tint Wizard Location: 6 Deltic Way, Kirkby, Liverpool, Merseyside, L33 7BA Classification: Window Tinting **Status: Inactive** Positional Accuracy: Manually positioned to the road within the address or location	A7SW (SW)	952	-	342910 398036

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
523	**Contemporary Trade Directory Entries** Name: Millers Motors Location: 4, Deltic Place, Deltic Way, Kirkby, Liverpool, L33 7BU Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	954	-	342888 398064
523	**Contemporary Trade Directory Entries** Name: M & R Auto Repairs Ltd Location: 3, Deltic Way, Kirkby, Liverpool, Merseyside, L33 7BA Classification: Garage Services **Status: Inactive** Positional Accuracy: Manually positioned to the address or location	A7SW (SW)	966	-	342895 398033
523	**Contemporary Trade Directory Entries** Name: A & B Taxis Location: 1, Deltic Place, Deltic Way, Kirkby, Liverpool, L33 7BU Classification: Garage Services **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	978	-	342878 398036
524	**Contemporary Trade Directory Entries** Name: Hoopers Location: Kirkby Lodge,South Boundary Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SF Classification: Vehicle Inspection Services **Status: Active** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	967	-	343037 397874
524	**Contemporary Trade Directory Entries** Name: In Style Location: Kirkby Lodge, South Boundary Road, Knowsley Industrial Park, Liverpool, L33 7SF Classification: Fireplaces & Mantelpieces **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	968	-	343019 397889
524	**Contemporary Trade Directory Entries** Name: W R Cables Ltd Location: Kirkby Lodge, South Boundary Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SF Classification: Fibre Optics **Status: Inactive** Positional Accuracy: Manually positioned to an adjacent address or location	A7SW (SW)	968	-	343019 397889
524	**Contemporary Trade Directory Entries** Name: Topshot Ltd Location: Kirkby Lodge, South Boundary Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7SF Classification: Fibre Optics **Status: Inactive** Positional Accuracy: Manually positioned to an adjacent address or location	A7SW (SW)	968	-	343019 397889
524	**Contemporary Trade Directory Entries** Name: Kml Fleet Sales Location: New Lodge Works, South Boundary Road, Knowsley Industrial Park, Liverpool, L33 7SF Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	968	-	343019 397889
524	**Contemporary Trade Directory Entries** Name: Kirkby Motors Ltd Location: New Lodge Works, South Boundary Road, Knowsley Industrial Park, Liverpool, L33 7SF Classification: Car Dealers - Used **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	970	-	343050 397859
525	**Contemporary Trade Directory Entries** Name: Manorside Joinery Ltd Location: Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Classification: Joinery Manufacturers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	971	-	342854 398084
526	**Contemporary Trade Directory Entries** Name: Quality Turnings Location: 1, Arbour Court, Kirkby, Liverpool, L33 7XE Classification: Precision Engineers **Status: Active** Positional Accuracy: Automatically positioned to the address	A11NE (W)	984	-	342737 398909

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
527	**Contemporary Trade Directory Entries** Name: Scrap My Car Now For Money Kirkby Kws Location: 4, Arbour Court, Kirkby, Liverpool, L33 7XE Classification: Car Breakers & Dismantlers **Status: Inactive** Positional Accuracy: Automatically positioned to the address	A11NE (W)	993	-	342708 398818
528	**Fuel Station Entries** Name: Gem Knowsley Location: Gale Road , Knowsley Industrial Park North, Liverpool, Merseyside, L33 7YB Brand: Texaco Premises Type: Petrol Station **Status: Open** Positional Accuracy: Manually positioned to the address or location	A7SE (SW)	839	-	343309 397846
529	**Fuel Station Entries** Name: Certas Energy Liverpool Hgv Location: Gores Road , Knowsley Industrial Park North, Liverpool, Merseyside, L33 7XS Brand: Certas Energy Premises Type: Petrol Station **Status: Non-Retail** Positional Accuracy: Automatically positioned to the address	A7SW (SW)	905	-	342995 398004
530	**Points of Interest - Commercial Services** Name: Tradebe Location: Image Business Park, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7UF Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A13SW (SW)	31	12	343833 398772
531	**Points of Interest - Commercial Services** Name: Croft Bros Location: Unit 8, Draw Well Road, Kirkby, Liverpool, L33 7BJ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A13SW (W)	146	12	343548 398694
531	**Points of Interest - Commercial Services** Name: Hydrodec UK Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A13SW (W)	174	12	343534 398766
531	**Points of Interest - Commercial Services** Name: O S S Group Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A13SW (W)	174	12	343534 398766
532	**Points of Interest - Commercial Services** Name: Sefton Logistics Co Ltd Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A13NW (NW)	150	12	343612 399020
532	**Points of Interest - Commercial Services** Name: Trident Waste Oil Solutions Ltd Location: Stockpit Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7TQ Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A13NW (NW)	169	12	343584 398982
533	**Points of Interest - Commercial Services** Name: Sovereign Transport Services Ltd Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7RD Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A13SW (SW)	166	12	343608 398449
534	**Points of Interest - Commercial Services** Name: Direct Express Deliveries Location: Unit 5 Capitol Trading Park, Kirkby Bank Road, Knowsley Industrial Park, Liverpool, L33 7SY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A12SE (SW)	206	12	343494 398506

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
535	**Points of Interest - Commercial Services** Name: Rentokil Location: 4 Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A18SW (N)	221	12	343693 399182
535	**Points of Interest - Commercial Services** Name: Landbridge Shipping Ltd Location: Pennine House, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UX Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SW (N)	275	12	343752 399245
536	**Points of Interest - Commercial Services** Name: Tradeteam Ltd Location: Knowsley Depot, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7RN Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	234	12	343870 399186
536	**Points of Interest - Commercial Services** Name: Tradeteam Ltd Location: Knowsley Depot, Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7RN Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	234	12	343869 399186
537	**Points of Interest - Commercial Services** Name: Ashcroft MOT Centre Location: Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (NW)	285	12	343499 399098
537	**Points of Interest - Commercial Services** Name: Ashcroft M O T Centre Location: Unit 9, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (NW)	286	12	343498 399098
538	**Points of Interest - Commercial Services** Name: A & B Taxis Location: Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7NE (SW)	306	12	343481 398364
538	**Points of Interest - Commercial Services** Name: Fielding Transport (NW) Ltd Location: Russell House, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7NE (SW)	324	12	343437 398382
539	**Points of Interest - Commercial Services** Name: Rentokil Location: Brightfide Building, 4 Bradman Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UR Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A17SE (NW)	351	12	343516 399228
540	**Points of Interest - Commercial Services** Name: Sovereign Transport Services Location: The Morgan Brightside Building, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SW (NW)	354	12	343606 399292
541	**Points of Interest - Commercial Services** Name: Green Shields Cowie & Co Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
541	**Points of Interest - Commercial Services** Name: The Knight Line Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335
541	**Points of Interest - Commercial Services** Name: Goldstar Transport Ltd Location: 1 Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3AY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344057 399335
541	**Points of Interest - Commercial Services** Name: Gold Start Transport Location: 1 Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3AY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344057 399335
541	**Points of Interest - Commercial Services** Name: Green Shields Cowie & Co Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335
541	**Points of Interest - Commercial Services** Name: Goldstar Transport Ltd Location: 1 Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3AY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335
541	**Points of Interest - Commercial Services** Name: The Knight Line Ltd Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335
541	**Points of Interest - Commercial Services** Name: Customwise Ltd Location: 1 Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3AY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344057 399335
541	**Points of Interest - Commercial Services** Name: Greenshields Cowie Location: Greenshields House, Perimeter Road, Knowsley Industrial Park, Liverpool, L33 3BA Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18SE (N)	415	12	344056 399335
542	**Points of Interest - Commercial Services** Name: Port of Liverpool Logistics Ltd Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A17SE (NW)	420	12	343364 399126
543	**Points of Interest - Commercial Services** Name: Potter Logistics Location: Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7NE (SW)	435	12	343495 398204
544	**Points of Interest - Commercial Services** Name: Total Car Cosmetics Location: Bradman House 6, Bradman Road, Knowsley Industrial Park, Liverpool, L33 7UR Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (NW)	444	12	343310 399018

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
544	**Points of Interest - Commercial Services** Name: Autocare Location: Derby Works, Birchill Road, Kirkby, L33 7TD Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (NW)	446	12	343310 399028
544	**Points of Interest - Commercial Services** Name: Newstet Motors Location: Unit 6a Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (W)	479	12	343273 399011
544	**Points of Interest - Commercial Services** Name: Newstet Motors Location: Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (NW)	489	12	343267 399031
545	**Points of Interest - Commercial Services** Name: Thomas Hardie Commercials Ltd Location: Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (W)	513	12	343215 398898
545	**Points of Interest - Commercial Services** Name: Autocare Location: Unit 14 Courtyard Works, Newstet Road, Knowsley Industrial Park, Liverpool, L33 7TJ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12NE (W)	532	12	343207 398954
546	**Points of Interest - Commercial Services** Name: Merseyside Auto Transport Location: Unit 115, North Mersey Business Centre, Woodward Rd, Knowsley Ind Pk, Liverpool, Merseyside, L33 7UY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	528	12	343687 399494
546	**Points of Interest - Commercial Services** Name: Merseyside Auto Transport Location: Unit 115, North Mersey Business Centre Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	528	12	343687 399494
546	**Points of Interest - Commercial Services** Name: Exclusive Freight Ltd Location: 109-111 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	530	12	343687 399496
546	**Points of Interest - Commercial Services** Name: Pure Filtration Services Location: Unit 39 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A18NW (N)	587	12	343648 399547
546	**Points of Interest - Commercial Services** Name: Virgin Oil Ltd Location: Unit 52 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A18NW (N)	609	12	343658 399571

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
546	**Points of Interest - Commercial Services** Name: P S L Restorations Location: Unit 67 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A18NW (N)	671	12	343658 399634
546	**Points of Interest - Commercial Services** Name: P S L Scooters Location: Unit 67 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A18NW (N)	671	12	343658 399634
547	**Points of Interest - Commercial Services** Name: T.P. Farrell Transport Ltd Location: Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	533	12	343596 399479
547	**Points of Interest - Commercial Services** Name: The Potter Group Ltd Location: Rail Freight Terminal, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	602	12	343557 399539
547	**Points of Interest - Commercial Services** Name: Potter Group Ltd Location: Rail Freight Terminal, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	602	12	343557 399539
548	**Points of Interest - Commercial Services** Name: O'Connell Site Services Location: Hammond Road, Knowsley Industrial Park, Liverpool, L33 7UL Category: Recycling Services Class Code: Scrap Metal Merchants Positional Accuracy: Positioned to address or location	A17SE (NW)	537	12	343258 399176
548	**Points of Interest - Commercial Services** Name: Autotrim Location: Old Lamplight Works, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17SE (NW)	562	12	343225 399160
548	**Points of Interest - Commercial Services** Name: Autotrim Location: Old Lamplight Works, Ashcroft Road, Knowsley Industrial Park, Liverpool, L33 7TW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17SE (NW)	563	12	343224 399159
548	**Points of Interest - Commercial Services** Name: Autopaint International Location: Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17SE (NW)	603	12	343214 399239
549	**Points of Interest - Commercial Services** Name: Avanti Waste Management Location: Avanti Waste Management, Charley Wood Road, Kirkby, L33 7SG Category: Recycling Services Class Code: Recycling, Reclamation and Disposal Positional Accuracy: Positioned to address or location	A7NE (SW)	553	12	343403 398119
550	**Points of Interest - Commercial Services** Name: Rentokil Initial Supplies Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SR Category: Contract Services Class Code: Pest and Vermin Control Positional Accuracy: Positioned to address or location	A12SW (W)	605	12	343072 398626

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
551	**Points of Interest - Commercial Services** Name: Knowsley Mechanix Ltd Location: Headland Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7NW (SW)	611	12	343167 398264
552	**Points of Interest - Commercial Services** Name: J & J Autos Location: Unit 5c Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17SE (NW)	628	12	343245 399338
553	**Points of Interest - Commercial Services** Name: Smart Auto Services Location: 16 Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UZ Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17NE (NW)	631	12	343409 399499
554	**Points of Interest - Commercial Services** Name: Adc Line UK Ltd Location: 14 Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7NW (SW)	653	12	343046 398431
555	**Points of Interest - Commercial Services** Name: J & J Auto Repairs Location: Unit 8 Cornhill Works, Marl Road, Knowsley Industrial Park, Liverpool, L33 7UH Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A17NE (NW)	655	12	343325 399465
556	**Points of Interest - Commercial Services** Name: Metrans Transport & Container Storage Ltd Location: Depot Road, Liverpool, L33 3AR Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	672	12	343659 399635
556	**Points of Interest - Commercial Services** Name: Metrans Transport Ltd Location: Depot Road, Liverpool, L33 3AR Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A18NW (N)	672	12	343659 399635
557	**Points of Interest - Commercial Services** Name: Headland Haulage Ltd Location: Unit 7 Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7NW (SW)	690	12	343067 398276
557	**Points of Interest - Commercial Services** Name: Headland Haulage Ltd Location: Unit 7 Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7NW (SW)	690	12	343067 398276
557	**Points of Interest - Commercial Services** Name: G & R E Motoring Engineers Location: Unit 8 Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7NW (SW)	691	12	343067 398276
557	**Points of Interest - Commercial Services** Name: G & R E Motoring Engineers Location: Unit 8 Venture Works, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7NW (SW)	692	12	343066 398275

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
558	**Points of Interest - Commercial Services** Name: Truckmend Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12SW (W)	703	12	342976 398551
558	**Points of Interest - Commercial Services** Name: Truckmend NW Ltd Location: Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12SW (W)	703	12	342976 398551
558	**Points of Interest - Commercial Services** Name: Purcell Transport Services Location: 7 Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A12SW (W)	755	12	342924 398537
558	**Points of Interest - Commercial Services** Name: Purcell Transport Services Ltd Location: 7 Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A12SW (W)	755	12	342924 398537
558	**Points of Interest - Commercial Services** Name: Kelleys Cars & Vans Location: Unit 1a, 7 Webber Road, Knowsley Industrial Park, Liverpool, L33 7SW Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12SW (W)	756	12	342924 398536
559	**Points of Interest - Commercial Services** Name: Wkh International Location: Unit B-c, Gores Road, Knowsley Industrial Park, Liverpool, L33 7XS Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7SE (SW)	778	12	343247 397951
560	**Points of Interest - Commercial Services** Name: McCormick Vehicle Repairs Location: 30 Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12SW (W)	807	12	342872 398541
560	**Points of Interest - Commercial Services** Name: Kirby Clutch Centre Location: Unit 12 Highgrove Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7HT Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A12SW (W)	814	12	342875 398462
560	**Points of Interest - Commercial Services** Name: Cheetah Distribution Location: Unit 1 Highgrove Business Centre, Lees Road, Knowsley Industrial Park, Liverpool, L33 7HT Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A11SE (W)	839	12	342846 398483
560	**Points of Interest - Commercial Services** Name: Abbey Logistics Group Location: 7-8 Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A11SE (W)	851	12	342836 398466
560	**Points of Interest - Commercial Services** Name: Kolor Range Location: 7-8 Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A11SE (W)	851	12	342836 398467

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
560	**Points of Interest - Commercial Services** Name: Kolor Range Location: Colourstyle House, Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A11SE (W)	853	12	342824 398598
560	**Points of Interest - Commercial Services** Name: McCormick Vehicle Repairs Location: 30 Lees Road, Knowsley Industrial Park, Liverpool, L33 7SE Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A11SE (W)	863	12	342817 398520
560	**Points of Interest - Commercial Services** Name: Glenn Freight North West Ltd Location: Lees Road, Knowsley Industrial Park, Kirkby, Liverpool, L33 7SE Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A11SE (W)	935	12	342745 398529
561	**Points of Interest - Commercial Services** Name: Gale Road M O T Station Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	831	12	343313 397852
561	**Points of Interest - Commercial Services** Name: Gem Knowsley Location: Gale Road, Knowsley Industrial Park North, Liverpool, L33 7YB Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A7SE (SW)	839	12	343309 397846
561	**Points of Interest - Commercial Services** Name: Car Wash Location: Gale Road, Knowsley Industrial Park North, Liverpool, Merseyside, L33 7YB Category: Personal, Consumer and other Services Class Code: Vehicle Cleaning Services Positional Accuracy: Positioned to address or location	A7SE (SW)	839	12	343309 397846
562	**Points of Interest - Commercial Services** Name: L B S Logistics Ltd Location: Unit I, Beckett Close, Liverpool, L33 7DF Category: Transport, Storage and Delivery Class Code: Distribution and Haulage Positional Accuracy: Positioned to address or location	A7SW (SW)	857	12	343155 397920
562	**Points of Interest - Commercial Services** Name: First Choice Commercials Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SE (SW)	869	12	343206 397869
563	**Points of Interest - Commercial Services** Name: Millers Motors Location: 4 Deltic Place, Deltic Way, Kirkby, Liverpool, L33 7BU Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SW (SW)	955	12	342887 398063
564	**Points of Interest - Commercial Services** Name: Elite Auto Care Centre Location: Unit 1 Arbour Place, Arbour Lane, Kirkby, Liverpool, L33 7XG Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A11NE (W)	967	12	342775 399012
565	**Points of Interest - Commercial Services** Name: Hoopers Location: Kirkby Lodge, South Boundary Road, Knowsley Industrial Park, Liverpool, L33 7SF Category: Repair and Servicing Class Code: Vehicle Repair, Testing and Servicing Positional Accuracy: Positioned to address or location	A7SW (SW)	969	12	343018 397889
566	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	0	12	343697 398597

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
566	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	0	12	343741 398611
566	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	0	12	343712 398606
566	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	8	12	343772 398585
566	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	8	12	343771 398580
566	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	9	12	343774 398591
566	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	15	12	343779 398582
566	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	44	12	343688 398551
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	12	12	343798 398691
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	13	12	343809 398744
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	18	12	343815 398746
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	18	12	343817 398754
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	18	12	343816 398750

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	19	12	343804 398689
567	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (SW)	19	12	343815 398740
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	24	12	343821 398747
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	24	12	343820 398741
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (SW)	25	12	343823 398752
567	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	29	12	343814 398687
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	31	12	343829 398751
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	31	12	343828 398744
567	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	31	12	343818 398698
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	25	12	343789 398582
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	26	12	343791 398589
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	29	12	343793 398581

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	30	12	343795 398588
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	34	12	343798 398580
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	35	12	343800 398585
568	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	38	12	343804 398591
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	40	12	343803 398579
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	44	12	343808 398583
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	53	12	343816 398575
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	57	12	343820 398575
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	60	12	343823 398573
568	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	61	12	343825 398579
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	64	12	343827 398574
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (S)	68	12	343831 398573

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	100	12	343877 398639
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SE (S)	105	12	343868 398568
568	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	105	12	343868 398568
568	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (S)	110	12	343883 398617
569	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (S)	34	12	343778 398546
570	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SE (E)	42	12	343956 398765
570	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (E)	51	12	343958 398756
570	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SE (E)	59	12	343950 398749
570	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	114	12	343907 398703
571	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SE (SE)	113	12	343900 398689
571	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SE (SE)	150	12	343928 398642
572	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13SW (W)	157	12	343544 398732

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (W)	166	12	343534 398728
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (W)	176	12	343526 398736
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13SW (W)	176	12	343524 398731
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	180	12	343522 398738
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	181	12	343520 398733
572	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	186	12	343515 398734
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	169	12	343543 398786
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	169	12	343545 398795
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	169	12	343544 398790
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	173	12	343538 398781
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	173	12	343539 398787
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	173	12	343540 398791

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A13NW (W)	173	12	343541 398797
573	**Points of Interest - Manufacturing and Production** Name: O S S Group Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Category: Extractive Industries Class Code: Oil and Gas Extraction, Refinery and Product Manufacture Positional Accuracy: Positioned to address or location	A13SW (W)	173	12	343534 398766
573	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A13NW (W)	183	12	343529 398787
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	185	12	343517 398739
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	189	12	343513 398740
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	190	12	343511 398735
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	226	12	343492 398822
573	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	226	12	343489 398804
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	229	12	343489 398822
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	229	12	343488 398818
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	233	12	343485 398823
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	234	12	343484 398819

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
573	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	237	12	343480 398816
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	284	12	343435 398832
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	285	12	343431 398817
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	285	12	343430 398814
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	285	12	343433 398827
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	285	12	343429 398808
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	285	12	343432 398823
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	286	12	343428 398805
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	288	12	343431 398833
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343432 398843
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343431 398839
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343427 398815

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343429 398828
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343427 398819
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	289	12	343428 398824
573	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	291	12	343424 398811
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	292	12	343423 398815
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	293	12	343424 398825
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	293	12	343423 398819
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	293	12	343425 398828
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	293	12	343426 398833
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	294	12	343426 398839
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	294	12	343427 398844
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	296	12	343421 398825

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	297	12	343421 398829
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	297	12	343419 398820
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	297	12	343417 398807
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	298	12	343418 398816
573	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	298	12	343417 398811
574	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NE (W)	331	12	343404 398911
574	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	332	12	343403 398915
575	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	332	12	343472 399146
576	**Points of Interest - Manufacturing and Production** Name: Lodge Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12NE (NW)	342	12	343416 399026
576	**Points of Interest - Manufacturing and Production** Name: Lodge Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12NE (NW)	353	12	343405 399025
577	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18SW (NW)	397	12	343554 399313
578	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SE (W)	398	12	343296 398722

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
578	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	403	12	343297 398752
578	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	403	12	343298 398758
578	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SE (W)	403	12	343298 398758
578	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	404	12	343293 398738
578	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SE (W)	404	12	343295 398745
579	**Points of Interest - Manufacturing and Production** Name: Refuel Energy Location: Acornfield Road, Knowsley Industrial Park, Liverpool, L33 7SX Category: Extractive Industries Class Code: Oil and Gas Extraction, Refinery and Product Manufacture Positional Accuracy: Positioned to address or location	A7NE (SW)	425	12	343297 398409
579	**Points of Interest - Manufacturing and Production** Name: Refuel Energy Ltd Location: Unit 1, Yardley Road, Knowsley Industrial Park, Liverpool, L33 7SS Category: Extractive Industries Class Code: Oil and Gas Extraction, Refinery and Product Manufacture Positional Accuracy: Positioned to address or location	A7NE (SW)	425	12	343297 398410
580	**Points of Interest - Manufacturing and Production** Name: Knowsley Industrial Park Location: L33 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A7NE (SW)	447	12	343330 398318
581	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SE (W)	482	12	343195 398595
581	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	540	12	343141 398531
581	**Points of Interest - Manufacturing and Production** Name: Orchard Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	541	12	343136 398578
581	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	541	12	343136 398613

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
581	**Points of Interest - Manufacturing and Production** Name: Orchard Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	555	12	343122 398579
582	**Points of Interest - Manufacturing and Production** Name: North Mersey Business Centre Location: L33 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A18NW (N)	516	12	343766 399486
583	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SW (W)	520	12	343169 398713
583	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SW (W)	521	12	343165 398698
583	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	521	12	343167 398707
584	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	521	12	343233 399025
584	**Points of Interest - Manufacturing and Production** Name: Courtyard Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	535	12	343207 398966
584	**Points of Interest - Manufacturing and Production** Name: Courtyard Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12NE (W)	553	12	343188 398964
585	**Points of Interest - Manufacturing and Production** Name: Knowsley Enterprise Academy Location: Unit 110 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to address or location	A18NW (N)	529	12	343687 399495
585	**Points of Interest - Manufacturing and Production** Name: North Mersey Business Centre Location: Woodward Rd, Knowsley Ind Pk, Liverpool, L33 7UY Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to address or location	A18NW (N)	594	12	343712 399562
585	**Points of Interest - Manufacturing and Production** Name: North Mersey Business Centre Location: Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to address or location	A18NW (N)	594	12	343712 399562
586	**Points of Interest - Manufacturing and Production** Name: Garden Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	530	12	343512 398096

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
587	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	561	12	343231 399173
587	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NE (NW)	579	12	343188 399093
587	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NW (NW)	589	12	343181 399106
587	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12NW (NW)	589	12	343180 399102
587	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (NW)	597	12	343173 399107
588	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	563	12	343315 399323
588	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	574	12	343263 399268
589	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	566	12	343164 398359
589	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	591	12	343184 398273
589	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (SW)	597	12	343182 398265
589	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (SW)	599	12	343175 398272
589	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (SW)	606	12	343156 398289

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
589	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7NW (SW)	607	12	343154 398292
589	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	614	12	343146 398290
589	**Points of Interest - Manufacturing and Production** Name: Venture Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	690	12	343066 398278
589	**Points of Interest - Manufacturing and Production** Name: Venture Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	690	12	343066 398279
590	**Points of Interest - Manufacturing and Production** Name: Manor Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	634	12	343058 398736
590	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SW (W)	678	12	343020 398770
590	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	679	12	343020 398776
590	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A12SW (W)	683	12	343015 398771
591	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	647	12	343863 399607
592	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SE (NW)	676	12	343249 399420
593	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	679	12	343072 399025
594	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7NW (SW)	696	12	343020 398370

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
595	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	697	12	342985 398511
596	**Points of Interest - Manufacturing and Production** Name: Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	717	12	344118 399631
596	**Points of Interest - Manufacturing and Production** Name: Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A18NE (N)	719	12	344123 399632
597	**Points of Interest - Manufacturing and Production** Name: Woodlands Works Location: Not Supplied Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	720	12	343053 399137
597	**Points of Interest - Manufacturing and Production** Name: Woodlands Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	735	12	343038 399136
598	**Points of Interest - Manufacturing and Production** Name: Manor Works Location: L33 Category: Industrial Features Class Code: Unspecified Works Or Factories Positional Accuracy: Positioned to an adjacent address or location	A12SW (W)	750	12	342943 398754
599	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	793	12	343358 397873
600	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	830	12	342917 399024
600	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	835	12	342911 399016
600	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A12NW (W)	891	12	342865 399074
601	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7SE (SW)	854	12	343213 397883
601	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SE (SW)	858	12	343211 397879

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
601	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SE (SW)	859	12	343205 397882
602	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	864	12	342954 399298
602	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	911	12	342920 399338
602	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A17SW (NW)	917	12	342904 399314
603	**Points of Interest - Manufacturing and Production** Name: Acorn Business Centre Location: L33 Category: Industrial Features Class Code: Business Parks and Industrial Estates Positional Accuracy: Positioned to an adjacent address or location	A11SE (W)	869	12	342818 398468
604	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	896	12	342781 398619
604	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	897	12	342780 398613
604	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SE (W)	897	12	342780 398627
604	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	903	12	342774 398621
604	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	904	12	342773 398613
604	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SE (W)	909	12	342773 398696
604	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A11SE (W)	937	12	342741 398635

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	898	12	342779 398608
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	900	12	342777 398595
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	900	12	342777 398602
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	902	12	342775 398590
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	903	12	342774 398584
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	905	12	342772 398578
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	906	12	342771 398604
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	908	12	342769 398596
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	909	12	342768 398588
605	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A11SE (W)	911	12	342766 398579
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	944	12	342994 397948
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	946	12	342990 397949

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
606	**Points of Interest - Manufacturing and Production** Name: Tanks Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to an adjacent address or location	A7SW (SW)	947	12	342979 397959
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	949	12	342985 397950
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	951	12	342980 397952
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	953	12	342976 397953
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	958	12	342970 397953
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	959	12	342967 397955
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	961	12	342963 397956
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	963	12	342960 397957
606	**Points of Interest - Manufacturing and Production** Name: Tank Location: L33 Category: Industrial Features Class Code: Tanks (Generic) Positional Accuracy: Positioned to address or location	A7SW (SW)	964	12	342956 397959
607	**Points of Interest - Public Infrastructure** Name: Waste Oils Ltd Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A13NW (NW)	169	12	343584 398983
608	**Points of Interest - Public Infrastructure** Name: Oss Group Location: Stockpit Road, Knowsley Industrial Park, Liverpool, L33 7TQ Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A13SW (W)	173	12	343534 398766
609	**Points of Interest - Public Infrastructure** Name: Neston Environmental Services Location: Mayfield House, Charleywood Road, Knowsley Industrial Park, Liverpool, L33 7SG Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A7NE (SW)	533	12	343304 398218

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
610	**Points of Interest - Public Infrastructure** Name: Cambraco Travel Location: Unit 1 & 27 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, L33 7UY Category: Public Transport, Stations and Infrastructure Class Code: Bus and Coach Stations, Depots and Companies Positional Accuracy: Positioned to address or location	A18NW (N)	594	12	343713 399563
610	**Points of Interest - Public Infrastructure** Name: Cambraco Travel Location: Unit 104 North Mersey Business Centre, Woodward Road, Knowsley Industrial Park, Liverpool, Merseyside, L33 7UY Category: Public Transport, Stations and Infrastructure Class Code: Bus and Coach Stations, Depots and Companies Positional Accuracy: Positioned to address or location	A18NW (N)	594	12	343713 399562
611	**Points of Interest - Public Infrastructure** Name: Neston Tank Cleaners Location: Rockfield House, Gale Road, Knowsley Industrial Park, Liverpool, L33 7YE Category: Infrastructure and Facilities Class Code: Waste Storage, Processing and Disposal Positional Accuracy: Positioned to address or location	A7SE (SW)	806	12	343322 397876
611	**Points of Interest - Public Infrastructure** Name: Texaco Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7SE (SW)	838	12	343309 397847
611	**Points of Interest - Public Infrastructure** Name: Spar Knowsley Location: Gale Road, Knowsley Industrial Park, Liverpool, L33 7YB Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7SE (SW)	838	12	343309 397847
611	**Points of Interest - Public Infrastructure** Name: Knowsley Service Station (Alfred Jones) Location: Gale Road, Knowsley Industrial Park North, Liverpool, L33 7YB Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7SE (SW)	839	12	343290 397855
611	**Points of Interest - Public Infrastructure** Name: Spar Knowsley Location: Gale Road, Knowsley Industrial Park North, Liverpool, L33 7YB Category: Road And Rail Class Code: Petrol and Fuel Stations Positional Accuracy: Positioned to address or location	A7SE (SW)	839	12	343309 397846

Map ID	Details	Quadrant Reference (Compass Direction)	Estimated Distance From Site	Contact	NGR
612	**Areas of Adopted Green Belt** Authority: Knowsley Metropolitan Borough Council Plan Name: Proposal Map **Status: Adopted** Plan Date: 6th January 2016	A13NE (E)	5	6	344037 398774
613	**Areas of Adopted Green Belt** Authority: West Lancashire District Council Plan Name: West Lancashire Local Plan **Status: Adopted** Plan Date: 16th October 2013	A13NE (NE)	26	13	344063 398934
614	**Local Nature Reserves** Name: Acornfield Plantation Multiple Area: N Area (m2): 122550.53 Source: Natural England Designation Date: 20th October 1995	A8SW (S)	588	15	343671 397994
615	**Nitrate Vulnerable Zones** Name: Alt Nvz Description: Surface Water Source: Environment Agency, Head Office	A13NW (E)	0	4	343840 398787

Agency & Hydrological	Version	Update Cycle
Contaminated Land Register Entries and Notices		
West Lancashire District Council - Environmental Services	April 2014	Annual Rolling Update
St Helens Metropolitan Borough Council - Environmental Protection Department	December 2014	Annual Rolling Update
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	December 2015	Annual Rolling Update
Knowsley Metropolitan Borough Council - Department of Planning and Development	January 2015	Annual Rolling Update
Sefton Metropolitan Borough Council - Environmental Health Department	October 2017	Annual Rolling Update
Discharge Consents		
Environment Agency - North West Region	January 2019	Quarterly
Enforcement and Prohibition Notices		
Environment Agency - North East Region	March 2013	Annual Rolling Update
Environment Agency - North West Region	March 2013	Annual Rolling Update
Integrated Pollution Controls		
Environment Agency - North West Region	October 2008	Variable
Integrated Pollution Prevention And Control		
Environment Agency - North West Region	January 2019	Quarterly
Local Authority Integrated Pollution Prevention And Control		
St Helens Metropolitan Borough Council - Environmental Health Department	April 2013	Variable
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	December 2015	Variable
Sefton Metropolitan Borough Council - Environmental Health Department	July 2015	Variable
Knowsley Metropolitan Borough Council - Environmental Health and Consumer Protection Division	June 2013	Variable
West Lancashire District Council - Environmental Health Department	October 2014	Variable
Local Authority Pollution Prevention and Controls		
St Helens Metropolitan Borough Council - Environmental Health Department	December 2014	Annual Rolling Update
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	December 2015	Annually
Knowsley Metropolitan Borough Council - Environmental Health and Consumer Protection Division	January 2015	Annual Rolling Update
Sefton Metropolitan Borough Council - Environmental Health Department	July 2015	Annual Rolling Update
West Lancashire District Council - Environmental Health Department	October 2014	Annual Rolling Update
Local Authority Pollution Prevention and Control Enforcements		
St Helens Metropolitan Borough Council - Environmental Health Department	December 2014	Variable
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	December 2015	Variable
Knowsley Metropolitan Borough Council - Environmental Health and Consumer Protection Division	January 2015	Variable
Sefton Metropolitan Borough Council - Environmental Health Department	July 2015	Variable
West Lancashire District Council - Environmental Health Department	October 2014	Variable
Nearest Surface Water Feature		
Ordnance Survey	January 2019	
Pollution Incidents to Controlled Waters		
Environment Agency - North West Region	January 2000	Not Applicable
Prosecutions Relating to Authorised Processes		
Environment Agency - North West Region	March 2013	Annual Rolling Update
Prosecutions Relating to Controlled Waters		
Environment Agency - North West Region	March 2013	Annual Rolling Update
Registered Radioactive Substances		
Environment Agency - North West Region	June 2016	
River Quality		
Environment Agency - Head Office	November 2001	Not Applicable
River Quality Biology Sampling Points		
Environment Agency - Head Office	July 2012	Annually
River Quality Chemistry Sampling Points		
Environment Agency - Head Office	July 2012	Annually

Agency & Hydrological	Version	Update Cycle
Substantiated Pollution Incident Register		
Environment Agency - North West Region - Central Area	January 2019	Quarterly
Environment Agency - North West Region - North Area	January 2019	Quarterly
Environment Agency - North West Region - South Area	January 2019	Quarterly
Water Abstractions		
Environment Agency - North West Region	January 2019	Quarterly
Water Industry Act Referrals		
Environment Agency - North West Region	October 2017	Quarterly
Groundwater Vulnerability Map		
Environment Agency - Head Office	June 2018	Annually
Bedrock Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Superficial Aquifer Designations		
Environment Agency - Head Office	January 2018	Annually
Source Protection Zones		
Environment Agency - Head Office	January 2019	Quarterly
Extreme Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	February 2019	Quarterly
Flooding from Rivers or Sea without Defences		
Environment Agency - Head Office	February 2019	Quarterly
Areas Benefiting from Flood Defences		
Environment Agency - Head Office	February 2019	Quarterly
Flood Water Storage Areas		
Environment Agency - Head Office	February 2019	Quarterly
Flood Defences		
Environment Agency - Head Office	February 2019	Quarterly
OS Water Network Lines		
Ordnance Survey	January 2019	Quarterly
Surface Water 1 in 30 year Flood Extent		
Environment Agency - Head Office	October 2013	Annually
Surface Water 1 in 100 year Flood Extent		
Environment Agency - Head Office	October 2013	Annually
Surface Water 1 in 1000 year Flood Extent		
Environment Agency - Head Office	October 2013	Annually
Surface Water Suitability		
Environment Agency - Head Office	October 2013	Annually
BGS Groundwater Flooding Susceptibility		
British Geological Survey - National Geoscience Information Service	May 2013	Annually

Waste	Version	Update Cycle
BGS Recorded Landfill Sites		
British Geological Survey - National Geoscience Information Service	June 1996	Not Applicable
Historical Landfill Sites		
Environment Agency - Head Office	July 2018	Quarterly
Integrated Pollution Control Registered Waste Sites		
Environment Agency - North West Region	October 2008	Not Applicable
Licensed Waste Management Facilities (Landfill Boundaries)		
Environment Agency - North West Region - Central Area	July 2018	Quarterly
Environment Agency - North West Region - North Area	July 2018	Quarterly
Environment Agency - North West Region - South Area	July 2018	Quarterly
Licensed Waste Management Facilities (Locations)		
Environment Agency - North West Region - Central Area	January 2019	Quarterly
Environment Agency - North West Region - North Area	January 2019	Quarterly
Environment Agency - North West Region - South Area	January 2019	Quarterly
Local Authority Landfill Coverage		
Knowsley Metropolitan Borough Council	May 2000	Not Applicable
Lancashire County Council - Waste Management Group	May 2000	Not Applicable
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	May 2000	Not Applicable
Merseyside Waste Disposal Authority	May 2000	Not Applicable
Sefton Metropolitan Borough Council - Environmental Health Department	May 2000	Not Applicable
St Helens Metropolitan Borough Council	May 2000	Not Applicable
West Lancashire District Council - Environmental Health Department	May 2000	Not Applicable
Local Authority Recorded Landfill Sites		
West Lancashire District Council - Environmental Health Department	March 2004	Not Applicable
Knowsley Metropolitan Borough Council	May 2000	Not Applicable
Lancashire County Council - Waste Management Group	May 2000	Not Applicable
Liverpool City Council - Liverpool Environmental Health & Trading Standards Division	May 2000	Not Applicable
Merseyside Waste Disposal Authority	May 2000	Not Applicable
Sefton Metropolitan Borough Council - Environmental Health Department	May 2000	Not Applicable
St Helens Metropolitan Borough Council	May 2000	Not Applicable
Potentially Infilled Land (Non-Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Potentially Infilled Land (Water)		
Landmark Information Group Limited	December 1999	Not Applicable
Registered Landfill Sites		
Environment Agency - North West Region - Central Area	March 2003	Not Applicable
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Environment Agency - North West Region - South Area	March 2003	Not Applicable
Registered Waste Transfer Sites		
Environment Agency - North West Region - Central Area	March 2003	Not Applicable
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Environment Agency - North West Region - South Area	March 2003	Not Applicable
Registered Waste Treatment or Disposal Sites		
Environment Agency - North West Region - Central Area	March 2003	Not Applicable
Environment Agency - North West Region - North Area	March 2003	Not Applicable
Environment Agency - North West Region - South Area	March 2003	Not Applicable

Hazardous Substances	Version	Update Cycle
Control of Major Accident Hazards Sites (COMAH)		
Health and Safety Executive	April 2018	Bi-Annually
Explosive Sites		
Health and Safety Executive	March 2017	Annually
Notification of Installations Handling Hazardous Substances (NIHHS)		
Health and Safety Executive	November 2000	Not Applicable
Planning Hazardous Substance Enforcements		
Knowsley Metropolitan Borough Council	August 2015	Variable
Lancashire County Council	February 2016	Variable
Sefton Metropolitan Borough Council	February 2016	Variable
St Helens Metropolitan Borough Council	February 2016	Variable
West Lancashire District Council	February 2016	Variable
Liverpool City Council	January 2016	Variable
Planning Hazardous Substance Consents		
Knowsley Metropolitan Borough Council	August 2015	Variable
Lancashire County Council	February 2016	Variable
Leeds City Council - Planning and Development	February 2016	Variable
Sefton Metropolitan Borough Council	February 2016	Variable
St Helens Metropolitan Borough Council	February 2016	Variable
West Lancashire District Council	February 2016	Variable
Liverpool City Council	January 2016	Variable

Geological	Version	Update Cycle
BGS 1:625,000 Solid Geology British Geological Survey - National Geoscience Information Service	January 2009	Not Applicable
BGS Estimated Soil Chemistry British Geological Survey - National Geoscience Information Service	October 2015	Annually
BGS Recorded Mineral Sites British Geological Survey - National Geoscience Information Service	April 2019	Bi-Annually
CBSCB Compensation District Cheshire Brine Subsidence Compensation Board (CBSCB)	August 2011	Not Applicable
Coal Mining Affected Areas The Coal Authority - Property Searches	March 2014	Annual Rolling Update
Mining Instability Ove Arup & Partners	October 2000	Not Applicable
Non Coal Mining Areas of Great Britain British Geological Survey - National Geoscience Information Service	May 2015	Not Applicable
Potential for Collapsible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Compressible Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Ground Dissolution Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Landslide Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Running Sand Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Potential for Shrinking or Swelling Clay Ground Stability Hazards British Geological Survey - National Geoscience Information Service	January 2019	Annually
Radon Potential - Radon Affected Areas British Geological Survey - National Geoscience Information Service	July 2011	Annually
Radon Potential - Radon Protection Measures British Geological Survey - National Geoscience Information Service	July 2011	Annually
Industrial Land Use	**Version**	**Update Cycle**
Contemporary Trade Directory Entries Thomson Directories	April 2019	Quarterly
Fuel Station Entries Catalist Ltd - Experian	May 2019	Quarterly
Gas Pipelines National Grid	July 2014	
Points of Interest - Commercial Services PointX	November 2018	Quarterly
Points of Interest - Education and Health PointX	November 2018	Quarterly
Points of Interest - Manufacturing and Production PointX	November 2018	Quarterly
Points of Interest - Public Infrastructure PointX	November 2018	Quarterly
Points of Interest - Recreational and Environmental PointX	November 2018	Quarterly
Underground Electrical Cables National Grid	December 2015	

Sensitive Land Use	Version	Update Cycle
Ancient Woodland		
Natural England	August 2018	Bi-Annually
Areas of Adopted Green Belt		
Knowsley Metropolitan Borough Council	March 2019	As notified
Liverpool City Council	March 2019	As notified
Sefton Metropolitan Borough Council	March 2019	As notified
St Helens Metropolitan Borough Council	March 2019	As notified
West Lancashire District Council	March 2019	As notified
Areas of Unadopted Green Belt		
Knowsley Metropolitan Borough Council	March 2019	As notified
Liverpool City Council	March 2019	As notified
Sefton Metropolitan Borough Council	March 2019	As notified
St Helens Metropolitan Borough Council	March 2019	As notified
West Lancashire District Council	March 2019	As notified
Areas of Outstanding Natural Beauty		
Natural England	August 2018	Bi-Annually
Environmentally Sensitive Areas		
Natural England	January 2017	
Forest Parks		
Forestry Commission	April 1997	Not Applicable
Local Nature Reserves		
Natural England	March 2019	Bi-Annually
Marine Nature Reserves		
Natural England	January 2018	Bi-Annually
National Nature Reserves		
Natural England	August 2018	Bi-Annually
National Parks		
Natural England	April 2017	Bi-Annually
Nitrate Vulnerable Zones		
Environment Agency - Head Office	December 2017	Bi-Annually
Department for Environment, Food and Rural Affairs (DEFRA - formerly FRCA)	October 2015	
Ramsar Sites		
Natural England	April 2019	Bi-Annually
Sites of Special Scientific Interest		
Natural England	March 2019	Bi-Annually
Special Areas of Conservation		
Natural England	June 2019	Bi-Annually
Special Protection Areas		
Natural England	April 2019	Bi-Annually

Data Suppliers

A selection of organisations who provide data within this report

Data Supplier	Data Supplier Logo
Ordnance Survey	
Environment Agency	
Scottish Environment Protection Agency	
The Coal Authority	
British Geological Survey	
Centre for Ecology and Hydrology	
Natural Resources Wales	
Scottish Natural Heritage	
Natural England	
Public Health England	
Ove Arup	
Peter Brett Associates	

Contact	Name and Address	Contact Details
1	**British Geological Survey - Enquiry Service** British Geological Survey, Environmental Science Centre, Keyworth, Nottingham, Nottinghamshire, NG12 5GG	Telephone: 0115 936 3143 Fax: 0115 936 3276 Email: enquiries@bgs.ac.uk Website: www.bgs.ac.uk
2	**Environment Agency - National Customer Contact Centre (NCCC)** PO Box 544, Templeborough, Rotherham, S60 1BY	Telephone: 03708 506 506 Email: enquiries@environment-agency.gov.uk
3	**Knowsley Metropolitan Borough Council - Environmental Health and Consumer Protection Division** Municipal Buildings, Cherryfield Drive, Kirkby, Knowsley, Merseyside, L32 1TX	Telephone: 0151 443 4731 Fax: 0151 289 7488 Website: www.knowsley.gov.uk
4	**Environment Agency - Head Office** Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol, Avon, BS32 4UD	Telephone: 01454 624400 Fax: 01454 624409
5	**Ordnance Survey** Adanac Drive, Southampton, Hampshire, SO16 0AS	Telephone: 03456 05 05 05 Email: customerservices@ordnancesurvey.co.uk Website: www.ordnancesurvey.gov.uk
6	**Knowsley Metropolitan Borough Council** Archway Road, Huyton, Liverpool, Merseyside, L36 9YU	Telephone: 0151 489 6000 Fax: 0151 443 2298 Website: www.knowsley.gov.uk
7	**Merseyside Waste Disposal Authority** 2nd Floor, North House, 17 North John Street, Liverpool, Merseyside, L2 5QY	Telephone: 0151 2551444 Fax: 0151 2271848 Email: enquiries@merseysidewda.gov.uk
8	**West Lancashire District Council - Environmental Health Department** Westec House, 52 Derby Street, Ormskirk, Lancashire, L39 2DF	Telephone: 01695 577177 Fax: 01695 571079 Website: www.westlancsdc.gov.uk
9	**Lancashire County Council - Waste Management Group** Environment Directorate, Guild House, Cross Street, Preston, Lancashire, PR1 8RD	Website: www.lancashire.gov.uk
10	**Health and Safety Executive** 5S.2 Redgrave Court, Merton Road, Bootle, L20 7HS	Website: www.hse.gov.uk
11	**Leeds City Council - Planning and Development** The Leonardo Building, 2 Rossington Street, Leeds, West Yorkshire, LS2 8HD	Telephone: 0113 247 8037 Fax: 0113 247 8009 Website: www.leeds.gov.uk
12	**PointX** 7 Abbey Court, Eagle Way, Sowton, Exeter, Devon, EX2 7HY	Website: www.pointx.co.uk
13	**West Lancashire District Council** Westec House, 52 Derby Street, Ormskirk, Lancashire, L39 2DF	Telephone: 01695 577177 Fax: 01695 571079 Website: www.westlancsdc.gov.uk
14	**St Helens Metropolitan Borough Council** Town Hall, Corporation Street, St Helens, Merseyside, WA10 1HP	Telephone: 01744 456000 Fax: 01744 733337 Website: www.sthelens.gov.uk
15	**Natural England** County Hall, Spetchley Road, Worcester, WR5 2NP	Telephone: 0300 060 3900 Email: enquiries@naturalengland.org.uk Website: www.naturalengland.org.uk

Useful Contacts

Contact	Name and Address	Contact Details
-	**Public Health England - Radon Survey, Centre for Radiation, Chemical and Environmental Hazards** Chilton, Didcot, Oxfordshire, OX11 0RQ	Telephone: 01235 822622 Fax: 01235 833891 Email: radon@phe.gov.uk Website: www.ukradon.org
-	**Landmark Information Group Limited** Imperium, Imperial Way, Reading, Berkshire, RG2 0TD	Telephone: 0844 844 9952 Fax: 0844 844 9951 Email: customerservices@landmarkinfo.co.uk Website: www.landmarkinfo.co.uk

Please note that the Environment Agency / Natural Resources Wales / SEPA have a charging policy in place for enquiries.

Geology 1:50,000 Maps Legends

Artificial Ground and Landslip

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	MGR	Made Ground (Undivided)	Artificial Deposit	Not Supplied - Holocene
	WGR	Worked Ground (Undivided)	Void	Not Supplied - Holocene

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	SSA	Shirdley Hill Sand Formation	Sand	Not Supplied - Devensian
	TILLD	Till, Devensian	Diamicton	Not Supplied - Devensian
	GFICD	Glaciofluvial Ice Contact Deposits, Devensian	Sand and Gravel	Not Supplied - Devensian
	PEAT	Peat	Peat	Not Supplied - Quaternary

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	CHES	Chester Formation	Sandstone	Not Supplied - Olenekian
	WLSF	Wilmslow Sandstone Formation	Sandstone	Not Supplied - Early Triassic
	PLCM	Pennine Lower Coal Measures Formation	Mudstone	Not Supplied - Westphalian
	MLRS	Milnrow Sandstone	Sandstone	Not Supplied - Westphalian
	OL	Old Lawrence Rock	Sandstone	Not Supplied - Westphalian
	HER	Helpet Edge Rock	Sandstone	Not Supplied - Westphalian
	WH	Woodhead Hill Rock	Sandstone	Not Supplied - Westphalian
	PLCM	Pennine Lower Coal Measures Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Westphalian
	ROSSE	Rossendale Formation	Mudstone, Siltstone and Sandstone	Not Supplied - Namurian
		Faults		
		Rock Segments		

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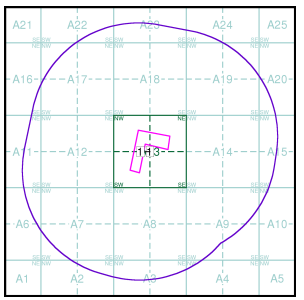
Geology 1:50,000 Maps

This report contains geological map extracts taken from the BGS Digital Geological map of Great Britain at 1:50,000 scale and is designed for users carrying out preliminary site assessments who require geological maps for the area around the site. This mapping may be more up to date than previously published paper maps.
The various geological layers - artificial and landslip deposits, superficial geology and solid (bedrock) geology are displayed in separate maps, but superimposed on the final 'Combined Surface Geology' map. All map legends feature on this page. Not all layers have complete nationwide coverage, so availability of data for relevant map sheets is indicated below.

Geology 1:50,000 Maps Coverage

Map ID:	**1**
Map Sheet No:	**084**
Map Name:	**Wigan**
Map Date:	**2013**
Bedrock Geology:	**Available**
Superficial Geology:	**Available**
Artificial Geology:	**Available**
Faults:	**Not Supplied**
Landslip:	**Available**
Rock Segments:	**Not Supplied**

Geology 1:50,000 Maps - Slice A



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National Grid Reference:	343840, 398790
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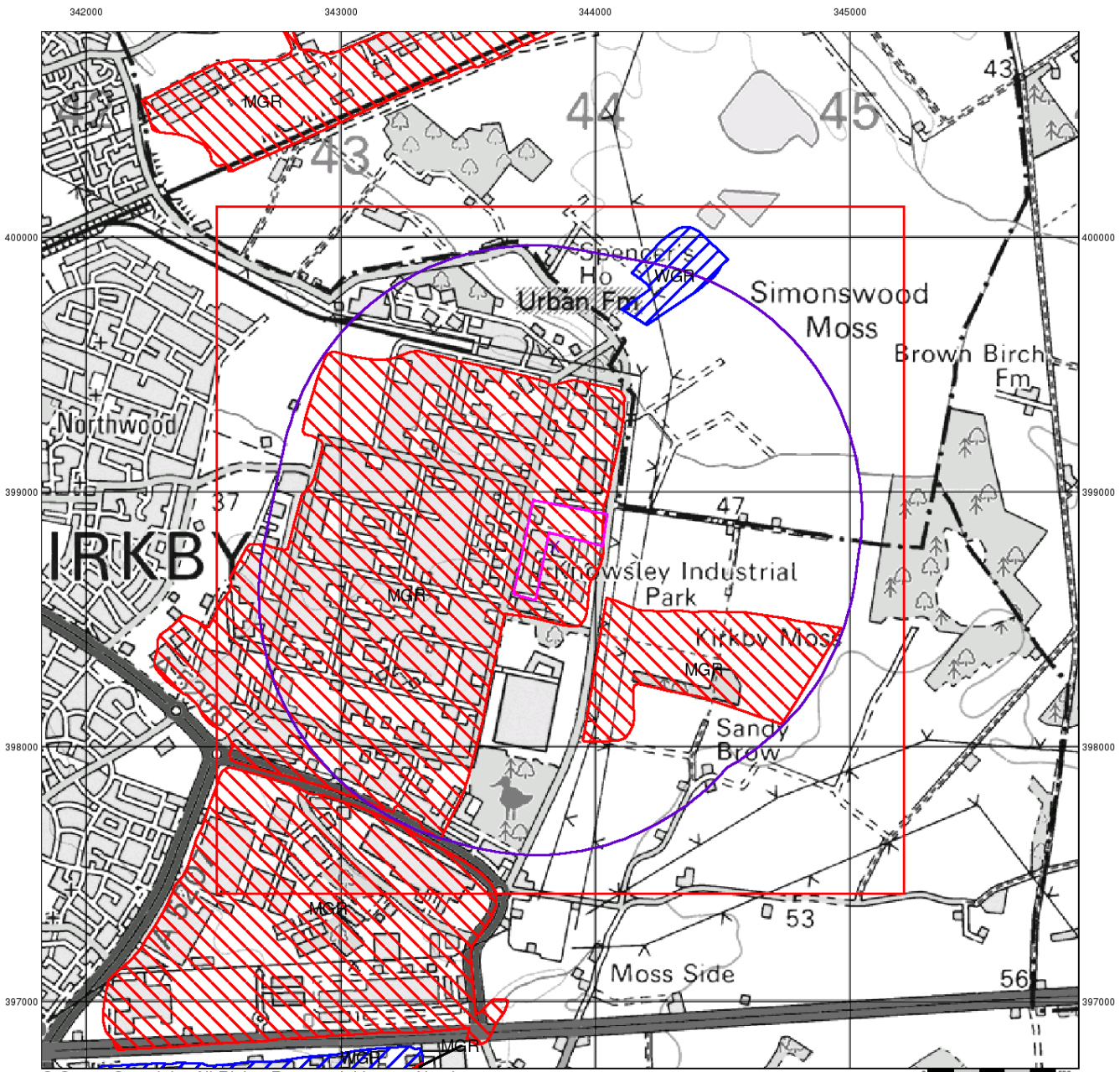
Search Buffer (m):	1000

Site Details:

Image Business Park, Acornfield Road, Knowsley Industrial Park, KIRKBY, L33 7UF



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Artificial Ground and Landslip

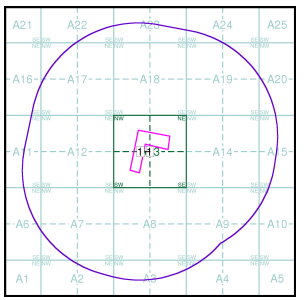
Artificial ground is a term used by BGS for those areas where the ground surface has been significantly modified by human activity. Information about previously developed ground is especially important, as it is often associated with potentially contaminated material, unpredictable engineering conditions and unstable ground.

Artificial ground includes:

- Made ground - man-made deposits such as embankments and spoil heaps on the natural ground surface.
- Worked ground - areas where the ground has been cut away such as quarries and road cuttings.
- Infilled ground - areas where the ground has been cut away then wholly or partially backfilled.
- Landscaped ground - areas where the surface has been reshaped.
- Disturbed ground - areas of ill-defined shallow or near surface mineral workings where it is impracticable to map made and worked ground separately.

Mass movement (landslip) deposits on BGS geological maps are primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground. The dataset also includes foundered strata, where the ground has collapsed due to subsidence.

Artificial Ground and Landslip Map - Slice A



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Site Details:

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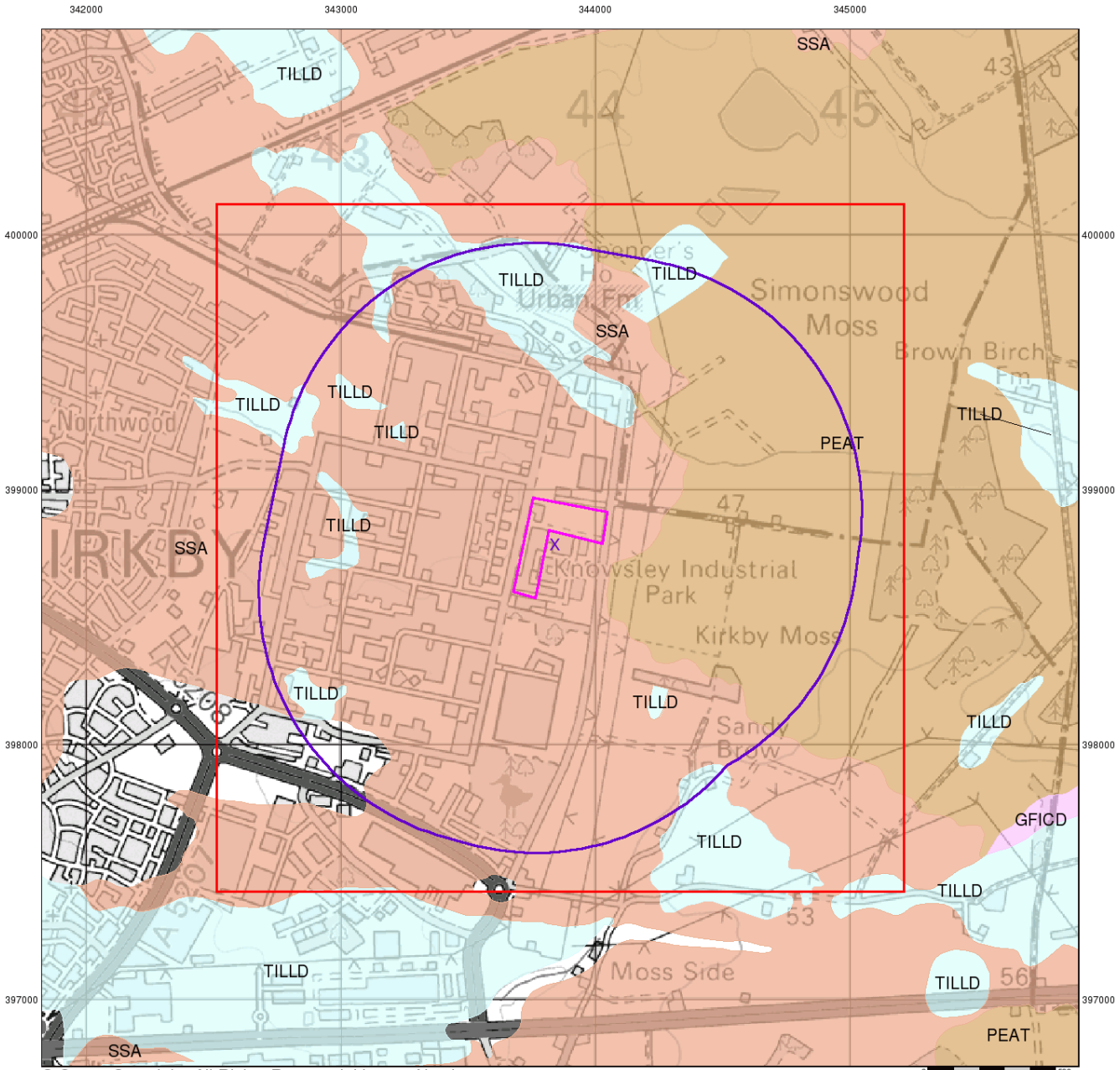
Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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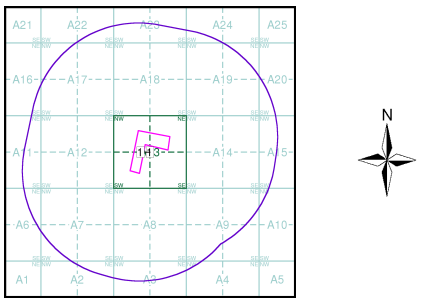
Superficial Geology

Superficial Deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 1.8 million years from the present.

They rest on older deposits or rocks referred to as Bedrock. This dataset contains Superficial deposits that are of natural origin and 'in place'. Other superficial strata may be held in the Mass Movement dataset where they have been moved, or in the Artificial Ground dataset where they are of man-made origin.

Most of these Superficial deposits are unconsolidated sediments such as gravel, sand, silt and clay, and onshore they form relatively thin, often discontinuous patches or larger spreads.

Superficial Geology Map - Slice A



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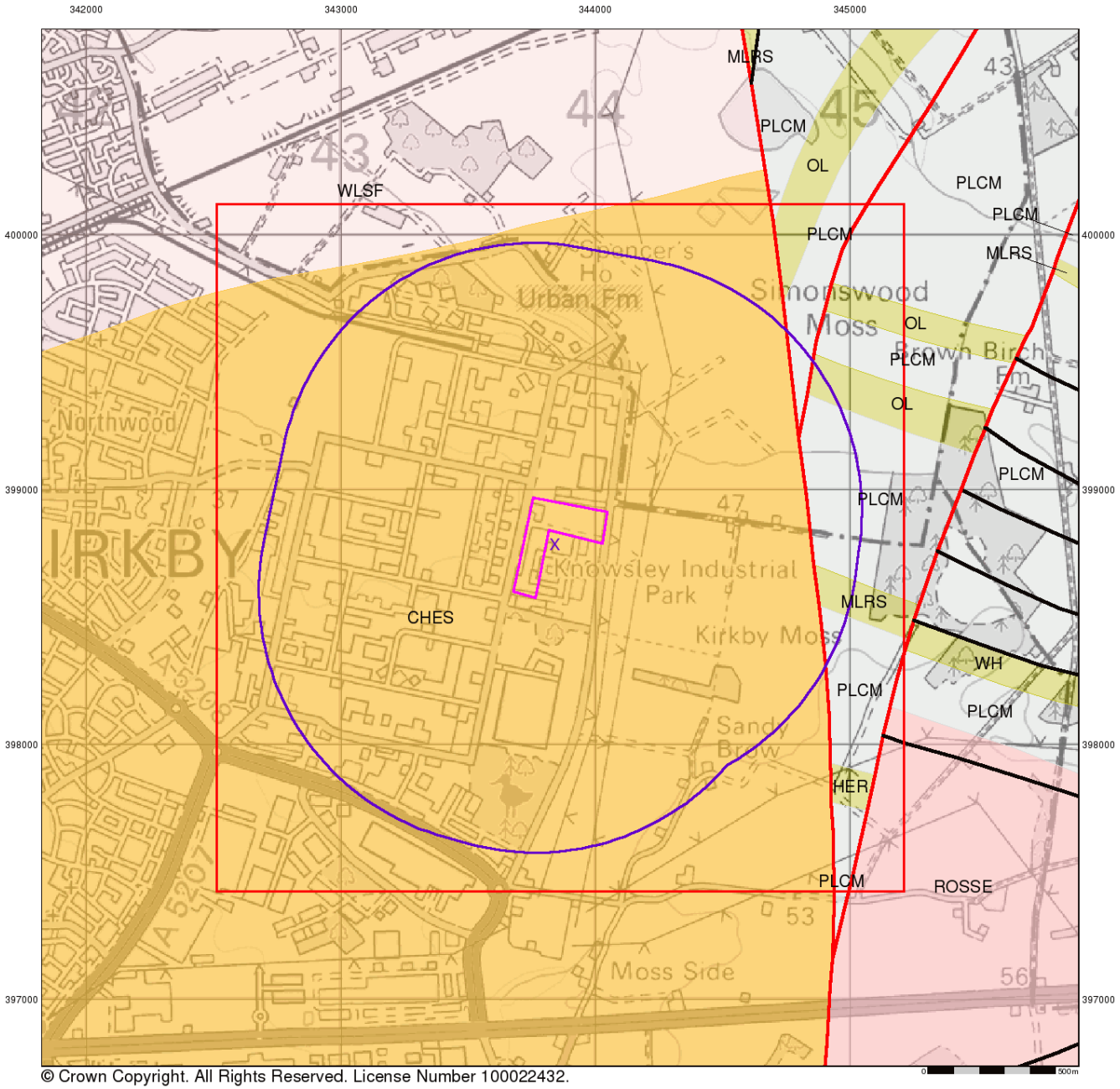

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Bedrock and Faults

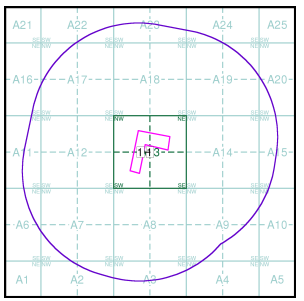
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



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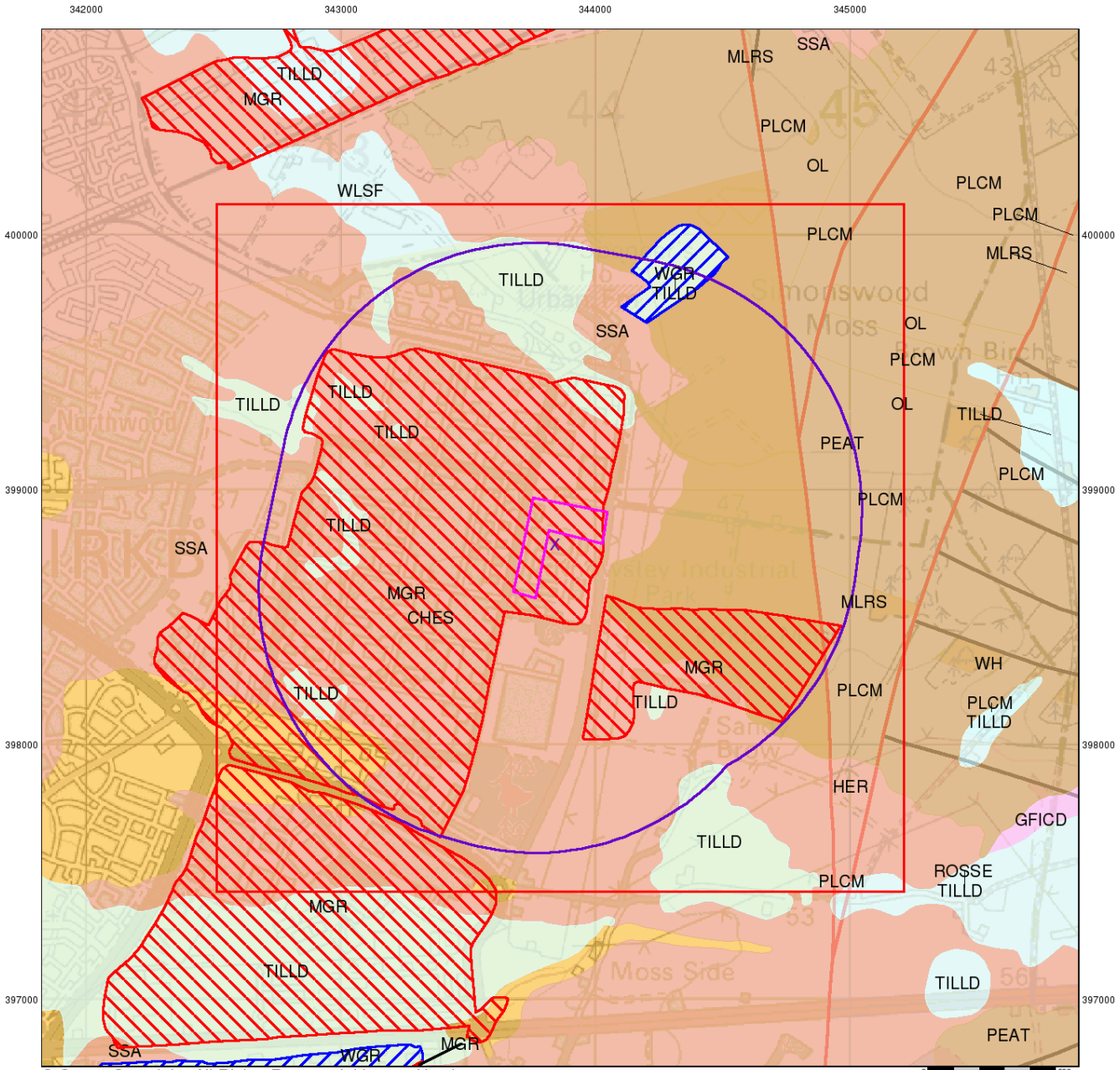

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Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

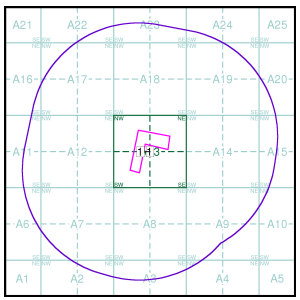
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A



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Site Details:

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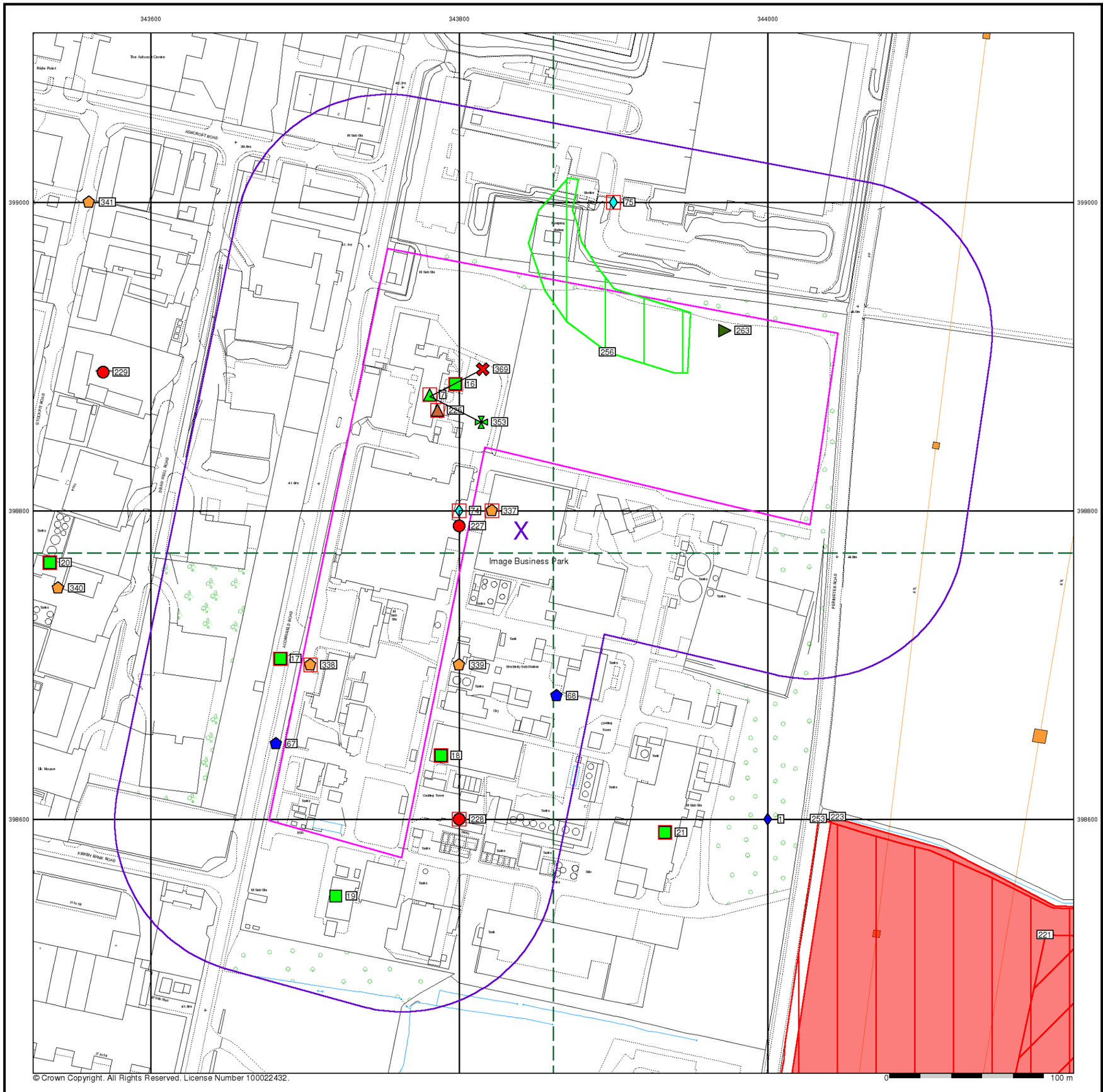

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location
- Pylon
- Overhead Transmission Line

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
- Contaminated Land Register Entry or Notice
- Discharge Consent
- Enforcement or Prohibition Notice
- Integrated Pollution Control
- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
- Local Authority Pollution Prevention and Control Enforcement
- Pollution Incident to Controlled Waters
- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
- Registered Radioactive Substance
- River Network or Water Feature
- River Quality Sampling Point
- Substantiated Pollution Incident Register
- Water Abstraction
- Water Industry Act Referral

Hazardous Substances

- COMAH Site
- Explosive Site
- NIHHS Site
- Planning Hazardous Substance Consent
- Planning Hazardous Substance Enforcement

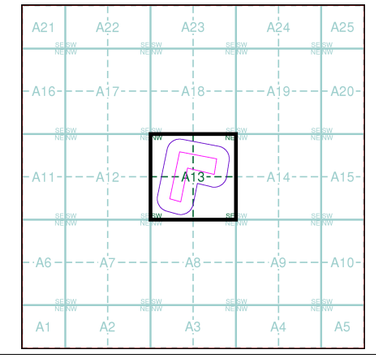
Geological

- BGS Recorded Mineral Site

Waste

- BGS Recorded Landfill Site (Location)
- BGS Recorded Landfill Site
- EA Historic Landfill (Buffered Point)
- EA Historic Landfill (Polygon)
- Integrated Pollution Control Registered Waste Site
- Licensed Waste Management Facility (Landfill Boundary)
- Licensed Waste Management Facility (Location)
- Local Authority Recorded Landfill Site (Location)
- Local Authority Recorded Landfill Site
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Segment A13



Order Details

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Customer Ref:	19-0654.01
National Grid Reference:	343840, 398790
Slice:	A
Site Area (Ha):	5.94
Plot Buffer (m):	100

Site Details

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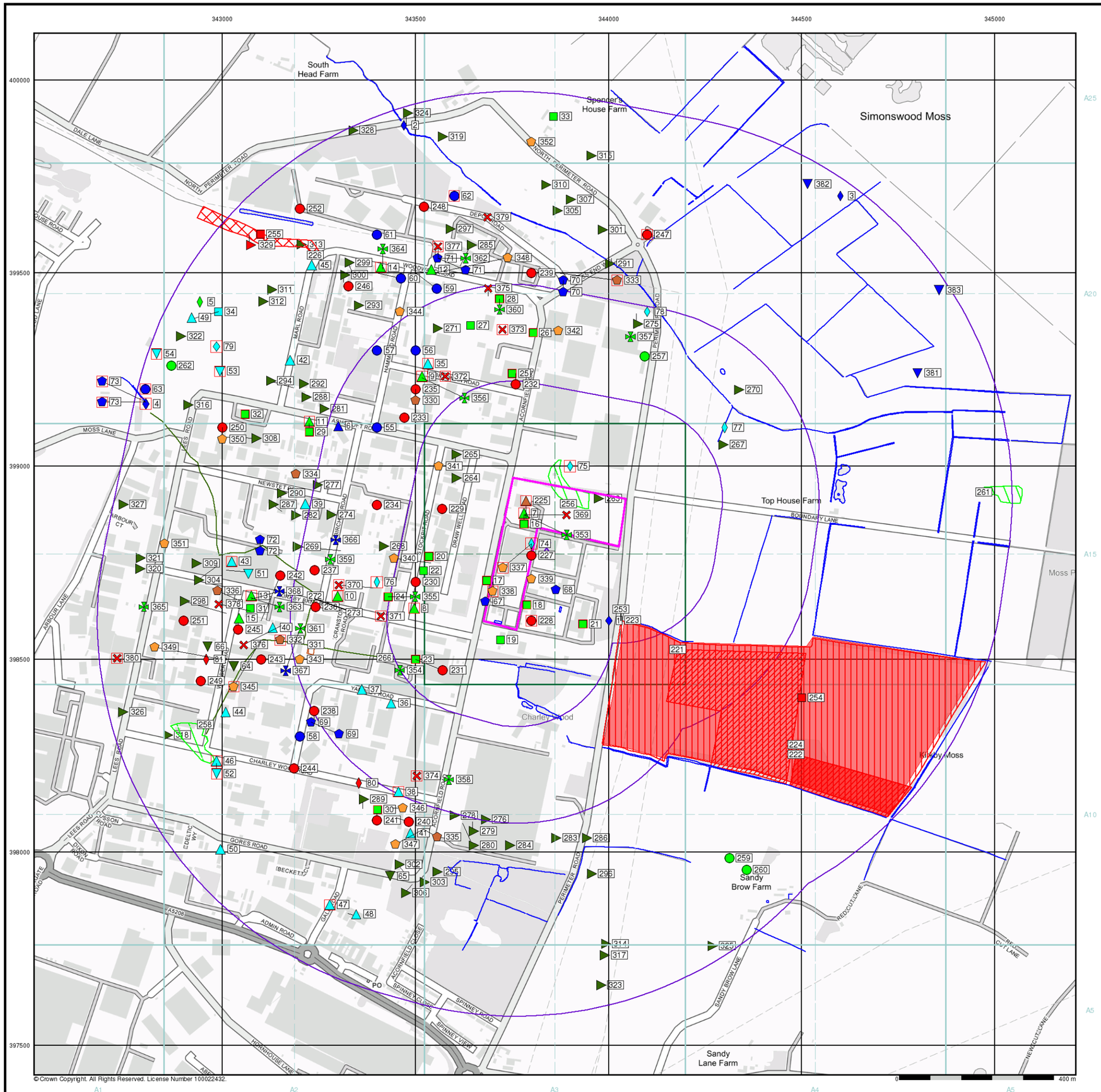
Landmark INFORMATION GROUP
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



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General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Map ID

Several of Type at Location

Agency and Hydrological

- Contaminated Land Register Entry or Notice (Location)
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- Enforcement or Prohibition Notice
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- Integrated Pollution Prevention Control
- Local Authority Integrated Pollution Prevention and Control
- Local Authority Pollution Prevention and Control
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- Prosecution Relating to Authorised Processes
- Prosecution Relating to Controlled Waters
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- River Quality Sampling Point
- Substantiated Pollution Incident Register
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- Water Industry Act Referral

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COMAH Site | Explosive Site

- NIHHS Site
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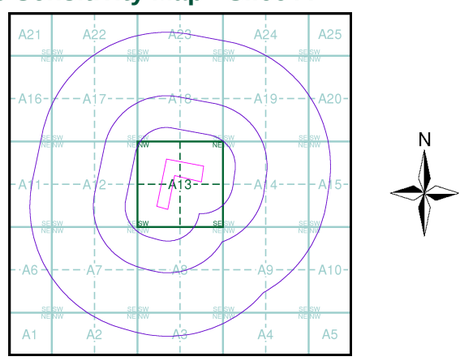
- Potentially Infilled Land (Non-water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Potentially Infilled Land (Water)
- Registered Landfill Site
- Registered Landfill Site (Location)
- Registered Landfill Site (Point Buffered to 100m)
- Registered Landfill Site (Point Buffered to 250m)
- Registered Waste Transfer Site (Location)
- Registered Waste Transfer Site
- Registered Waste Treatment or Disposal Site (Location)
- Registered Waste Treatment or Disposal Site

Site Sensitivity Map - Slice A



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Slice:	A
Site Area (Ha):	5.94
Search Buffer (m):	1000

Site Details

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Landmark INFORMATION GROUP

Tel: 0844 844 9952
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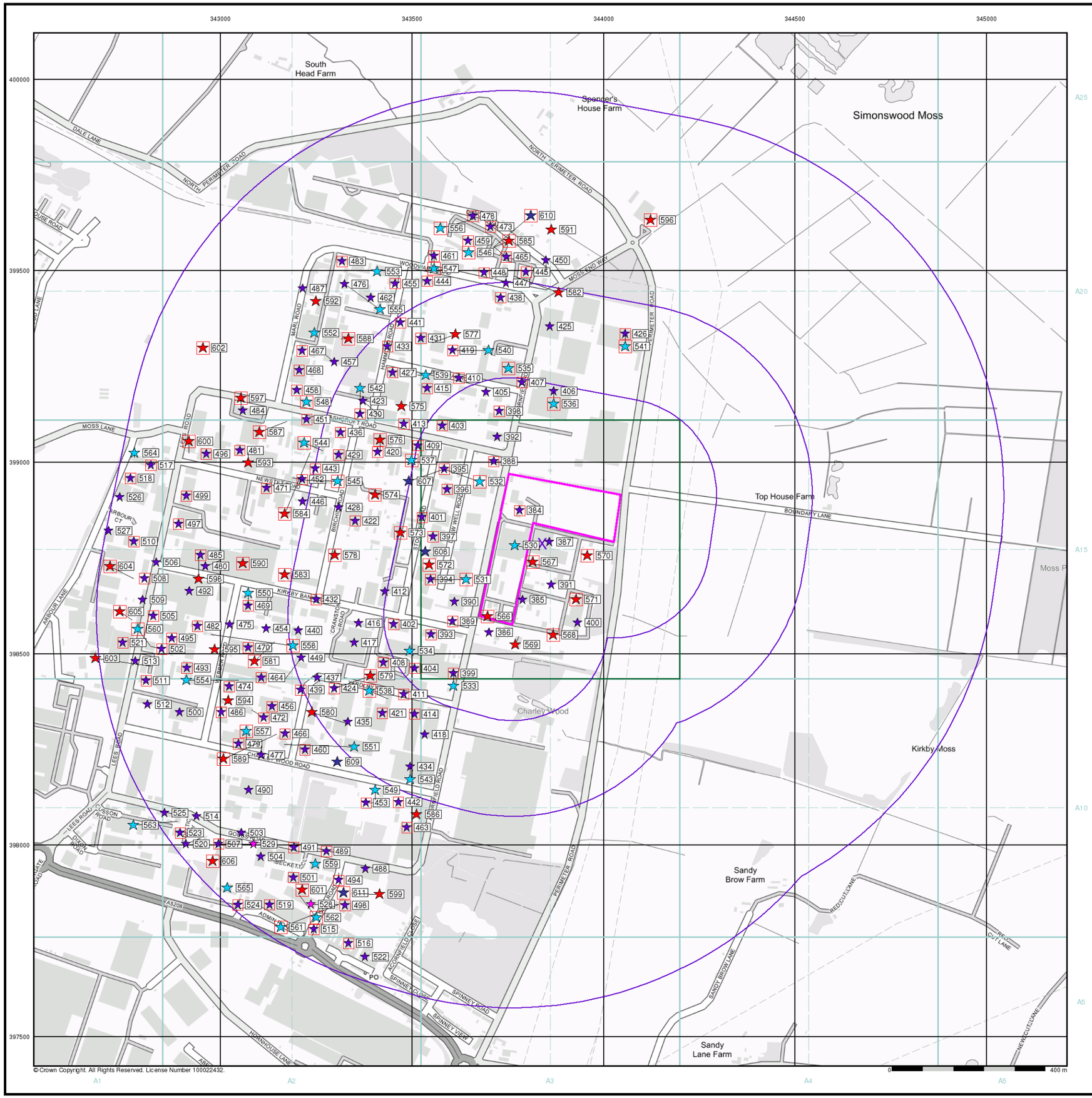
Web: www.envirocheck.co.uk



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Industrial Land Use Map

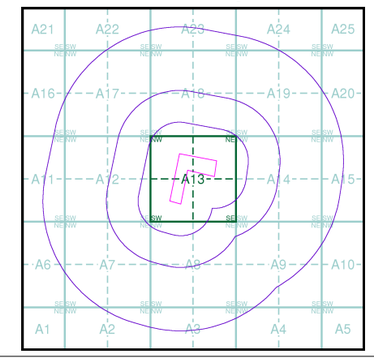
General

Specified Site
Specified Buffer(s)
Bearing Reference Point
Slice
Map ID

Industrial Land Use

- Contemporary Trade Directory Entry
- Fuel Station Entry
- Gas Pipeline
- Points of Interest - Commercial Services
- Points of Interest - Education and Health
- Points of Interest - Manufacturing and Production
- Points of Interest - Public Infrastructure
- Points of Interest - Recreational and Environmental
- Underground Electrical Cables

Industrial Land Use Map - Slice A

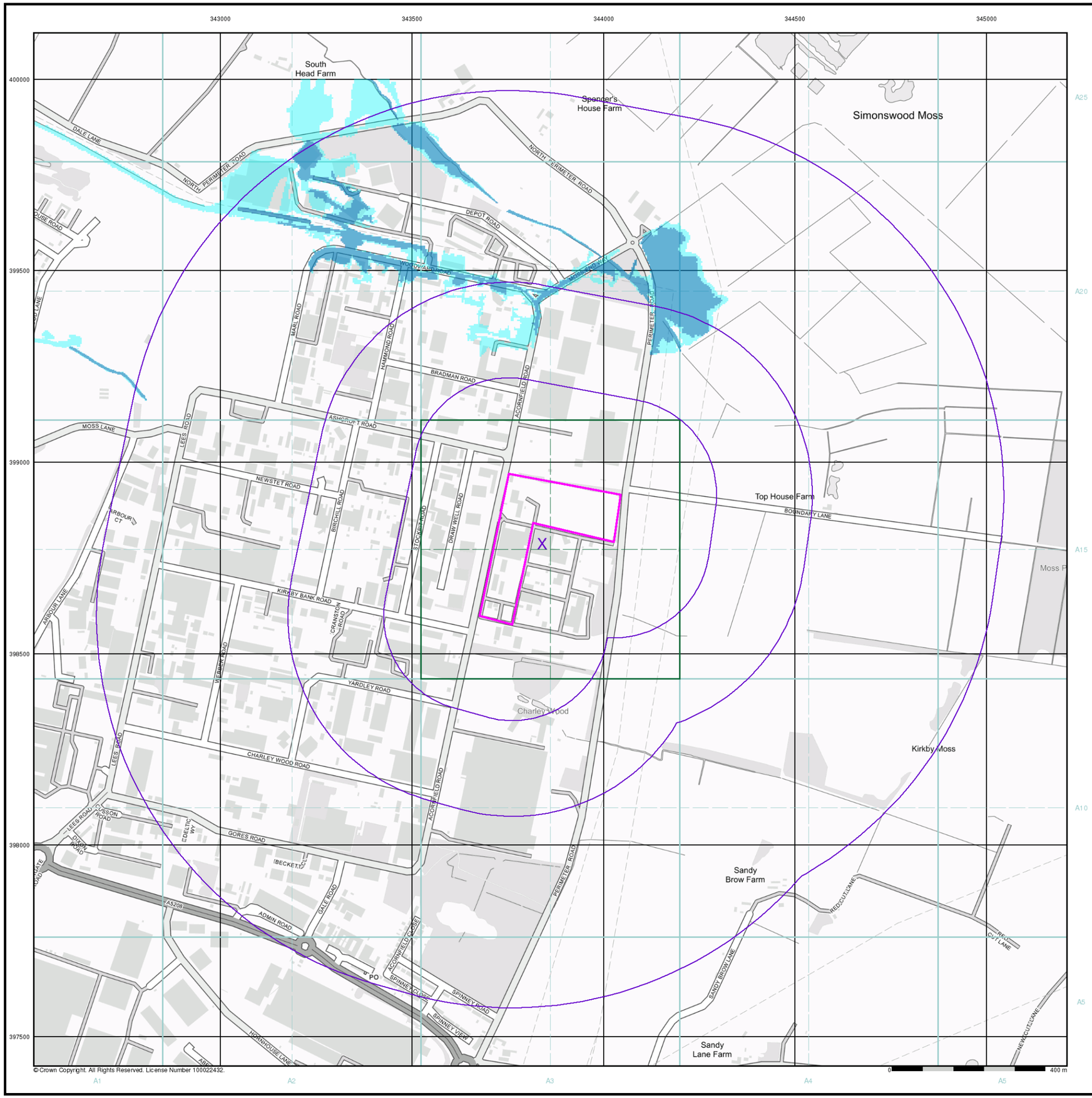


Order Details

Order Number:	207456127_1_1
Customer Ref:	19-0654.01
National Grid Reference:	343840, 398790
Slice:	A
Site Area (Ha):	5.94
Search Buffer (m):	1000

Site Details

Image Business Park, Acornfield Road, Knowsley Industrial Park, KIRKBY, L33 7UF



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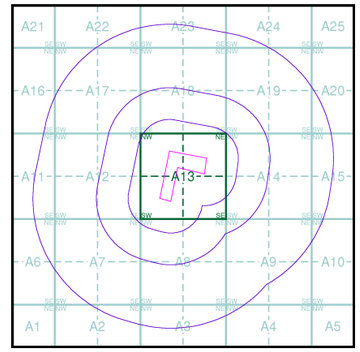
General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Agency and Hydrological (Flood)

- Extreme Flooding from Rivers or Sea without Defences (Zone 2)
- Flooding from Rivers or Sea without Defences (Zone 3)
- Area Benefiting from Flood Defence
- Flood Water Storage Areas
- Flood Defence

Flood Map - Slice A



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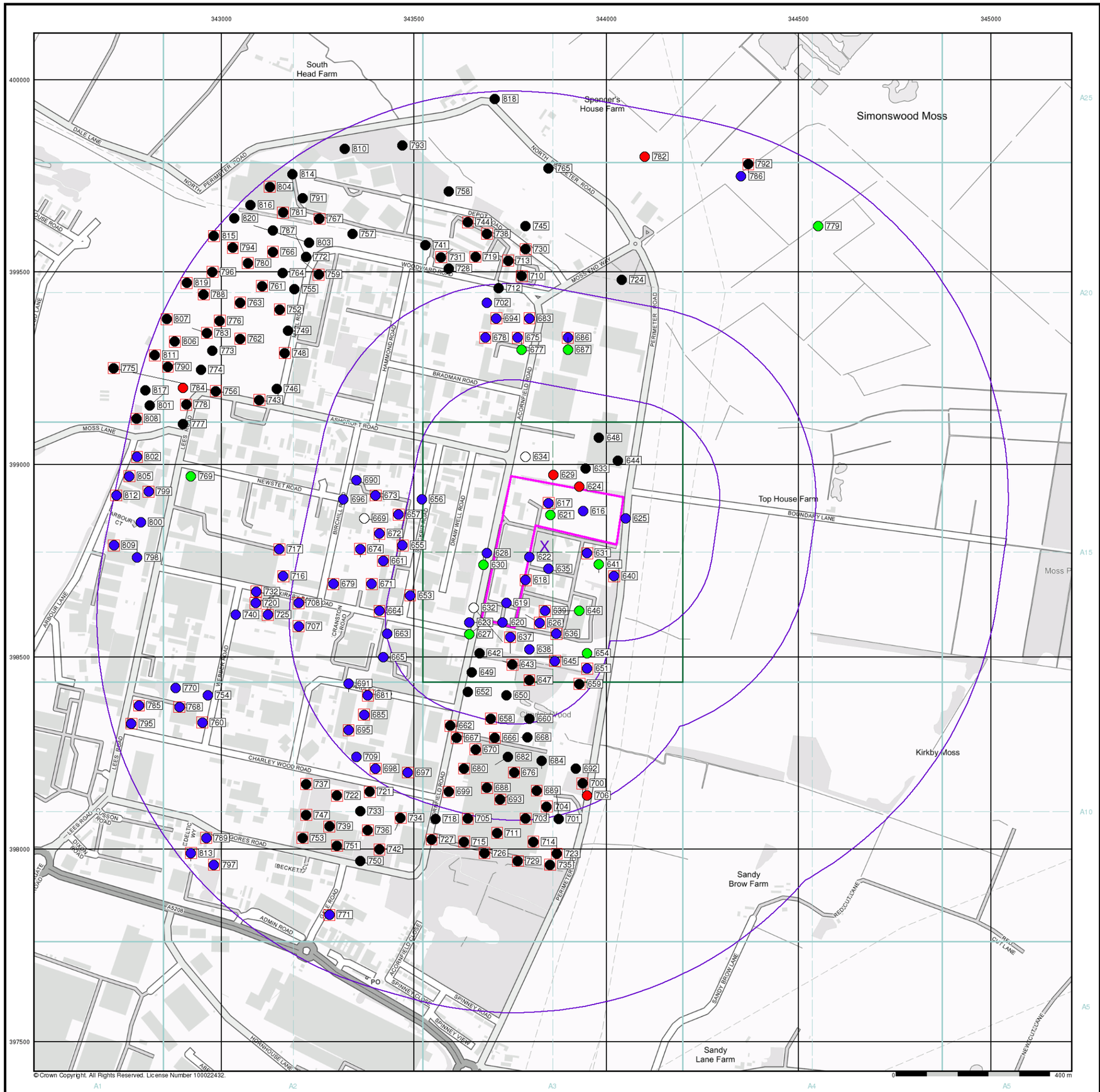

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point
- Map ID
- Several of Type at Location

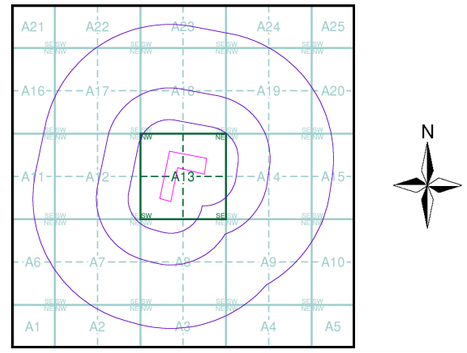
Agency and Hydrological (Boreholes)

- BGS Borehole Depth 0 - 10m
- BGS Borehole Depth 10 - 30m
- BGS Borehole Depth 30m +
- Confidential
- Other

For Borehole information please refer to the Borehole .csv file which accompanied this slice.

A copy of the BGS Borehole Ordering Form is available to download from the Support section of www.envirocheck.co.uk.

Borehole Map - Slice A



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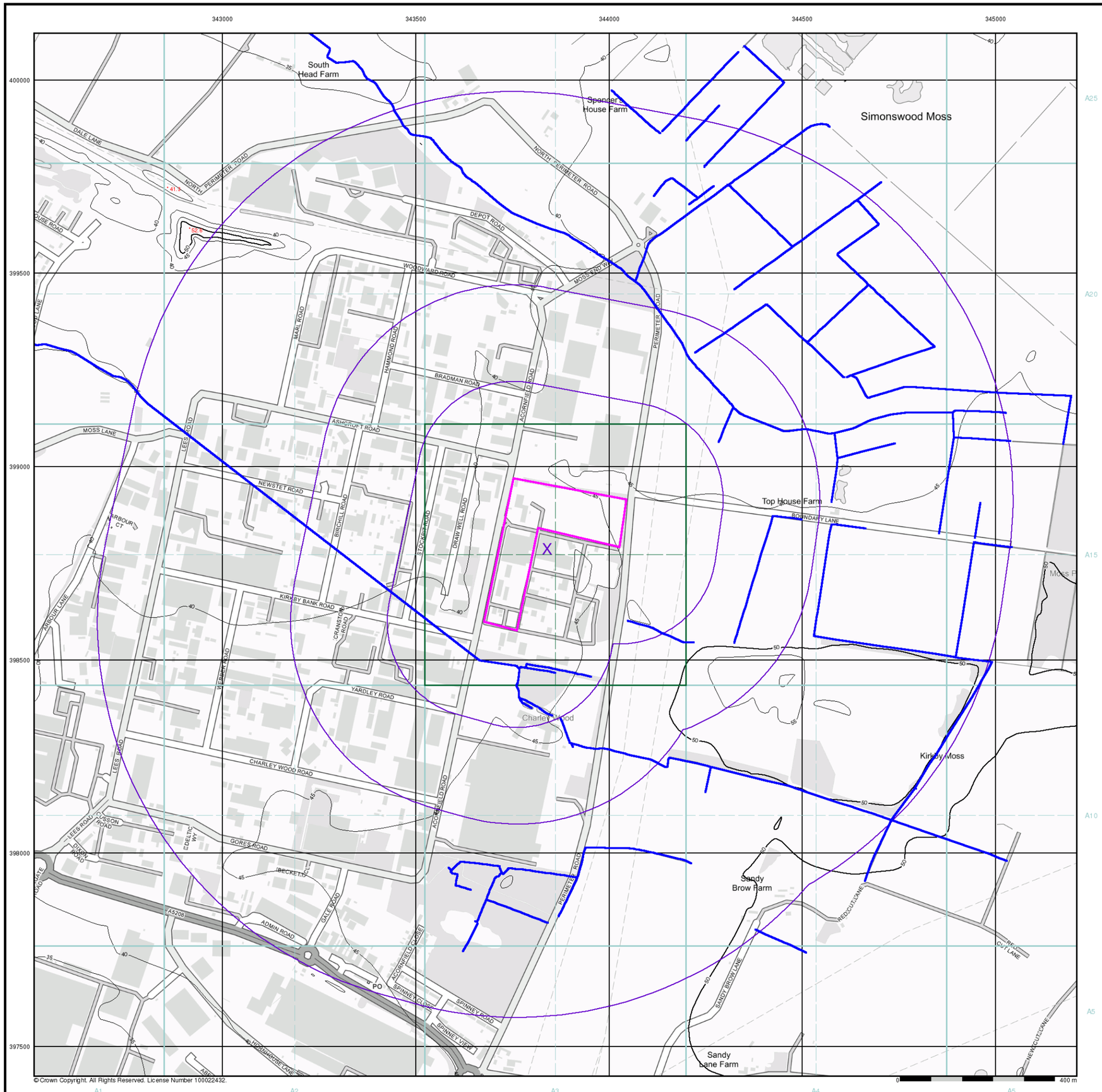

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General

- Specified Site
- Specified Buffer(s)
- Bearing Reference Point

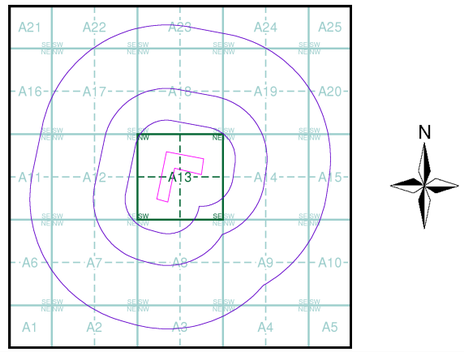
OS Water Network Data

- Canal
- Reservoir
- Foreshore
- Marsh
- Tidal River
- Inland River
- Drain
- Other
- Lake
- Transfer
- Lock Or Flight Of Locks
- Sea

Contours (height in meters)

- Standard Contour
- Master Contour
- Spot Height 167.3
- MLW Mean Low Water
- MHW Mean High Water

OS Water Network Map - Slice A



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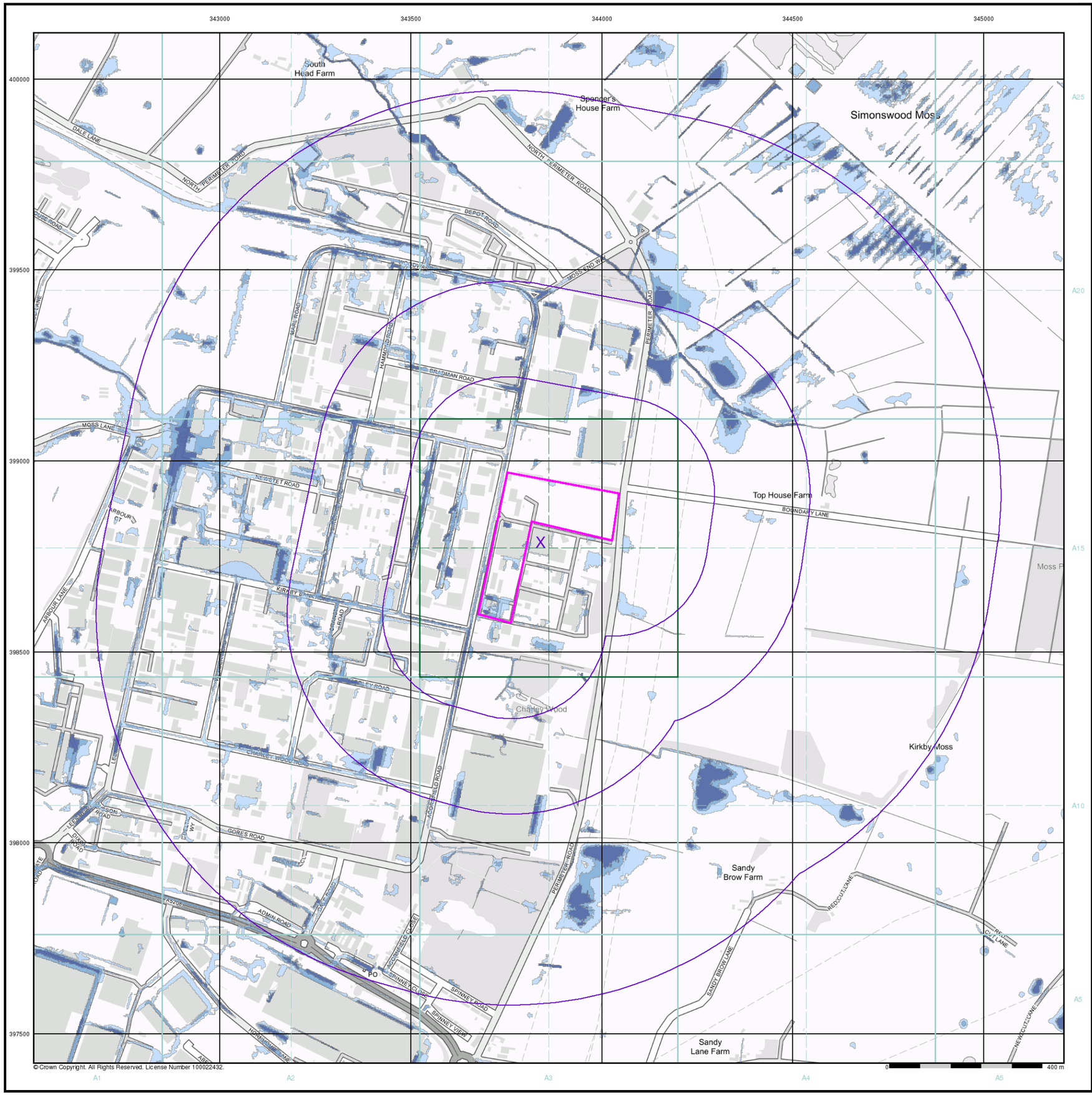

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deltasimons

General

- Specified Site
- Specified Buffer(s)
- X Bearing Reference Point

Risk of Flooding from Surface Water

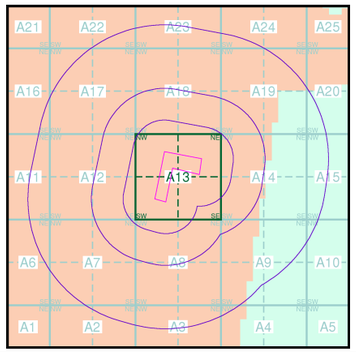
- High - 30 Year Return
- Medium - 100 Year Return
- Low - 1000 Year Return

Suitability

See the suitability map below

- National to county
- County to town
- Town to street
- Street to parcels of land
- Property

EA/NRW Suitability Map - Slice A



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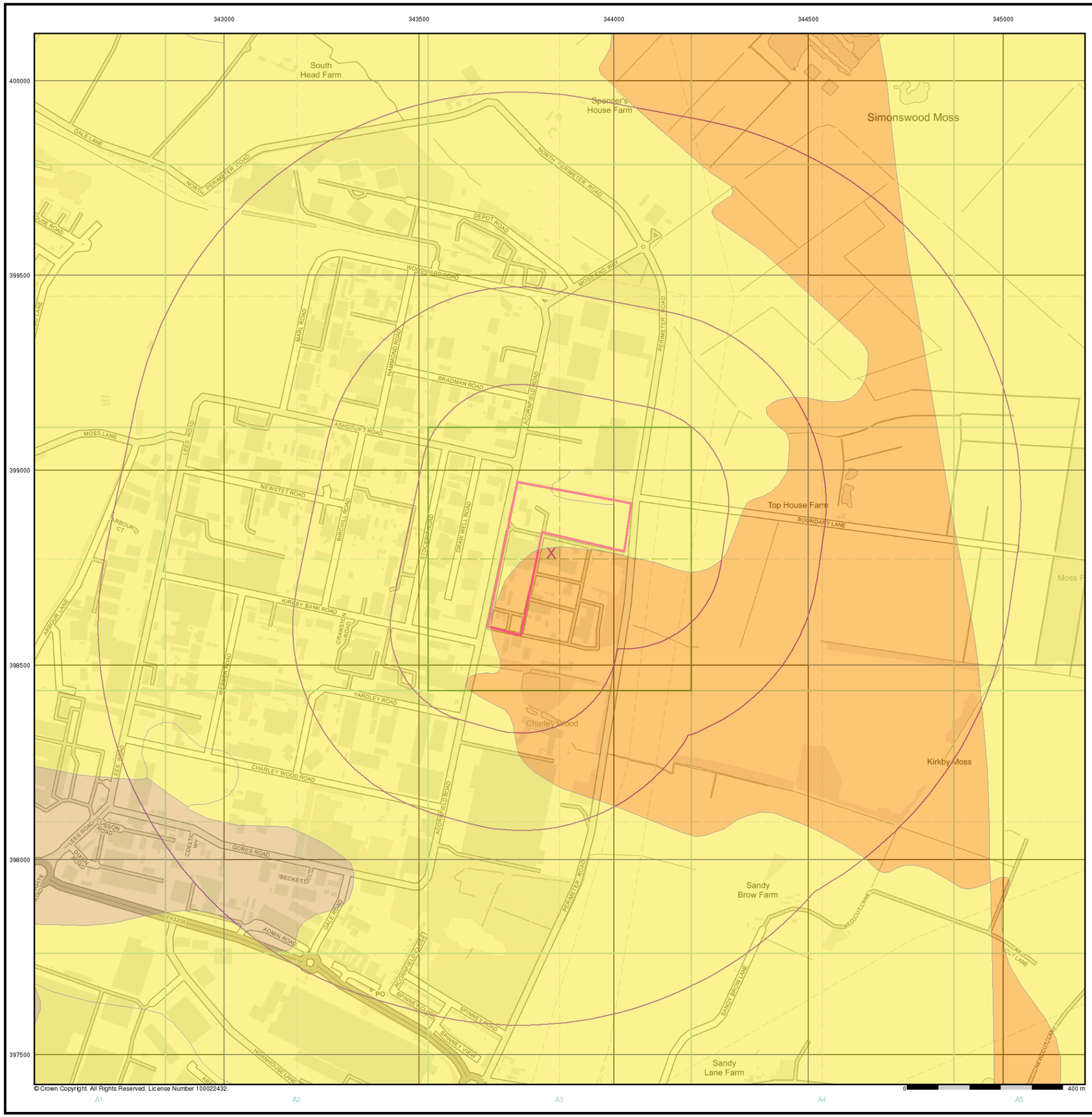

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General

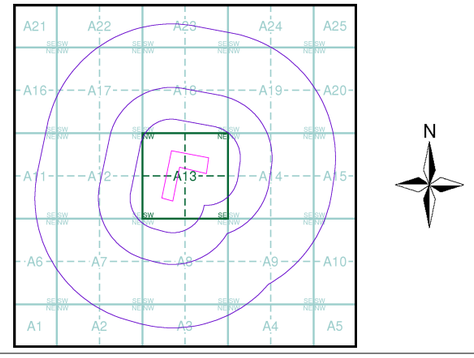
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Arsenic

Arsenic Concentrations mg/kg

- < 15
- 15 - 25
- 25 - 35
- 35 - 45
- 45 - 60
- 60 - 120
- > 120

Estimated Soil Chemistry Arsenic - Slice A



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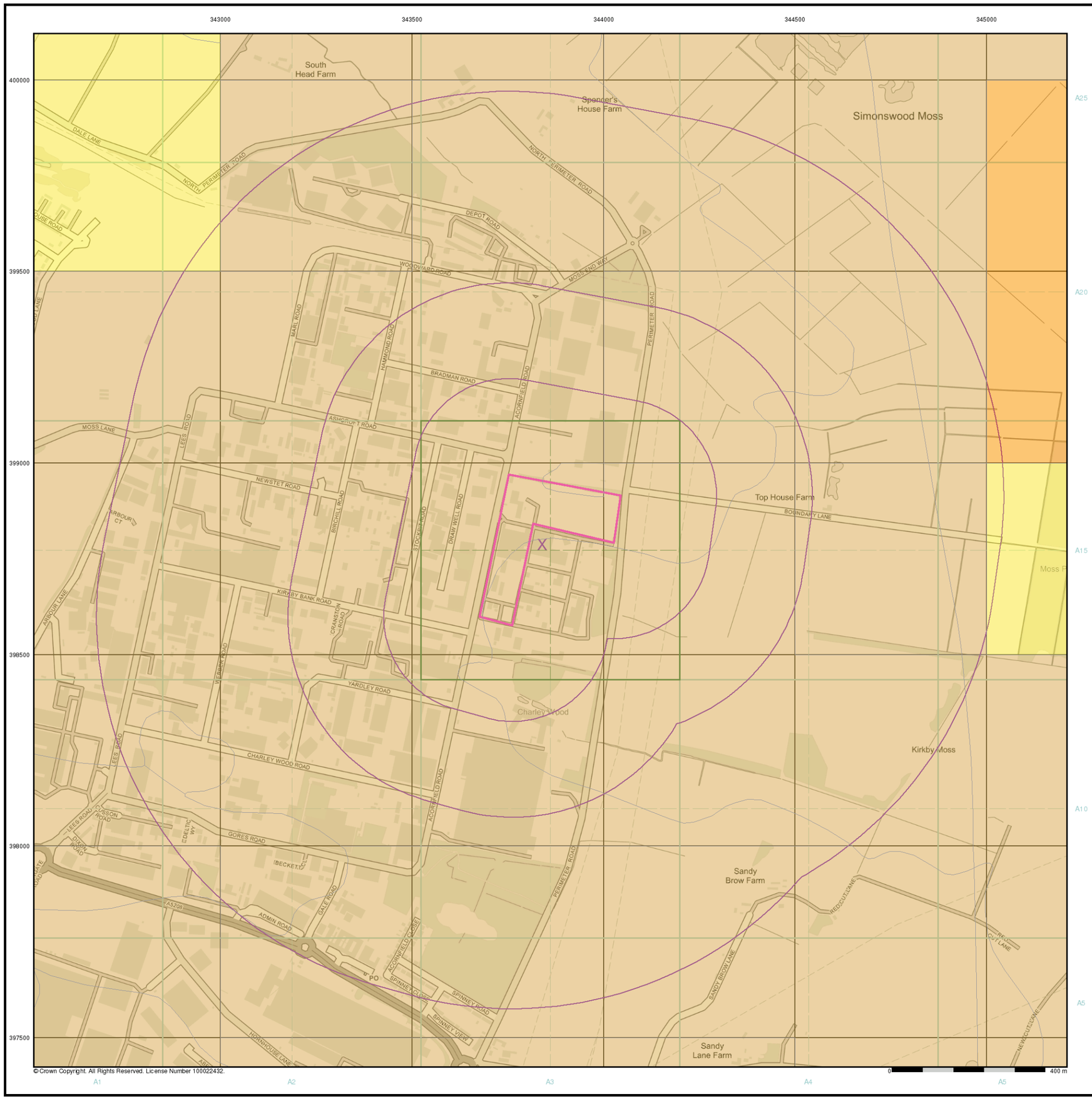

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General

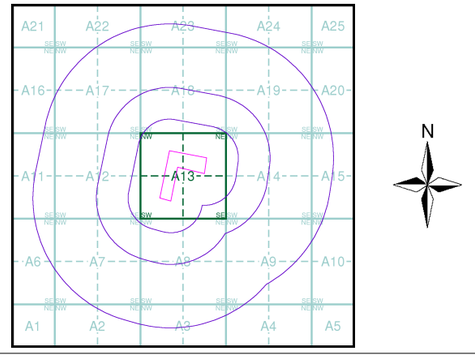
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Cadmium

Cadmium Concentrations mg/kg

	< 1.8
	1.8 - 2.2
	2.2 - 3.0
	> 3.0

Estimated Soil Chemistry Cadmium - Slice A



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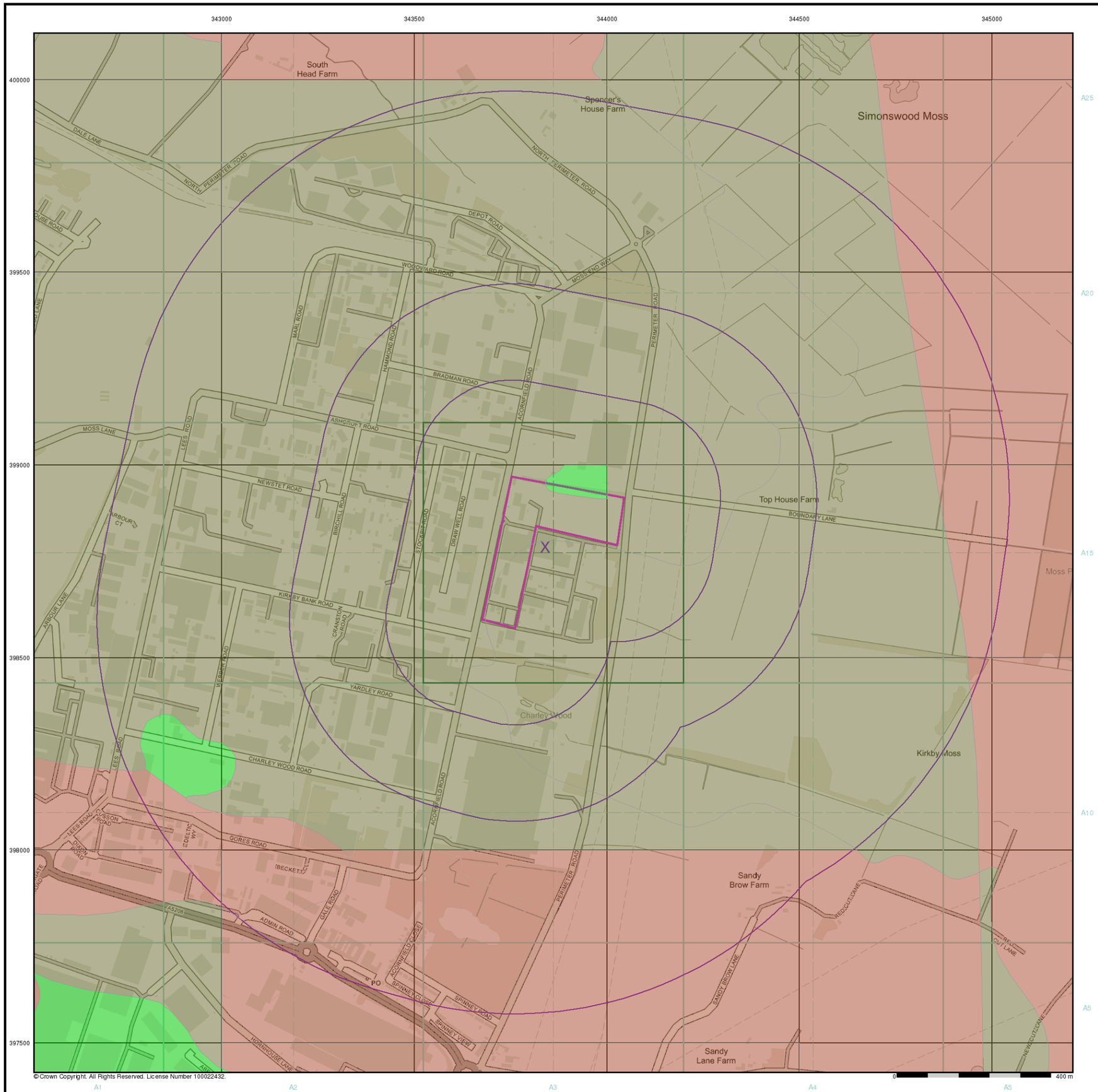

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General

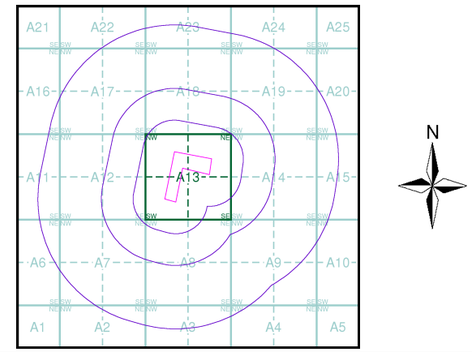
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Chromium

Chromium Concentrations mg/kg

- < 20
- 20 - 40
- 40 - 60
- 60 - 90
- 90 - 120
- 120 - 180
- > 180

Estimated Soil Chemistry Chromium - Slice A



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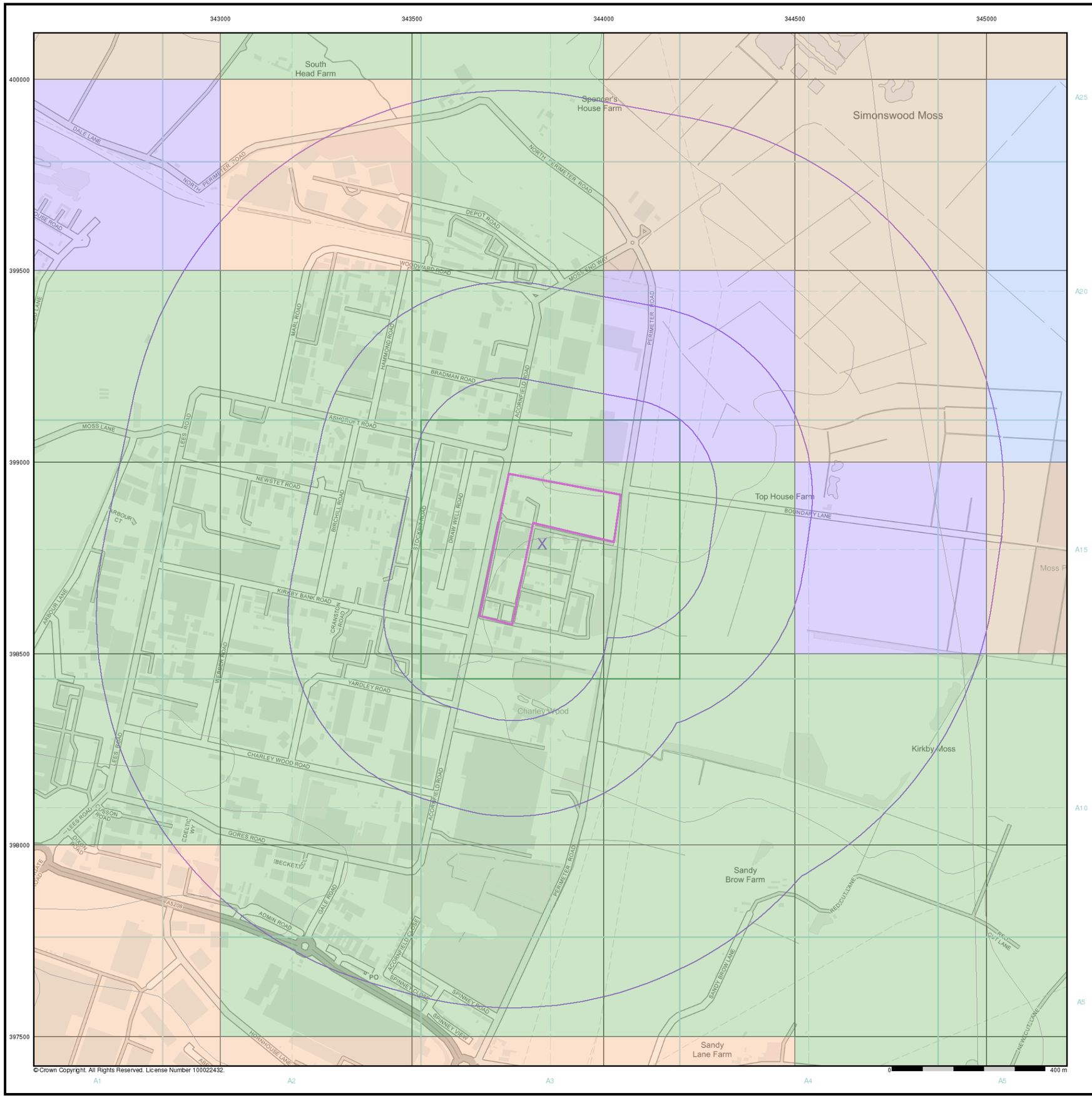

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General

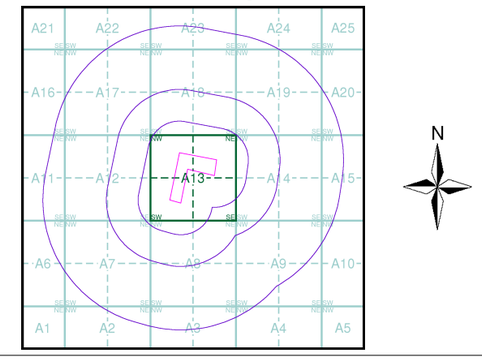
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Lead

Lead Concentrations mg/kg

- <100 mg/kg
- 100 - 200
- 200 - 300
- 300 - 600
- 600 - 1200
- >1200

Estimated Soil Chemistry Lead - Slice A



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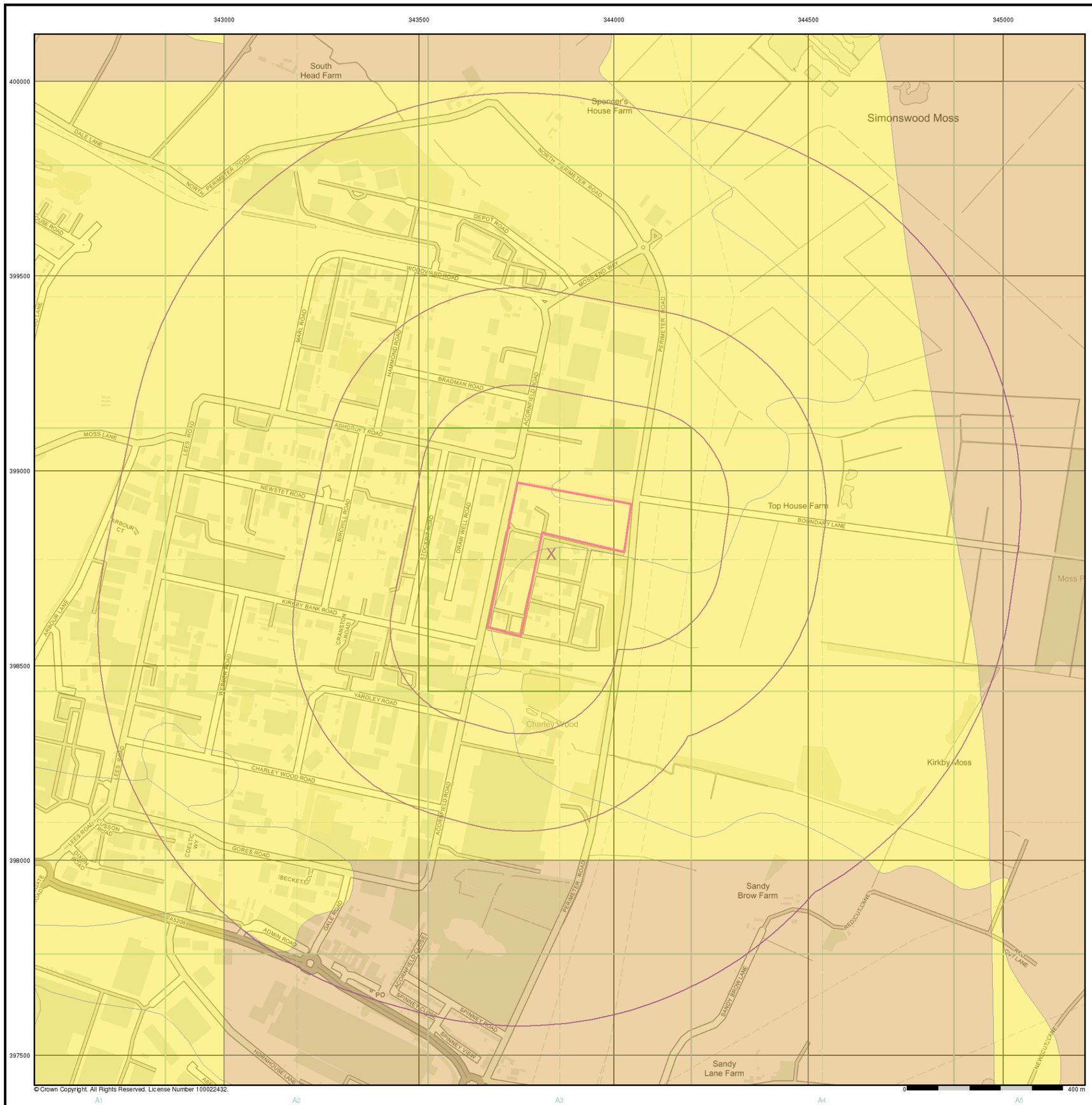

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General

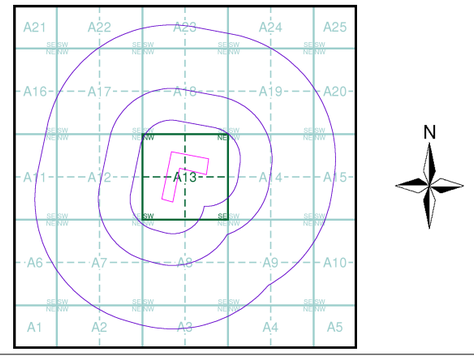
Specified Site | Specified Buffer(s) | X Bearing Reference Point

Estimated Soil Chemistry Nickel

Nickel Concentrations mg/kg

- < 15
- 15 - 30
- 30 - 45
- 45 - 60
- 60 - 80
- 80 - 100
- > 100

Estimated Soil Chemistry Nickel - Slice A



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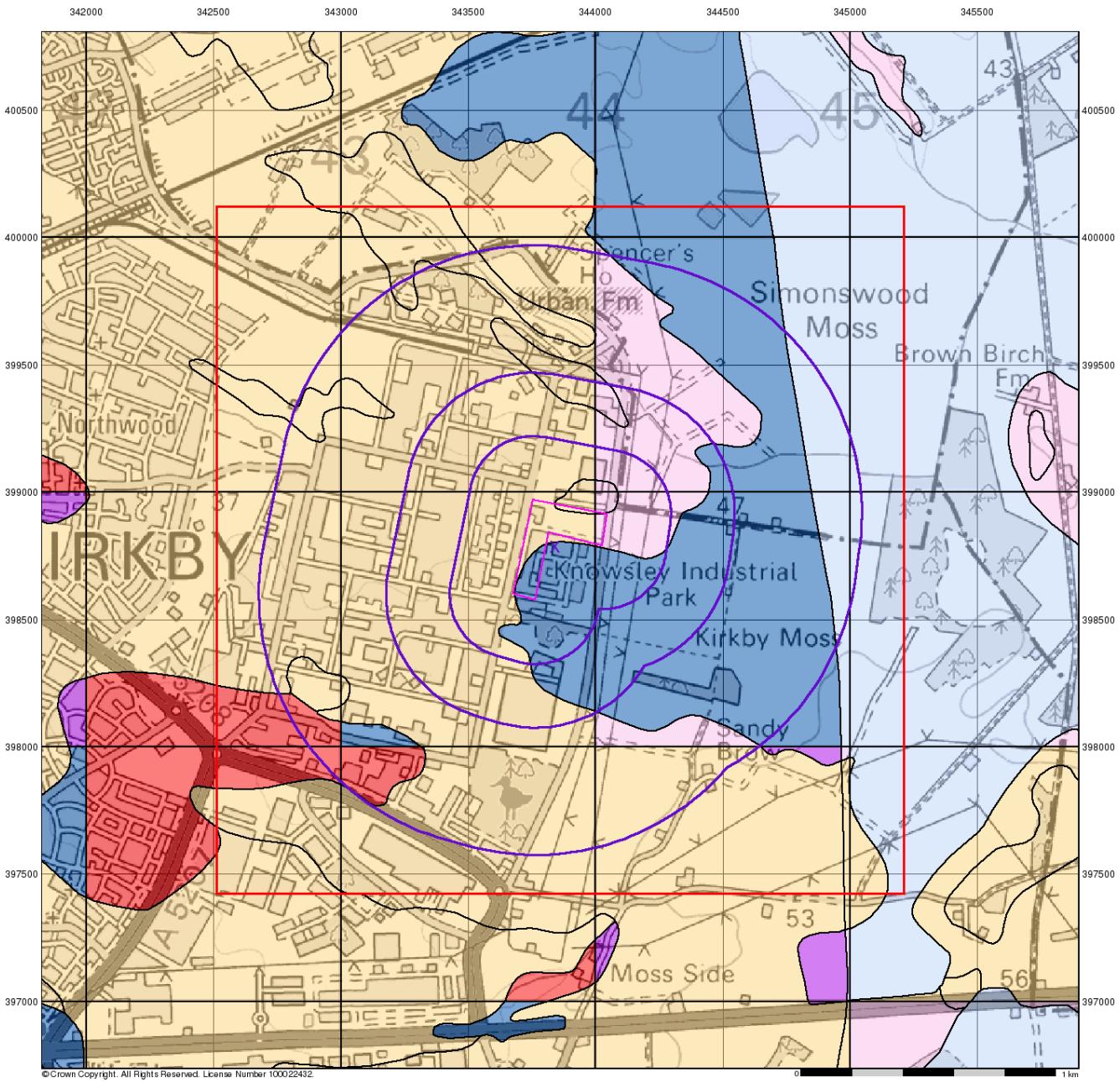

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Groundwater Vulnerability

General

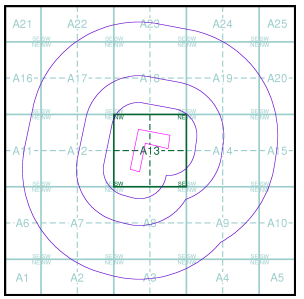
Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Agency and Hydrological

Bedrock Aquifers	Superficial Aquifers
High Vulnerability, Principal Aquifer	High Vulnerability, Principal Aquifer
High Vulnerability, Secondary Aquifer	High Vulnerability, Secondary Aquifer
Medium Vulnerability, Principal Aquifer	Medium Vulnerability, Principal Aquifer
Medium Vulnerability, Secondary Aquifer	Medium Vulnerability, Secondary Aquifer
Low Vulnerability, Principal Aquifer	Low Vulnerability, Principal Aquifer
Low Vulnerability, Secondary Aquifer	Low Vulnerability, Secondary Aquifer

Unproductive Aquifer
Soluble Rock

Site Sensitivity Context Map - Slice A



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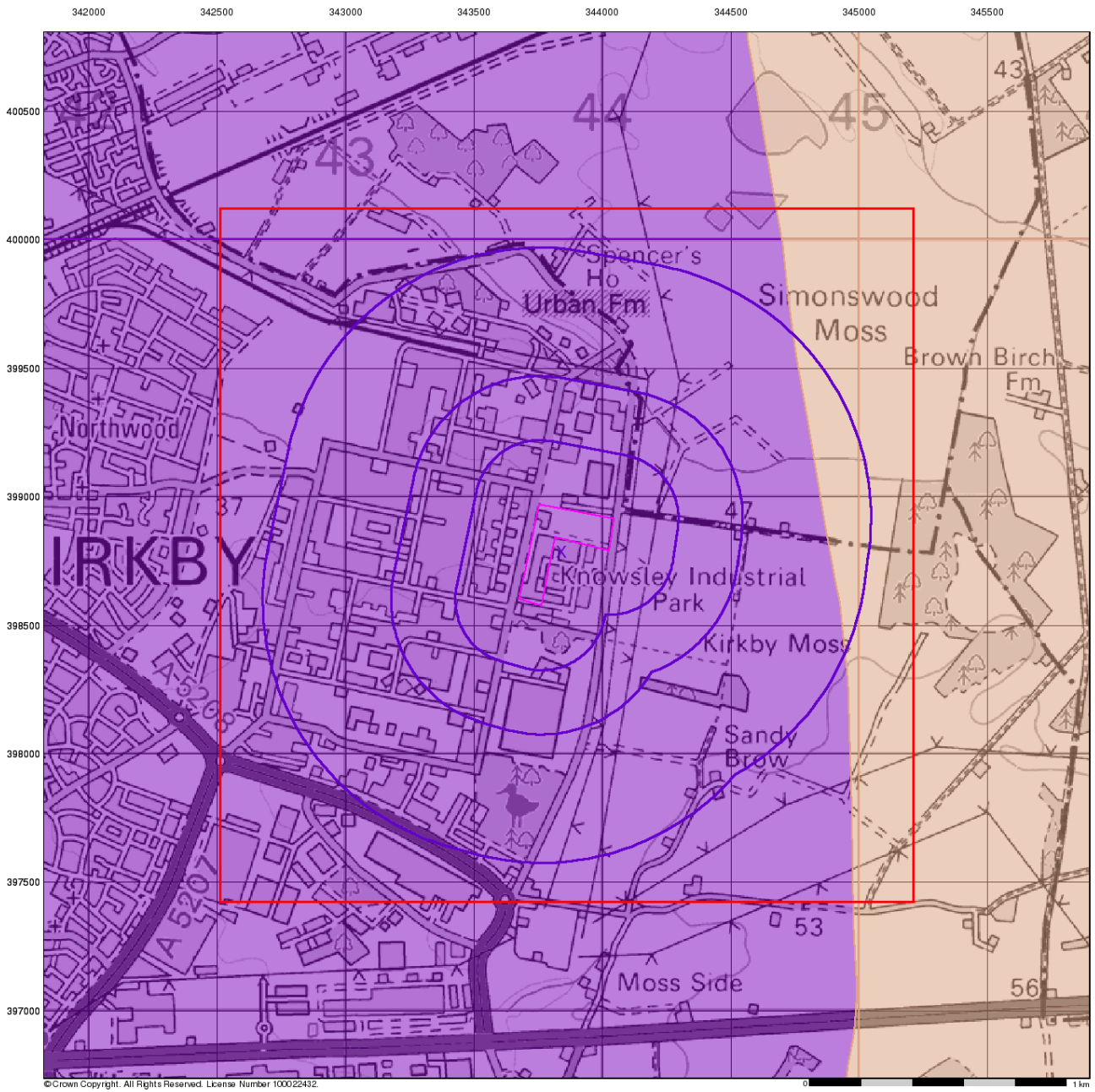

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Bedrock Aquifer Designation

General

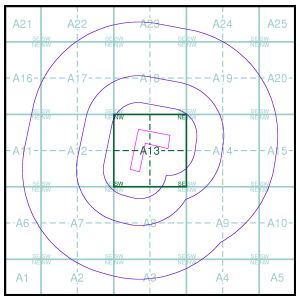
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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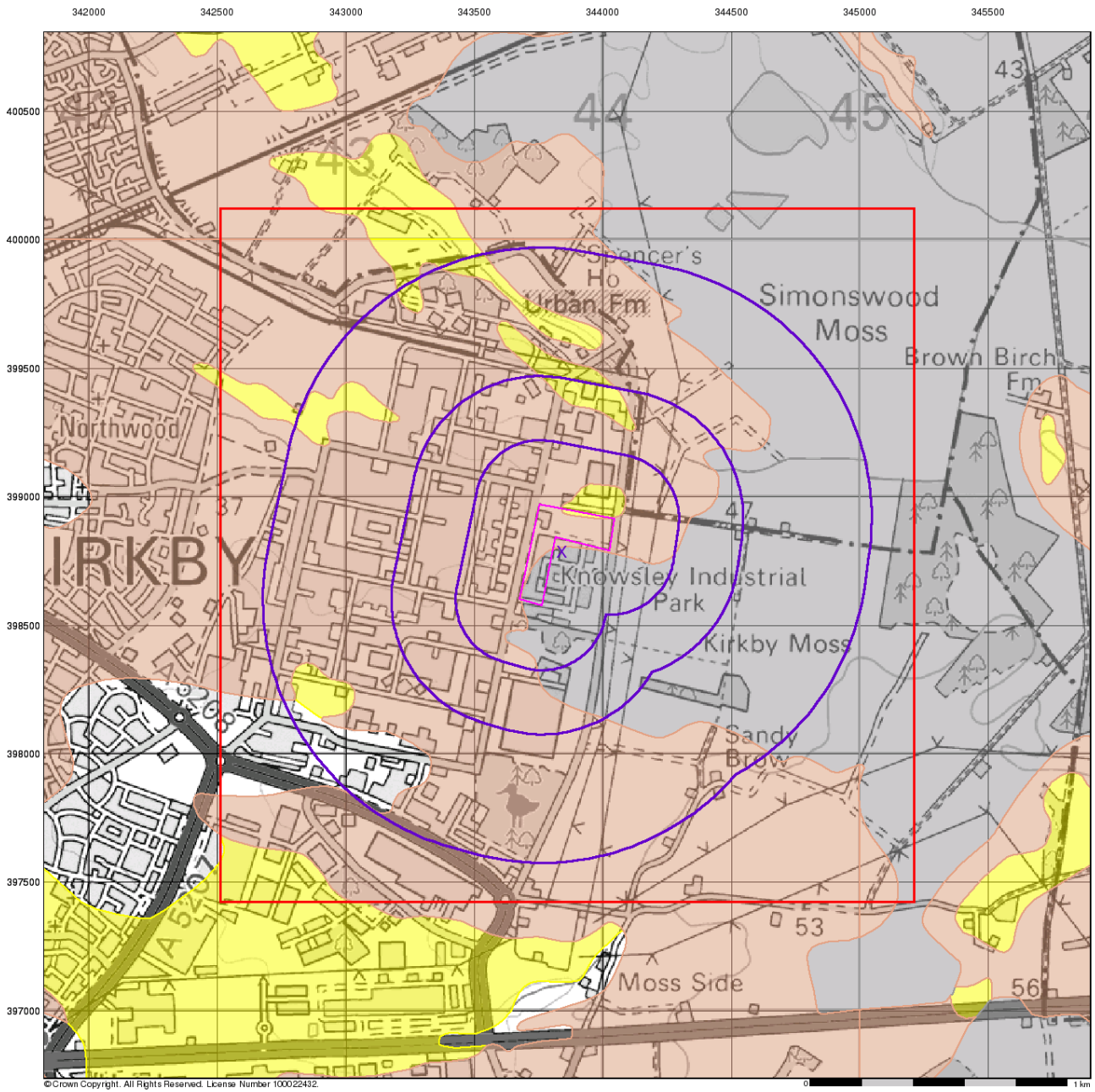

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Superficial Aquifer Designation

General

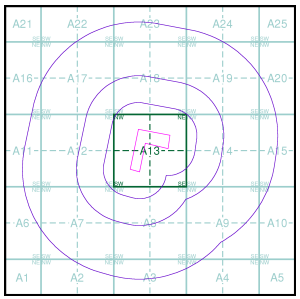
Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

Geological Classes

- Principal Aquifer
- Secondary A Aquifer
- Secondary B Aquifer
- Secondary Undifferentiated
- Unproductive Strata
- Unknown
- Unknown (Lakes and Landslip)

Site Sensitivity Context Map - Slice A



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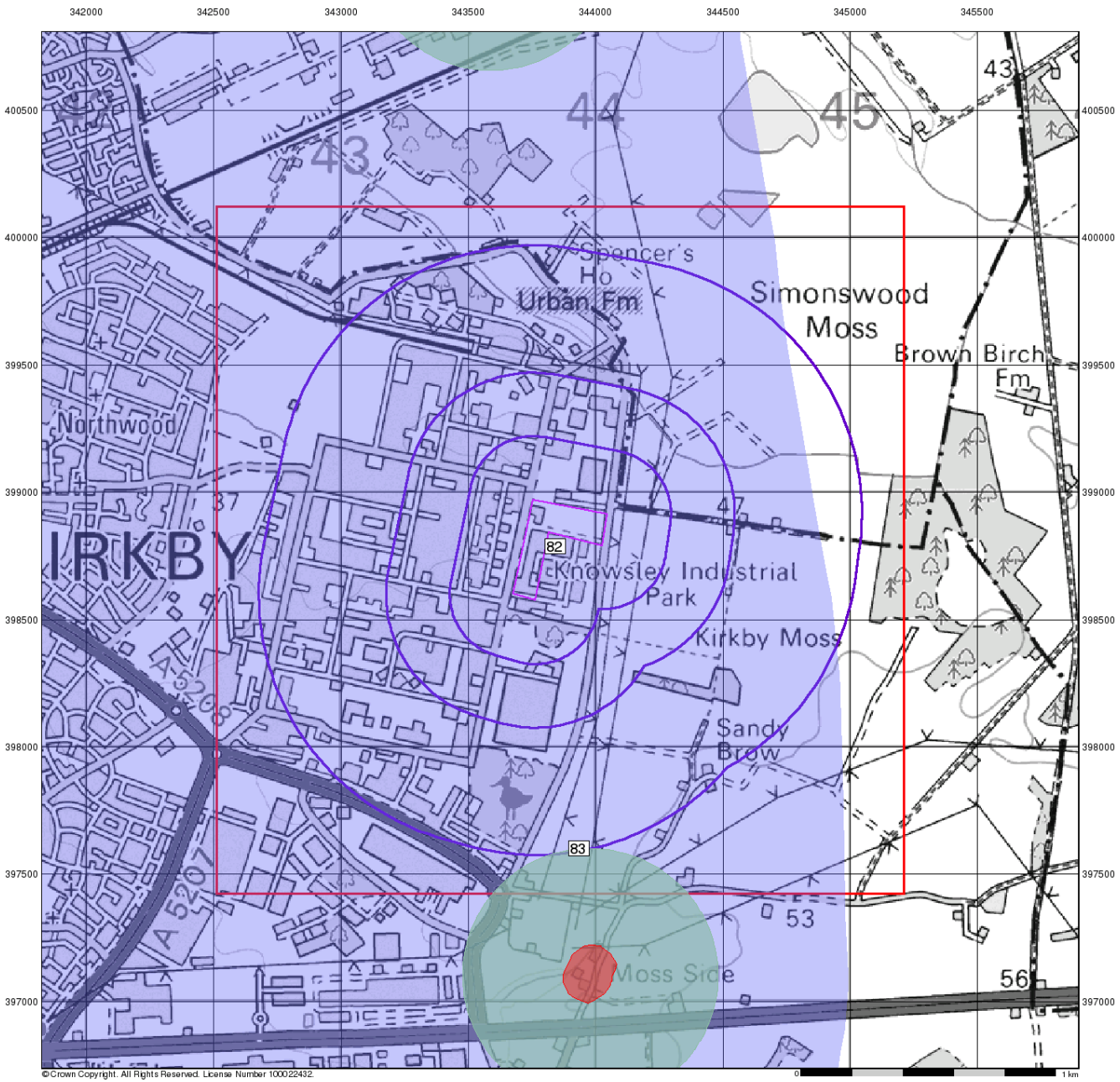

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Source Protection Zones

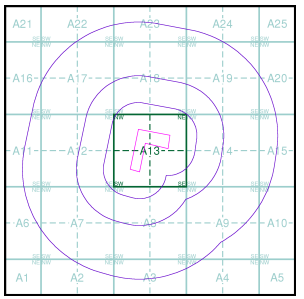
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice | Map ID

Agency and Hydrological

- Inner zone (Zone 1)
- Inner zone - subsurface activity only (Zone 1c)
- Outer zone (Zone 2)
- Outer zone - subsurface activity only (Zone 2c)
- Total catchment (Zone 3)
- Total catchment - subsurface activity only (Zone 3c)
- Special interest (Zone 4)

Site Sensitivity Context Map - Slice A



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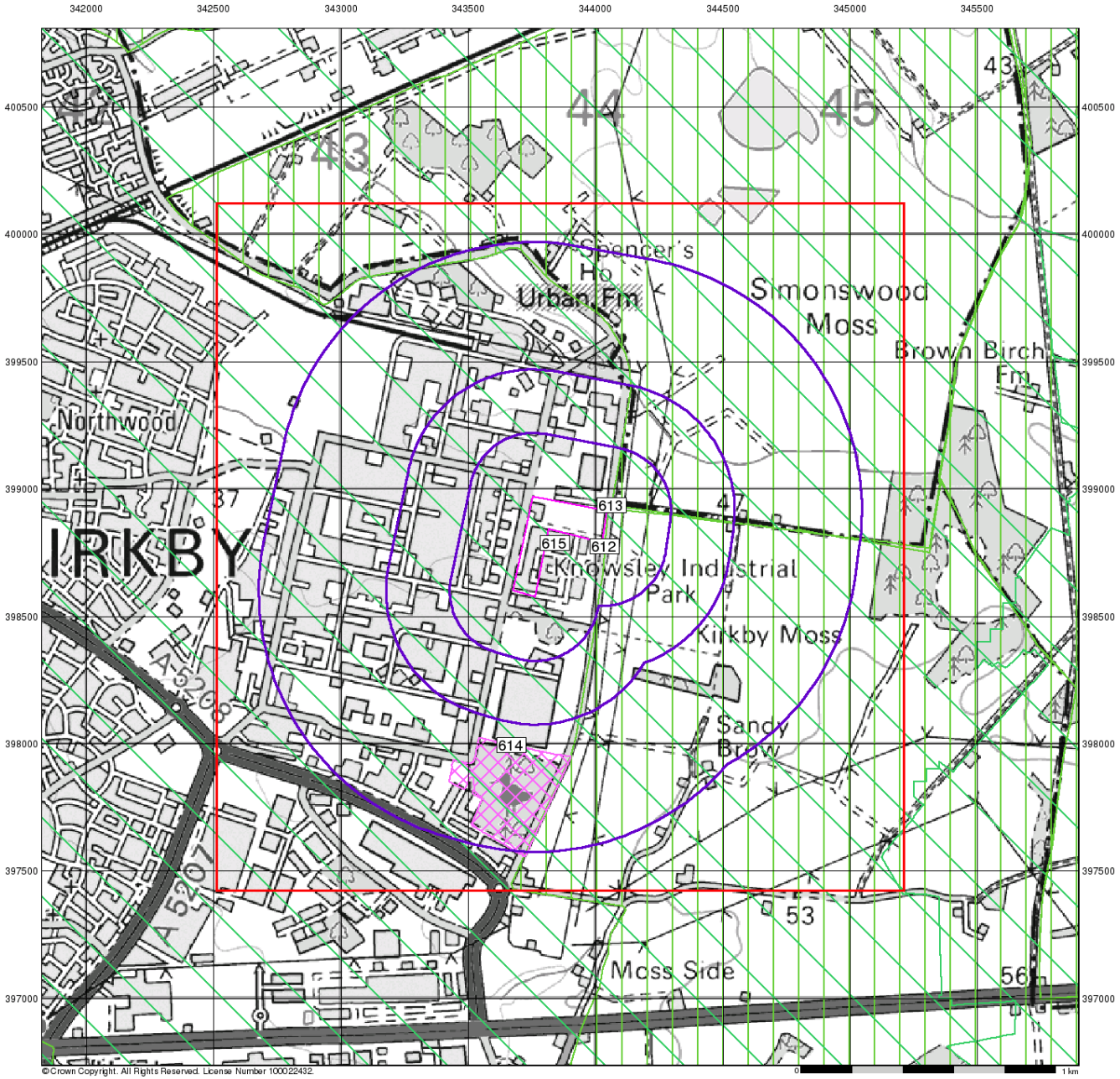

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Sensitive Land Uses

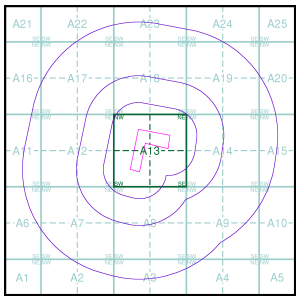
General

Specified Site | Specified Buffer(s) | Bearing Reference Point
Slice | Map ID

Sensitive Land Uses

- Ancient Woodland
- Area of Adopted Green Belt
- Area of Unadopted Green Belt
- Area of Outstanding Natural Beauty
- Environmentally Sensitive Area
- Forest Park
- Local Nature Reserve
- Marine Nature Reserve
- National Nature Reserve
- National Park
- Nitrate Sensitive Area
- Nitrate Vulnerable Zone
- Ramsar Site
- Site of Special Scientific Interest
- Special Area of Conservation
- Special Protection Area
- World Heritage Sites

Site Sensitivity Context Map - Slice A



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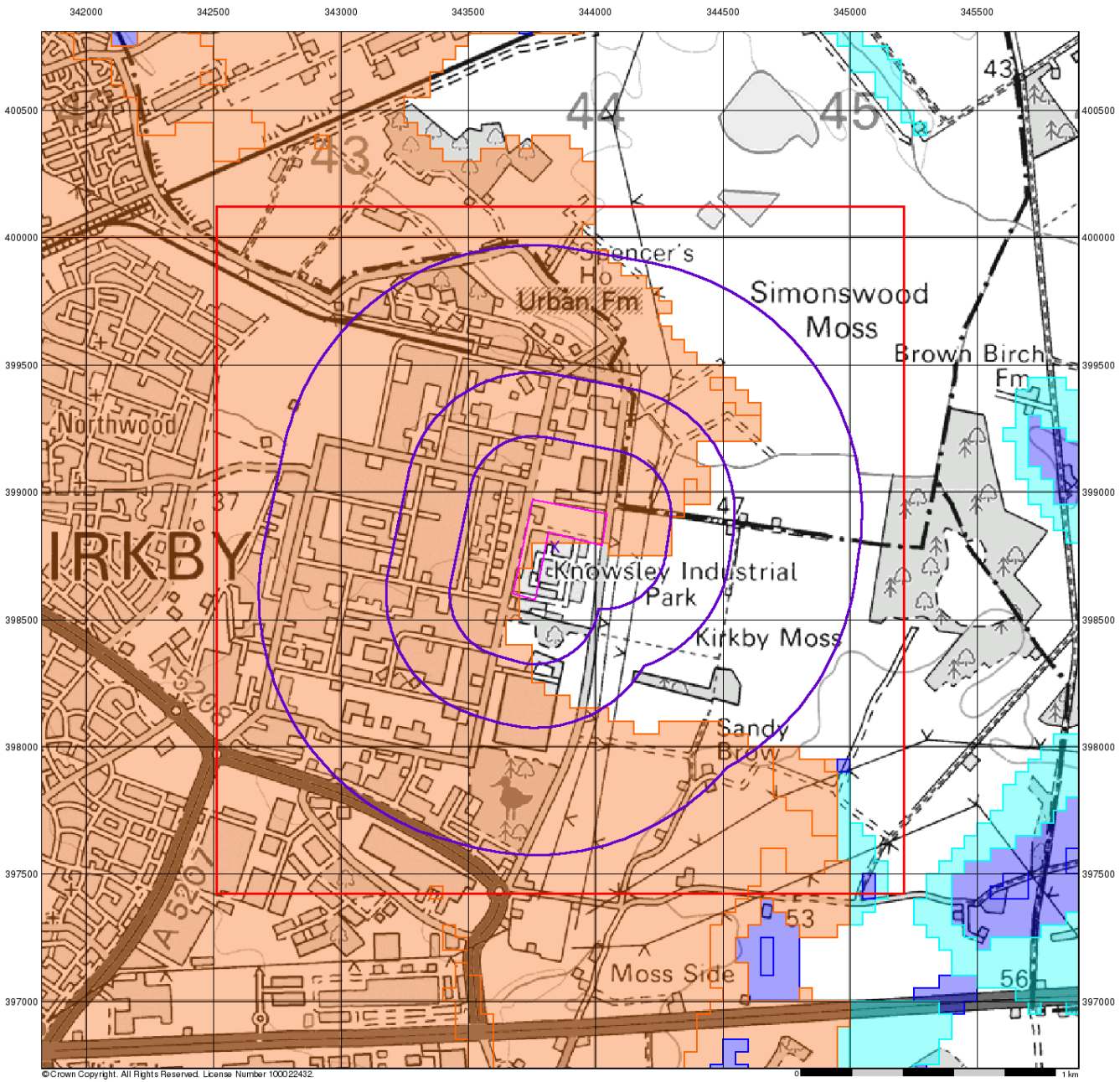
Site Details

Image Business Park, Acornfield Road, Knowsley Industrial Park, KIRKBY, L33 7UF



deltasimons

BGS Flood GFS Data

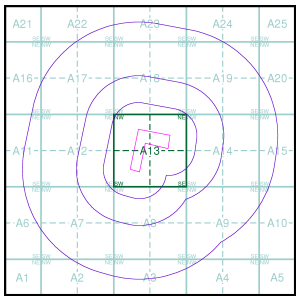
General

Specified Site | Specified Buffer(s) | Bearing Reference Point | Slice

Agency and Hydrological (Flood)

- Limited Potential for Groundwater Flooding to Occur
- Potential for Groundwater Flooding of Property Situated Below Ground Level
- Potential for Groundwater Flooding to Occur at Surface

Site Sensitivity Context Map - Slice A



Order Details

Order Number:	207456127_1_1
Customer Ref:	19-0654.01
National Grid Reference:	343840, 398790
Slice:	A
Site Area (Ha):	5.94
Search Buffer (m):	1000

Site Details

Image Business Park, Acornfield Road, Knowsley Industrial Park, KIRKBY, L33 7UF

Appendix E – Planning Information

Planning Applications

Planning applications lodged at the Site include the following:

- Demolition of Vacant Industrial Buildings - Plot C, Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 18/00698/DEMCON – November 2018;
- Demolition of three storey office building - Eastman Company UK Ltd Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7BJ, Ref. No: 18/00434/DEMCON – July 2018;
- External alterations to buildings to include installation of roller shutter door to front of building K62 and re-roofing with roof lights to building K47 together with removal and bricking up of windows at ground floor level to front and rear elevations - Ames Goldsmith UK Ltd Image Business Park (Buildings K47 & K62) Acornfield Road Knowsley Industrial Park Kirkby L33 7UF, Ref. No: 16/00459/FUL - July 2016;
- Upgrading of existing waste treatment facility including new covered storage areas, additional bulk liquid storage tanks (2 No. tank farms), new hydrogenation plant together with distillation plant (including thermal oxidiser unit) and re-location and re-use of a redundant 30 m high stack - Future Industrial Services Limited Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF , Ref. No: 15/00509/FU – October 2015;
- Demolition of 3 No. buildings, erection of new industrial building and new plant to be installed in association with the existing waste treatment use together with amendments to road layout and installation of weighbridges - Future Industrial Services Limited Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7SP, Ref. No: 14/00481/FUL – October 2014;
- Erection of 1200m^2 warehouse and storage silo for storage and recycling of hazardous and non-hazardous commercial and industrial waste together with erection of single storey facilities laboratory building and associated car parking - Land At Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 11/00221/FUL – October 2011;
- Display of 1 No. free-standing illuminated sign to entrance to business park - Image Business Park Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 08/00183/ADV – April 2008;
- Erection of drum storage compound and press building, installation of portacabin, mixing tank, 2 No. silos and 2 No. reactors, together with construction of car parking area - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 08/00111/FUL – April 2008;
- Display of 1 No. internally illuminated free standing sign - Eastman Company Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 07/00525/ADV – May 2007;
- Installation of 13.3 m high steam boiler chimney stack - Ames Goldsmith Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 07/00420/FUL – May 2007;
- Erection of 2.4 m high perimeter fencing - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 07/00379/FUL – May 2007;
- Installation of steam boiler housed in its own container and aluminium chimney - Eastman Company UK LTD Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 07/00394/FU – May 2007;
- Erection of chimney stack to facilitate installation of boiler to building 32 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 06/01067/FUL – January 2007;
- Erection of new building to house new fire pump equipment - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 03/01173/FUL – November 2003;
- Installation of 60 No. hydrogen cylinders - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 03/00018/FUL – February 2003;

- Installation of externally sited chiller plant - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 02/00559/FUL – July 2002;
- Erection of extension to K82 building to house additional plant - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 02/00496/FUL – June 2002;
- Erection of extension to K94 building - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 02/00361/FUL – May 2002;
- Installation of 8 m high column to support CCTV camera - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 02/00003/FUL – January 2002;
- Erection of extension to existing nitrogen plant building to house additional chilling plant - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 01/00215/FUL – April 2001;
- Installation of 2 No. waste effluent interceptor tanks - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 00/00825/FUL – December 2000;
- Modification of existing vent scrubbing system to roof of building 82 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 00/00663/FUL – October 2000;
- Claim for deemed consent for the storage of various hazardous substances - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 99/00703/HSC – October 1999;
- Erection of 10 m high steel CCTV column - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 97/00209/APP – April 1997;
- Kodak Ltd Acornfield Road Industrial Estate – Erection of detached double garage and relocation of portable - Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 96/00614/APP – December 1996;
- Kodak Ltd Acornfield Road Industrial Estate – Erection of building to house compressed air dehumidifier - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 96/00608/APP – December 1996;
- Building Kodak Ltd 46 Acornfield Road, Knowsley – Erection of extension to existing boiler house and construction - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 96/00459/AP – August 1996;
- Building 15 – installation of gas scrubbing unit and discharge stack - Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 96/00458/APP – August 1996;
- Kirkby Industrial Kodak Ltd – Erection of extension to existing treatment plant for waste - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 95/00669/APP – November 1995;
- Kirkby Industrial Kodak Ltd – Erection of steel framed portable type building for use as, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 94/00679/APP – October 1994;
- Kirkby Industrial Kodak Ltd – The replacement of an existing steel portable building - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 94/00677/AP – October 1994;
- Installation of portacabin for use as temporary contractors reception - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 93/00167/APP – August 1993;
- Erection of new process building alterations to existing warehouse to accommodate facilities associated with the process works extension and adaption of existing workshop to house service plant and erection of external process plant and support -Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/14937/HIST – January 1974;

- Erection of single storey extension to existing building, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/12792/HIST – January 1974;
- Erection of electricity substation, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/14980/HIST – January 1974;
- Erection of silos 30 m high for bulk supplies of plastics material, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/08773/HIST – January 1974;
- Acornfield Road, Kirby – Widen existing vehicular access and entrance gate - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00314/HIST – January 1974;
- Erection of 350 m2 processing laboratory, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/14337/HIST – January 1974;
- Acornfield Road Kirkby – Covered area to protect raw materials - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00972/HIST – January 1974;
- Acornfield Road, Kirkby Industrial Estate : Pump House, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/06864/HIST – January 1974;
- Acornfield Road Kirkby - Advert - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00502/HIST January 1974;
- Acornfield Rd Kirkby – Development of site for chemical manufacturing processing and storage - Acornfield Road Knowsley Industrial Park Kirkby Knowsley, Ref. No: 74/00641/HIST – January 1974;
- Acornfield Rd Kirkby Ind Estate: Extension to locker and messing facilities Bldg 43 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/04092/HIST – January 1974;
- Acornfield Rd Kirkby - Extension to compressor house - Acornfield Road Kirkby L33 7UF, Ref. No: 74/03433/HIST – January 1974;
- Erection of extension to existing building for loading and storage facility for plastic granules, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/13197/HIST – January 1974;
- Renewal of temporary permission for portacabin to provide temporary office accommodation - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/05968/HIST – January 1974;
- Erection of a housing for compressor, Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00734/HIST – January 1974;
- Acornfield Rd Kirkby- Maintenance access stairway bldg. No. 38 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/06675/HIS – January 1974;
- Acornfield Road Kirkby – Water storage and pumping facilities for factory sprinkler installations - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00268/HIST – January 1974;
- Kodak Ltd Acornfield Drive Kirkby – Erection of new security gatehouse and wood boundary fence panel - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/09221/HIST – January 1974;
- New facilities for the manufacture of synthetic chemicals - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/03012/HIS – January 1974;
- Emergency access to site from public highway - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/06792/HIST – January 1974;
- Erection and installation of trade effluent handling plant - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/12697/HIST – January 1974;

- Acornfield Rd Kirkby – New Door and Fire Escape from 2dn floor of Bldg 48 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/01100/HIST – January 1974;
- Erection and installation of trade effluent handling plant to comply with revised water authority consent limits - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/05260/HIST – January 1974;
- Proposed construction and installation of photo processing treatment plant - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/13878/HIS – January 1974;
- Acornfield Kirkby – Portacabin for messing changing and toilet fac - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/02776/HIST – January 1974;
- Renewal of temporary Permission K/APP/2631 - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/05967/HIST – January 1974;
- Acornfield Rd Kirkby Ind Est - Trunker Loading Dock - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/07686/HIS – January 1974;
- Acornfield Rd Kirkby - Extension to receiving office and new locker room - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00247/HIST – January 1974;
- Acornfield Rd Kirkby, Temporary proprietary prefabricated bldg. for kitchen dry good store - Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/03847/HIST – January 1974; and
- Acornfield Rd Kirkby, - Proposed valve housings integral part of storage etc. Kodak Ltd Acornfield Road Knowsley Industrial Park Kirkby Knowsley L33 7UF, Ref. No: 74/00510/HIST – January 1974.

Appendix F – Previous Reports

CONESTOGA-ROVERS
& ASSOCIATES (UK) LTD

FINAL REPORT

PHASE II ENVIRONMENTAL ASSESSMENT
PLAYING FIELD AREA

KODAK LIMITED
(MANUFACTURING DIVISION)
ACORNFIELD ROAD
KIRKBY, LIVERPOOL
UK

Prepared for NPEC Incorporated

Prepared by:
Conestoga-Rovers
& Associates (UK) Ltd

6 Clarendon Street
Nottingham, UK
NG1 5HQ

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JANUARY 2005
REF. NO. 033154.02
This report is printed on recycled paper.

August 23, 2005

Eastman Kodak Company
343 State Street
Rochester, NY
14650-0217

Attention: Ms. Jo Ann Gould

Report
Phase II Environmental Site Assessment
Playing Field Area
Kodak Limited
Manufacturing Division
Acornfield Road,
Kirkby,
Liverpool
UK

Dear Ms. Gould

Conestoga-Rovers & Associates (Europe) Ltd is pleased to present this Phase II Environmental Site Assessment (ESA) report for the above-referenced property. The purpose of this ESA was to investigate whether current or historical activities which may have been carried out on a playing field area at the subject property have impacted the underlying soil or groundwater.

We have enjoyed working with you on this project and appreciate the opportunity to be of service. Should you have any questions, please do not hesitate to contact us at 44 (0) 115-985 9050.

Very truly yours,

Ian Lightfoot

cc: Joseph G. Gabriel, NPEC, Inc.
Julia Ispentchian, NPEC, Inc.

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1

2 INTRODUCTION 3

2.1 GENERAL 3
2.2 SITE SETTING INFORMATION 3
2.2.1 SITE LOCATION AND SETTING 3
2.2.2 ADJACENT LAND USE 3
2.2.3 GEOLOGY 4
2.2.4 HYDROGEOLOGY 4
2.3 PREVIOUS INVESTIGATIONS 5
2.4 CURRENT INVESTIGATION 5
2.5 SOIL VAPOUR TESTING: MEMBRANE INTERFACE PROBE (MIP) 6
2.6 SOIL BOREHOLES: DYNAMIC SAMPLING 7
2.7 SOIL SAMPLING PROGRAMME 7
2.8 GROUNDWATER SAMPLING PROGRAMME 8

3 GROUND CONDITIONS 9

4 ANALYTICAL AND MIP TESTING RESULTS 10

4.1 MIP TESTING 10
4.2 ASSESSMENT CRITERIA 10
4.2.1 CLEA 11
4.2.2 DUTCH GUIDELINES 11
4.2.3 UK DRINKING WATER QUALITY STANDARDS (DWQS) 12
4.3 SOIL ANALYSES 12
4.3.1 HEAVY METALS 12
4.3.2 GASOLINE RANGE ORGANICS (GRO) AND DIESEL RANGE ORGANICS (DRO) 13
4.3.3 VOLATILE ORGANIC COMPOUNDS (VOCS) 14
4.3.4 SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCS) 14
4.3.5 CYANIDE AND PH 14
4.4 GROUNDWATER ANALYSES 14
4.4.1 HEAVY METALS 15
4.4.2 GASOLINE RANGE ORGANICS (GRO) AND DIESEL RANGE ORGANICS (DRO) 15
4.4.3 VOLATILE ORGANIC COMPOUNDS (VOCS) 15
4.4.4 SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCS) 15
4.4.5 CYANIDE AND PH 16

5 SUMMARY 17

5.1 GROUND CONDITIONS 17
5.2 ANALYTICAL RESULTS 17

6 REFERENCES 19

7 LIMITATIONS TO ENVIRONMENTAL ASSESSMENTS 20

Figures
(Following Report)

Figure 1 Site Location Map
Figure 2 MIP Soil Probe Location Plan
Figure 3 Borehole Location Plan

Tables
(Following Report)

Tables 1a and 1b Metals Results Summary
Tables 2a and 2b GRO and DRO Results Summary
Tables 3a and 3b VOCs Results Summary
Tables 4a and 4b SVOCs Results Summary
Tables 5a and 5b Cyanide and pH Results Summary

Appendices
(Following Report)

Appendix A Borehole Logs
Appendix B Membrane Interface Probe Report
Appendix C Soil and Groundwater Analytical Results

1 EXECUTIVE SUMMARY

Conestoga-Rovers & Associates (Europe) Limited (CRA) was retained by NPEC Incorporated (NPEC) to complete a baseline Phase II Environmental Site Assessment (ESA) of a portion of the playing field area of the Kodak chemical manufacturing facility located at Acornfield Road, Kirkby, Liverpool, UK (the "Site"). The Phase II ESA was carried out to assess whether historical activities that may have been carried out on the eastern section of the playing field have impacted the underlying soil or groundwater.

A truck-mounted Membrane Interface Probe (MIP) was used to detect the presence of any volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) compounds, or other petroleum-based hydrocarbons in the shallow soils beneath the Site. A total of 22 probe holes were positioned across the Site in an approximate herringbone grid formation. The MIP tool was advanced at each location to a maximum depth of 6 metres below ground level (m bgl) using a percussive Geoprobe drilling rig. As the heated probe was forced into the underlying soil, ground gas was collected from around the probe tip and returned to a three-stage gas analyser located at the ground surface. A real-time measurement of potential VOC, SVOC, and petroleum-based hydrocarbon concentrations with depth was recorded using a photo-ionisation detector (PID), flame-ionisation detector (FID), and a dry electrolytic conductivity detector (DELCD).

The results of the MIP screening were used to identify those areas of the Site most likely to have hydrocarbon contamination beneath the ground surface. A dynamic sampling drilling rig was then used for shallow soil boring and collection of soil samples for laboratory chemical analysis from the areas identified. Soil boreholes were drilled to a maximum depth of 3m bgl. Chemical analysis was carried out for a range of contaminants, including a suite of metals, VOCS, SVOCs, cyanide and pH.

The ground conditions encountered during the Phase II ESA were consistent with previous Phase II investigations carried out across a wider area of the Kodak Kirkby facility in 2003 and ground conditions reported in a previous Phase II report by Aspinwall in 1993. A thin layer of turf and sandy topsoil was encountered from ground level, underlain by made ground (fill) material, thin peaty clay layer and boulder clay deposits. The thickness of the made ground material was recorded at approximately 1m in the eastern part of the playing field area and 2m in the western part.

<u>Soil</u>

- No significant concentrations of metals were recorded in any of the soil samples submitted for analysis. All metal concentrations detected were below the respective CLEA SGVs or, where no CLEA SGV has been published in the UK, relevant Dutch Guideline values;
- No cyanide (total or free) was detected in any of the soil samples submitted for analysis;
- No significantly acidic or alkaline soil pH values were recorded;
- Trace concentrations of gasoline range organic compounds, including benzene, toluene ethylbenzene and xylene were recorded at one borehole location (WS2; 1.72-1.90m), to a

maximum of 80µg/kg toluene. This is consistent with olfactory evidence of contamination at this location and the results of the MIP testing, which recorded a vapour peak at approximately the same depth in the adjacent MIP test location. The recorded GRO concentrations in the remaining soil samples were generally less than the analytical detection limit of 10µg/kg. No other VOCs (including chlorinated hydrocarbons) were detected in the soil samples;

- A maximum DRO concentration of 14,357mg/kg was recorded in WS5 (1.10-1.30m), above the Dutch intervention value for mineral oil of 5,000mg/kg. A possible tar-like substance was observed at this borehole location and depth. All remaining soil samples recorded DRO concentrations less than 1,000mg/kg; and
- Trace concentrations of SVOCs, including PAHs and Dibenzofuran were recorded in twelve of the soil samples analysed, generally at concentrations less than 1,000µg/kg and below relevant Dutch guideline values, where specified. The SVOC Bis(2-ethylhexyl)phthalate was recorded in two of the soil samples. A maximum Bis(2-ethylhexyl)phthalate concentration of 1,131µg/kg was recorded, below the Dutch intervention value for total phthalates of 60,000µg/kg.

Groundwater

- No significant concentrations of metals were recorded in the deep groundwater at BH1A(D);
- No VOCs, SVOCs or cyanide was detected in the deep groundwater at BH1A(D);
- No GRO, BTEX or MTBE was detected in the deep groundwater at BH1A(D); and
- An elevated DRO concentration of 1,211µg/l was recorded in the deep well. This is not consistent with other groundwater data for this well or the absence of significant visual or olfactory evidence of contamination noted in the groundwater during the well purging and sampling activities; and
- The pH value of the groundwater sample was recorded near neutral at pH 7.4

2 INTRODUCTION

2.1 GENERAL

Conestoga-Rovers & Associates (Europe) Limited was retained by NPEC to complete a Phase II ESA a portion of the playing field area (the "Site") located within the Kodak chemical manufacturing facility at Acornfield Road, Kirkby, Liverpool, UK. The Phase II ESA was carried out to assess the potential for soil and groundwater contamination beneath the Site associated with historic activities. The fieldworks were carried out by CRA on the 21st, 22nd and 27th of September 2004.

This report presents the findings of the Phase II ESA.

2.2 SITE SETTING INFORMATION

2.2.1 SITE LOCATION AND SETTING

The Kodak facility is situated on the eastern side of the Knowsley Industrial Park, approximately 2km to the east of Kirkby and 12.5km northeast of Liverpool City centre. A location map is given in Figure 1.

The total area of the Kodak site is 54 acres (including car parking); there are approximately 45 buildings on the Site, which comprise a mixture of office, service and process buildings. There are also a number of disused plant and storage buildings. Plant areas are served by a number of bulk chemical storage facilities and drum storage compounds. The Site has a comprehensive network of access roads (streets and avenues), an area of open grass to the north and large staff car park immediately west of Acornfield Road.

The playing field area, which is the subject of the current Phase II ESA, is located at the northern end of the Kodak facility, and is approximately 2.88 acres in area. A Site layout plan is provided in Figure 2.

2.2.2 ADJACENT LAND USE

Current land use surrounding the playing field is as follows:

- To the north by other commercial/industrial premises on the Knowsley Industrial Estate;
- To the east by Perimeter Road, with open land beyond (Kirkby Moss);
- To the south by the Kodak chemical manufacturing facility; and
- To the west by the research and development laboratories of Eastman Kodak.

2.2.3 GEOLOGY

The 1:50,000-scale British Geological Survey geological map for the area (Solid and Drift; Sheet 84: Wigan) indicates the Site is underlain by overburden deposits of peat and sand (Shirdley Hill Sand). The overburden is underlain by sandstone bedrock (Sherwood Sandstone Formation).

A previous Phase II ESA carried out at the Kodak facility by CRA in June 2003 encountered shallow made ground beneath the playing field, overlying superficial boulder clay deposits. The Sherwood Sandstone bedrock was encountered beneath the area of the playing field at a depth of approximately 9.8m bgl.

2.2.4 HYDROGEOLOGY

The 1:100,000-scale Groundwater Vulnerability Map for the area (Sheet 16: West Cheshire), published by the Environment Agency of England and Wales classifies the Sherwood Sandstone strata beneath the Site as a Major Aquifer. Major Aquifers are defined as follows:

"Highly permeable formations usually with a known or probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes".

The map also classifies the leachability and potential for contaminant migration through the overlying shallow soils. The soils in the area of the Site are given a leaching potential of 'HU' (high / urban). Soils with a high leaching potential are defined as follows:

"Soils with little ability to attenuate or diffuse source pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or to shallow groundwater".

The Site is given a 'worst case' soil leaching potential since soil information for urban areas is less reliable and based on fewer observations than elsewhere. Soils immediately east and north of the Site are given a leaching potential of H1, defined as follows:

"Soils, which readily transmit liquid discharges because they are either shallow or susceptible to rapid by-pass, flow directly to rock, gravel or groundwater".

Data from the previous Phase II ESA carried out by CRA across the entire Kodak facility in June 2003 showed that there are two groundwater bodies beneath the Site. Shallow, groundwater is present as discontinuous pockets in the made ground / Shirdley Hill Sand, perched above the boulder clay deposits. Deeper groundwater is present in the underlying Sherwood Sandstone aquifer.

2.3 PREVIOUS INVESTIGATIONS

A previous site investigation of the entire Kodak facility was carried out by Aspinwall & Co. Limited in 1993 (Ref. 1). The scope of work for the playing field area of the facility included the excavation of five trial pits and installation of one shallow groundwater monitoring well for collection of soil and groundwater samples respectively. Made Ground was encountered to a depth of to 1.1m bgl at the shallow ell location, overlying a sequence of peaty, sandy clay. The sandstone rock head was encountered at 9.3m bgl beneath the playing field. No significant soil or groundwater contamination was encountered beneath the area of the playing field.

A Phase II ESA was also carried out by CRA for the entire Kodak facility (including the area covered by the playing field in the north) in 2003 (Ref. 2). The Phase II ESA scope of works for the playing field area included drilling two soil boreholes to assess shallow soil conditions and the installation of two monitoring wells to assess shallow and deep groundwater conditions, BH1A(S) and BH1A(D) respectively. No significant shallow soil contamination was identified beneath the playing field area of the Kirkby facility. An elevated manganese concentration was recorded in the shallow groundwater at BH1A(S); elevated concentrations of barium and pentachlorophenol were recorded in the deep groundwater at BH1A(D).

2.4 CURRENT INVESTIGATION

CRA carried out the Phase II ESA fieldworks on the 21st, 22nd and 27th of September 2004. The assessment was targeted on approximately the eastern half of the playing field, located at the northern end of the Kodak Kirkby facility. Figure 2 shows the location of the Site area in relation to the adjacent Kodak facility and surrounding land.

The field investigation was split into two separate phases:

1) An initial Membrane Interface Probe (MIP) investigation was carried out across the Site using a herringbone grid formation to allow maximum area coverage. The underlying soil was penetrated to a maximum depth of 6m bgl whilst a real-time analysis was carried out for potential volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and other hydrocarbon-based compounds using a three-stage gas analyser; and

2) The results of the MIP investigation were used to target specific areas thought most likely to have potential underlying soil contamination. An intrusive window sampling investigation concentrated in these areas where soil bores were collected up to depths of 3m bgl and inspected and logged by an engineer. Selected samples were collected for laboratory analysis, including metals, VOCs, SVOCs, GRO, DRO and inorganic parameters.

The field activities undertaken as part of the Site investigation were as follows:

1) Local service plans were checked with Kodak representatives before any intrusive work was carried out. Each area was also assessed using a cable avoidance tool (CAT) to ensure that no unrecorded cables were in the area under investigation;

2) A total of 22 MIP probe holes were formed to a maximum depth of 6m bgl. Ground gas was collected from around the probe and analysed for VOCs, SVOCs, and other possible hydrocarbon-based compounds using a photo-ionisation detector (PID), flame-ionisation detector (FID) and a dry electrolytic conductivity detector (DELCD). A specialist geotechnical company (FUGRO Limited) with extensive experience of membrane interface probe investigations carried out the MIP testing under supervision of CRA. The MIP probe borehole locations are shown on Figure 2;

3) Drilling of 12 window sample boreholes (labelled as WS 1 to WS10, WS13 and WS17 [1] on figure 3) to a maximum depth of 3m bgl to investigate the condition of the shallow soil. The borehole locations were concentrated towards areas highlighted by the MIP rig as potentially containing VOCs, SVOCs and TPH. The window sampling was carried out by a specialist contractor (Sintec Environmental Limited) on the 27th September, again under the supervision of representatives from CRA, who also logged the soil boreholes and obtained selected soil samples for laboratory analysis. The soil boreholes were backfilled with soil arisings. The window sample borehole locations are shown on Figure 3;

4) Up to two soil samples from each borehole were submitted for the following suite of chemical analysis: heavy metals (arsenic, cadmium, lead, mercury, chromium, selenium, copper, nickel, and zinc), silver, boron, VOCs, SVOCs, GRO, DRO, cyanide (total & free) and pH; and

5) A water sample was obtained from the previously installed deep well position BH1A (D). This was analysed for the same chemical analyses as the soil samples. The shallow well was dry installed at BH1A(S) was dry and therefore no groundwater samples were obtained for analysis.

2.5 SOIL VAPOUR TESTING: MEMBRANE INTERFACE PROBE (MIP)

The shallow ground conditions beneath the Site were investigated using a membrane interface probe (MIP).

The use of soil vapour testing allows targeting of areas of potential VOC, SVOC and TPH contamination within shallow soils. The MIP system comprises a heated probe tip, maintained at approximately 125 to 135°C, which is continuously driven into the soil. The

[1] Note: A total of 22 window sample boreholes (WS1 to WS22) were initially marked out for drilling adjacent to the MIP probe holes. However, WS11 and WS12; WS14 to WS16; and WS18 to WS22 were not drilled since no significant readings were obtained from the MIP rig.

heating of the ground vaporises liquid phase VOCs, the more volatile SVOCs and volatile petroleum hydrocarbon fractions within the soil matrix.

The semi-permeable membrane causes the gas phase from the soil to cross into a chamber that is continuously purged using a controlled flow of nitrogen, which acts as a carrier gas. The collected gas flows to the detection system that is fitted with a PID, FID and DELCD. The PID is able to detect SVOCs that have an electron Volt (eV) potential equal to or near that of the PID ultraviolet lamp. The FID will detect any hydrocarbon compound, i.e. a compound with hydrogen-carbon bonds and is particularly sensitive to methane. The DELCD specifically detects halogenated compounds e.g. chlorinated hydrocarbons such as trichloroethylene (TCE).

Probe depth is recorded by means of a depth encoder that transmits depth data to the logging computer. By comparing depth and detector output the approximate depth of any VOCs, SVOCs and TPHs detected can be estimated allowing targeting of soil samples for further laboratory analysis.

The probe is calibrated periodically with trichloroethylene to ensure that all three detectors are operating correctly, as well as determining the time taken for any contaminant to travel from the membrane up the gas line to the detectors.

2.6 SOIL BOREHOLES: DYNAMIC SAMPLING

In order to investigate the shallow ground conditions beneath the Site, a series of soil boreholes were completed across the designated area. The soil boreholes were drilled using a dynamic sampling rig. Hollow steel sampling barrels one metre in length with internal HDPE liners were advanced into the ground using a weighted percussive action. This allowed the collection of the shallow soil inside the liners as each barrel was advanced into the subsurface. After each metre of advancement into the subsurface the sampling barrel was removed from the ground and the sample liner pulled out to allow the inspection and logging of the soil.

The approximate locations of the soil boreholes are shown on Figure 3. Borehole logs are presented in Appendix A. The soil boreholes were located close to the respective probe holes at a distance of approximately 0.5m. The majority of the boreholes were within the areas highlighted by the MIP testing as potentially contaminated with VOCs, SVOCs and TPHs. Boreholes were also drilled in areas where no detector response was recorded during the MIP testing to ensure that adequate Site coverage was achieved.

2.7 SOIL SAMPLING PROGRAMME

Where applicable two soil samples were taken from each soil borehole to be submitted for laboratory chemical analysis. Where the MIP had shown an elevated detector response a soil sample was taken at approximately the same depth from the corresponding window

sample core. A second sample was taken from either the natural ground or near the surface of the borehole. For boreholes that showed no detector response during the MIP testing a single soil sample was taken for laboratory chemical analysis.

It should be noted that the weather conditions during the Phase II field works were extremely wet and the ground was noted to be water-logged in certain areas. This resulted in some of the soil cores not being recovered, especially where a significant content of sandy material was present.

The soil samples were collected using disposable latex gloves, which were changed between samples to minimise any cross contamination. The soils were split into three containers: a VOC vial, a glass jar for SVOCs and hydrocarbon analysis, and a plastic tub for the various inorganic parameters. The sample containers were packed in cool boxes and couriered to the laboratory of ALcontrol Geochem Limited in Chester, UK. The laboratory is accredited by the United Kingdom Accreditation Service (UKAS).

At the laboratory the soil samples were refrigerated prior to analysis being undertaken. The analytical suites selected were based on knowledge obtained from previous investigations carried out by CRA on this Site as well as general chemical parameters that may be expected in any large-scale inorganic chemical industry.

The analytical results for soil samples are discussed in Section 4.2.

2.8 GROUNDWATER SAMPLING PROGRAMME

There are two groundwater monitoring wells adjacent to the area under investigation, BH1A(S) and BH1A(D). Since it was not possible to sample the shallow groundwater during the dynamic soil sampling exercise, it was proposed to re-sample the groundwater in the two adjacent wells on the playing field area, installed by CRA as part of the facility-wide Phase II ESA in June 2003. The shallow well at BH1A(S) was recorded as dry and therefore no groundwater samples were collected. The total depth of this well is five metres, with the well screen placed from 1m to 5m bgl.

The deep well at BH1A (D) was purged of three times the initial well volume of groundwater prior to collection of groundwater samples. This was carried out to ensure that the sample of groundwater collected was representative of the groundwater in the surrounding sandstone bedrock strata. Purging was achieved using an inertia pump and HDPE tubing. Once purged, the groundwater was sampled using a disposable HDPE bailer.

The groundwater was placed in a one-litre plastic bottle for metals and inorganic analyses; a one-litre glass bottle for DRO and SVOC analysis; and a 40ml glass vial for VOC analysis. The samples were placed in a cool box for transport to the laboratory of ALcontrol Geochem Limited.

3 GROUND CONDITIONS

The ground conditions encountered during the Phase II ESA carried out on the Site were consistent with the previous investigations carried out by CRA and Aspinwall & Company. Beneath a thin layer of turf and sandy topsoil, a varying thickness of made ground was encountered in each of the twelve boreholes, extending across the whole area under investigation. Beneath the made ground, the Shirdley Hill Sand layer was encountered, underlain by boulder clay deposits.

The depth of the made ground varied from approximately 2m towards the west of the area under investigation to approximately 1m towards the east of the field adjacent to the road. The made ground generally comprised alternating layers of clay and sand with varying proportions of silt and gravels and rare quantities of cobbles, glass, brick, pottery, wood, slate, plastic and crushed hardcore. The boulder clay was encountered at various depths (between 1.5m and 3m bgl) in all of the boreholes with the exception of WS5; this may be due to the borehole being terminated at approximately 2.7m bgl. Groundwater was observed in most of the boreholes, although in insufficient quantities for representative samples to be obtained for analysis.

Slight hydrocarbon odours and possible fragments of coal/charcoal were noted in the shallow soil at various depths at four boreholes locations (WS2, WS4, WS6 and WS9). Borehole WS5 contained an isolated pocket of a tar-like substance at approximately 1.2m bgl. Fragments of wood were also found in many of the boreholes, some of which showed evidence of burning.

4 ANALYTICAL AND MIP TESTING RESULTS

4.1 MIP TESTING

Fugro provided CRA with a report for the MIP testing, including traces for each individual probe hole. A copy of the MIP report is included as Appendix B.

For each of the probe hole positions, two scans are included, the first of which correlates detector response to depth. The x-axis indicates probe depth whereas the y-axis denotes detector output. On each scan three separate detector responses are plotted one for each type of detector FID, PID and DELCD. Where a significant detector response was encountered in a probe hole this depth was targeted during the window sampling investigation.

The second scan for each probe hole logs the temperature of the probe against probe depth. This shows the probe was maintained at sufficient temperature to volatilise any VOCs, SVOCs and TPHs present in the soil. Also, adjacent to the temperature profile, is a graph showing the rate of penetration of the probe, this gives a rough estimate as to how firm the ground was.

For probe holes K1-8 and K10, FID responses were detected at various depths between 0.5 and 2.5m bgl. This correlates well with the made ground on the western half of the field as shown in Figure 2. Samples sent for analytical testing were targeted where a detector response was observed. For probe holes K9 and K11-21 no elevated detector responses were recorded, suggesting little or no VOCs, SVOCs and TPHs were present in the ground on the northeast half of the field. Elevated MIP detector responses were recorded mainly towards the western half of the Site, most notably in the area around probe holes K3, K4, K5 and K6. In order to determine the potential depth of any contamination a final probe hole (K22) was centred in this area of elevated detector response. The probe was driven to a depth of 6m bgl with no detector response being recorded below a depth of 3.5m bgl.

4.2 ASSESSMENT CRITERIA

The analytical data obtained from the intrusive investigation has been compared against established guidelines and standards to assess the significance of the measured concentrations. Criteria used to identify these contaminants include:

- Soil Guideline Values (SGVs) derived from the Contaminated Land Exposure Assessment (CLEA) Model, published by the Department for Environment, Food & Rural Affairs and The Environment Agency;
- Soil and Groundwater guidelines published by the Dutch Ministry of Housing, Spatial Planning and the Environment (VROM); and

- UK Drinking Water Quality Standards (DWQS), derived from the Water supply (Water Quality) Regulations 1989 and 2000.

4.2.1 CLEA

Where applicable, the analytical results for the soil samples have been compared with the soil guidance values (SGVs) published by DEFRA and the Environment Agency in March 2002 (Ref. 3). Guideline concentrations have been published for seven inorganic and one organic contaminant, including arsenic, cadmium, chromium, lead, nickel, selenium, mercury and benzo(a)pyrene. These contaminants have been selected on the basis that they are likely to be present on many sites affected by current or former industrial use in the UK in sufficient concentrations to pose a risk to human health.

The SGVs have been derived from the CLEA model for three different land uses (Ref. 4). These are specified as residential land use (with and without plant uptake), land used for allotments and commercial/industrial sites. The soil analytical data have, therefore, been compared with the relevant default SGVs for commercial/industrial land use, given the current and likely future land use at the Site. The assumptions used in the CLEA model to determine the default SGV concentrations have been reviewed and appear to be relevant and/or conservative when compared to actual Site conditions. Therefore the use of the default Soil Guidance Values is considered valid for initial comparison purposes.

The CLEA SGV values have been derived for the protection of human health only and do not take account of other potential environmental receptors such as groundwater. The CLEA model assumes that the contaminant concentrations are available to the human receptor, and therefore is limited to soil-borne contaminants within the upper one metre of the soil profile. However, as these values may be considered conservative in respect of the setting of the Site, CRA has used them as comparison criteria for all soil samples.

4.2.2 DUTCH GUIDELINES

Groundwater laboratory data have been screened using the Dutch guidelines (Ref. 5). In the absence of CLEA SGVs for soil contaminants, the Dutch guidelines have also been used for screening the soil data. The Dutch guidelines use target values, intervention values, and "levels indicative of serious contamination". Due to the number of footnotes and qualifiers within the Dutch circular and associated environmental policy documents, it is impractical to state all assumptions and validations herein. The following, however are noted:

Dutch Target Values (DTVs) for individual substances have been derived from the Integrated Environmental Quality Standards project (INS) that was published in December 1997 (VROM, INS for Soil, Water and Air 1997) and are underpinned by risk analysis wherever possible to apply to specific substances. Target values indicate the level that has to be achieved to fully recover the functional properties of the soil and water for humans, animal and plant life.

The Dutch Intervention Value (DIV) is the maximum tolerable concentration above which remediation is required. This occurs if one or more compounds in concentrations equal to or higher than the intervention value are recorded in more than 25 m^3 of soil or 1000 m^3 of groundwater.

Indicative levels for serious contamination have been given to certain substances that have no measurement regulations for soil/sediment, and to those substances that do not have eco-toxicological data to back up intervention values. It is noted that indicative values have a greater degree of uncertainty than the intervention values, and professional judgement with a risk-based approach should be used in determining the significance of the results.

Finally, it should be noted that the intervention values and indicative levels of serious contamination specified in the Dutch circular are for a standard soil type with 10% organic matter and 25% clay.

4.2.3 UK DRINKING WATER QUALITY STANDARDS (DWQS)

The DWQS are derived from the Water Supply (Water Quality) Regulations 1989 and 2000, which list a number of metal, organic and inorganic contaminants for which a maximum prescribed value or concentration is given. Although relatively stringent for the purposes of this report, CRA has used the DWQS as comparison criteria for the groundwater data in addition to the Dutch guidelines.

4.3 SOIL ANALYSES

The results of the soil chemical analyses are included in Appendix C. The relevant findings are discussed in the following sections, with reference to summary data tables following the report.

4.3.1 HEAVY METALS

Table 1a provides a summary of the results for the nineteen soil samples submitted for metal analysis. None of the soil samples analysed contained a metal concentration above the relevant CLEA SGV or DIV for metals.

Arsenic was detected in eleven of the soil samples, with concentrations ranging from 1mg/kg to 15 mg/kg. The CLEA SGV for soils specified for industrial / commercial land use is 500mg/kg.

Cadmium was detected in three of the soil samples, with concentrations ranging from 1mg/kg to 4mg/kg. The CLEA SGV for cadmium in soils specified for commercial/industrial land use is 1,400 mg/kg.

Chromium was detected in nineteen of the soil samples, at concentrations ranging from 5mg/kg to 60 mg/kg. The CLEA SGV for chromium in soils specified for industrial/commercial land use is 5,000 mg/kg.

Copper was detected in eighteen of the soil samples, at concentrations ranging from 6mg/kg to 112 mg/kg. No CLEA SGV has been published for copper. Borehole WS2 (1.72-1.90m) recorded the highest copper concentration of 112mg/kg, which is above the DTV of 140 mg/kg, but below the DIV of 720 mg/kg.

Nickel was detected in nineteen of the soil samples, at concentrations ranging from 2mg/kg to 78 mg/kg. The CLEA SGV for nickel in soils specified for industrial / commercial land use is 5,000 mg/kg.

Zinc was detected in nineteen of the soil samples at concentrations ranging from 3 mg/kg to 165 mg/kg. No CLEA SGVs has been produced for zinc. Borehole WS1 (0.07-0.30m) recorded the highest zinc concentration of 165 mg/kg, which is above the DTV of 140mg/kg, but below the DIV of 720 mg/kg.

Mercury was not detected above the method detection limit of 1 mg/kg in any of the samples submitted for analysis. The CLEA SGV for mercury in soils specified for industrial/commercial land use is 480 mg/kg.

Selenium was detected in eleven of the soil samples, with concentrations ranging from 1mg/kg to 2mg/kg The CLEA SGV for selenium in soils specified for commercial/industrial land use is 8,000 mg/kg.

Lead was detected in eighteen of the soil samples, with concentrations ranging from 4mg/kg to 110mg/kg. The CLEA SGV for lead in soils specified for commercial/industrial land use is 750 mg/kg.

Silver was not detected in any of the soil samples above the analytical detection limit of 10mg/kg. Boron was detected in four soil samples at concentrations ranging from 1mg/kg to 2mg/kg. No CLEA SGVs or Dutch guidelines have been published for boron.

4.3.2 GASOLINE RANGE ORGANICS (GRO) AND DIESEL RANGE ORGANICS (DRO)

Table 2a provides a summary of the GRO and DRO concentrations recorded in the soil samples. Gasoline range organics (C_4-C_{10}) were detected in three of the soil samples, at concentrations ranging from 13µg/kg to 196 µg/kg. Borehole WS2 (1.72-1.90m) recorded the highest GRO concentration of 196µg/kg. The GRO concentrations detected in the three samples consist entirely of one or more of the BTEX compounds (benzene, toluene, ethylbenzene and xylene). Maximum benzene, toluene, ethylbenzene and xylene concentrations of 20µg/kg, 80µg/kg, 25µg/kg and 62µg/kg were recorded respectively at WS2 (1.72-1.90m), all below the relevant DIVs.

Diesel range organics were detected in nineteen of the soil samples, with concentrations ranging from 2mg/kg to 14,357mg/kg; WS5 (1.10-1.30m) recorded the highest DRO concentration of 14,357 mg/kg, in excess of the DIV for mineral oil of 5,000mg/kg. The laboratory interpretation of the types of DRO compounds recorded in this soil sample is given as used engine oil. This provides approximate identification of the DRO mass only. Other laboratory interpretations of the DRO results suggest that naturally occurring humic acids account for a significant proportion of the elevated DRO concentrations at a number of the sampling locations.

4.3.3 VOLATILE ORGANIC COMPOUNDS (VOCS)

Table 3a provides a summary of the results for the twelve soil samples submitted for VOC analysis. Apart from the BTEX compounds, the recorded concentrations of VOCs in the soil samples were less than the analytical detection limit of 1µg/kg. Trace concentrations of BTEX were detected in three soil samples as part of the VOC analysis suite at WS1 (0.80-1.50m), WS2 (1.72-1.90m) and WS4 (2.00-2.15m). The recorded BTEX concentrations do not exceed 10µg/kg and are less than the relevant DIVs.

4.3.4 SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCS)

Table 4a provides a summary of the results for the twelve soil samples submitted for SVOC analysis. Polycyclic aromatic hydrocarbons (PAHs) were recorded at trace concentrations in 10 of the 12 soil samples analysed. The maximum total PAH concentration was 16.63mg/kg at WS5 (1.10-1.30), which is less than the DIV for total PAHs of 40 mg/kg.

In addition to PAHs, the analysis suite recorded two other SVOCs in three of the soil samples submitted for analysis: Dibenzofuran at a concentration of 124µg/kg in WS10 (0.55-0.70); and Bis(2-ethylhexyl)phthalate at concentrations of 1131µg/kg in WS4 (20-2.5) and 1047µg/kg in WS8 (1.05-1.35). The Bis(2-ethylhexyl)phthalate concentrations recorded at these soil bore locations are below the DIV for total phthalates of 60,000µg /kg.

4.3.5 CYANIDE AND PH

Table 5a provides a summary of the cyanide analyses and pH. No total or free cyanide was detected in any of the soil samples analysed above the analytical limit of detection 0.1mg/kg. The recorded pH values range from 5.44 to 7.90, indicating slightly acidic to near neutral soil pH conditions.

4.4 GROUNDWATER ANALYSES

The results of the groundwater chemical analyses are included in Appendix C. The relevant findings are discussed in the following sections, with reference to summary data tables following the report.

4.4.1 HEAVY METALS

Table 1b provides a summary of the metals results for the groundwater sample submitted for analysis. Arsenic was detected in BH1A(D) at a concentration of 13µg/l, which is slightly above the drinking water quality standard (DWQS) of 10µg/l but below the Dutch intervention value of 60µg/l. For cadmium, chromium, mercury, lead, silver and boron, the recorded concentrations at BH1A(D) were below the relevant analytical detection limits and also below the corresponding DWQS and DIV. Selenium was detected at a concentration of 3µg/l, which is below the DWQS of 10µg/l and the Dutch indicative level for serious contamination of 100µg/l.

With respect to phytotoxic metals, a copper concentration of 4µg/l was recorded, which is below the DWQS of 2,000µg/l and the DIV of 75µg /l. Nickel and zinc concentrations of 20µg/l and 29µg/l were recorded respectively, less than the DIVs.

4.4.2 GASOLINE RANGE ORGANICS (GRO) AND DIESEL RANGE ORGANICS (DRO)

Table 2b provides a summary of the GRO and DRO results for the groundwater sample submitted for analysis. No GRO or BTEX compounds were detected in the deep groundwater at BH1A (deep) sample. In addition, no MTBE was detected in the deep groundwater sample. A DRO concentration of 1,211µg/l was recorded in the groundwater, above the DWQS of 10µg/l and the DIV of 600µg/l.

It should be noted that no significant visual or olfactory evidence of contamination was noted in the groundwater during the purging and sampling activities. In addition, the elevated DRO concentration recorded in the groundwater from BH1A(D) is not consistent with the initial groundwater data collected at this well location as part of the facility-wide Phase II ESA carried out by CRA or subsequent groundwater monitoring rounds. It is likely that additional groundwater quality data from this well will be obtained in the future for further validation of the groundwater DRO concentrations at this location.

4.4.3 VOLATILE ORGANIC COMPOUNDS (VOCS)

Table 3b provides a summary of the VOC results for the groundwater sample submitted for analysis. No VOCs were recorded in the deep groundwater sampled from BH1A(D).

4.4.4 SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCS)

Table 4b provides a summary of the SVOC results for the groundwater sample submitted for analysis. No SVOCs were recorded in the deep groundwater from BH1A(D).

4.4.5 CYANIDE AND pH

Table 5b provides a summary of the cyanide (free and total) and pH results for the groundwater sample submitted for analysis. No cyanide was detected in the deep groundwater at concentrations above the analytical detection limit of and the current DWQS level of 0.05mg/l. The recorded pH value was 7.48 for the BH1A (deep) sample. This pH value is consistent with the soil pH values recorded and is within the DWQS limits of pH5.5 to pH9.5.

5 SUMMARY

5.1 GROUND CONDITIONS

The baseline Phase II ESA carried out at the Site by CRA has identified that made ground (fill) materials immediately underlie the Site to a depth of up to approximately 2m bgl on the western part of the playing field area, and 1m bgl on the eastern part. Beneath the made ground is a layer of clay, which is consistent with previous ground investigations in this area of the Site. The made ground generally comprised alternating layers of clay and sand with varying proportions of silt and gravels and rare quantities of cobbles, glass, brick, pottery, wood, slate, plastic and crushed hardcore.

Slight hydrocarbon odours and possible fragments of coal/charcoal were noted in the shallow soil at various depths at four boreholes locations (WS2, WS4, WS6 and WS9). Borehole WS5 contained an isolated pocket of a tar-like substance at approximately 1.2m bgl. Fragments of wood were also found in many of the boreholes, some of which showed evidence of burning.

5.2 ANALYTICAL RESULTS

Soil

- No significant concentrations of metals were recorded in any of the soil samples submitted for analysis. All metal concentrations detected were below the respective CLEA SGVs or, where no CLEA SGV has been published in the UK, relevant Dutch Guideline values;

- No cyanide (total or free) was detected in any of the soil samples submitted for analysis;

- No significantly acidic or alkaline soil pH values were recorded;

- Trace concentrations of gasoline range organic compounds, including benzene, toluene ethylbenzene and xylene were recorded at one borehole location (WS2; 1.72-1.90m), to a maximum of 80µg/kg for toluene. This is consistent with olfactory evidence of contamination at this location and the results of the MIP testing, which recorded a vapour peak at approximately the same depth in the adjacent MIP test location. The recorded GRO concentrations in the remaining soil samples were generally less than the analytical detection limit of 10µg/kg. No other VOCs were detected in the soil samples;

- A maximum DRO concentration of 14,357mg/kg was recorded in WS5 (1.10-1.30m), above the DIV for mineral oil of 5,000mg/kg. A possible tar-like substance was observed at this borehole location and depth. All remaining soil samples recorded DRO concentrations less than 1,000mg/kg; and

- Trace concentrations of SVOCs, including PAHs and Dibenzofuran were recorded in twelve of the soil samples analysed, generally at concentrations less than 1,000µg/kg and below relevant Dutch guideline values, where specified. Bis(2-ethylhexyl)phthalate was recorded in two of the soil samples. A maximum concentration of 1,131µg/kg was recorded, less than the DIV for total phthalates of 60,000µg/kg.

Groundwater

- No significant concentrations of metals were recorded in the deep groundwater at BH1A(D);
- No VOCs, SVOCs or cyanide was detected in the deep groundwater at BH1A(D);
- No GRO, BTEX or MTBE was detected in the deep groundwater at BH1A(D);
- An elevated DRO concentration of 1,211µg/l was recorded in the deep well. This is not consistent with other groundwater data for this well or the absence of significant visual or olfactory evidence of contamination noted in the groundwater during the well purging and sampling activities; and
- The pH value of the groundwater sample was recorded near neutral at pH 7.4

6 REFERENCES

1) ***"Phase II Site Investigation at the Kodak Facility, Kirkby, Liverpool".*** Aspinwall & Company. Ref. KO0102F. March 1994;

2) ***"Phase II Environmental Site Assessment".*** Conestoga-Rovers & Associates (Europe) Limited. Ref. 32236. December 2003;

3) ***"Soil Guideline Values"*** series of reports. R&D publications Soil Guideline Value (SGV) 1, 3, 4, 5, 7, 9 and 10. Department of Environment, Food and Rural Affairs (DEFRA) and the Environment Agency. March 2002;

4) ***"The Contaminated Land Exposure Assessment (CLEA) Model: Technical Basis and Algorithms".*** R&D publication CLR 10. Department of Environment, Food and Rural Affairs and the Environment Agency. January 2002;

5) ***"Circular on Target Values and Intervention Values for Soil Remediation. Annexes A to D".*** Dutch Ministry of Housing, Spatial Planning and the Environment (VROM); February 2000; and

6) **"The Water Supply (Water Quality) Regulations".** 1989 (Statutory Instrument No. 1147) and 2000 (Statutory Instrument No. 3184).

7 LIMITATIONS TO ENVIRONMENTAL ASSESSMENTS

Conestoga -Rovers & Associates (Europe) Limited (CRA) obtained, reviewed and evaluated information from the client, property owner and others. The conclusions, opinions and recommendations made by CRA in this report are based on this information and observations made during the Site reconnaissance and Phase II ESA.

These opinions were arrived in accordance with currently accepted industry practices and hydrological and engineering practices at this time and location and as such are not a guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

CRA has prepared this report on behalf of their client. Any third party using this report do so entirely at their own risk. CRA makes no warranty or representation whatsoever, express or implied, with respect to the use by a third party of any information contained in this report or its suitability for any purpose. CRA accepts no responsibility for any costs, claims, damages or expenses (including any consequential damages) resulting from the use of this report or any information contained in this Report by a third party.

All of which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES (EUROPE) LIMITED

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Figures

Figure 1
Site Location Map

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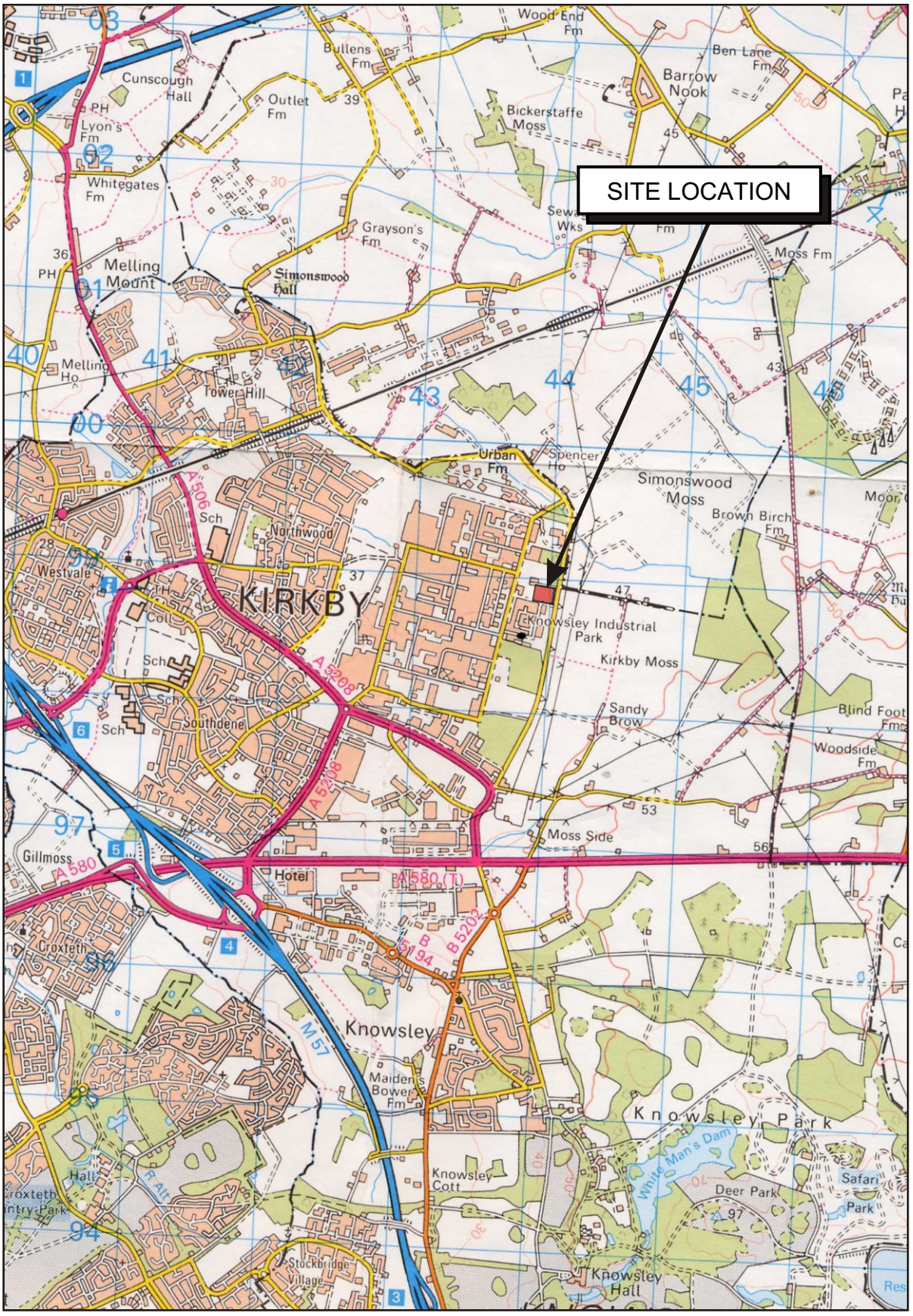

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NG1 5HQ

FIGURE 1
SITE LOCATION PLAN
ACORNFIELD ROAD, KIRKBY, LIVERPOOL
NPEC INC.

Figure 2
MIP Soil Probe Location Plan

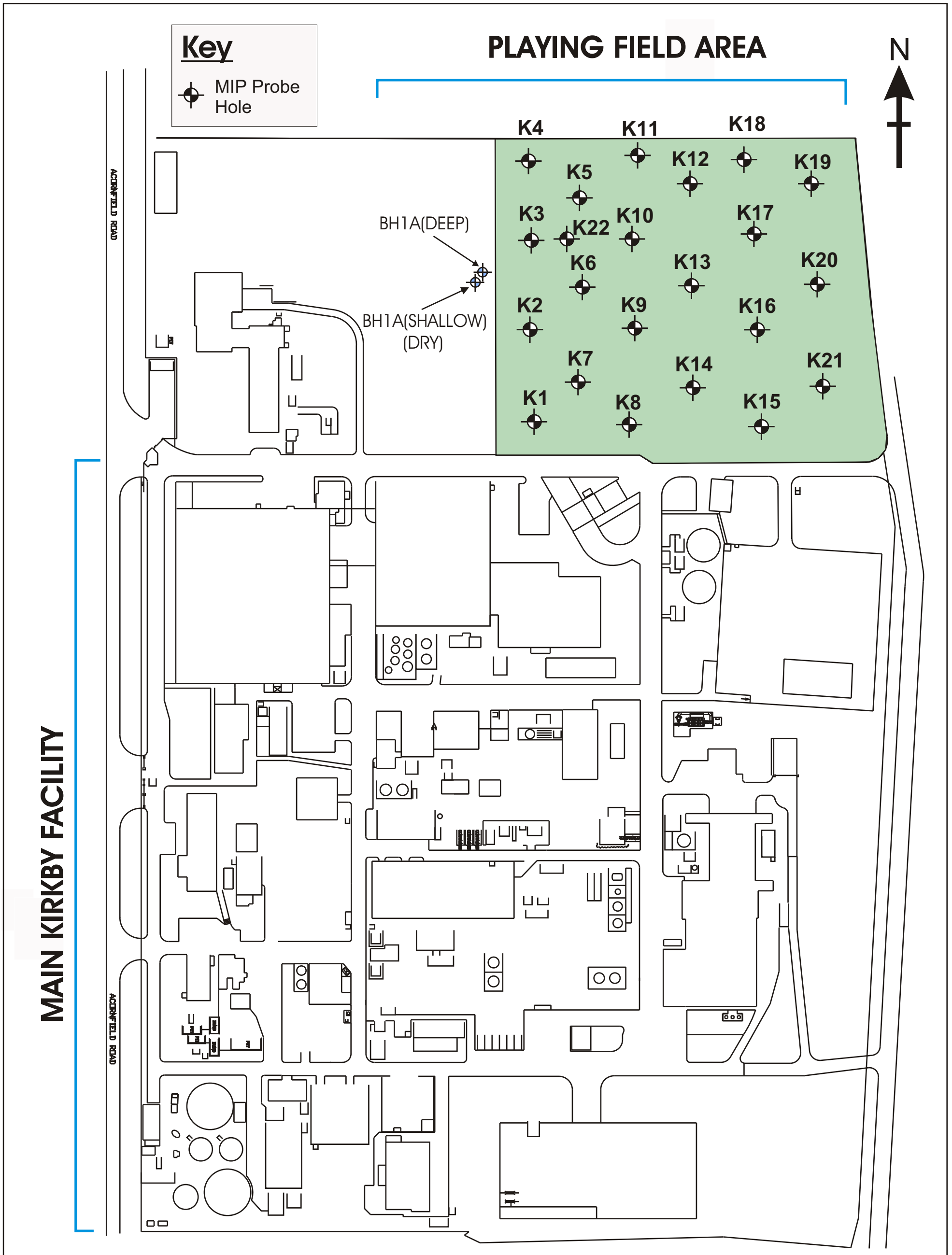

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FIGURE 2
MIP SOIL PROBE LOCATION PLAN
ACORNFIELD ROAD, KIRKBY, LIVERPOOL, ENGLAND
NPEC INC.

Figure 3

Borehole Location Plan

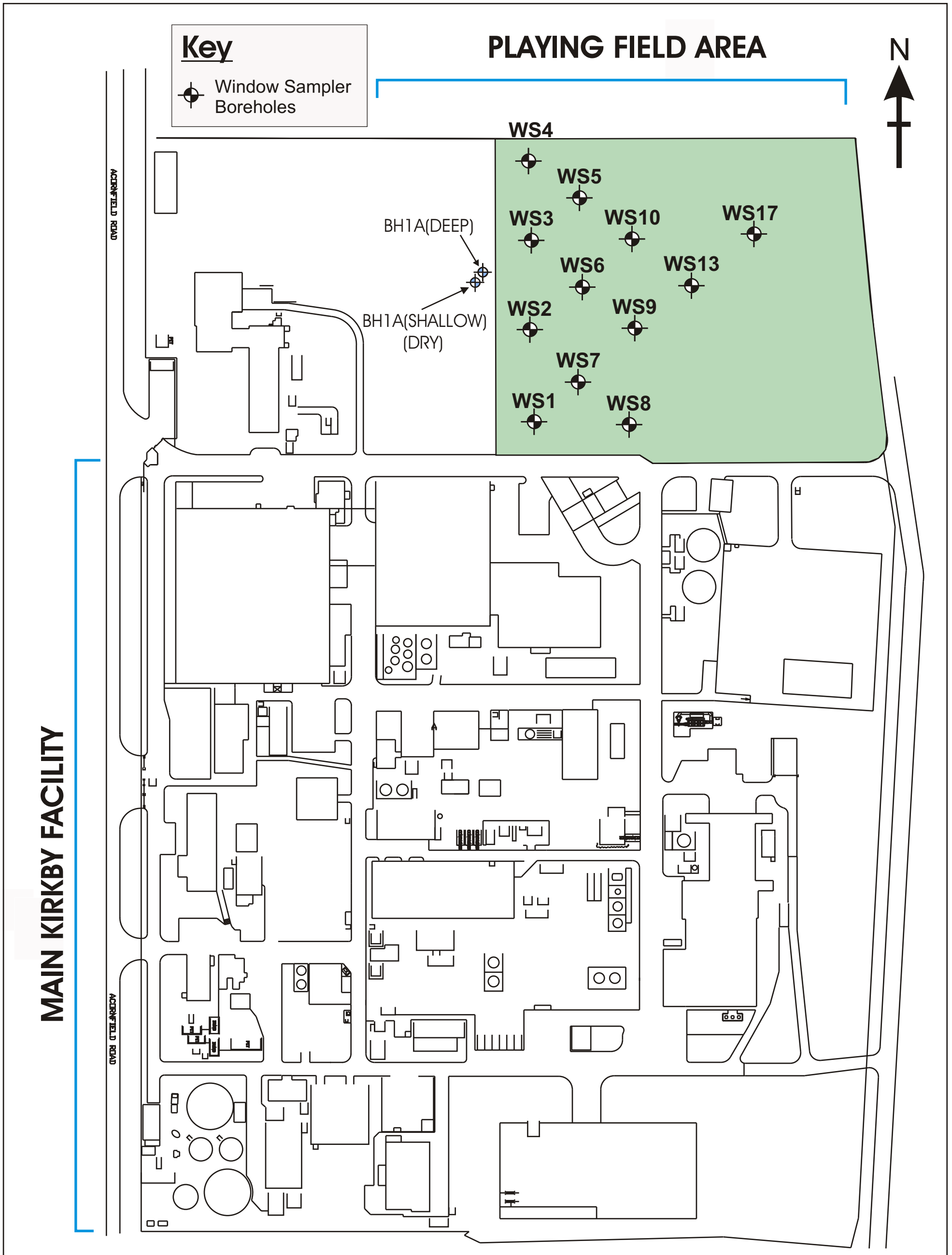

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FIGURE 3
BOREHOLE LOCATION PLAN
ACORNFIELD ROAD, KIRKBY, LIVERPOOL, ENGLAND
NPEC INC.

Tables

TABLE 3A
SUMMARY OF VOC RESULTS FOR SOIL
(1 of 3)

	Borehole Location	WS1		WS2		WS3		WS4		Dutch Target Value (DTV)	Dutch Intervention Value (DIV)		Borehole Location	WS1		WS2		WS3		WS4		Dutch Target Value (DTV)	Dutch Intervention Value (DIV)
		0.07-0.30	0.80-1.50	0.25-0.55	1.72-1.90	0.25-0.55	1.60-2.00	1.10-1.25	2.00-2.15					0.07-0.30	0.80-1.50	0.25-0.55	1.72-1.90	0.25-0.55	1.60-2.00	1.10-1.25	2.00-2.15		
CAS No	Compound	Concentration µg/kg								µg/kg	µg/kg	CAS No	Compound	Concentration µg/kg								µg/kg	µg/kg
75-71-8	Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	106-93-4	1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---
74-87-3	Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	127-18-4	Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	2	4,000
75-01-4	Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1	10	100	630-20-6	1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---
74-83-9	Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	108-90-7	Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
75-00-3	Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	100-41-4	Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	30	50,000
75-69-4	Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	108-38-3*	p / m-Xylene	<1	3	<1	5	<1	<1	<1	2	100**	25,000**
156-60-5	trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	200	1,000	75-25-2	Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	---	---
75-09-2	Dichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	400	10,000	100-42-5	Styrene	<1	<1	<1	<1	<1	<1	<1	<1	300	100000
75-15-0	Carbon disulphide	<1	<1	<1	<1	<1	<1	<1	<1	---	---	79-34-5	1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	100**	25,000**
75-35-4	1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	100	300	95-47-6	o-Xylene	<1	1	<1	3	<1	<1	<1	<1	100**	25,000**
75-34-3	1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	20	15,000	96-18-4	1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	---	---
1634-04-4	methyl tert-butyl ether	<1	<1	<1	<1	<1	<1	<1	<1	---	---	98-82-8	Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
156-59-2	cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	200	1,000	108-86-1	Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
74-97-5	Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	95-49-8	2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
67-66-3	Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	20	10,000	103-65-1	Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
594-20-7	2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	2	2,000	106-43-4	4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
107-06-2	1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	20	4,000	95-63-6	1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
71-55-6	1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	70	15,000	99-87-6	4-Isopropyltoluene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
563-58-6	1,1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	---	---	108-67-8	1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
71-43-2	Benzene	<1	3	<1	4	<1	<1	<1	<1	10	1,000	95-50-1	1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
56-23-5	Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	400	1,000	106-46-7	1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
74-95-3	Dibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	135-98-8	sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
78-87-5	1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	2	2,000	98-06-6	tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
75-27-4	Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	541-73-1	1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
79-01-6	Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	100	60,000	104-51-8	n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
10061-01-5	cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	---	---	96-12-8	1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	---	---
10061-02-6	trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	---	---	120-82-1	1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
79-00-5	1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	400	10,000	91-20-3	Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	1***	40***
108-88-3	Toluene	<1	<1	<1	10	<1	<1	<1	1	10	130,000	87-61-6	1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
142-28-9	1,3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	---	---	87-68-3	Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	<1	---	---
124-48-1	Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	---	---												

* = Dutch intervention and target values specified for total chlorobenzenes, ** = Dutch intervention and target values specified for total xylenes,

***= Dutch intervention and target values specified for sum of 10 PAH compounds

TABLE 3A
SUMMARY OF VOC RESULTS FOR SOIL
(2 OF 3)

	Borehole Location	WS5		WS6		WS7	WS8		Dutch Target Value (DTV)	Dutch Intervention Value (DIV)		Borehole Location	WS5		WS6		WS7	WS8		Dutch Target Value (DTV)	Dutch Intervention Value (DIV)
		0.60-0.85	1.10-1.30	1.15-1.25	240-2.60	0.75-0.90	0.50-0.60	1.05-1.15					0.60-0.85	1.10-1.30	1.15-1.25	240-2.60	0.75-0.90	0.50-0.60	1.05-1.15		
CAS No	Compound	Concentration µg/kg							µg/kg	µg/kg	CAS No	Compound	Concentration µg/kg							µg/kg	µg/kg
75-71-8	Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	---	---	106-93-4	1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	---	---
74-87-3	Chloromethane	<1	<1	<1	<1	<1	<1	<1	---	---	127-18-4	Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	2	4000
75-01-4	Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	10	100	630-20-6	1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	---	---
74-83-9	Bromomethane	<1	<1	<1	<1	<1	<1	<1	---	---	108-90-7	Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
75-00-3	Chloroethane	<1	<1	<1	<1	<1	<1	<1	---	---	100-41-4	Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	30	50000
75-69-4	Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	---	---	108-38-3*	p / m-Xylene	<1	<1	<1	<1	<1	<1	<1	100**	25,000**
156-60-5	trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	200	1,000	75-25-2	Bromoform	<1	<1	<1	<1	<1	<1	<1	---	---
75-09-2	Dichloromethane	<1	<1	<1	<1	<1	<1	<1	400	10,000	100-42-5	Styrene	<1	<1	<1	<1	<1	<1	<1	300	100000
75-15-0	Carbon disulphide	<1	<1	<1	<1	<1	<1	<1	---	---	79-34-5	1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	100**	25,000**
75-35-4	1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	100	300	95-47-6	o-Xylene	<1	<1	<1	<1	<1	<1	<1	100**	25,000**
75-34-3	1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	20	15,000	96-18-4	1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	---	---
1634-04-4	methyl tert-butyl ether	<1	<1	<1	<1	<1	<1	<1	---	---	98-82-8	Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
156-59-2	cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	200	1,000	108-86-1	Bromobenzene	<1	<1	<1	<1	<1	<1	<1	---	---
74-97-5	Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	---	---	95-49-8	2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	---	---
67-66-3	Chloroform	<1	<1	<1	<1	<1	<1	<1	20	10,000	103-65-1	Propylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
594-20-7	2,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	2	2,000	106-43-4	4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	---	---
107-06-2	1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	20	4,000	95-63-6	1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
71-55-6	1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	70	15,000	99-87-6	4-Isopropyltoluene	<1	<1	<1	<1	<1	<1	<1	---	---
563-58-6	1,1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	---	---	108-67-8	1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
71-43-2	Benzene	<1	<1	<1	<1	<1	<1	<1	10	1,000	95-50-1	1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
56-23-5	Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	400	1,000	106-46-7	1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
74-95-3	Dibromomethane	<1	<1	<1	<1	<1	<1	<1	---	---	135-98-8	sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
78-87-5	1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	2	2,000	98-06-6	tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
75-27-4	Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	---	---	541-73-1	1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
79-01-6	Trichloroethene	<1	<1	<1	<1	<1	<1	<1	100	60,000	104-51-8	n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	---	---
10061-01-5	cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	---	---	96-12-8	1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	---	---
10061-02-6	trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	---	---	120-82-1	1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
79-00-5	1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	400	10,000	91-20-3	Naphthalene	<1	<1	<1	<1	<1	<1	<1	1***	40***
108-88-3	Toluene	<1	<1	<1	<1	<1	<1	<1	10	130,000	87-61-6	1,2,3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	30*	30,000*
142-28-9	1,3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	---	---	87-68-3	Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	---	---
124-48-1	Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	---	---											

* = Dutch intervention and target values specified for total chlorobenzenes, ** = Dutch intervention and target values specified for total xylenes,

***= Dutch intervention and target values specified for sum of 10 PAH compounds

TABLE 3A
SUMMARY OF VOC RESULTS FOR SOIL (3 OF 3)

	Borehole Location	WS9	WS10	WS13	WS17	Dutch Target Value (DTV)	Dutch Intervention Value (DIV)		Borehole Location	WS9	WS10	WS13	WS17	Dutch Target Value (DTV)	Dutch Intervention Value (DIV)
		0.60-0.70	0.55-0.70	0.55-0.70	1.05-1.35					0.60-0.70	0.55-0.70	0.55-0.70	1.05-1.35		
CAS No	Compound	Concentration µg/kg				µg/kg	µg/kg	CAS No	Compound	Concentration µg/kg				µg/kg	µg/kg
75-71-8	Dichlorodifluoromethane	<1	<1	<1	<1	---	---	106-93-4	1,2-Dibromoethane	<1	<1	<1	<1	---	---
74-87-3	Chloromethane	<1	<1	<1	<1	---	---	127-18-4	Tetrachloroethene	<1	<1	<1	<1	2	4000
75-01-4	Vinyl Chloride	<1	<1	<1	<1	10	100	630-20-6	1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	---	---
74-83-9	Bromomethane	<1	<1	<1	<1	---	---	108-90-7	Chlorobenzene	<1	<1	<1	<1	30*	30,000*
75-00-3	Chloroethane	<1	<1	<1	<1	---	---	100-41-4	Ethylbenzene	<1	<1	<1	<1	30	50000
75-69-4	Trichlorofluoromethane	<1	<1	<1	<1	---	---	108-38-3*	p / m-Xylene	<1	<1	<1	<1	100**	25,000**
156-60-5	trans-1,2-Dichloroethene	<1	<1	<1	<1	200	1,000	75-25-2	Bromoform	<1	<1	<1	<1	---	---
75-09-2	Dichloromethane	<1	<1	<1	<1	400	10,000	100-42-5	Styrene	<1	<1	<1	<1	300	100000
75-15-0	Carbon disulphide	<1	<1	<1	<1	---	---	79-34-5	1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	100**	25,000**
75-35-4	1,1-Dichloroethene	<1	<1	<1	<1	100	300	95-47-6	o-Xylene	<1	<1	<1	<1	100**	25,000**
75-34-3	1,1-Dichloroethane	<1	<1	<1	<1	20	15,000	96-18-4	1,2,3-Trichloropropane	<1	<1	<1	<1	---	---
1634-04-4	methyl tert-butyl ether	<1	<1	<1	<1	---	---	98-82-8	Isopropylbenzene	<1	<1	<1	<1	---	---
156-59-2	cis-1,2-Dichloroethene	<1	<1	<1	<1	200	1,000	108-86-1	Bromobenzene	<1	<1	<1	<1	---	---
74-97-5	Bromochloromethane	<1	<1	<1	<1	---	---	95-49-8	2-Chlorotoluene	<1	<1	<1	<1	---	---
67-66-3	Chloroform	<1	<1	<1	<1	20	10,000	103-65-1	Propylbenzene	<1	<1	<1	<1	---	---
594-20-7	2,2-Dichloropropane	<1	<1	<1	<1	2	2,000	106-43-4	4-Chlorotoluene	<1	<1	<1	<1	---	---
107-06-2	1,2-Dichloroethane	<1	<1	<1	<1	20	4,000	95-63-6	1,2,4-Trimethylbenzene	<1	<1	<1	<1	---	---
71-55-6	1,1,1-Trichloroethane	<1	<1	<1	<1	70	15,000	99-87-6	4-Isopropyltoluene	<1	<1	<1	<1	---	---
563-58-6	1,1-Dichloropropene	<1	<1	<1	<1	---	---	108-67-8	1,3,5-Trimethylbenzene	<1	<1	<1	<1	---	---
71-43-2	Benzene	<1	<1	<1	<1	10	1,000	95-50-1	1,2-Dichlorobenzene	<1	<1	<1	<1	30*	30,000*
56-23-5	Carbon tetrachloride	<1	<1	<1	<1	400	1,000	106-46-7	1,4-Dichlorobenzene	<1	<1	<1	<1	30*	30,000*
74-95-3	Dibromomethane	<1	<1	<1	<1	---	---	135-98-8	sec-Butylbenzene	<1	<1	<1	<1	---	---
78-87-5	1,2-Dichloropropane	<1	<1	<1	<1	2	2,000	98-06-6	tert-Butylbenzene	<1	<1	<1	<1	---	---
75-27-4	Bromodichloromethane	<1	<1	<1	<1	---	---	541-73-1	1,3-Dichlorobenzene	<1	<1	<1	<1	30*	30,000*
79-01-6	Trichloroethene	<1	<1	<1	<1	100	60,000	104-51-8	n-Butylbenzene	<1	<1	<1	<1	---	---
10061-01-5	cis-1,3-Dichloropropene	<1	<1	<1	<1	---	---	96-12-8	1,2-Dibromo-3-chloropropane	<1	<1	<1	<1	---	---
10061-02-6	trans-1,3-Dichloropropene	<1	<1	<1	<1	---	---	120-82-1	1,2,4-Trichlorobenzene	<1	<1	<1	<1	30*	30,000*
79-00-5	1,1,2-Trichloroethane	<1	<1	<1	<1	400	10,000	91-20-3	Naphthalene	<1	<1	<1	<1	1***	40***
108-88-3	Toluene	<1	<1	<1	<1	10	130,000	87-61-6	1,2,3-Trichlorobenzene	<1	<1	<1	<1	30*	30,000*
142-28-9	1,3-Dichloropropane	<1	<1	<1	<1	---	---	87-68-3	Hexachlorobutadiene	<1	<1	<1	<1	---	---
124-48-1	Dibromochloromethane	<1	<1	<1	<1	---	---								

* = Dutch intervention and target values specified for total chlorobenzenes, ** = Dutch intervention and target values specified for total xylenes,

***= Dutch intervention and target values specified for sum of 10 PAH compounds

TABLE 3B

SUMMARY OF VOC RESULTS FOR GROUNDWATER

(1 of 1)

	Well location	BH1A (DEEP)	Dutch Target Value (DTV)	Dutch Intervention Value (DIV)	Drinking Water Quality Standards (DWQS)		Well location	BH1A (DEEP)	Dutch Target Value (DTV)	Dutch Intervention Value (DIV)	Drinking Water Quality Standards (DWQS)
CAS No	**Compound**					**CAS No**	**Compound**				
75-71-8	Dichlorodifluoromethane	<1	---	---		106-93-4	1,2-Dibromoethane	<1	---	---	---
74-87-3	Chloromethane	<1	---	---		127-18-4	Tetrachloroethene	<1	0.01	40	10
75-01-4	Vinyl Chloride	<1	0.01	5	0.5	630-20-6	1,1,1,2-Tetrachloroethane	<1	---	---	---
74-83-9	Bromomethane	<1	---	---	---	108-90-7	Chlorobenzene	<1	7	180	---
75-00-3	Chloroethane	<1	---	---	---	100-41-4	Ethylbenzene	<1	4	150	---
75-69-4	Trichlorofluoromethane	<1	---	---	---	108-38-3*	p / m-Xylene	<1	0.2*	70*	---
156-60-5	trans-1,2-Dichloroethene	<1	0.01	20	---	75-25-2	Bromoform	<1	---	---	10
75-09-2	Dichloromethane	<1	0.01	1000	---	100-42-5	Styrene	<1	6	300	---
75-15-0	Carbon disulphide	<1	---	---	---	79-34-5	1,1,2,2-Tetrachloroethane	<1	---	---	---
75-35-4	1,1-Dichloroethene	<1	0.01	10	---	95-47-6	o-Xylene	<1	0.2*	70*	---
75-34-3	1,1-Dichloroethane	<1	7	900	---	96-18-4	1,2,3-Trichloropropane	<1	---	---	---
1634-04-4	methyl tert-butyl ether	<1	---	---	---	98-82-8	Isopropylbenzene	<1	---	---	---
156-59-2	cis-1,2-Dichloroethene	<1	0.01	20	---	108-86-1	Bromobenzene	<1	---	---	---
74-97-5	Bromochloromethane	<1	---	---	---	95-49-8	2-Chlorotoluene	<1	---	---	---
67-66-3	Chloroform	<1	6	400	10	103-65-1	Propylbenzene	<1	---	---	---
594-20-7	2,2-Dichloropropane	<1	---	80	---	106-43-4	4-Chlorotoluene	<1	---	---	---
107-06-2	1,2-Dichloroethane	<1	7	400	3	95-63-6	1,2,4-Trimethylbenzene	<1	---	---	---
71-55-6	1,1,1-Trichloroethane	<1	0.01	300	---	99-87-6	4-Isopropyltoluene	<1	---	---	---
563-58-6	1,1-Dichloropropene	<1			---	108-67-8	1,3,5-Trimethylbenzene	<1	---	---	---
71-43-2	Benzene	<1	0.2	30	1	95-50-1	1,2-Dichlorobenzene	<1	3	50	---
56-23-5	Carbon tetrachloride	<1			---	106-46-7	1,4-Dichlorobenzene	<1	3	50	---
74-95-3	Dibromomethane	<1	---	---	---	135-98-8	sec-Butylbenzene	<1	---	---	---
78-87-5	1,2-Dichloropropane	<1	0.8	80	---	98-06-6	tert-Butylbenzene	<1	---	---	---
75-27-4	Bromodichloromethane	<1	---	---	10	541-73-1	1,3-Dichlorobenzene	<1	3	50	---
79-01-6	Trichloroethene	<1	24	500	10	104-51-8	n-Butylbenzene	<1	---	---	---
10061-01-5	cis-1,3-Dichloropropene	<1	---	---	---	96-12-8	1,2-Dibromo-3-chloropropane	<1	---	---	---
10061-02-6	trans-1,3-Dichloropropene	<1	---	---	---	120-82-1	1,2,4-Trichlorobenzene	<1	0.01	10	---
79-00-5	1,1,2-Trichloroethane	<1	0.01	130	---	91-20-3	Naphthalene	<1	0.01	70	---
108-88-3	Toluene	<1	7	1,000	---	87-61-6	1,2,3-Trichlorobenzene	<1	0.01	10	---
142-28-9	1,3-Dichloropropane	<1	---	---	---	87-68-3	Hexachlorobutadiene	<1	---	---	---
124-48-1	Dibromochloromethane	<1	---	---	10						

Notes: all units in µg / l

* = Dutch intervention and target values specified for total xylenes

Appendices

Appendix A

Borehole logs

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS01
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Grass over medium brown TOPSOIL.	0.04	01	G		
	MADE GROUND; Soft fine medium brown, slightly silty SAND with some rootlets and occasional sub rounded grey gravels and brick fragments.	0.42				
0.5	MADE GROUND; Soft, very fine light brown clayey SAND.	0.48				
	MADE GROUND; firm clayey SAND matrix containing grey cobbles, crushed concrete and rounded fine to medium gravels.	0.78				
1.0	MADE GROUND; Soft fine medium brown clayey SAND with some sub-rounded cobble sized stone fragments.	1				
	Unrecovered.	1.29	02	G		
1.5	MADE GROUND; semi-soft brown slightly damp silty SAND with many fine to medium sub rounded grey-black gravels.	1.5				
	MADE GROUND; soft very fine light brown SAND.					
2.0						
2.5						
	NATURAL GROUND; semi firm light brown silty CLAY with occasional sub rounded medium grey gravel.	2.9				
3.0		3				
	END OF HOLE @ 3.00m BGS					
	The borehole was terminated at three metres in clay.					
3.5						
4.0						
4.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS02
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft medium brown TOPSOIL.	0.03				
	MADE GROUND; Very soft, fine dark brown to black silty SAND with occasional medium angular sized brick fragments and occasional sub-rounded grey gravels. Some broken pottery fragments.		03	G		
0.5		0.57				
	MADE GROUND; Soft, light brown to red sandy CLAY with many grey subrounded gravels. Rare areas of black charcoal like material and areas of very soft, light brown CLAY.					
		0.91				
1.0	MADE GROUND; Semi firm dark brown silty SAND with occasional brick fragments, many sub-rounded and sub-angular grey gravels.	1				
	MADE GROUND; Very wet and very fine silty dark brown to black SAND, some fine to medium fragments of angular brick. Some areas of finer grey clay.	1.2				
	MADE GROUND; Fine semi-firm silty SAND with many brick fragments and rare cloth fibres.					
1.5		1.55				
	MADE GROUND; Very firm crushed BRICK with fragments of gravel sized stone. Black, fine angular charcoal fragments					
	MADE GROUND; Semi firm, black, fine to medium GRAVELS with some stones, small fragmets of brick. Slightly sweet odour.	1.72	04	G		
	NATURAL GROUND; Soft grey to brown slightly silty CLAY.	1.9				
2.0	Unrecovered	2				
		2.24				
	NATURAL GROUND; soft, very fine light brown, red in places, silty CLAY.					
2.5						
3.0	END OF HOLE @ 3.00m BGS	3				
	The borehole was terminated at 0.4 metres in made ground. Three additional attempts made in the vicinity, all experienced refusals at 0.4m in reinforced concrete.					
3.5						
4.0						
4.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG UK 033154 KIRKBY SI.GPJ CRA_UK.GDT 01/12/04

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS03
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH mBGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH mBGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft fine brown TOPSOIL.	0.1				
	MADE GROUND; Large brick fragment.	0.15				
	MADE GROUND; Semi-firm to soft, fine dark brown clayey SAND with occasional firm angular red brick fragments, some rootlets.		05	G		
0.5						
	MADE GROUND; One medium crushed BRICK fragment.	0.75				
	MADE GROUND; Semi-firm to firm, slightly silty brown, with some black streaks, CLAY with rare sub angular gravels.	0.9				
1.0						
	MADE GROUND; Soft, fine dark brown to black silty SAND with occasional fine angular brick and tile fragments and some small gravels.	1.4				
1.5	NATURAL GROUND; Very firm, very dry light grey to brown slightly silty sandy CLAY. Some fine angular pebbles.	1.55				
	NATURAL GROUND; Very soft, very fine light bron SAND.	1.8	06	G		
	NATURAL GROUND; Soft, smooth medium brown CLAY.	1.9				
2.0						
	NATURAL GROUND; Semi firm, light brown SAND.	2.2				
	NATURAL GROUND; Semi soft smooth medium brown CLAY.	2.4				
2.5						
	NATURAL GROUND; One firm, light brown sandstone fragment/ cobble.	2.6				
	NATURAL GROUND; Soft, smooth medium brown CLAY.	2.7				
3.0						
	END OF HOLE @ 3.00m BGS	3				
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS04
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL.	0.05				
	MADE GROUND; Soft sand TOPSOIL with some rootlets, occasional fine sub-rounded grey pebbles and rare brick fragments	0.2				
	MADE GROUND; Firm slightly clayey medium to light brown SAND with sub-angular light brown gravels. One rare medium angular coal like fragment and some brick fragments Also one large gritstone at @0.7m					
0.5		0.75				
	MADE GROUND; Semi firm to soft, brown to black slightly sandy and silty CLAY. Occasional brick fragments, rare black angular shiney fragments.					
1.0		1				
	MADE GROUND; Soft sandy brown to black CLAY, some angular brick fragments with some fine coal like material		07	G		
	MADE GROUND; Soft black streaks dark brown CLAY with some angular brick fragment sand one large wood fragment and occasional grey pebbles.	1.25				
1.5		1.6				
	MADE GROUND; Soft light brown to red SAND with areas of black sand. One large rounded sandstone fragment and occasional small grey pebbles.					
2.0		2				
	NATURAL GROUND; Firm grey CLAY with bands of soft fine grey black sand.		08	G		
2.5		2.5				
	NATURAL GROUND; Firm grey CLAY with bands of soft fine grey black sand with sandstone fragments.	2.6				
	NATURAL GROUND; Very soft, fine black brown slightly damp SAND.	2.7				
	NATURAL GROUND; Firm grey CLAY with bands of soft fine grey black sand with sandstone fragments.					
3.0		3				
	END OF HOLE @ 3.00m BGS					
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS05
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL	0.05				
	MADE GROUND; Semi firm brown SAND with some brick fragments and very small angular grey gravels. Rare fine coal like fragments, some medium cobbles of standstone.		09	G		
	MADE GROUND; Firm clayey, sandy brown CLAY with crushed red brick fragments. Some small angular pebbles.	0.85				
	MADE GROUND; Firm, brown sandy SOIL with many fine brick and stone fragments.	1				
	MADE GROUND; Semi loose to firm angular fragmets of tar in a semi soft brown sandy CLAY. Some brick fragments.	1.13	10	G		
	- MADE GROUND; Brown semi-firm sandy CLAY with fragments of wood, broken brick fragments, brittle light brown sandstone fragments and somegravels of crushed granite. from 1.31 to 1.76m BGS	1.31				
	MADE GROUND; Firm sandy black to brown CLAY with some fine brick and occasional sandstone fragments.					
	MADE GROUND; Loose dark brown SAND. Some sub angular stones and very small glass fragments.	2				
	MADE GROUND; Very loose dark brown slightly clayey SAND with many fine fragments of crushed bricks	2.15				
	MADE GROUND; One large cobble and many small fragments of of crushed GRANITE	2.3				
	MADE GOUND; Soft dark brown clayey SAND with some brick fragments and stones.	2.36				
		2.66				
	END OF HOLE @ 3.00m BGS					

0.5
1.0
1.5
2.0
2.5
3.0
3.5

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG UK 033154 KIRKBY SI.GPJ CRA_UK.GDT 01/12/04

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS06
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL.	0.04				
	MADE GROUND;Loose dark brown slightly clayey SAND with some angular brick fragments.	0.15				
	MADE GROUND; Firm dark brown SAND.	0.24				
	MADE GROUND; Firm dark brown SAND with some angular stone fragments.					
0.5		0.54				
	MADE GROUND; Firm dark brown clayey SAND with some brick and wood fragments.					
	MADE GROUND; Loose dark brown SAND with fragments of stones and bricks. Rare small coal like fragments.	0.75				
1.0		1				
	MADE GROUND; Semi firm, with some areas of clay, SAND with many brick fragments, pebbles and rootlets.		11	G		
	MADE GROUND; Loose dark brown SAND with occasional black streaks.	1.29				
	NATURAL GROUND; Firm grey CLAY with some sandy layers.	1.39				
1.5						
	NATURAL GROUND; Semi firm dark brown, with occasional grey areas, CLAY with some sandy pockets.	1.66				
2.0		2				
	NATURAL GROUND; Stiff dark brown, with occasional areas of grey, black and red, CLAY. Some very small rounded stones.					
2.5			12	G		
3.0		3				
	END OF HOLE @ 3.00m BGS					
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG UK 033154 KIRKBY SI.GPJ CRA_UK.GDT 01/12/04

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS07
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL	0.04				
	MADE GROUND; Firm dark brown slightly clayey SAND Occasional light brown areas of sand, black shiney tar fragment and a single red / light brown sandstone fragment.					
0.5	MADE GROUND; One medium angular brick fragment in dark brown sandy CLAY.	0.51				
	MADE GROUND; Firm dark brown slightly sandy CLAY. Many subrounded gravels, cobbles and sandstone. Some pieces of black / burnt wood and occcasional fibres. Slight odour.	0.56	13	G		
1.0	MADE GROUND; Soft to semi-firm dark brown slightly sandy CLAY with some brick fragments.	1				
	NATURAL GROUND; Very fine light brown to grey SAND.	1.2				
1.5	NATURAL GROUND;Very soft light grey CLAY with some pockets of light brown golden sand.	1.6				
2.0	NATURAL GROUND; Semi firm to soft dark brown to grey CLAY. Some brittle sandy fragments	2				
2.5						
3.0	END OF HOLE @ 3.00m BGS	3				
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS08
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL.	0.04				
	MADE GROUND; Soft fine very sandy TOPSOIL with some rootlets. Occasional fine angular brick fragments with some semi firm clayey areas.	0.24				
	MADE GROUND; One large possible granite PEBBLE.	0.27				
	MADE GROUND; Loose very fine SAND with fine angular brick fragments and sub rounded grey pebbles. Occasional blue / white glazed pottery with medium rounded grey gravels.	0.47				
0.5	MADE GROUND; Slightly peaty dark brown SAND with some fine red angular brick and black burnt wood fragments.	0.62	12	G		
	NATURAL GROUND; Firm clayey peaty dark brown SAND.	0.9				
	NATURAL GROUND; Firm dark brown clayey SAND	1				
1.0	NATURAL GROUND; Soft very fine dark brown to red SAND with some red rounded pebbles.	1.25	13	G		
	NATURAL GROUND;Loose light brown to tan SAND with some grey sub-angular gravels.	1.47				
1.5	NATURAL GROUND; Very fine, semi soft grey CLAY with gravel layer and small rounded pebbles.	1.7				
	NATURAL GROUND; Loose very fine light brown SAND with occasional pebbles.	2				
2.0	NATURAL GROUND; Fine light brown to tan SAND	2.2				
	NATURAL GROUND; Soft dark brown to red CLAY.					
2.5						
3.0	END OF HOLE @ 3.00m BGS	3				
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG UK 033154 KIRKBY SI.GPJ CRA_UK.GDT 01/12/04

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS09
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH mBGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH mBGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL	0.04				
	MADE GROUND; Dark brown / black SAND with rootlets and some angular gravels	0.32				
0.5	MADE GROUND; Semi firm dark brown CLAY with some lighter brown sandy areas. Many red and grey angular gravels, areas of fine red sand and brittle yellow sandstone. Occasional coal like fragments.	0.7	14	G		
	MADE GROUND; Semi firm slightly clayey SAND with some fine to medium red / grey gravels. Some coal like fragments.	1				
1.0	NATURAL GROUND; Very fine dark red / brown SAND.	1.25				
	NATURAL GROUND; soft light brown SAND with some areas of soft clay. Black angular gravels and one medium rounded grey cobble.	1.5				
1.5	NATURAL GROUND; Semi firm sandy CLAY.	1.9				
	NATURAL GROUND; Loose tan coloured SAND with some medium rounded and occasional very fine grey granite gravels.	2.2				
2.0	NATURAL GROUND; Smooth soft chocolate brown CLAY	2.85				
2.5						
	END OF HOLE @ 3.00m BGS					
3.0						
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS10
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL	0.04				
	MADE GROUND; Fine semi firm dark brown slightly silty SAND with occasional fine to medium fragments of brick. Rare sub rounded standstone fragments.	0.38				
0.5	MADE GROUND; Fine red brown SAND with medium red sandstone fragments and some light brown medium rounded cobbles.	0.5				
	MADE GROUND; Semi firm slightly clayey dark brown SAND with some areas of semi soft red clay. Occasional fragments of wood fibres, angular sandstone and fine rounded red gravels.		15	G		
1.0	NATURAL GROUND; Green / brown slightly sandy CLAY with occasional angular grey pebbles and one medium sub-angular grey cobble.	1				
	NATURAL GROUND; Semi firm slightly sandy grey / green CLAY with occcasional sub-rounded gravels. Some streaks of fine red sand.	1.2				
1.5	NATURAL GROUND;Very firm dark brown , with occasional pockets of light brown / grey, SAND. Rare sub rounded gravels.	1.42				
	NATURAL GROUND; Fine very wet light brown / tan SAND	1.8				
2.0	NATURAL GROUND; Semi firm grey CLAY with areas of grey sand and rarerounded grey pebbles.	2.1				
2.5						
3.0	END OF HOLE @ 3.00m BGS	3				
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG UK 033154 KIRKBY SI.GPJ CRA_UK.GDT 01/12/04

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS13
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sampler
FIELD PERSONNEL: CW/IL

DEPTH mBGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH mBGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL.	0.04				
	MADE GROUND; Semi soft dark brown SAND with rootlets					
	MADE GROUND; Semi soft dark brown SAND with rootlets with medium angular eroded brick.	0.34				
	MADE GROUND; Semi soft dark brown sandy CLAY with fragments of blue polystyrene like material and one medium rounded cobble.	0.39	16	G		
	MADE GROUND; Firm red brown CLAY with some fine grey pebbles.	0.75				
	MADE GROUND; Firm brown / black CLAY with one cobbl sized fragment of blue polystyrene.	0.8				
	MADE GROUND; One crushed red brick.	1				
	Unrecovered	1.05				
	MADE GROUND; Semi firm SAND with occasional brick fragments.	1.5				
	MADE GROUND; Firm brown / grey CLAY with some brown sand areas and small brick fragments.	1.6				
	NATURAL GROUND;Firm medium red/brown smooth CLAY.	1.85				
	END OF HOLE @ 3.00m BGS	2.65				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: Kirkby Field Investigation
PROJECT NUMBER: 033154
CLIENT: Eastman Kodak Corporation
LOCATION: Kirkby, Liverpool

HOLE DESIGNATION: WS17
DATE COMPLETED: 27 September 2004
DRILLING METHOD: Window sample
FIELD PERSONNEL: CW/IL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH m BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (m)	SAMPLE 'N' VALUE
	MADE GROUND; Turf, soft brown TOPSOIL.	0.06				
	MADE GROUND; Very fine dark brown SAND with angular brick fragments .	0.27				
	MADE GROUND; One large concrete cobble.	0.35				
0.5	MADE GROUND; Dark brown clayey SAND with large grey granite gravel and many fine to medium gravels. Occasional pieces of plastic.	0.65				
	MADE GROUND; One large BRICK cobble.	0.75				
	NATURAL GROUND;Very fine soft brown / tan coloured SAND.	1.05				
1.0	NATURAL GROUND; Firm very smooth greeny grey CLAY with some small stones / pebbles around 1.35.	1.35	17	G		
	NATURAL GROUND; very soft tan / brown SAND.	1.5				
1.5	NATURAL GROUND; Semi firm smooth dark brown CLAY with occasional fine grey sand.	2.05				
2.0						
2.5						
	END OF HOLE @ 3.00m BGS					
3.0						
3.5						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

Appendix B

Membrane Interface Probe (MIP) Report

SOILS INVESTIGATION
AT
KODAK LTD, KIRKBY
NR LIVERPOOL

FOR

CRA

REPORT NO:	ENV043528-1
ISSUE NO:	1
DATE:	13th October 04

CONFIDENTIAL

SOILS INVESTIGATION
AT
KODAK LTD, KIRKBY
NR LIVERPOOL

REPORT NO: **ENV043528-1**

CLIENT : **CRA**
6 CLARENDON STREET
NOTTINGHAM
NG1 5HQ

REPORT ISSUE STATUS

1	13th October 2004	DRAFT REPORT	LRFB		DC	
Issue	**Date**	**Description**	**Prepared**	**Checked (Signed)**	**Approved (Printed)**	**Approved (Signed)**

Date: 13 October 2004
Our Ref: O:\Projects\Basingstoke\ENV043528\Report

CRA
6 CLARENDON STREET
NOTTINGHAM
NG1 5HQ

Attention: Chris Wood

Dear Sirs,

SOILS INVESTIGATION AT KODAK LTD, KIRKBY, NR LIVERPOOL

We have pleasure in submitting one draft copy of our factual report concerning Geoprobe™ Membrane Interface Probe (MIP) tests and Geoprobe™ soil sampling at the above site. This work was performed to obtain factual information at the site on the presence of semi-volatile organic carbon contamination in the soil and ground water.

We trust that you will find this report satisfactory, but should you have any comments or require any additional information, then please do not hesitate to contact the undersigned.

Yours faithfully,
FUGRO ENGINEERING SERVICES LIMITED

D L Cook
Geo-Environmental Engineer

CONTENTS

		Page No.
1.	INTRODUCTION	2
2.	THE SITE GEOLOGY	2
2.1	SITE LOCATION AND DESCRIPTION	2
2.2	GEOLOGY	2
3.	MEMBRANE INTERFACE PROBE TESTING	2
3.1	GENERAL	2
3.2	METHOD OF TESTING	3
3.3	RESULTS	4
3.4	SYSTEM CHECK	4
4.	GEOPROBE™ SOIL SAMPLING	5
4.1	GENERAL	5
4.2	METHOD OF SOIL SAMPLING	5
5.	REFERENCES	5

APPENDIX A
General Site Location Plan
Service Constraints
Data Sheet - - "MIP System"
"Geoprobe™ system"

APPENDIX B
Membrane Interface Probe Test Results

APPENDIX C
Soil sampling details

APPENDIX D
System Check

1. INTRODUCTION

On the instructions and under the supervision of CRA (the Client and Engineer), a soils investigation has been carried out by Fugro Engineering Services (FES) Limited at the Kodak facility in Kirkby near Liverpool.

The investigation consisted of carrying out twenty five Membrane Interface Probe Tests at twenty two locations, and one Geoprobe™ soil sample location, as specified by the Client. A factual report was requested including field testing records and a site plan. This work was performed to obtain factual data on the presence of semi-volatile organic carbon contamination in the soil and ground water.

The works were instructed by the Client's faxed Purchase Order Number CRA/377/04, dated 27th August and was carried between the 21st August and 22nd August 2004.

2. THE SITE GEOLOGY

2.1 SITE LOCATION AND DESCRIPTION

The site is located within the Kodak Facility in Kirkby near Liverpool. Refer to the site location plan in Appendix A.

The approximate National Grid reference of the site is SJ 437 988.

At the time of the investigation the site was in use by Kodak Ltd.

2.2 GEOLOGY

The records of the British Geological Survey (Sheet 84 – Wigan - of the 1:50,000 Series Geological Map, Solid Edition) indicate that the site is underlain by glacial and post glacial deposits (thought to comprise peaty clay over Boulder Clay), which in turn overlies Sandstone of Permo-Triassic age.

3. MEMBRANE INTERFACE PROBE TESTING

3.1 GENERAL

The Membrane Interface Probe (MIP) fieldwork was carried out on the 21st August 2004. MIP testing of the ground was performed as detailed below. The probe system

layout is presented in Appendix A. The MIP is a system for detecting the presence of semi-volatile organic carbon compounds (VOC's) in the subsurface. The MIP tool is advanced into the ground using a van mounted Geoprobe™ percussion hammer drilling rig. Soil stratigraphy is inferred from electrical conductivity measurements. A total of twenty five MIP's were made at twenty two locations, as set out by the Client's representative on site.

3.2 METHOD OF TESTING

The MIP system allows VOCs in the soil to cross a heated hydrophobic membrane where they enter a gas stream of inert gas (nitrogen) and are carried to a detector mounted in the vehicle. Depth is recorded by means of a depth encoder which transmits depth data to the logging computer. The inert carrier gas takes the VOCs to a set of detectors mounted in series on a gas chromatograph (GC). The return gas flow goes firstly to the Photo Ionising Detector (PID) then to a flame Ionising Detector (FID) and finally to a Dry Electrolytic Conductivity Detector (DELCD). The results from the MIP tests are presented in Appendix B. The results are presented against depth and include membrane temperature, rate of penetration, detector output for FID, PID and DELCD.

For the Geoprobe™ percussion deployed MIP, measurements of electrical conductivity (EC) were made. The data from the EC sensor are presented in Appendix B. In ground saturated with fresh water low conductivity readings are associated with granular soils and high conductivity readings are associated with fine grained soils e.g. clays.

The MIP membrane is approximately 7mm in Diameter. The membrane consists of a porous stainless steel substrate impregnated with a polymer. The gas pressure on the inside face of the membrane is kept at approximately 0.3 to 0.5 bar. In order to speed the diffusion through the membrane polymer and to reduce the solubility of the organic compounds in the membrane polymer the membrane is heated. The temperature of the membrane block is constantly monitored by a thermocouple embedded in the membrane block. In the open air temperature is maintained at approximately 125 to 135°C. Once the membrane is driven into the soil the temperature of the membrane reduces to between 75 and 125°C depending on ground conditions.

A constant flow of a clean carrier gas is used to transport the compounds that have crossed the membrane to detectors located in the vehicle. Ultra pure carrier gases are used for this purpose. A gas flow rate of 40ml per minute is typically used. This flow rate gives a return time from the membrane to the detector of about 30 to 35 seconds. The time delay was checked with a calibration sample prior to testing on site.

3.3 RESULTS

The PID is able to detect VOCs that have an electron Volt (eV) potential equal to or near that of the PID ultraviolet lamp. The FID will detect any hydrocarbon compound, i.e. a compound with hydrogen to carbon bonds and is particularly sensitive to methane. The DELCD specifically detects halogenated compounds e.g. chlorinated hydrocarbons such as trichloroethylene (TCE).

The rate of penetration (ROP) data is gathered from the penetration rate logged against time. This data is presented as distance \ time. This data indicates the relative strength of the soils i.e. the slower the ROP the stronger the soils. This is due to the fact that the probe string is driven by a hydraulic hammer which gives a known controlled driving energy.

The electrical conductivity (EC) data is collected from the electrical conductivity 'button' sensor mounted near the tip of the probe. The measurements indicate the soil lithology i.e. low conductivity equates to coarse grained soils (sands \ gravels). Conversely high conductivity equates to fine grained soils (clays \ silts).

3.4 SYSTEM CHECK

During the fieldwork a system check is carried out by spiking the membrane with a known chemical "flash test". The system check is carried out to give a quality control test of the complete MIP system, i.e. to ensure all system components are working correctly.

Various chemicals can be used for the flash test depending on which detectors are to be checked. TCE (Trichloroethylene) is periodically used as it produces a response from all three of the chemical detectors fitted to the GC (PID, FID & DELCD). Butane is also used and produces a response from both the PID and the FID, this along with its quicker clearing from the system makes it the favoured method for testing the system.

The "flash test" is also used to calculate the trip time for the system, i.e. the time for the contaminant to travel from the membrane up the gas line to the detectors. This information is then used in the data processing.

Data from the GC detectors for each of the flash tests performed have been included in Appendix D.

4. GEOPROBE™ SOIL SAMPLING

4.1 GENERAL

The Geoprobe™ soil sampling fieldwork was carried out on the 22nd August 2004. A single soil sample hole was made using a van mounted Geoprobe™ system. A total of 3.00 metres of sampling was performed at the location as set out by the Client's representative on site. A single location only was completed, due to the van sinking in the grass field after heavy rainfall.

4.2 METHOD OF SOIL SAMPLING

Soil samples were taken using a Geoprobe™ discrete piston sampling system, details are presented in Appendix A. The Geoprobe™ sampler takes samples using a combined hydraulic push/percussion drive system, which was deployed from the vehicle.

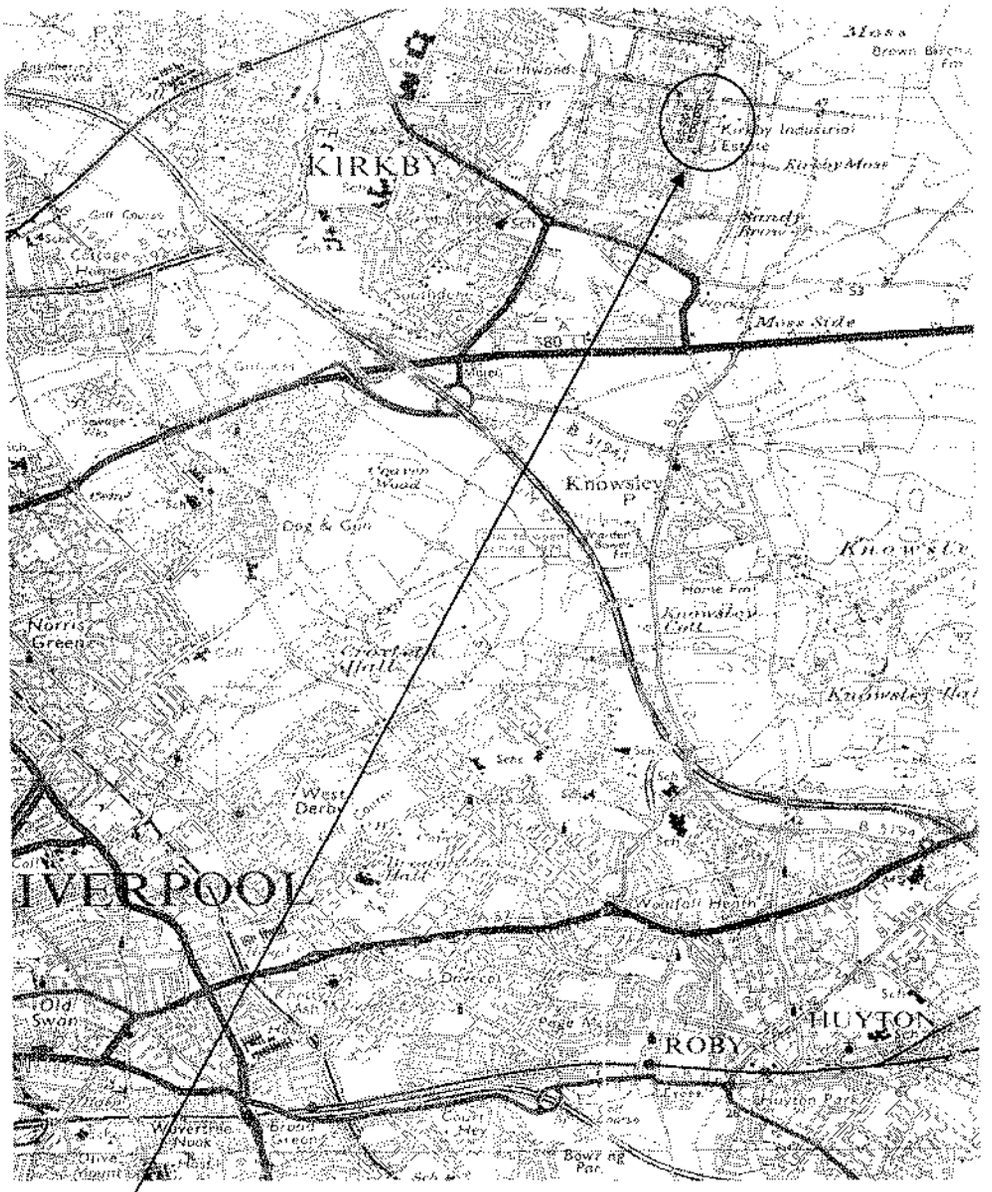
The sampler is fitted with a disposable liner and the assembled sampler is driven to the required sampling depth. The soil sample is recovered in a clear, chemically inert, plastic liner and fitted with end caps to prevent loss of soil or fluid. The test number and depths of each Geoprobe™ are presented in Appendix C. The recovered samples were handed over to the Client's representative during the field works.

5. REFERENCES

Jacobs, P.A., (2000). Spatial delineation of a TCE spill plume in 3 dimensions using in situ data from the membrane interface probe CPT. Implementation of in situ Remediation Techniques - International congress Utrecht, The Netherlands, October 2000.

APPENDIX A

Site Location Plan
Service Constraints
Data Sheets



Approximate Site Location

Reproduced from Landranger® Map 108 - Liverpool 1:50,000 scale, OSGB, 1974, SJ 437 988 by permission of Ordnance Survey® on behalf of The Controller of Her Majesty's Stationery Office

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GENERAL SITE LOCATION PLAN

SERVICE CONSTRAINTS

1. This report and the assessment carried out in connection with the report (together the "Services") were compiled and carried out by Fugro Engineering Services Limited ("FESL") for CRA (the "Client") in accordance with the terms of a contract between FESL and the Client fax dated 27th August 2004. The Services were performed by FESL with the skill and care ordinarily exercised by a reasonable geotechnical specialist at the time the Services were performed. Further, and in particular, the Services were performed by FESL taking into account the limits of the scope of works required by the Client, the time scale involved and the resources, including financial and manpower resources, agreed between FESL and the Client.

2. Other than that expressly contained in paragraph 1 above, FESL provides no other representation or warranty whether express or implied, in relation to the Services.

3. The Services were performed by FESL exclusively for the purposes of the Client. FESL is not aware of any interest of or reliance by any party other than the Client in or on the Services. Unless expressly provided in writing, FESL does not authorise, consent or condone any party other than the Client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and FESL disclaims any liability to such party. Any such party would be well advised to seek independent advice from a competent geotechnical specialist and / or lawyer.

4. It is FESL's understanding that this report is to be used for the purpose described in Section 1 - "Introduction" of this report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, and/or should the Client's proposed development or use of the site change (including in particular any change in any design and/or specification relating to the proposed use or development of the site), this report may no longer be valid or appropriate and any further use of or reliance upon the report in those circumstances by the Client without FESL's review and advice shall be at the Client's sole and own risk. Should FESL be requested, and FESL agree, to review the report after the date hereof, FESL shall be entitled to additional payment at the then existing rates or such other terms as may be agreed between FESL and the Client.

5. The passage of time may result in changes (whether man-made or otherwise) in site conditions and changes in regulatory or other legal provisions, technology, methods of analysis, or economic conditions which could render the report inaccurate or unreliable. The information, recommendations and conclusions contained in this report should not be relied upon if any such changes have taken place or after a period of 2 years from

the date of this report or such other period as maybe expressly stated in the report, without the written agreement of FESL. In the absence of such written agreement of FESL, reliance on the report after any such changes have occurred or after the period of 2 years has expired shall be at the Client's own and sole risk. Should FESL agree to review the report after the period of 2 years has expired, FESL shall be entitled to additional payment at the then existing rates or such other terms as may be agreed between FESL and the Client.

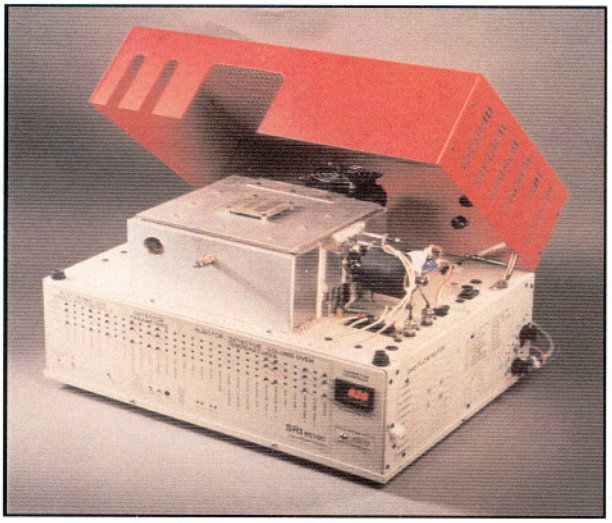
6. The observations, recommendations and conclusions in this report are based solely upon the Services, which were provided pursuant to the contract between the Client and FESL. FESL has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the Client and FESL. FESL is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services.

7. Where the Services have involved FESL's interpretation and/or other use of any information (including documentation or materials, analysis, recommendations and conclusions) provided by third parties (including independent testing and/or information services or laboratories) or the Client and upon which FESL was reasonably entitled to rely or involved FESL's observations of existing physical conditions of any site involved in the Services, then the Services clearly are limited by the accuracy of such information and the observations which were reasonably possible of the said site. Unless otherwise stated, FESL was not authorised and did not attempt to independently verify the accuracy or completeness of such information, received from the Client or third parties during the performance of the Services. FESL is not liable for any inaccuracies (including any incompleteness) in the said information, the discovery of which inaccuracies required the doing of any act including the gathering of any information which it was not reasonably possible for FESL to do including the doing of any independent investigation of the information provided to FESL save as otherwise provided in the terms of the contract between the Client and FESL.

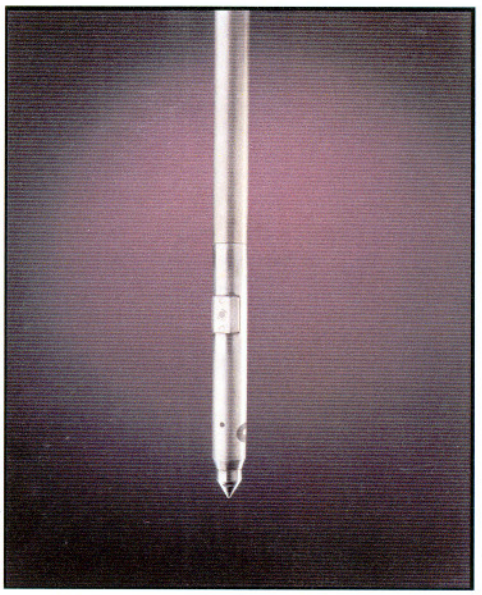
8. The soil and ground conditions information provided in the Services are based solely on evaluations of soil and ground condition samples and in-situ tests at determined sample test locations and elevations. That information cannot be extrapolated to any area or elevation outside those locations and elevations unless specifically so stated in the report. In the light of the information available to FESL, the soil and ground conditions information are considered appropriate for use in relation to the geotechnical design and installation aspects of the structures addressed in the report, but they may not be appropriate for the design of other structures.

Fugro Engineering Services Limited

MEMBRANE INTERFACE PROBE (MIP) FOR DE-LINEATION OF SEMI-VOLATILE ORGANIC CARBON CONTAMINATION



Gas chromatograph system providing in-situ detection of contaminants



MIP probe, usually deployed from one of Fugro's Cone Penetrometer trucks.

Applications

- Rapid continuous accurate in-situ screening for all Semi-VOC (carbon based organic contaminants) in soil and groundwater in both free and dissolved phases e.g.
  - methane
  - aliphatic hydrocarbons
  - halogenated hydrocarbons
  - chlorinated solvents

- The MIP collects almost continuous vertical profiles of contamination distribution that are used to generate 3D contours of the contaminant plume very rapidly.
- Up to 80 metres of probing can be performed in a day.
- Resolution of the Photo Ionising and Flame Ionising detectors is <1 ppm.

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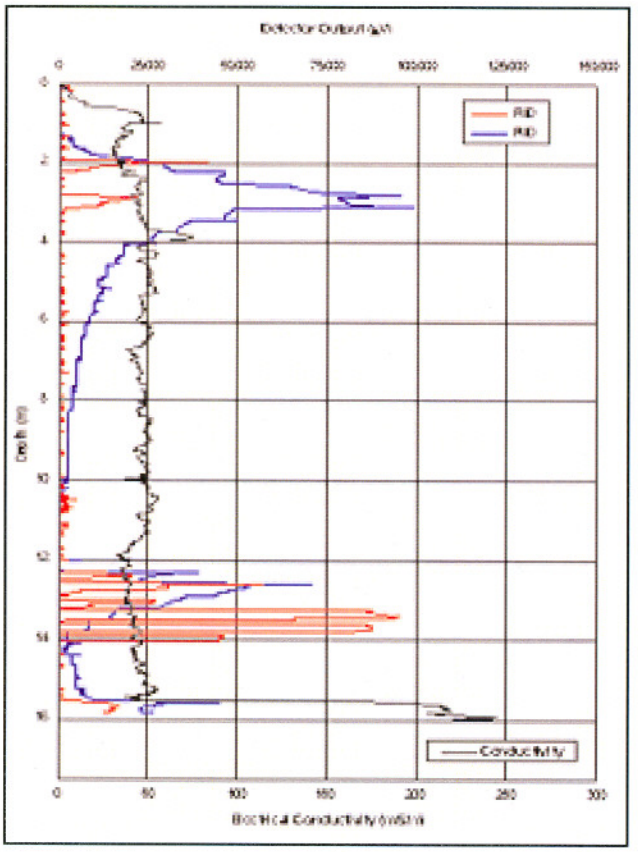
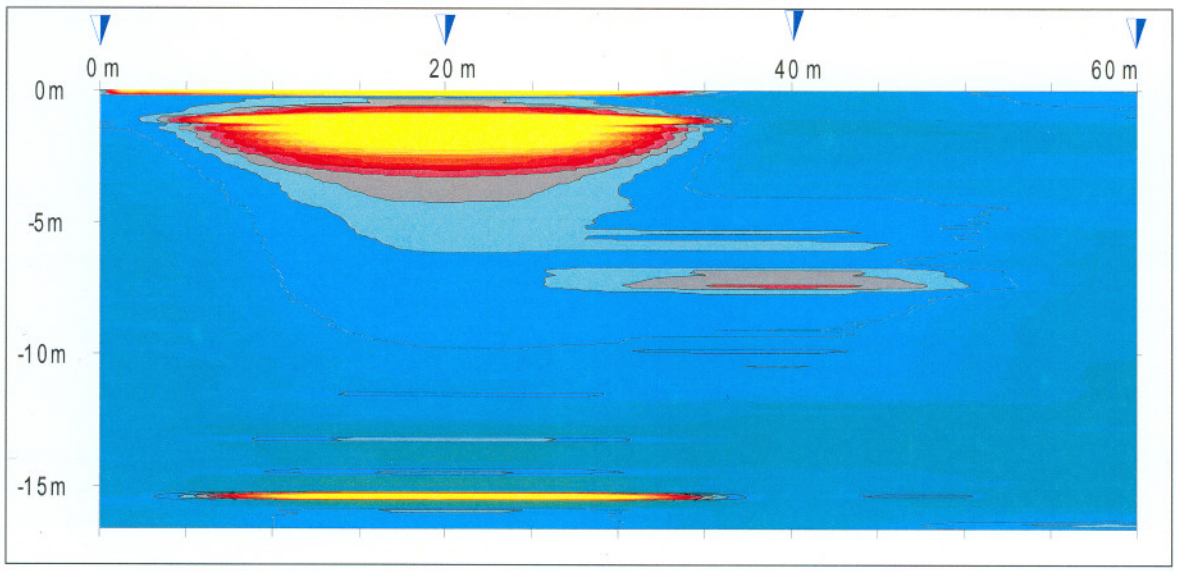
Our major disciplines are Geotechnics, Environmental Services and Survey.

MIP system with typical results





Typical results from a series of MIP tests.

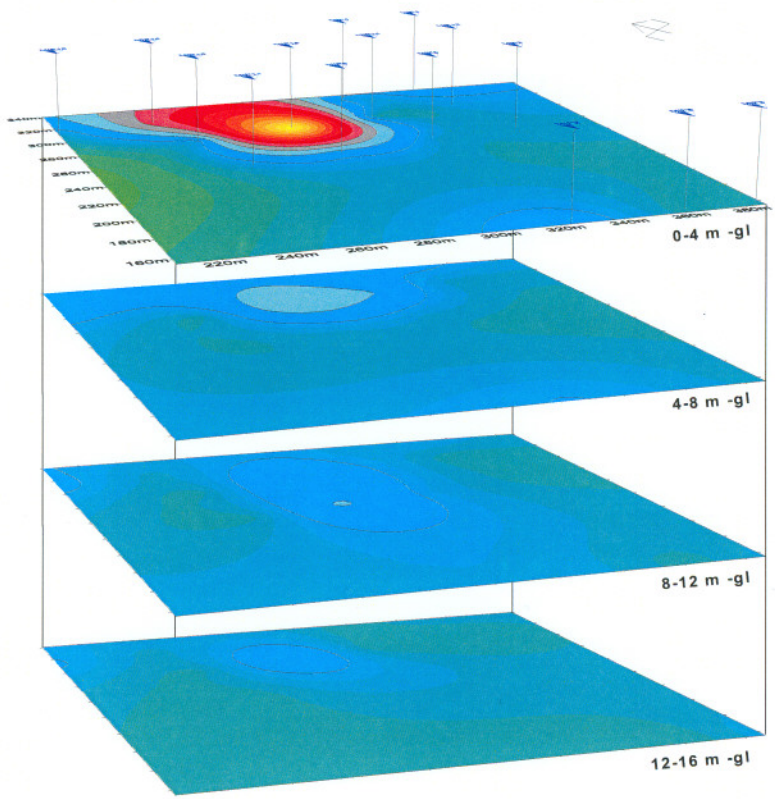
Results

The large volume of digital data (500 data points for a 10 metre test) collected by the MIP system allows high resolution presentation of the data even in 3D or in the form of cross-sections.

The example above provides a clear picture of a contamination plume's extent and the direction the contamination is flowing within the groundwater, as well as the distribution of the free-phase contaminant.

This data presentation permits:-

- planning optimum sampling programme
- effective and accurate placement of wells
- comparison of the effectiveness of remediation



Series of contour slices to map contamination distribution

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Ref: E2-MIP

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Fugro Engineering Services Limited

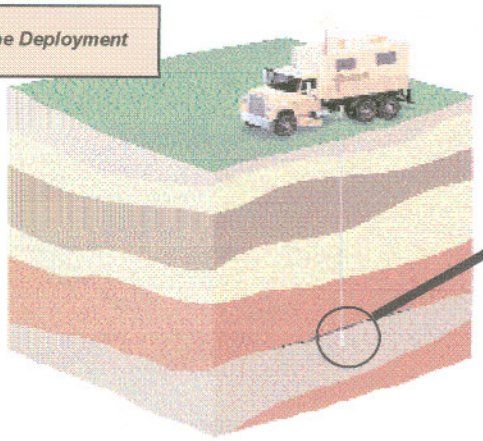
MEMBRANE INTERFACE PROBE (MIP) CPT SYSTEM

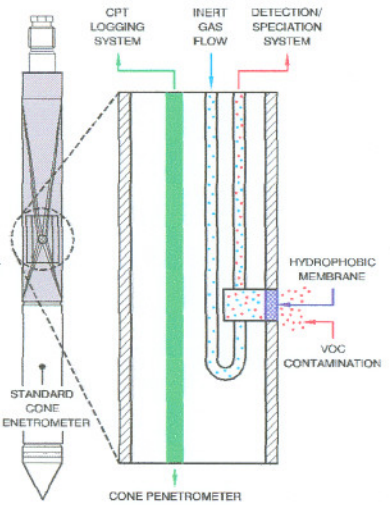
VOC DETECTION - LNAPL & DNAPL HYDROCARBONS

MIP Probe provides data on soil conditions and contamination distribution and can detect:-

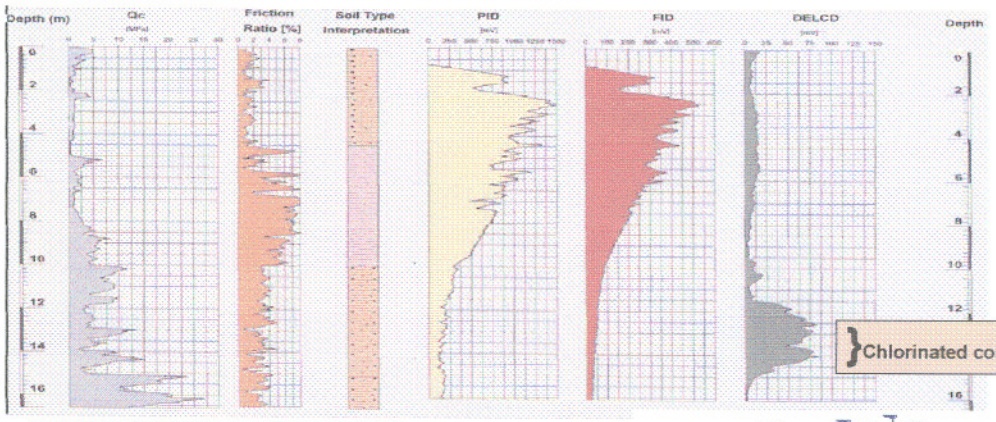
- aromatics (BTEX, PAHs)
- chlorinated hydrocarbon (TCE, PCE.....)
- aliphatics (methane)

Probe Deployment

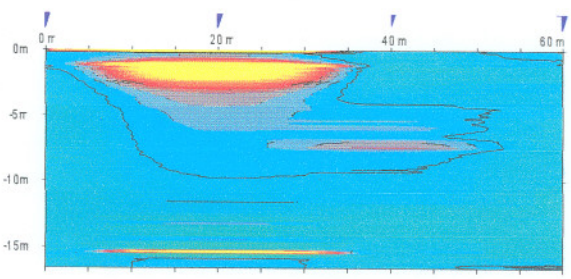




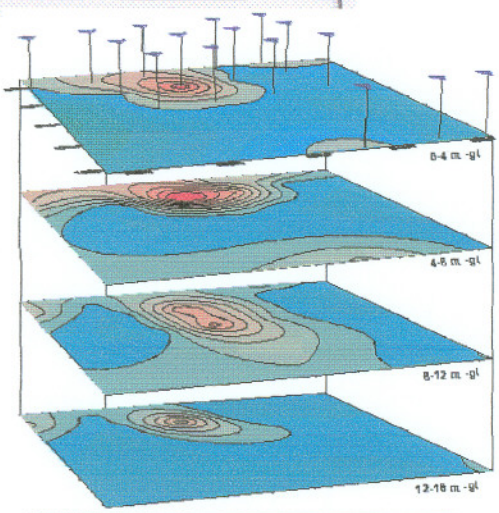
Layout of MIP CPT probe



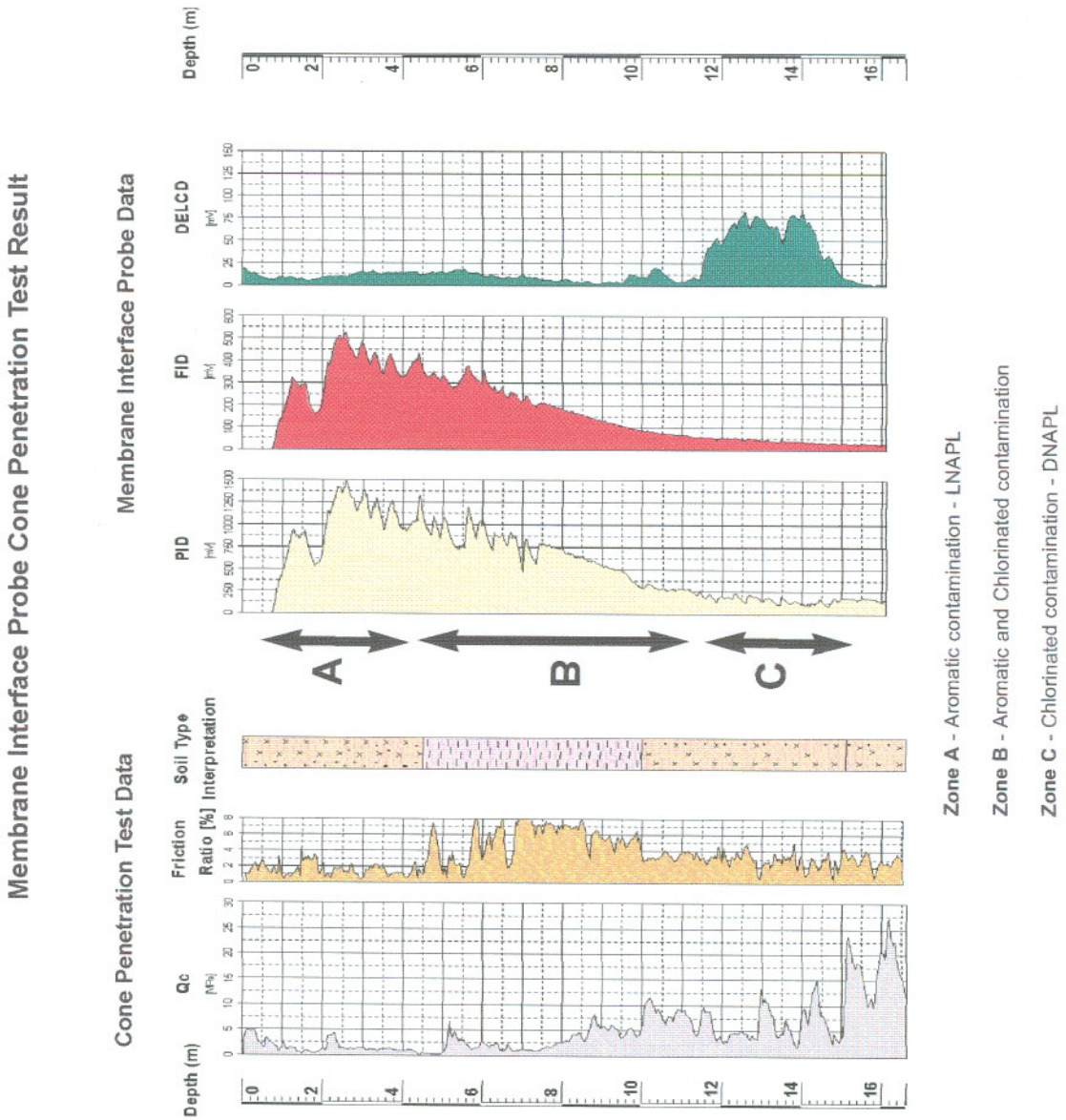
Typical MIP CPT result
SEE OVER FOR DETAIL



MIP contamination distribution



Pseudo 3D MIP contamination distribution



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Ref: E3-VOC Detection

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UKAS TESTING 0925 14853 1656

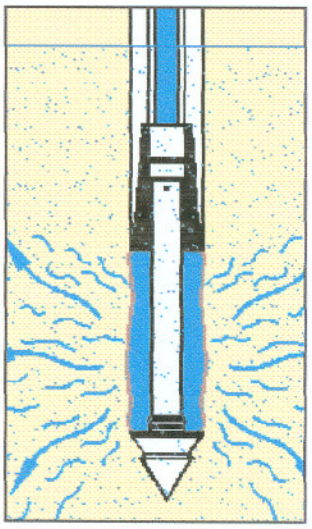
Fugro Engineering Services Limited

REMEDIATION & INVESTIGATION SERVICES

- **Reduce remediation costs**
- **Reduce remediation & investigation programme**
- **Reduce liability exposure**
- **Increase understanding of site problems**

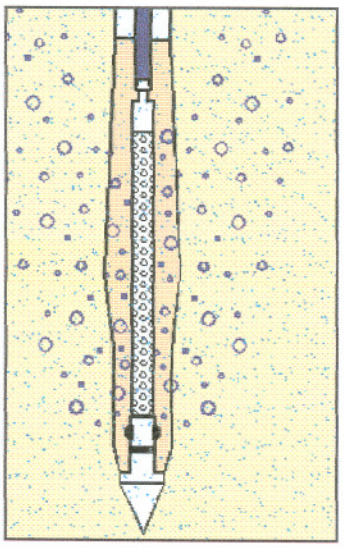
Remediation Fluid Injection

- Cost savings due to control on injected volumes
- Rapid & direct injection of fluids
- Reliable measurements of QC & QA volume injected

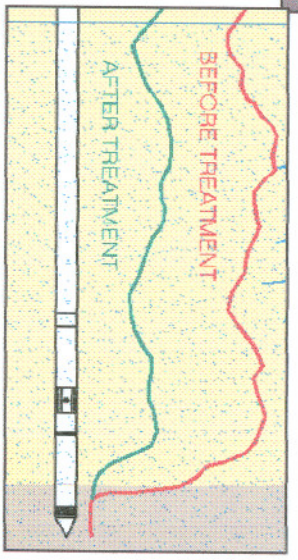


Air Sparging

- More economic than drilled installation
- 10 to 15 installations per day
- US EPA approved.



Versatile operation of tools and implants

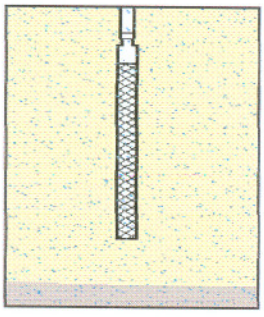


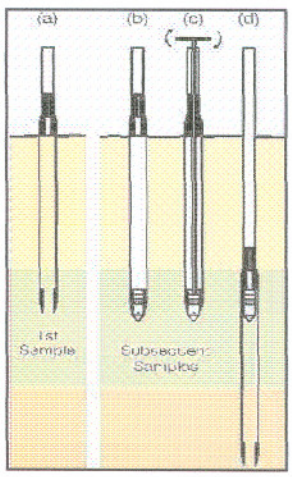
Contamination Screening

- Detailed in-situ detection of contaminants
- Provides detailed lithology of contaminated soil
- Immediate validation of remediation
- Reduced remediation time and cost.

Water Sampling (VOCs)

- No cross contamination of samples
- Reliable data for remediation monitoring





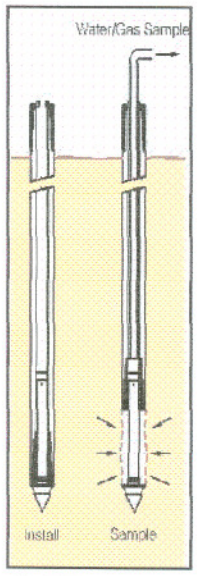
Discrete Soil Sampling - Sequence of Operations

(a) Sample from ground level

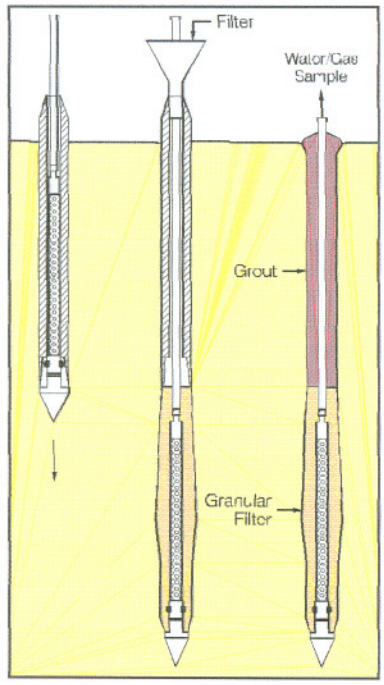
(b) Re-entry for second sample

(c) Release piston

(d) Take second sample



Fluid / Gas Sampler



Soil Gas and Groundwater Sampling Wells

- Powerful vacuum pump draws up soil gas
- Bailer or vacuum pump to collect ground water samples

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Glasgow G33 4DB
Tel: +44 141 774 8828
Fax: +44 141 774 6112
Email: info@fsl.fugro.co.uk

Brunel House, Stephenson Road
Houndmills Estate
Basingstoke
Hants RG21 6XR
Tel: +44 1256 340000
Fax: +44 1256 841798
Email: basingstoke@fes.co.uk

Armstrong House, Unit 43
Number One Industrial Estate
Medomsley Road, Consett
Co. Durhamm DH8 6TW
Tel: +44 1207 581120
Fax: +44 1207 581609
Email: consett@fes.co.uk

Fugro Engineering Services Limited

GEO-ENVIRONMENTAL SAMPLER

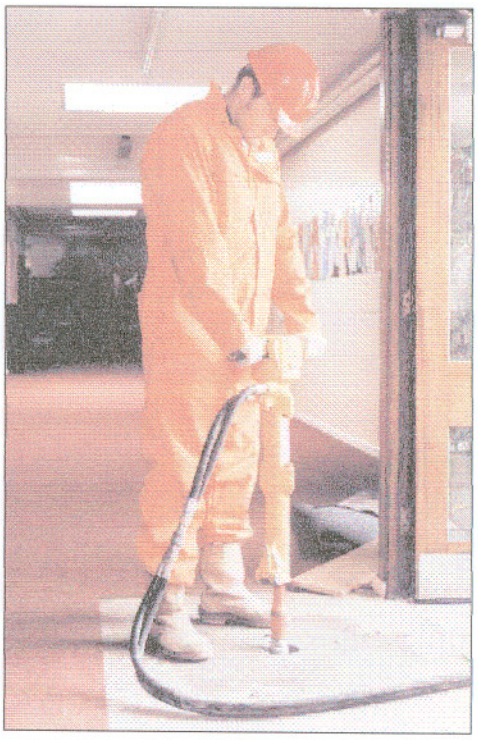
High quality samples of soil / soil gas / groundwater are obtained using the Geoprobe ™ geo-environmental sampler.

The features of the Geoprobe ™ system are:-

- Powerful hydraulic percussion hammer system - depths 10 to 15m routinely achieved
- Pre-drill concrete or tarmac
- Fast operation - 30 to 45m of samples per day
- Releasable piston sampler - no risk of sample cross-contamination
- Samples of soil gas and groundwater obtained from known depth
- Operated from a vehicle or hand portable
- Samples recovered in clear chemically inert liners
- Optional on site analysis using GC / FID.

EQUIPMENT

Vehicle Mounted



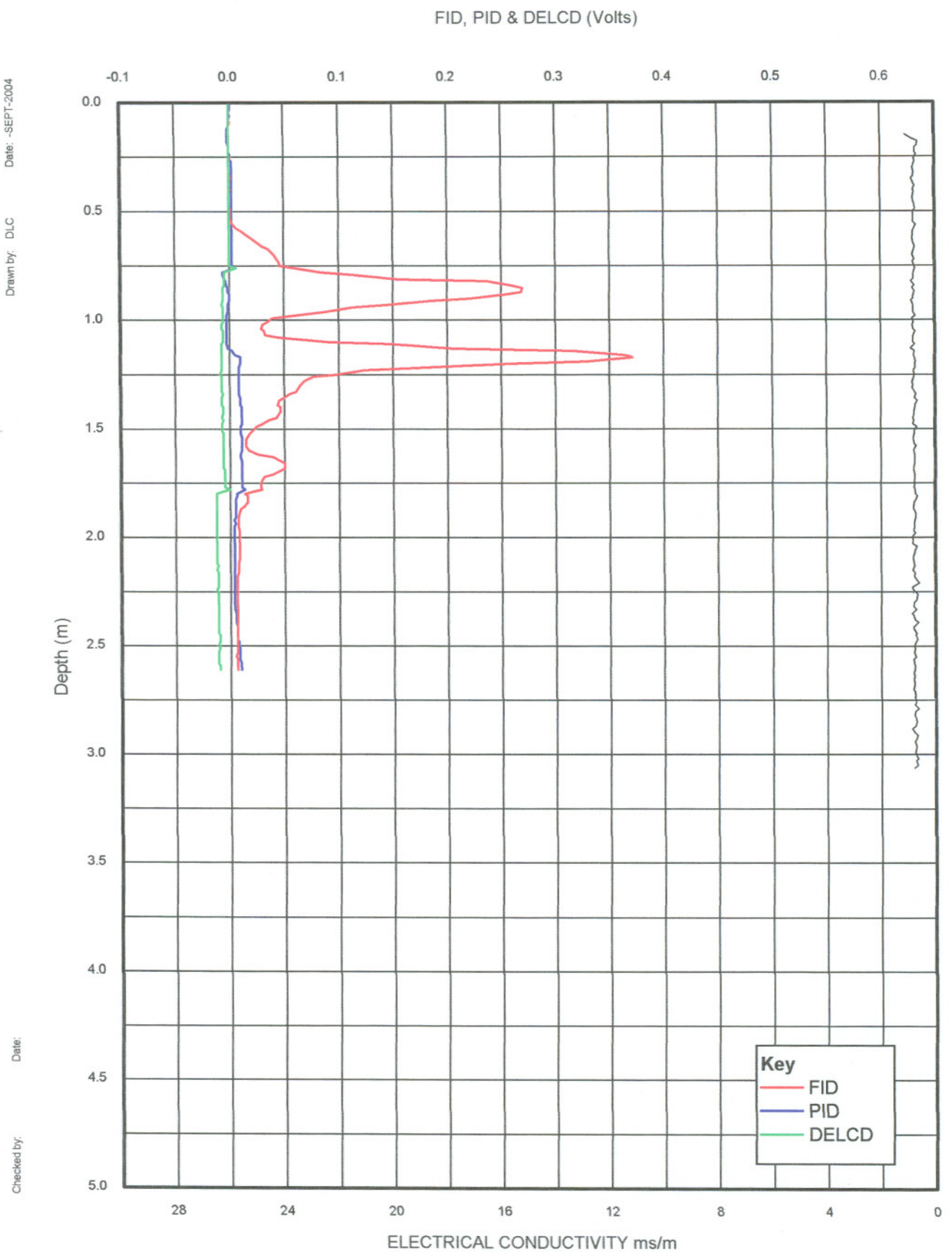
Hand Held

APPENDIX B

Membrane Interface Probe Test Results

Test numbers K1B to K22

CRA
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K1B

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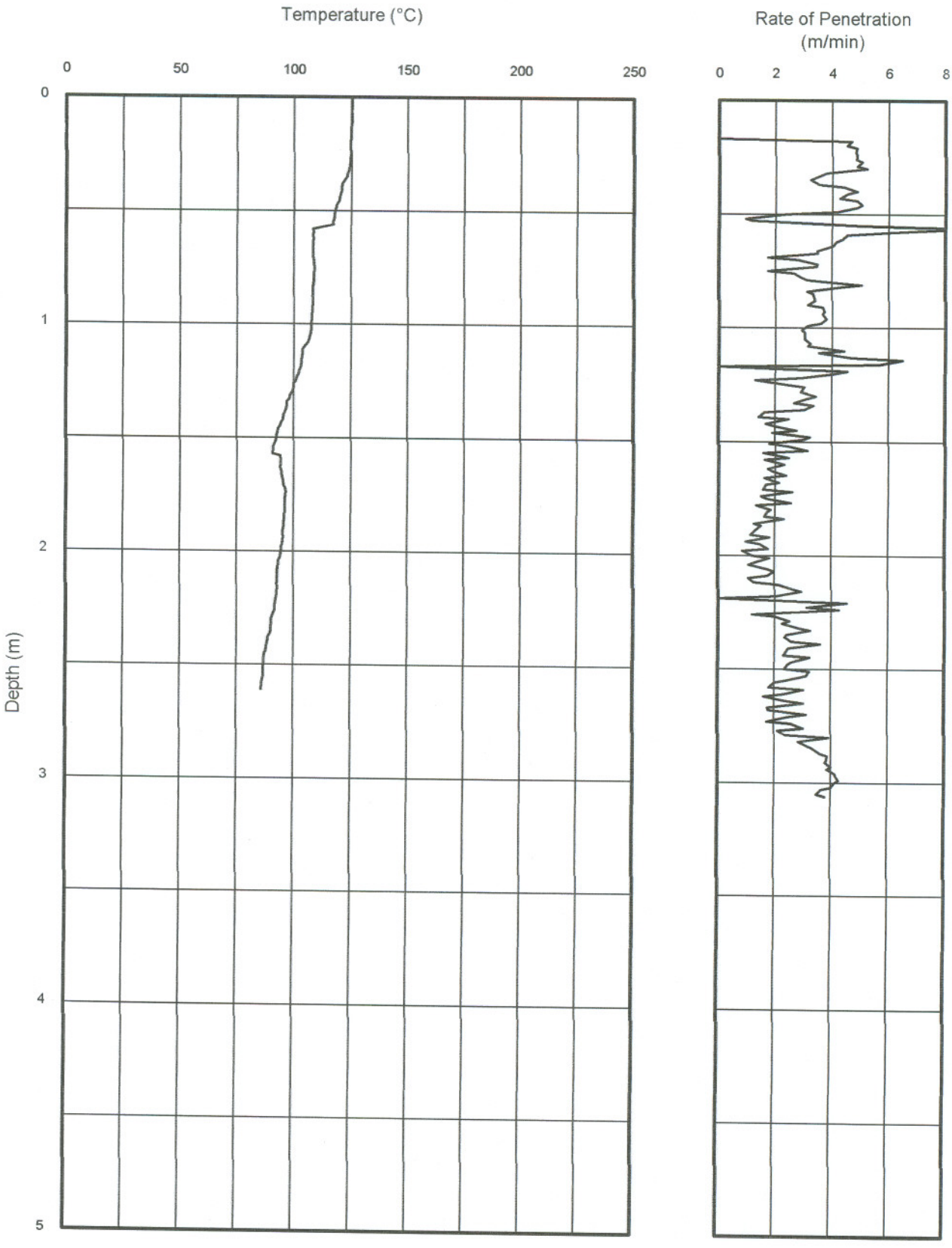
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: -SEPT-2004

Checked by: Date:

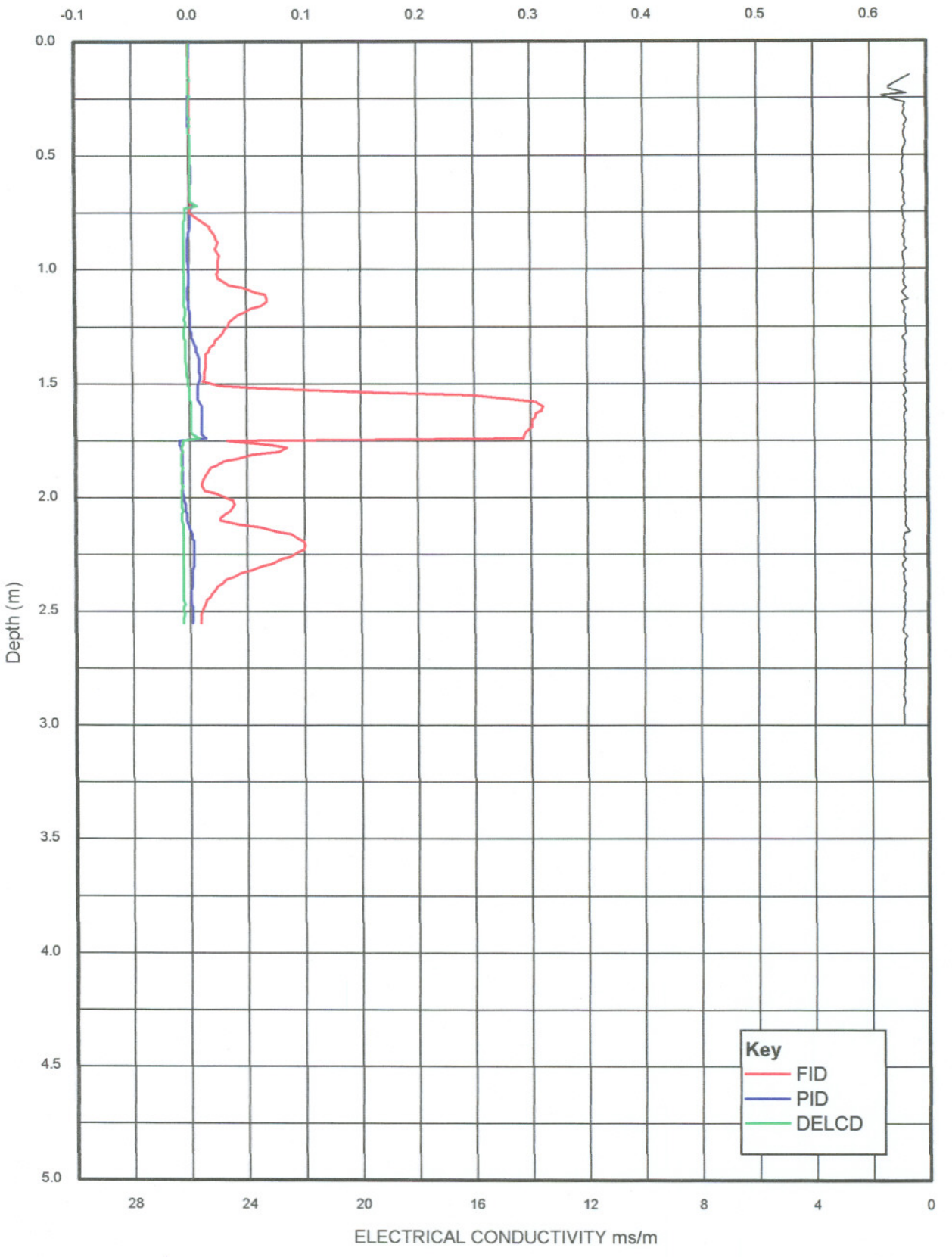
itle

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K1B

CRA
KODAK, KIRKBY, nr LIVERPOOL

Drawn by: DLC Date: 28-SEPT-2004

Checked by: Date:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K2

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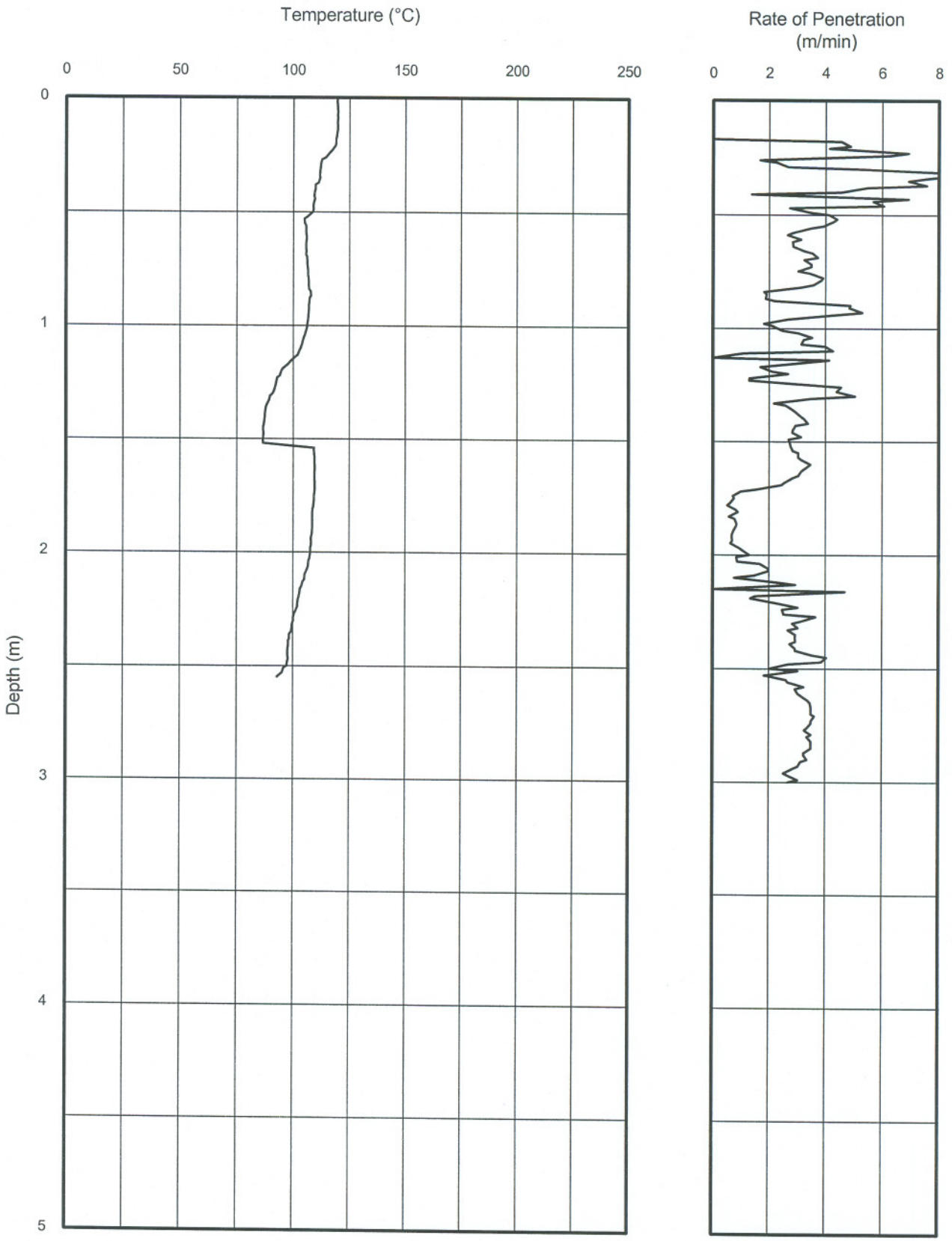
KODAK, KIRKBY, nr LIVERPOOL

Date: 28-SEPT-2004
Drawn by: DLC
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K2

itle

Report No. : ENV043528

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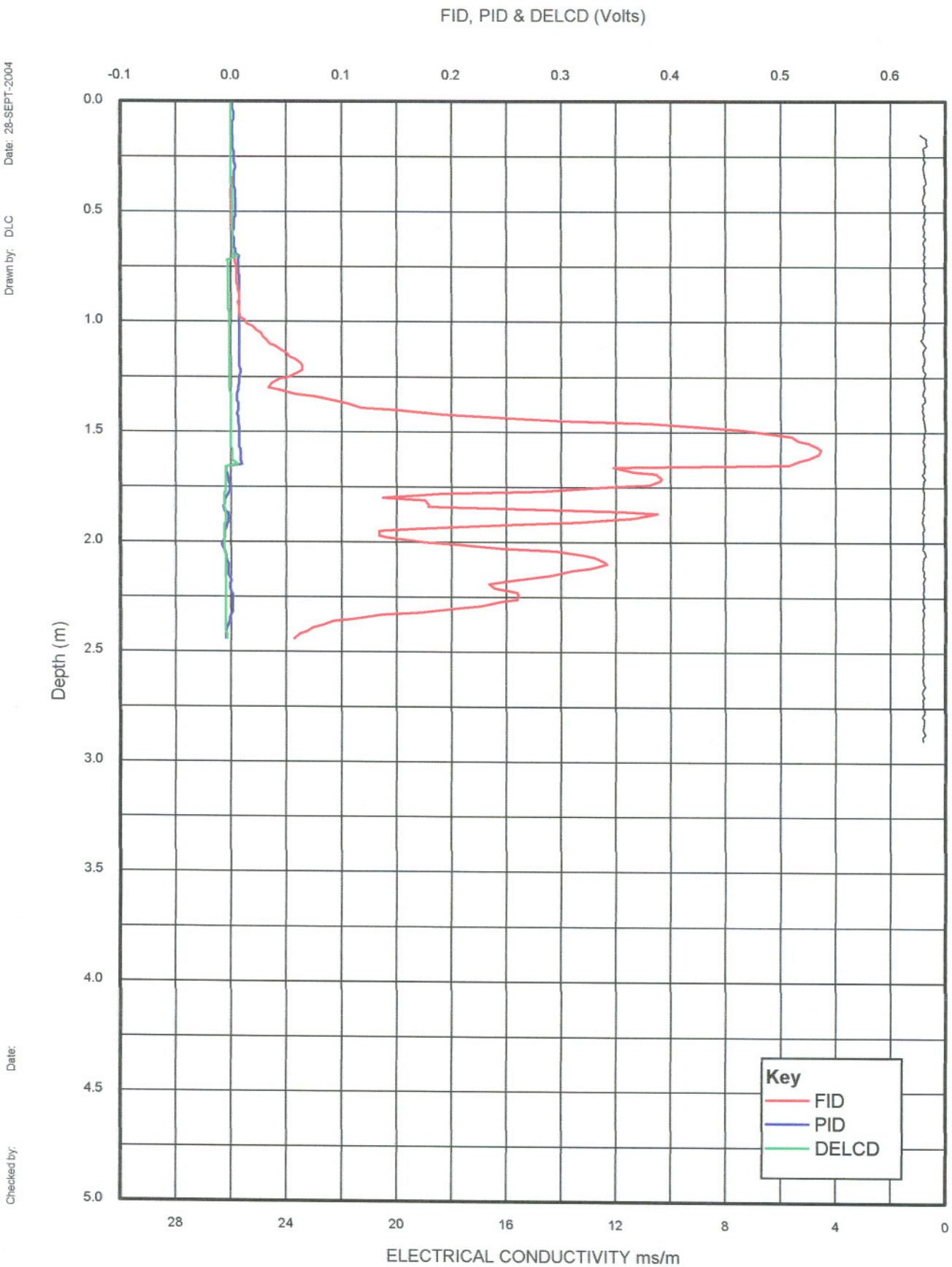
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K3

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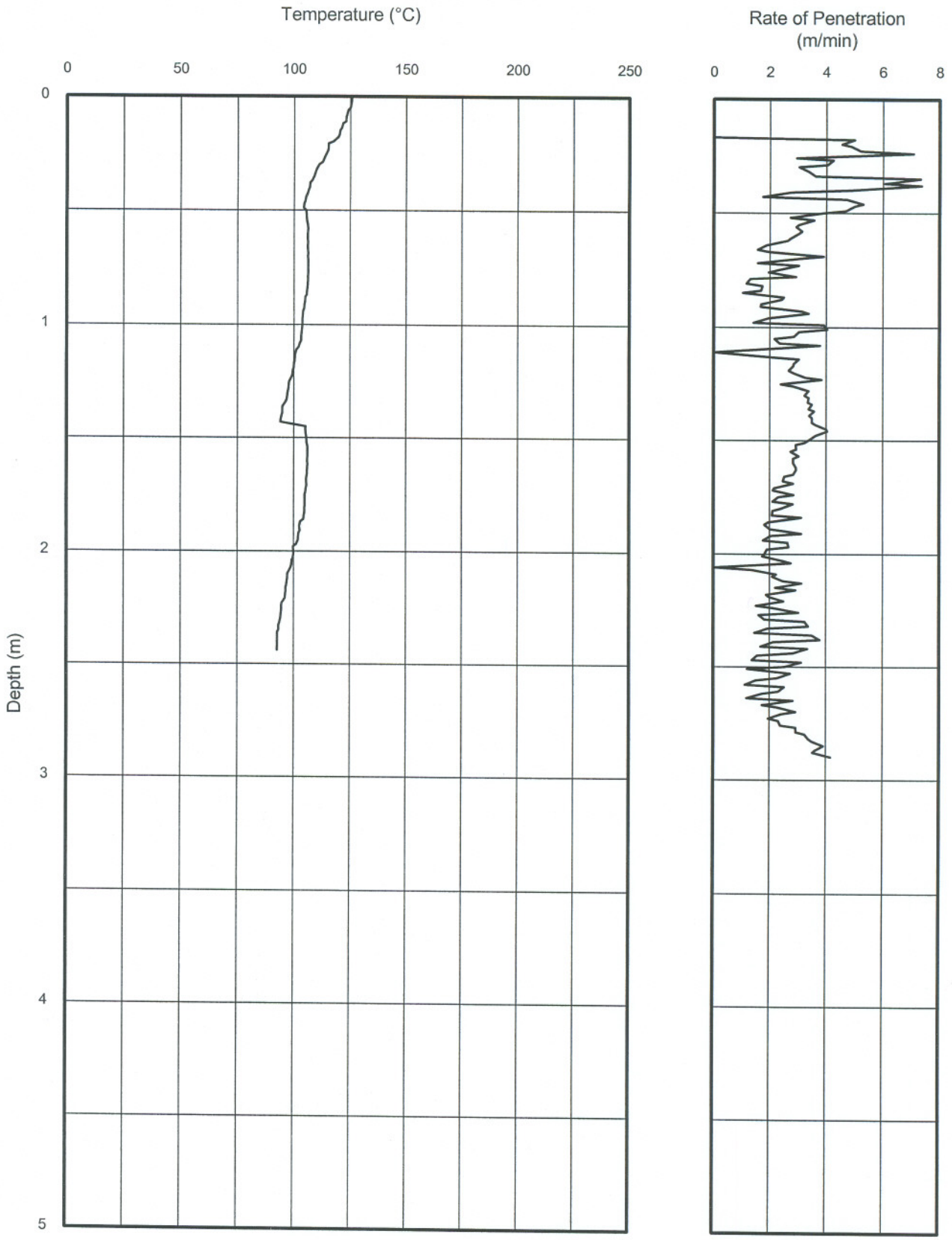
KODAK, KIRKBY, nr LIVERPOOL

Date: 28-SEPT-2004
Drawn by: DLC
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K3

itle

Report No. : ENV043528

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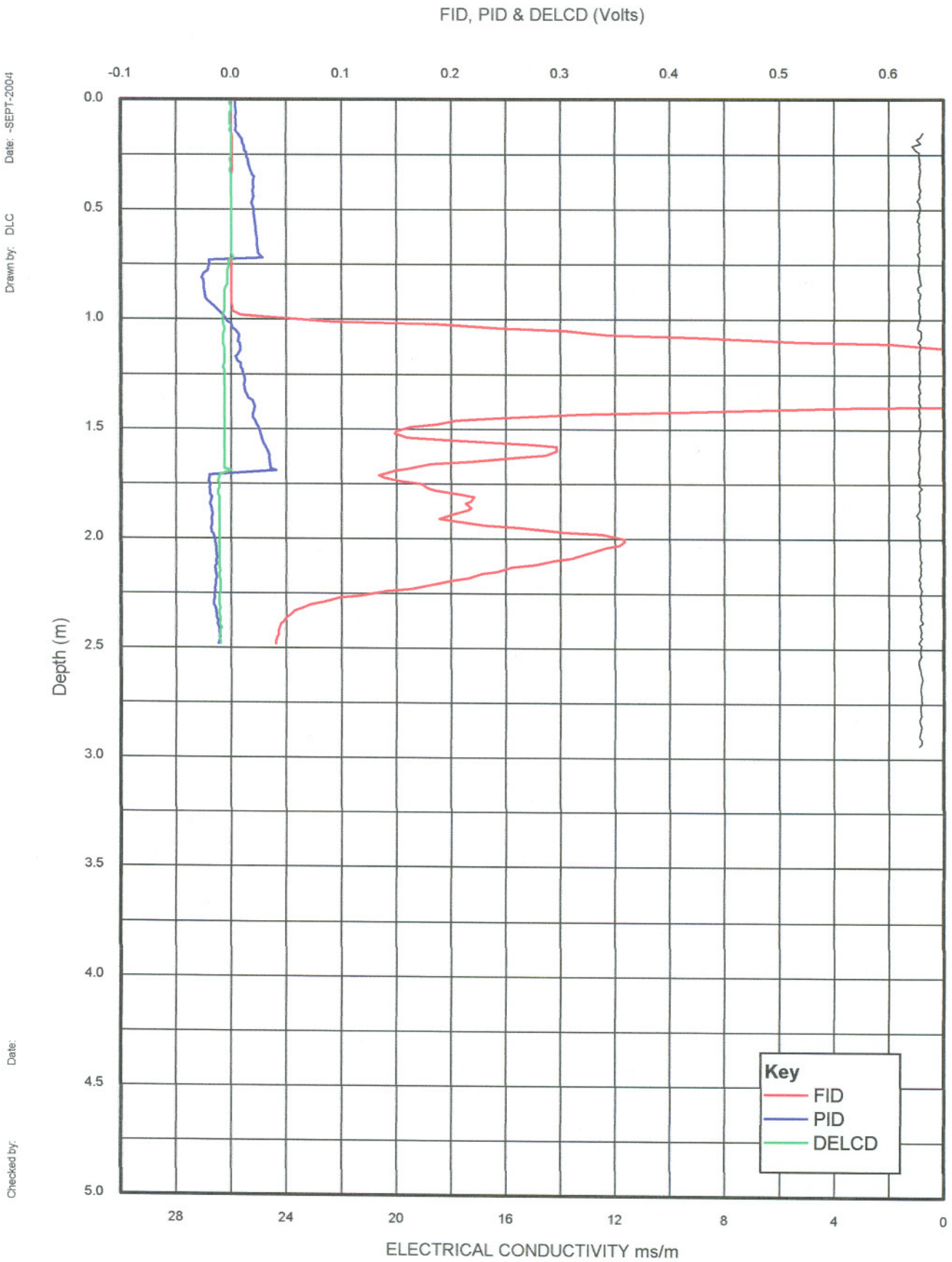
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K4b

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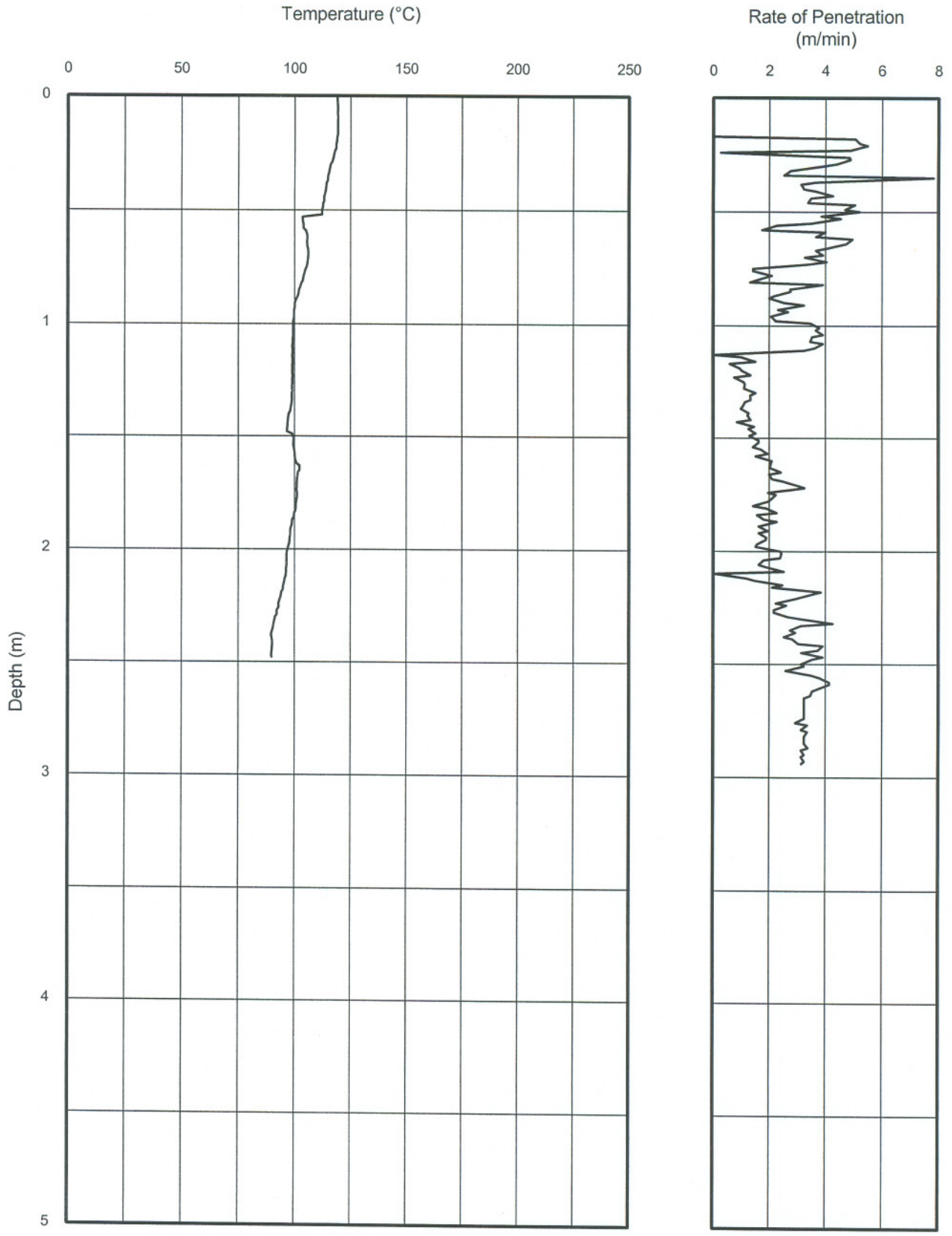
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: -SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K4b

itle

Report No. : ENV043528

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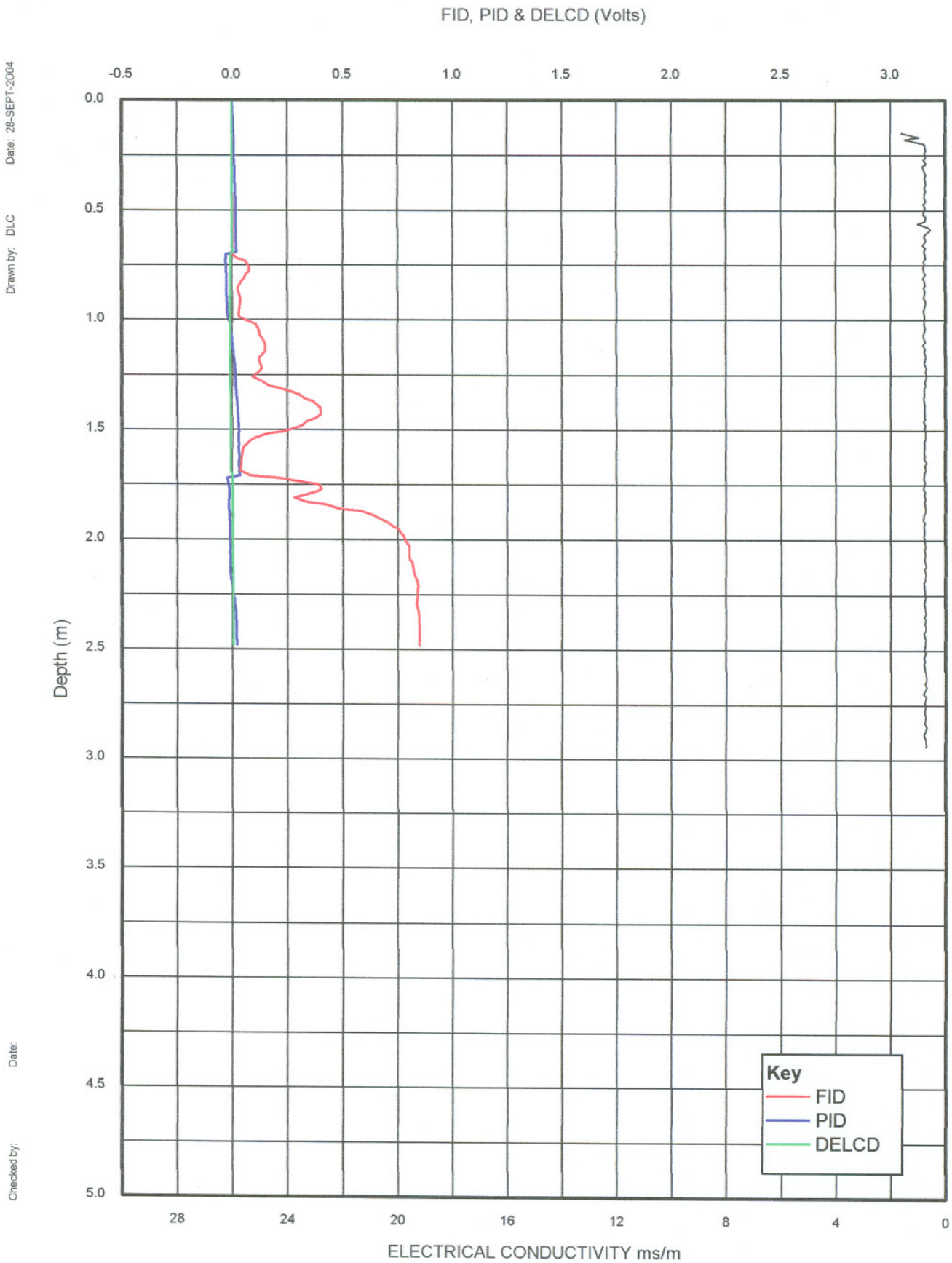
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K5

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KODAK, KIRKBY, nr LIVERPOOL

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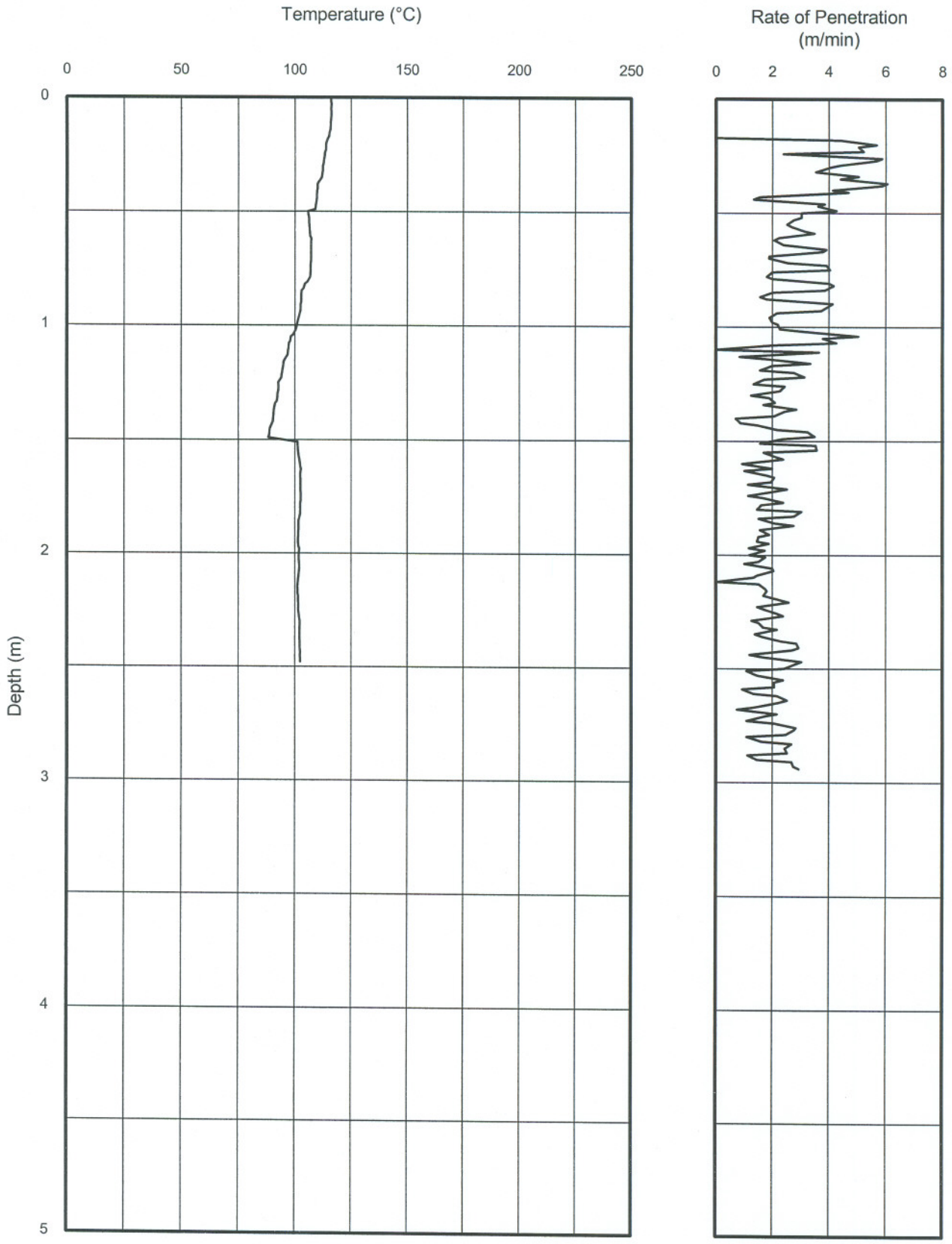
Checked by: Date:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K5

itle

Report No. : ENV043528

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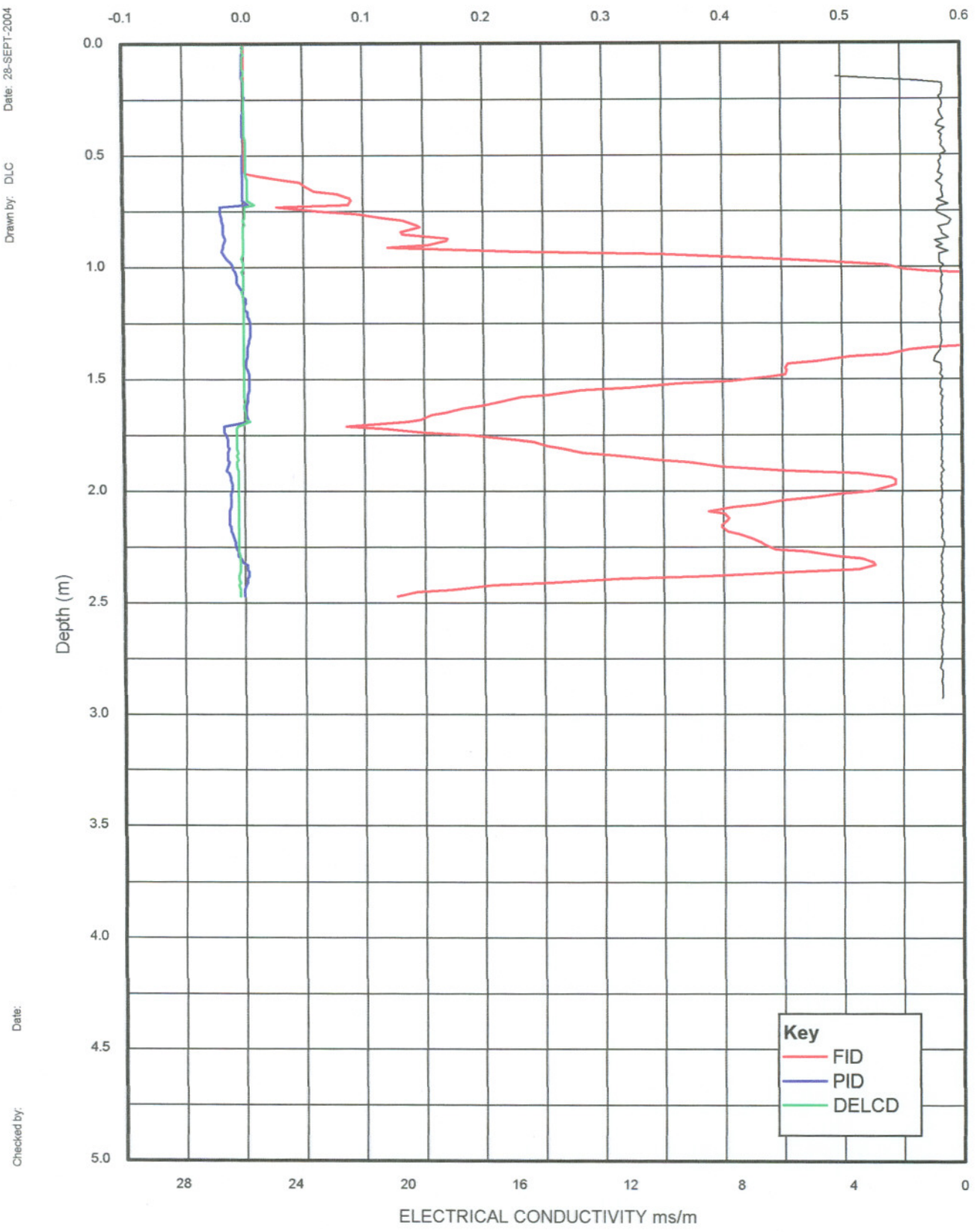
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K6

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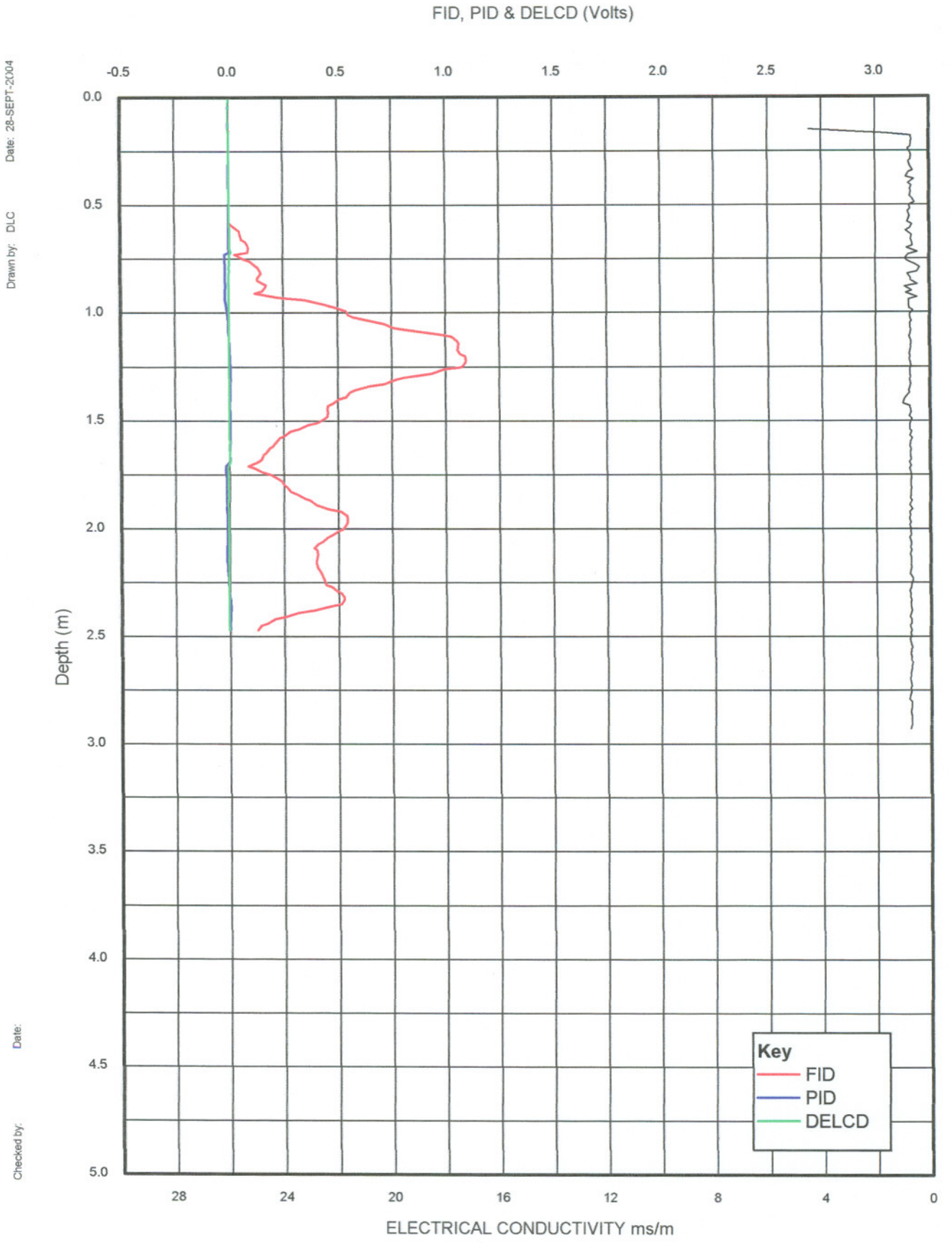
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K6

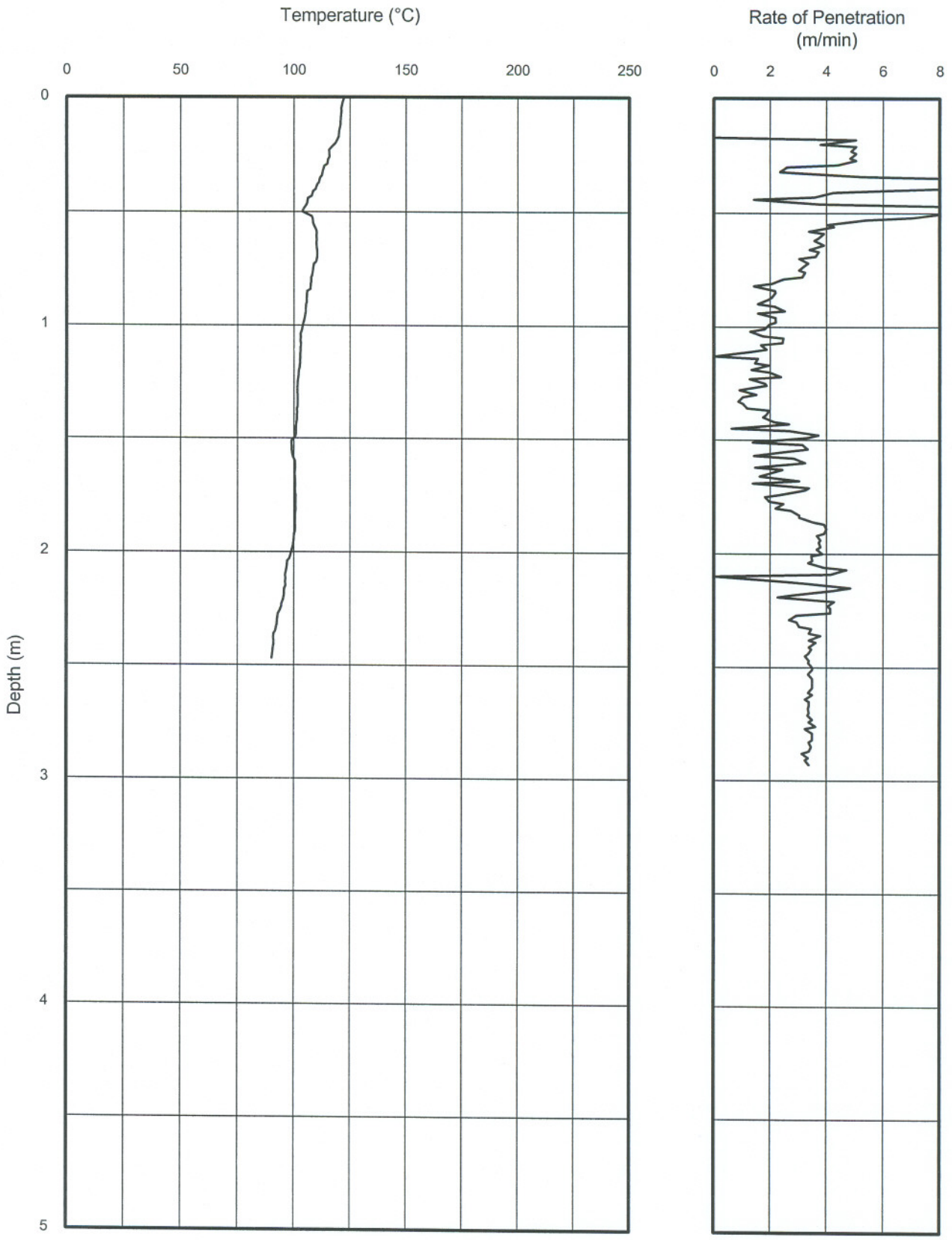
CRA
KODAK, KIRKBY, nr LIVERPOOL

Date: 28-SEPT-2004

Drawn by: DLC

Date:

Checked by:



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MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K6

Report No. : ENV043528

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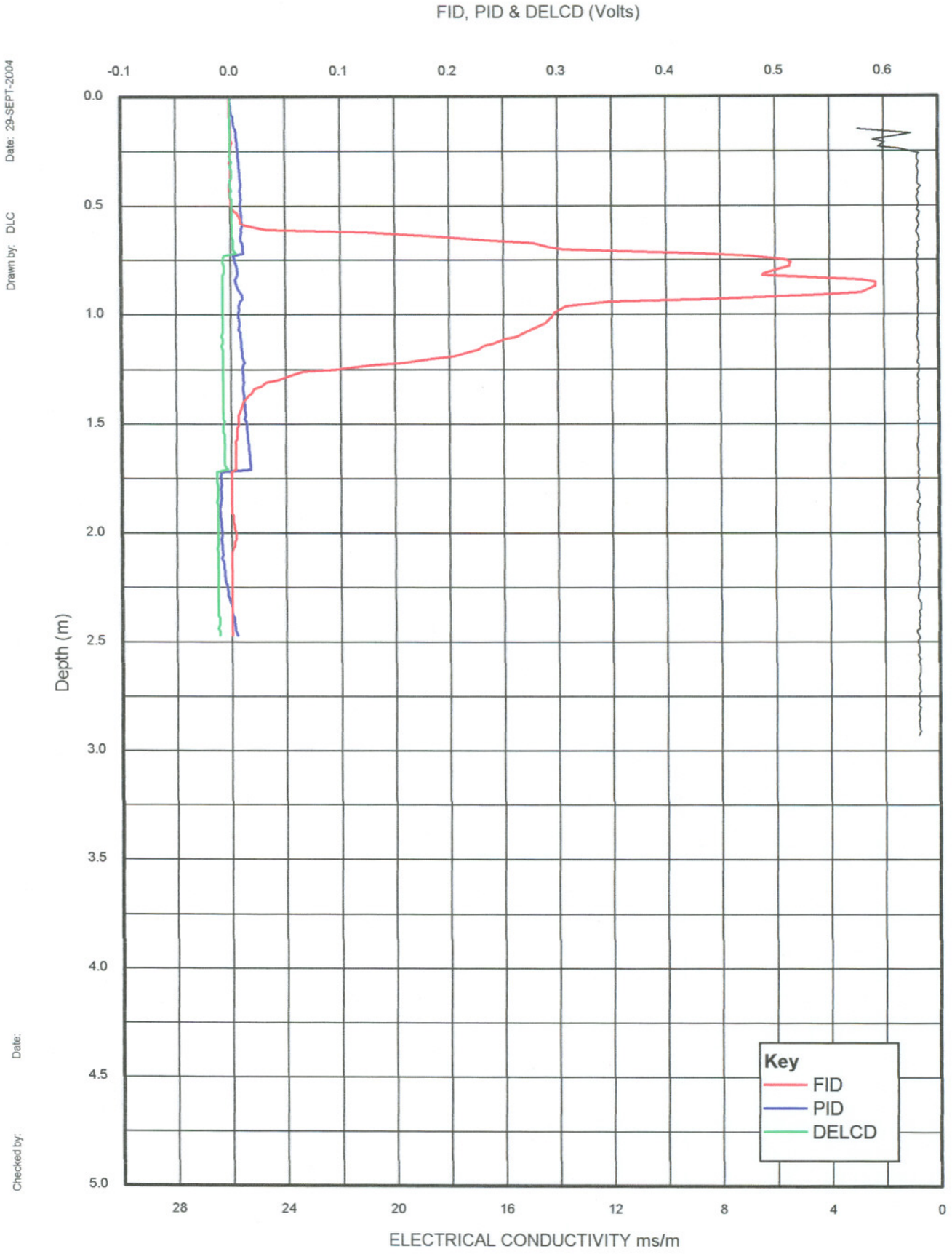
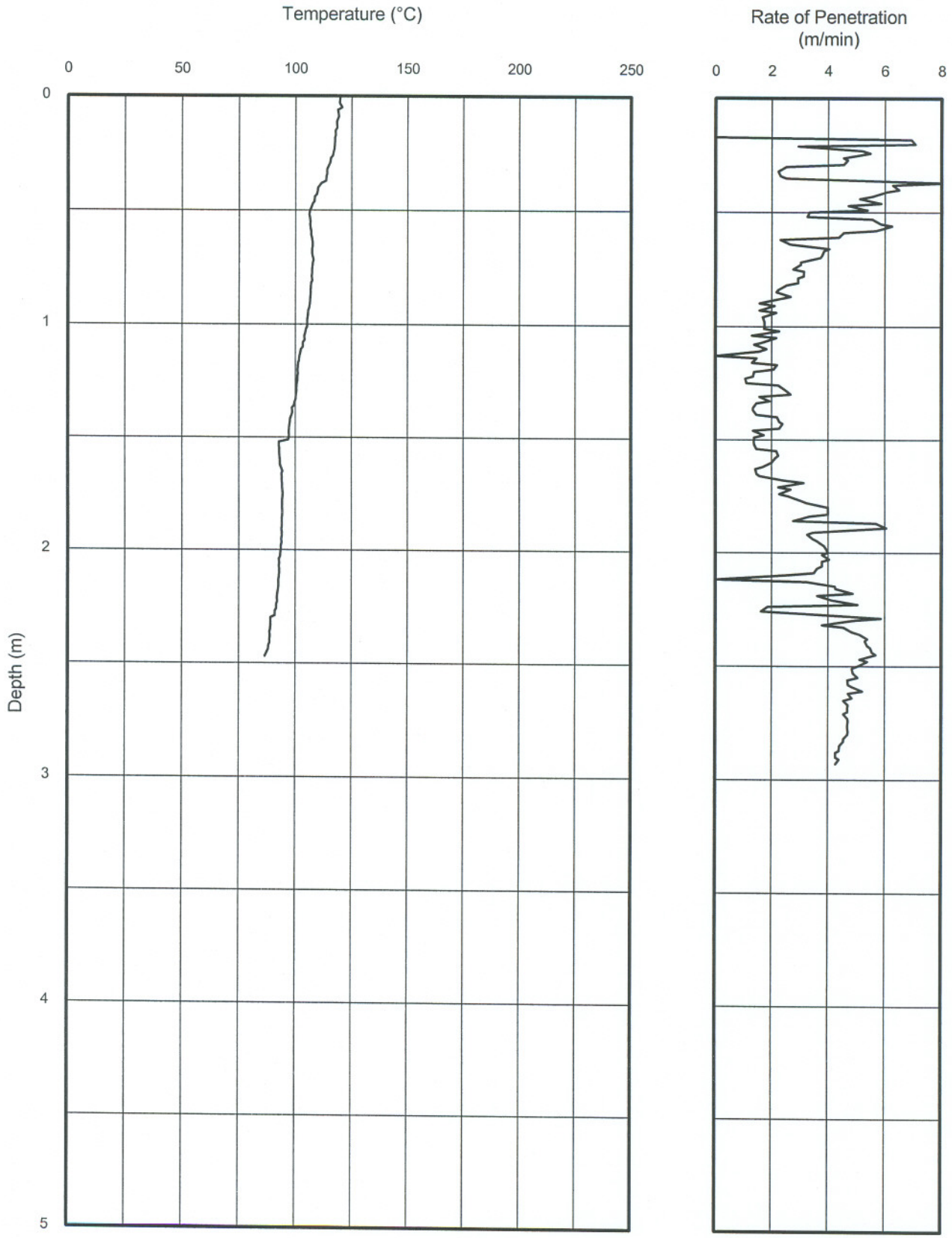
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K7A

CRA
KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K7A

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Report No. : ENV043528

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KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
Date:
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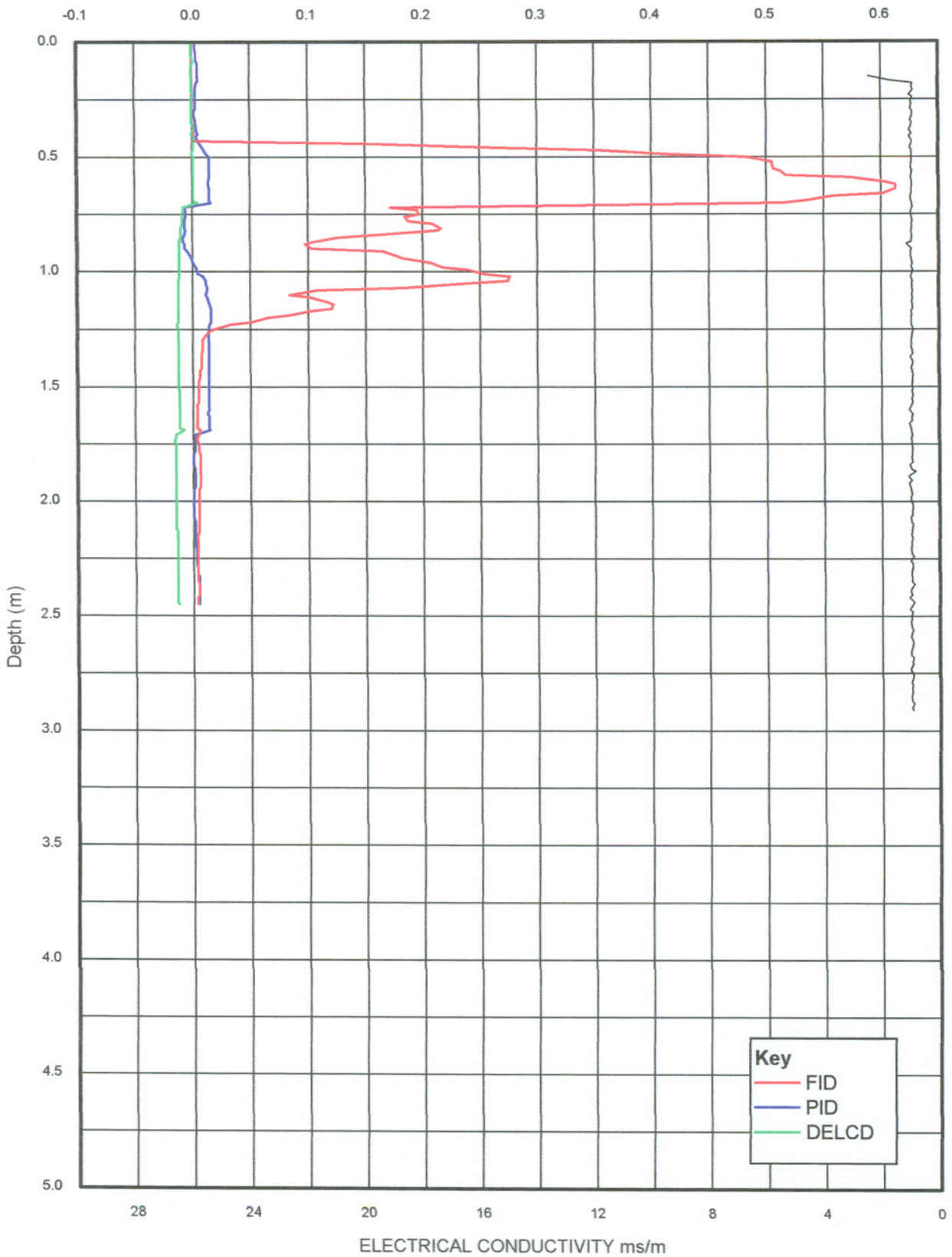

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K8A

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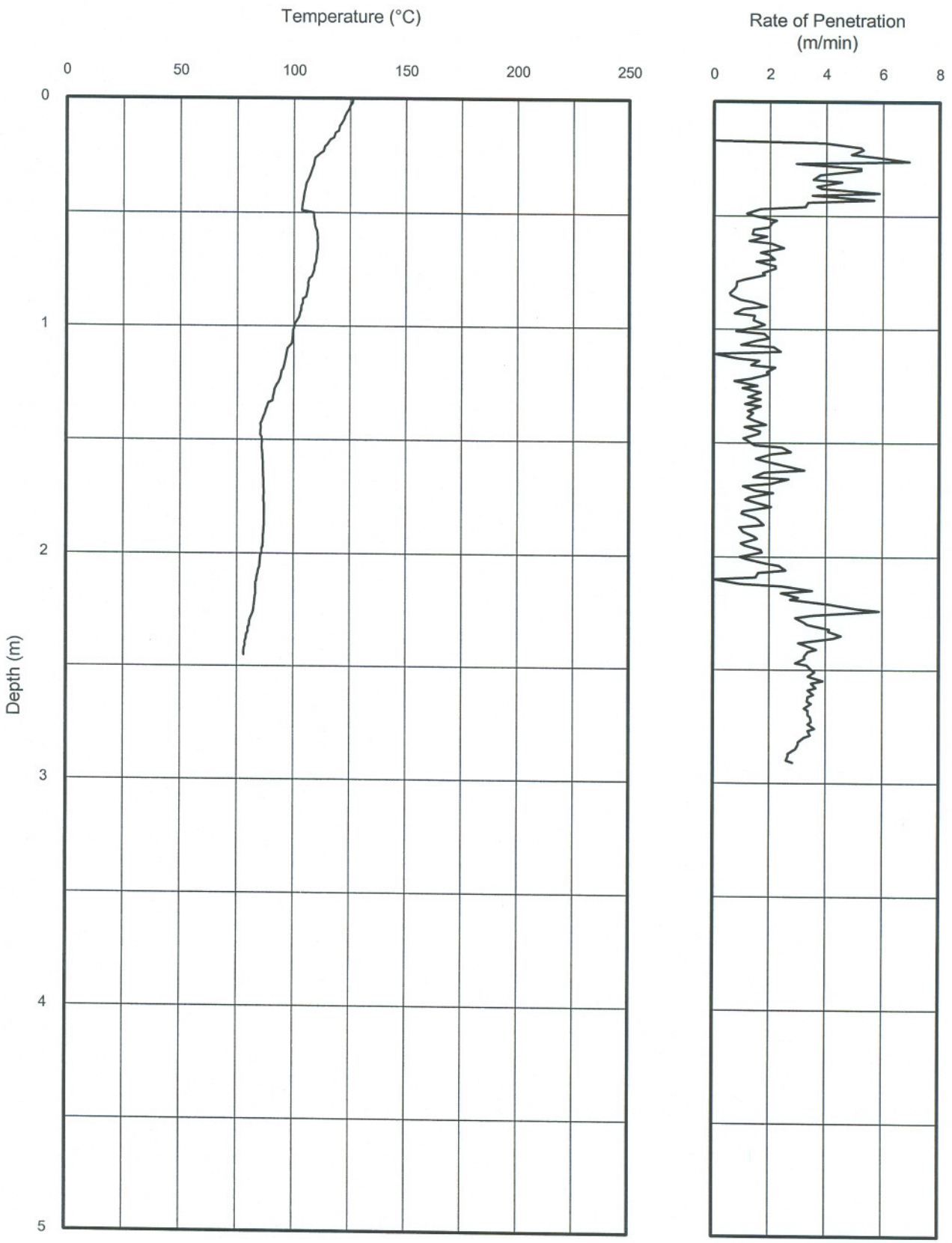
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K8A

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Report No. : ENV043528

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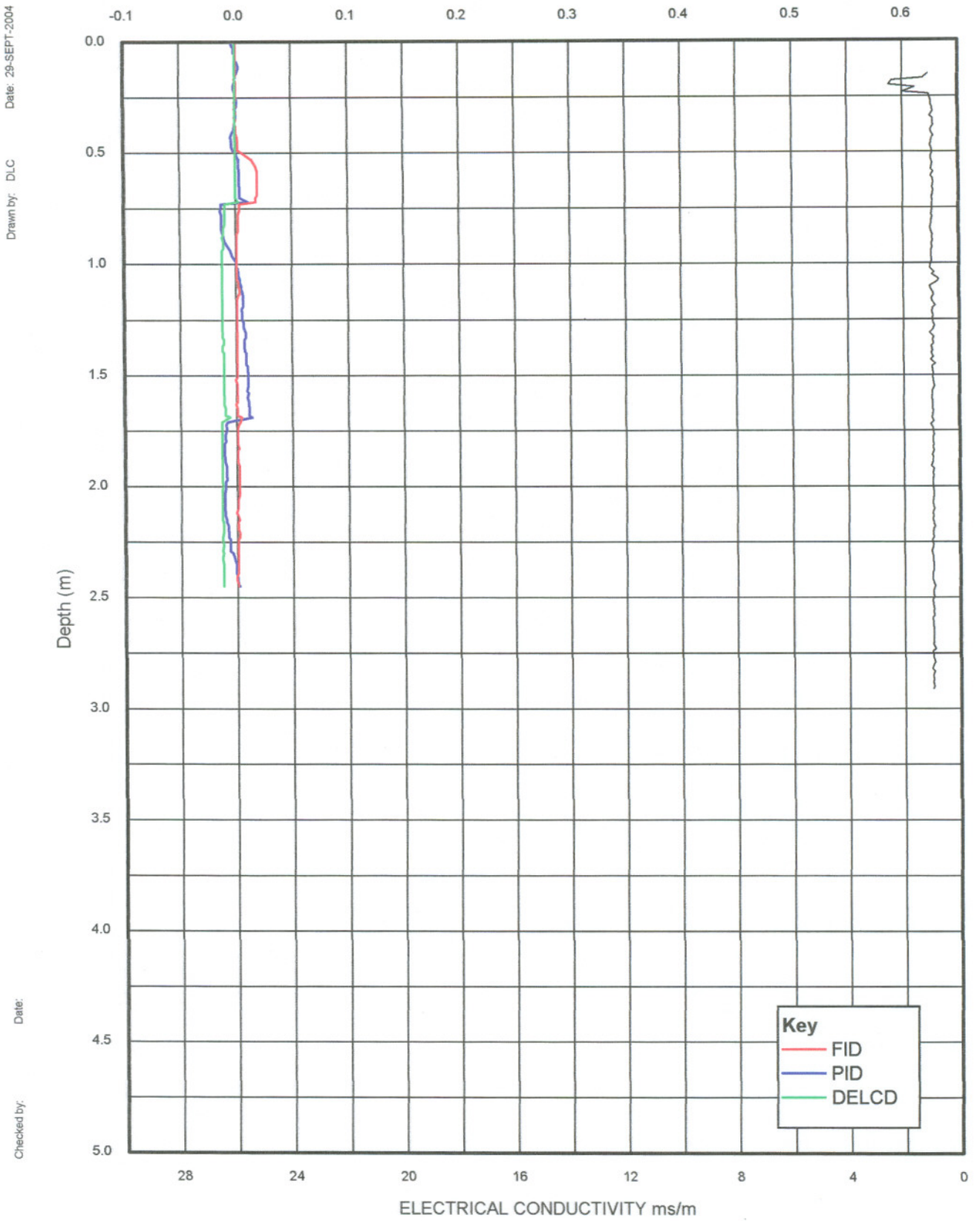
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K9

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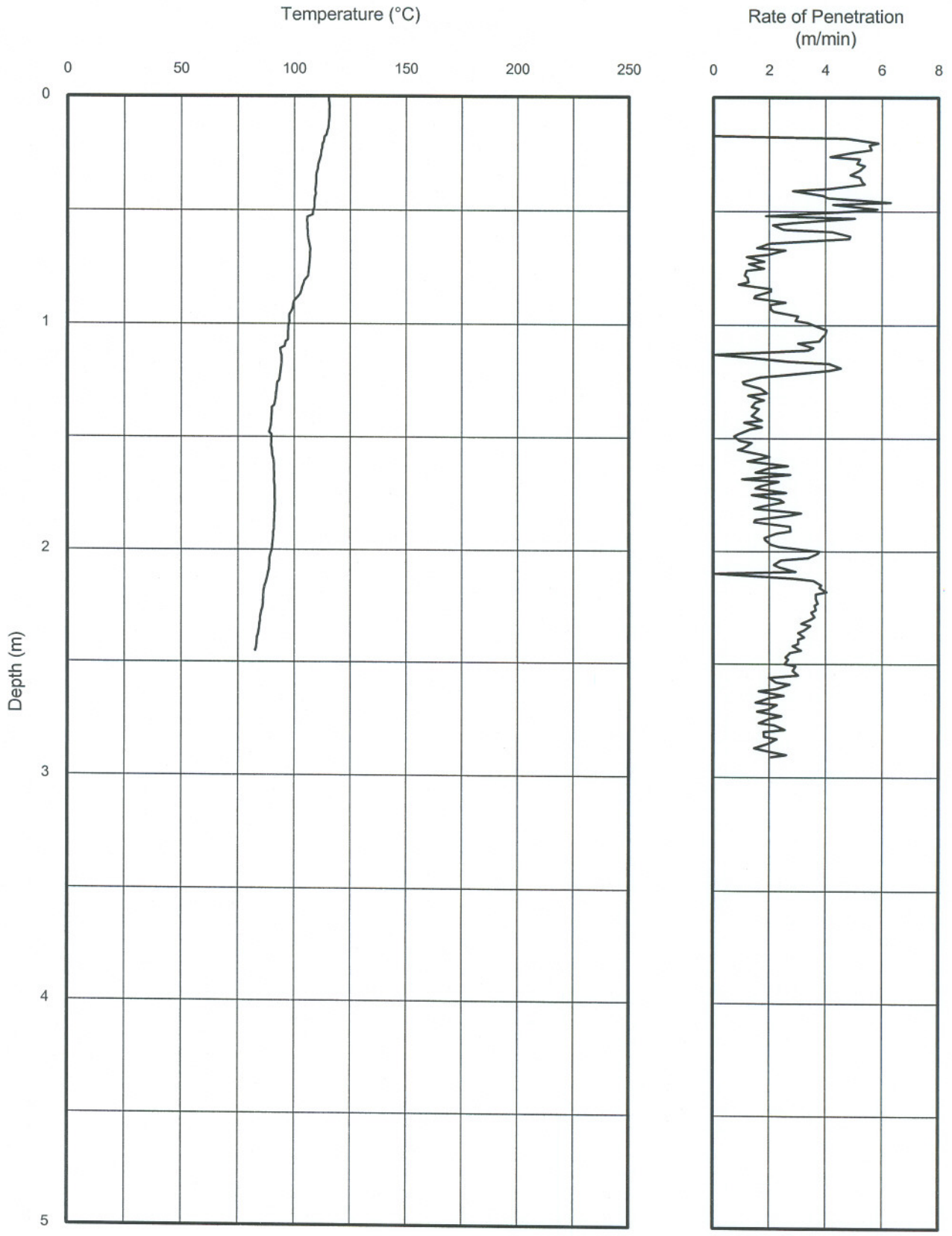
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K9

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Report No. : ENV043528

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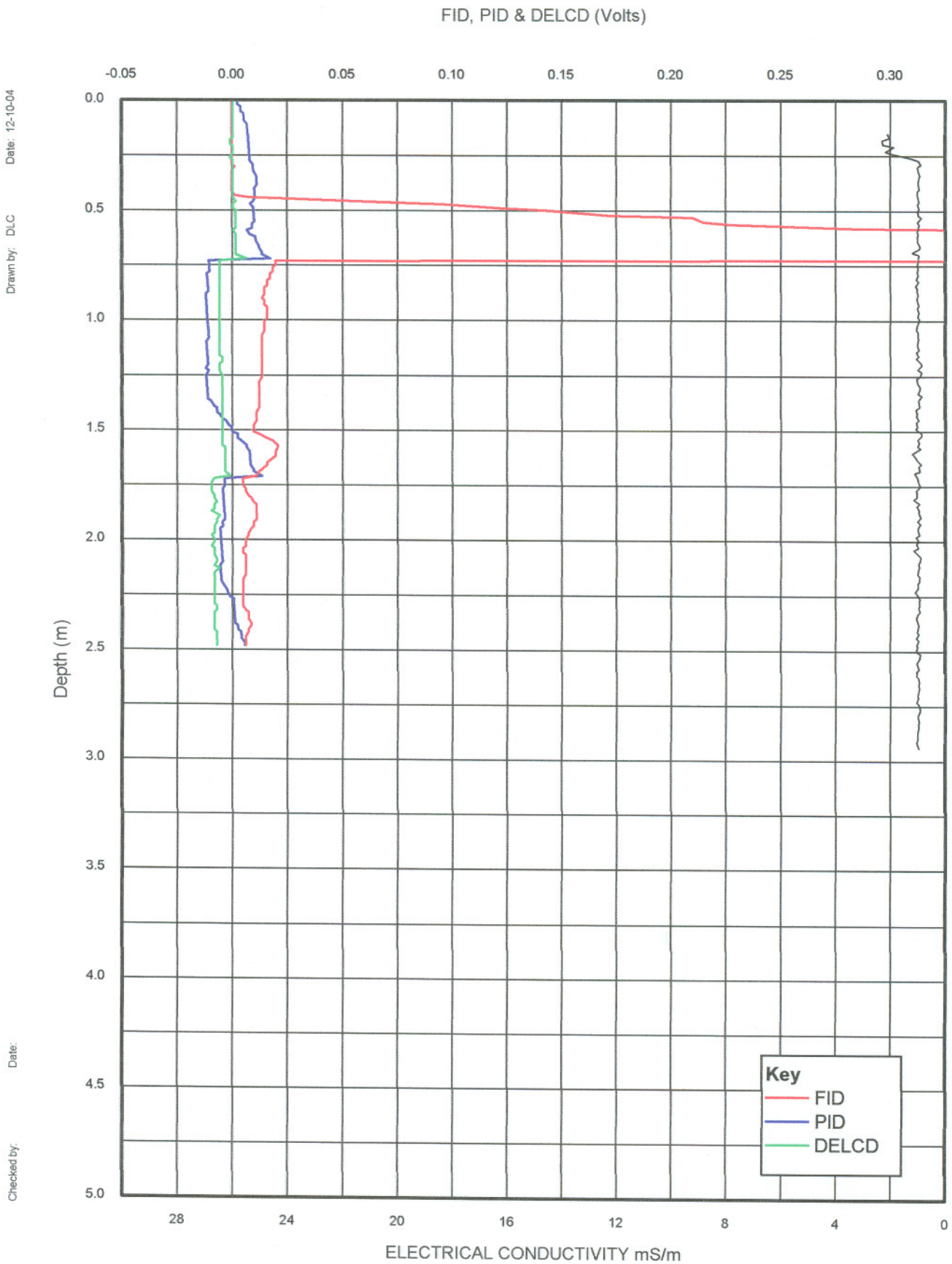
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K10

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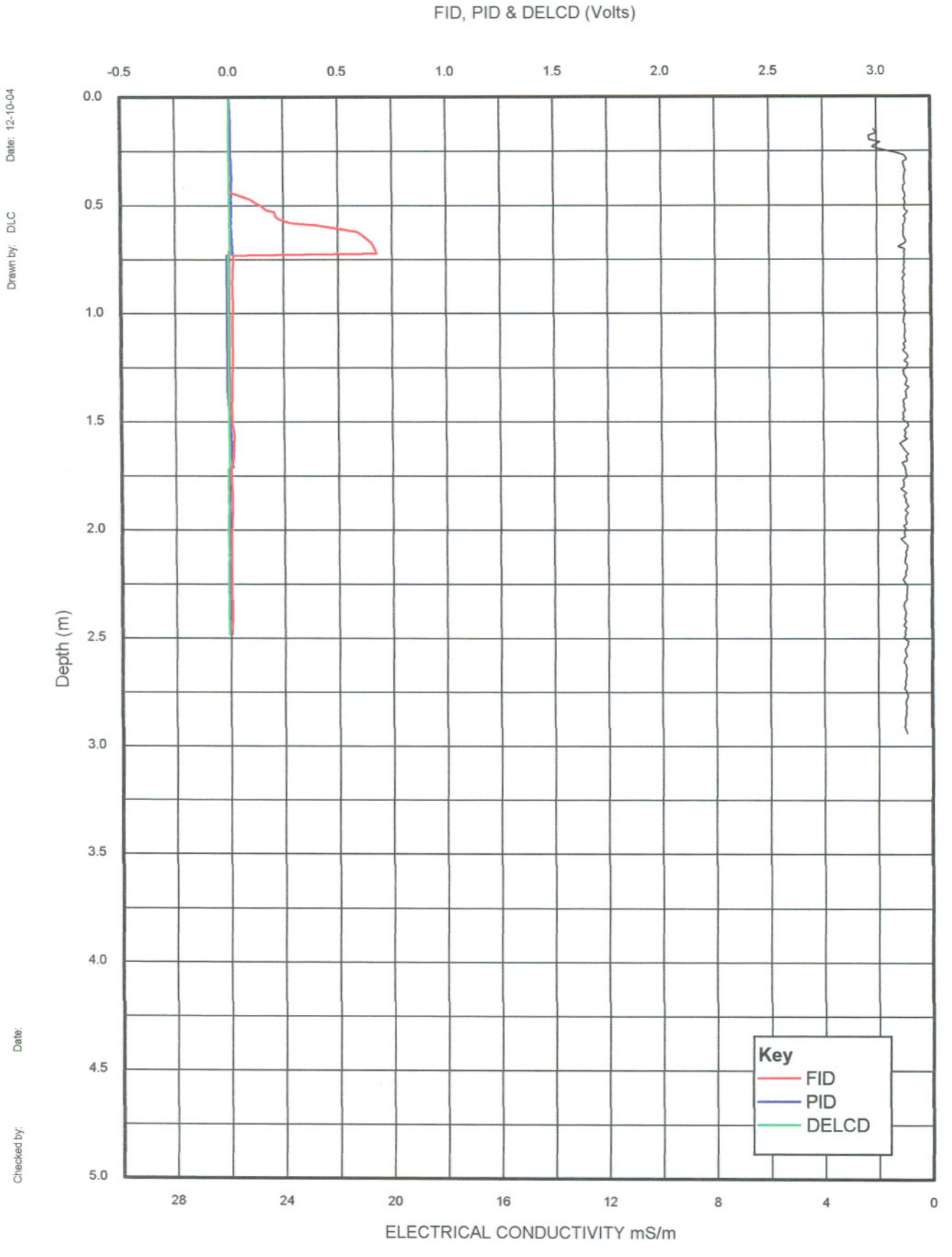
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K10

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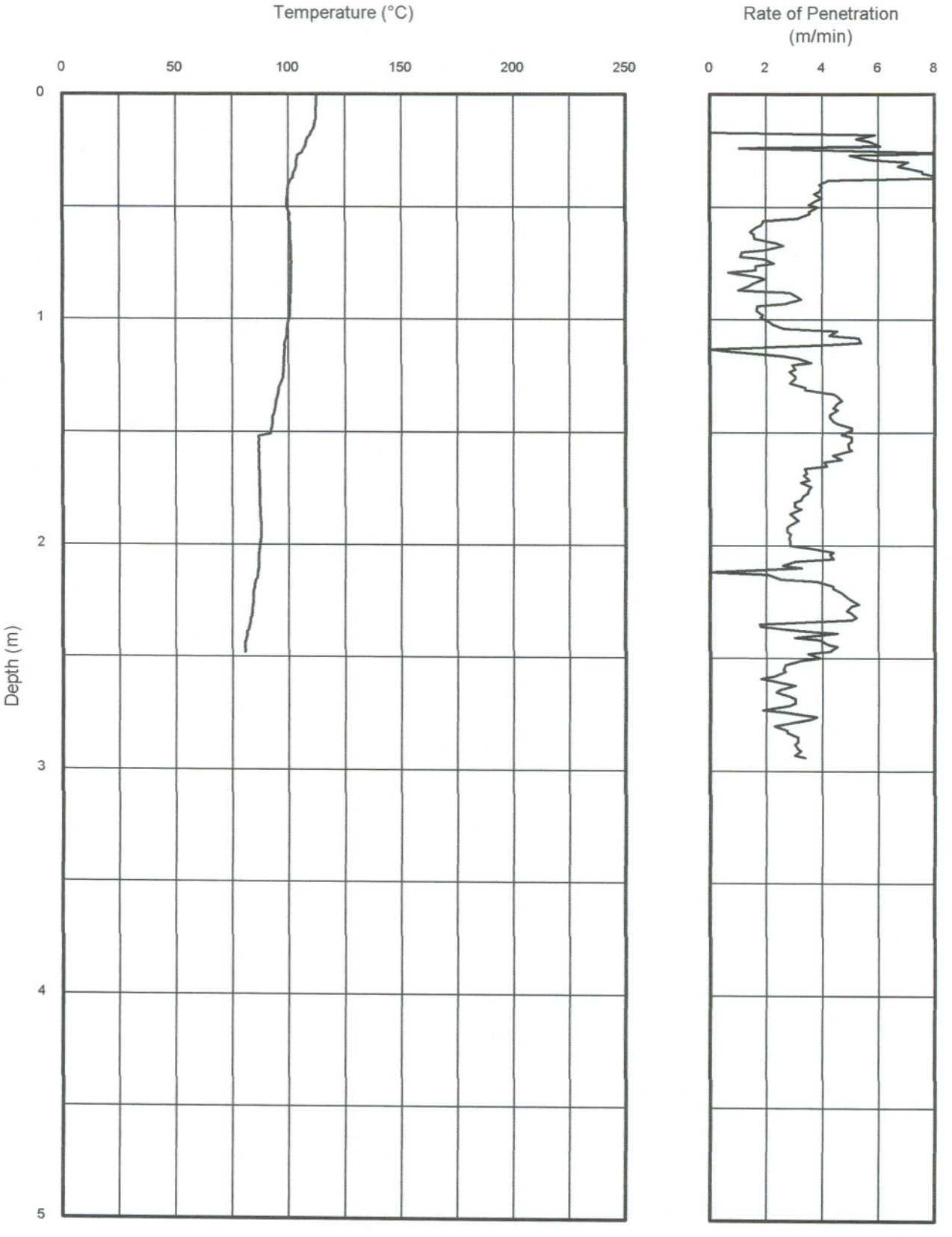
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 12-10-04

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K10

itle

CRA
KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
Date:
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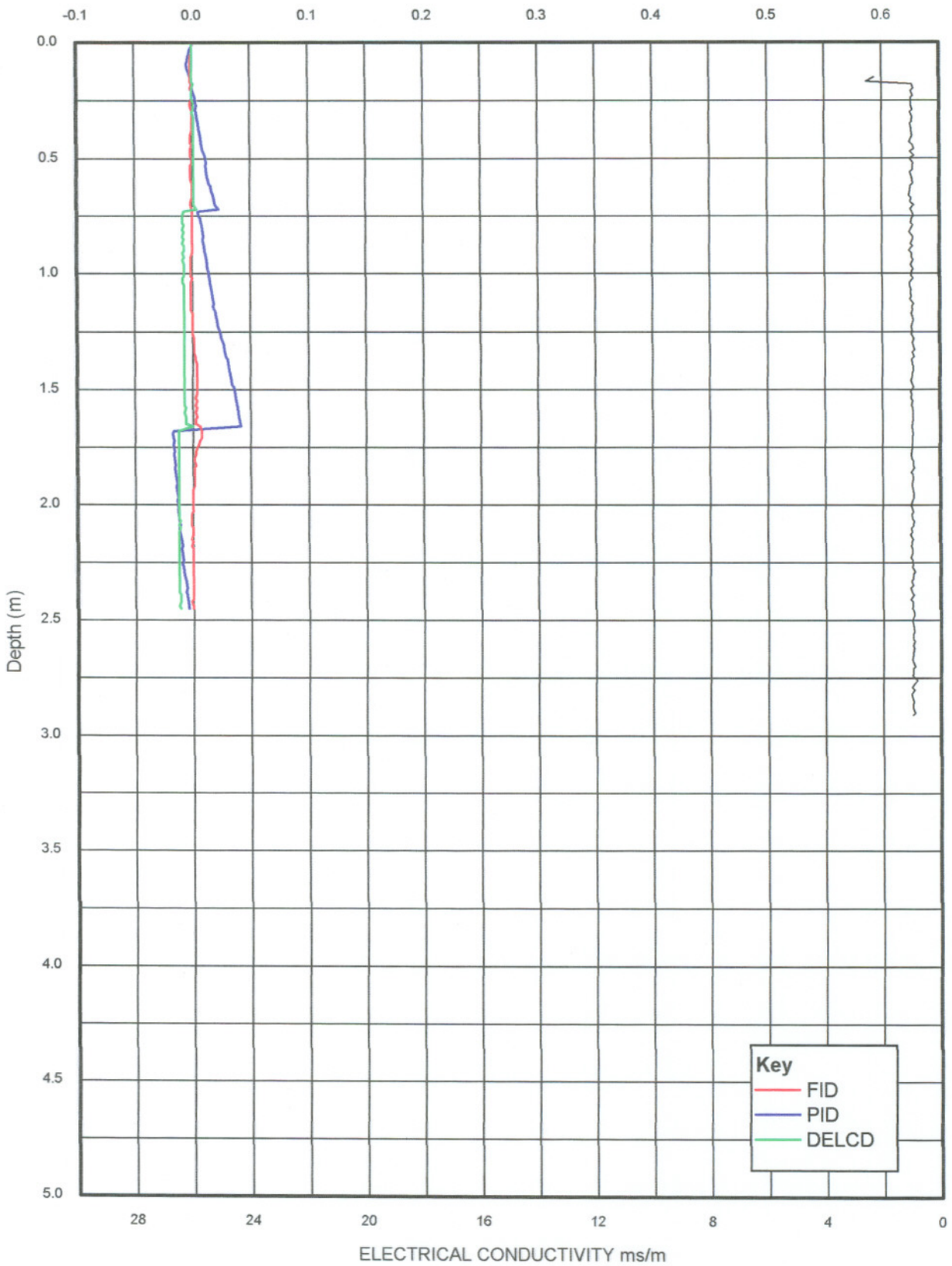

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K11

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KODAK, KIRKBY, nr LIVERPOOL

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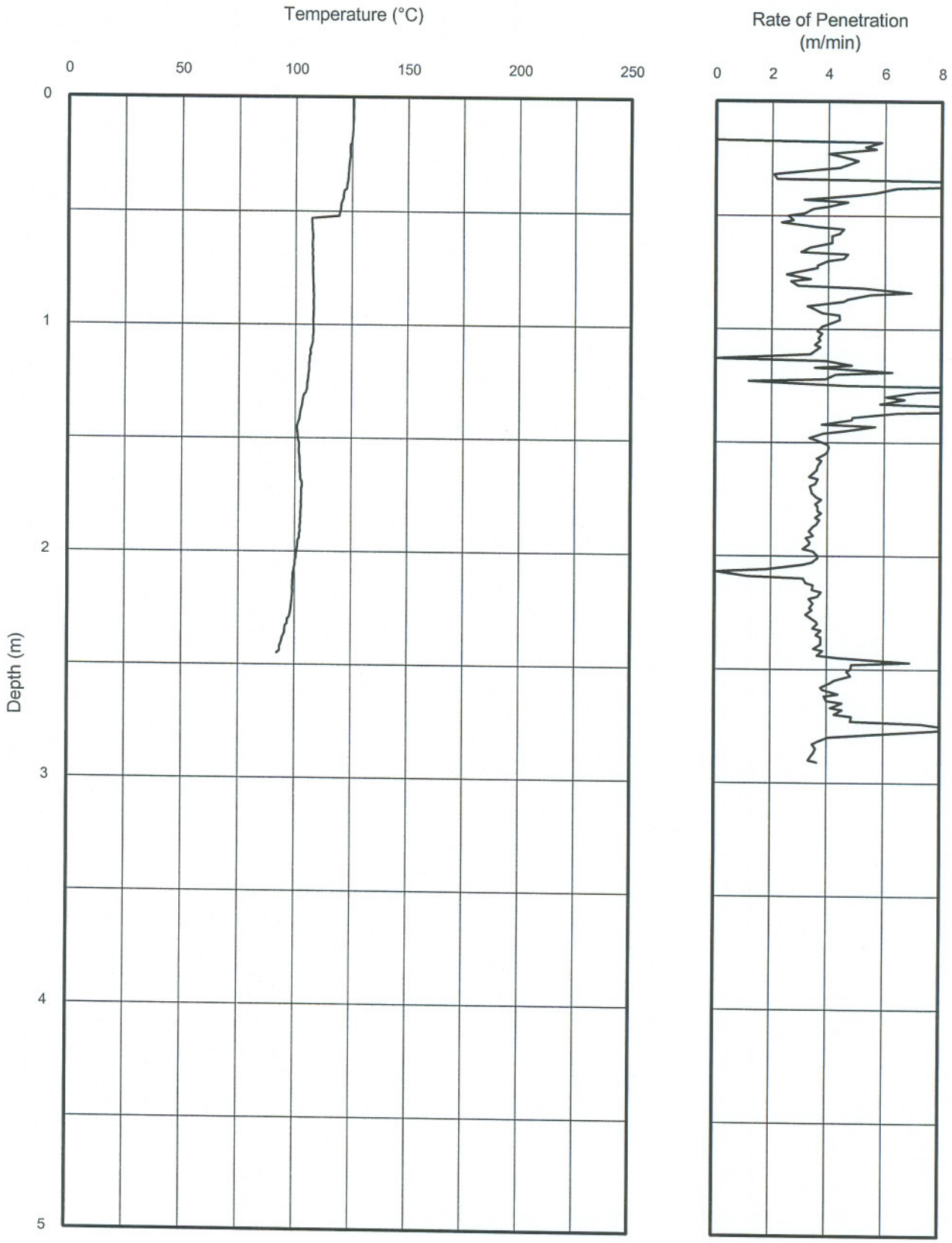

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K11

itle

Report No. : ENV043528

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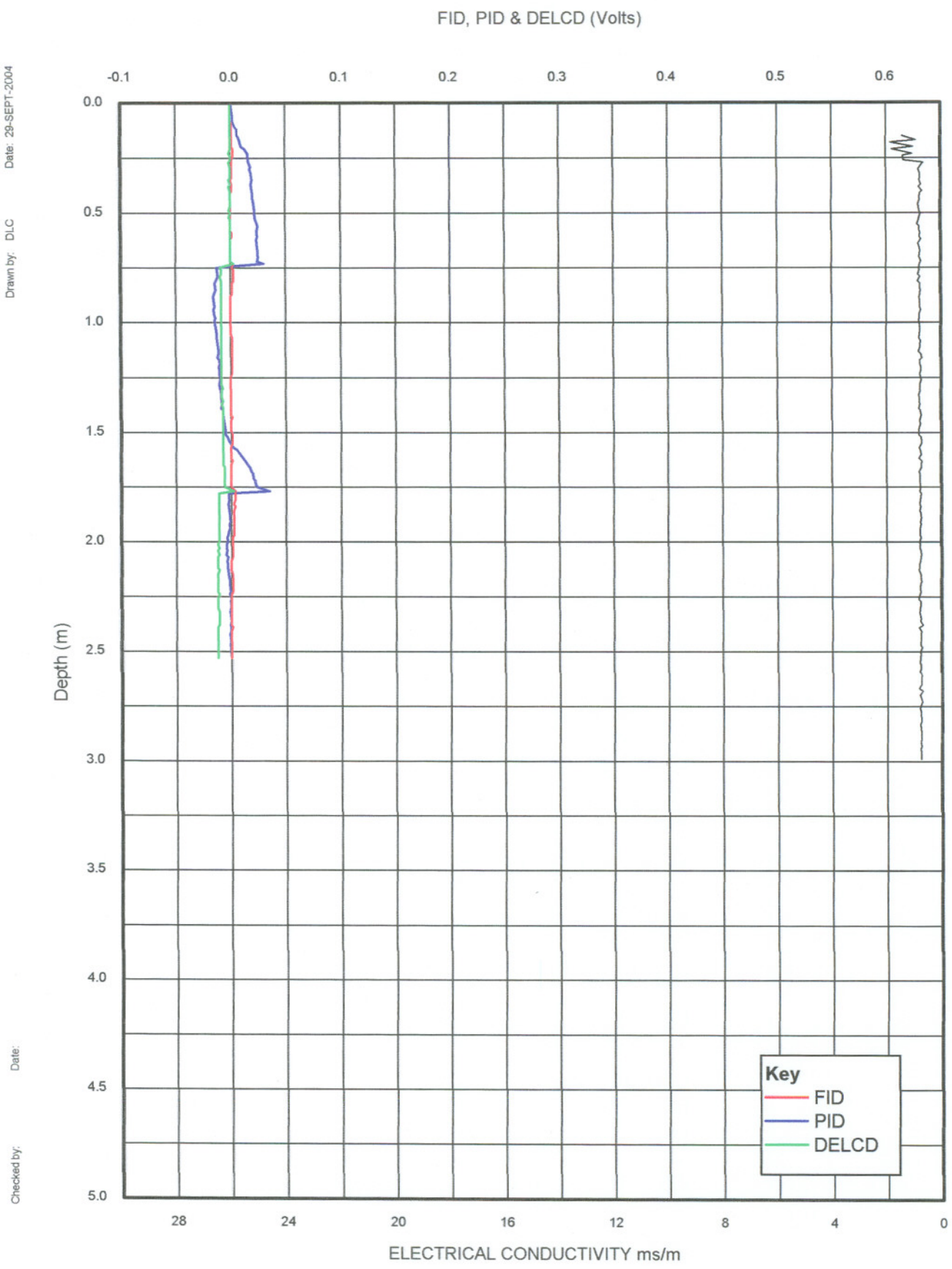
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K12

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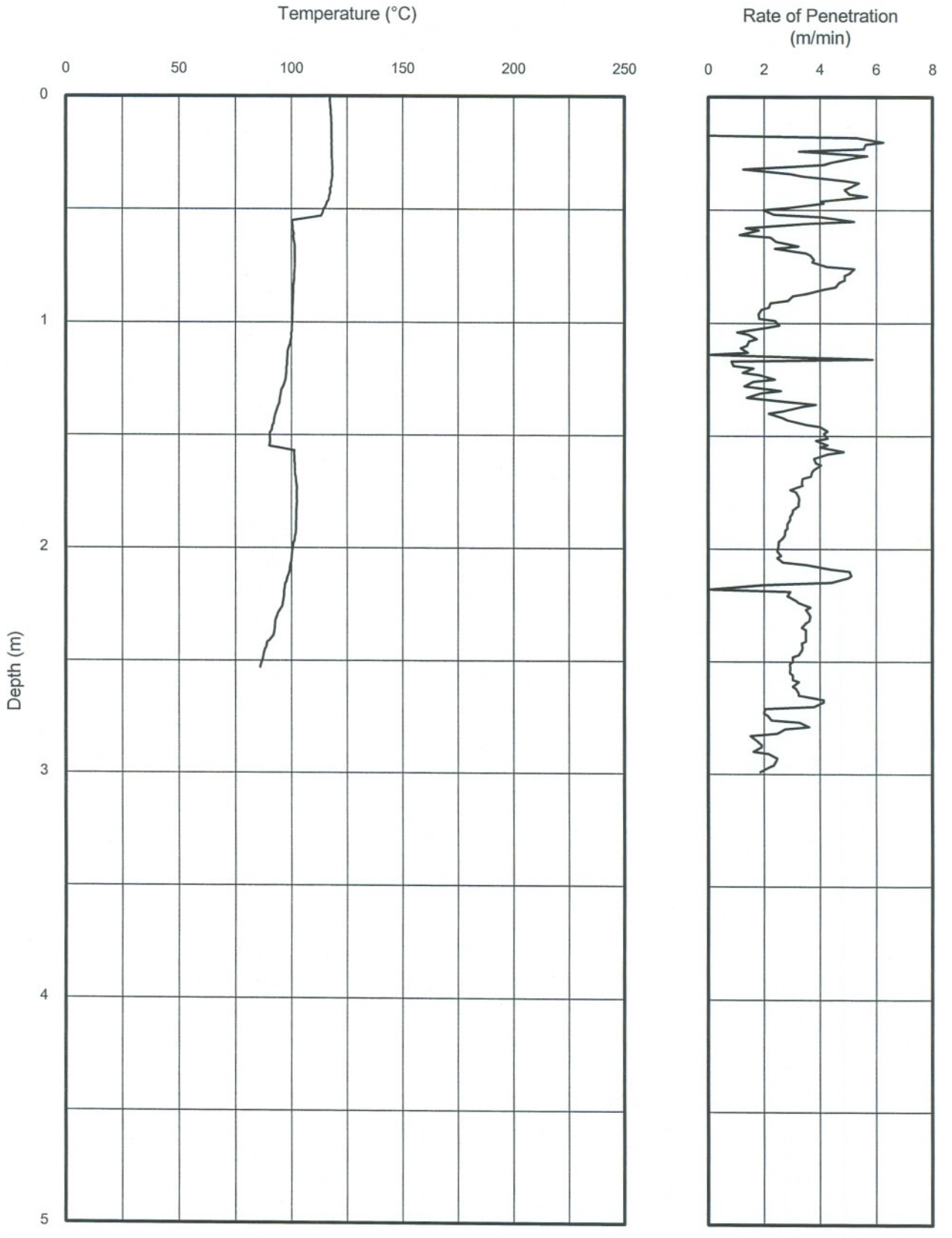

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K12

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Report No. : ENV043528

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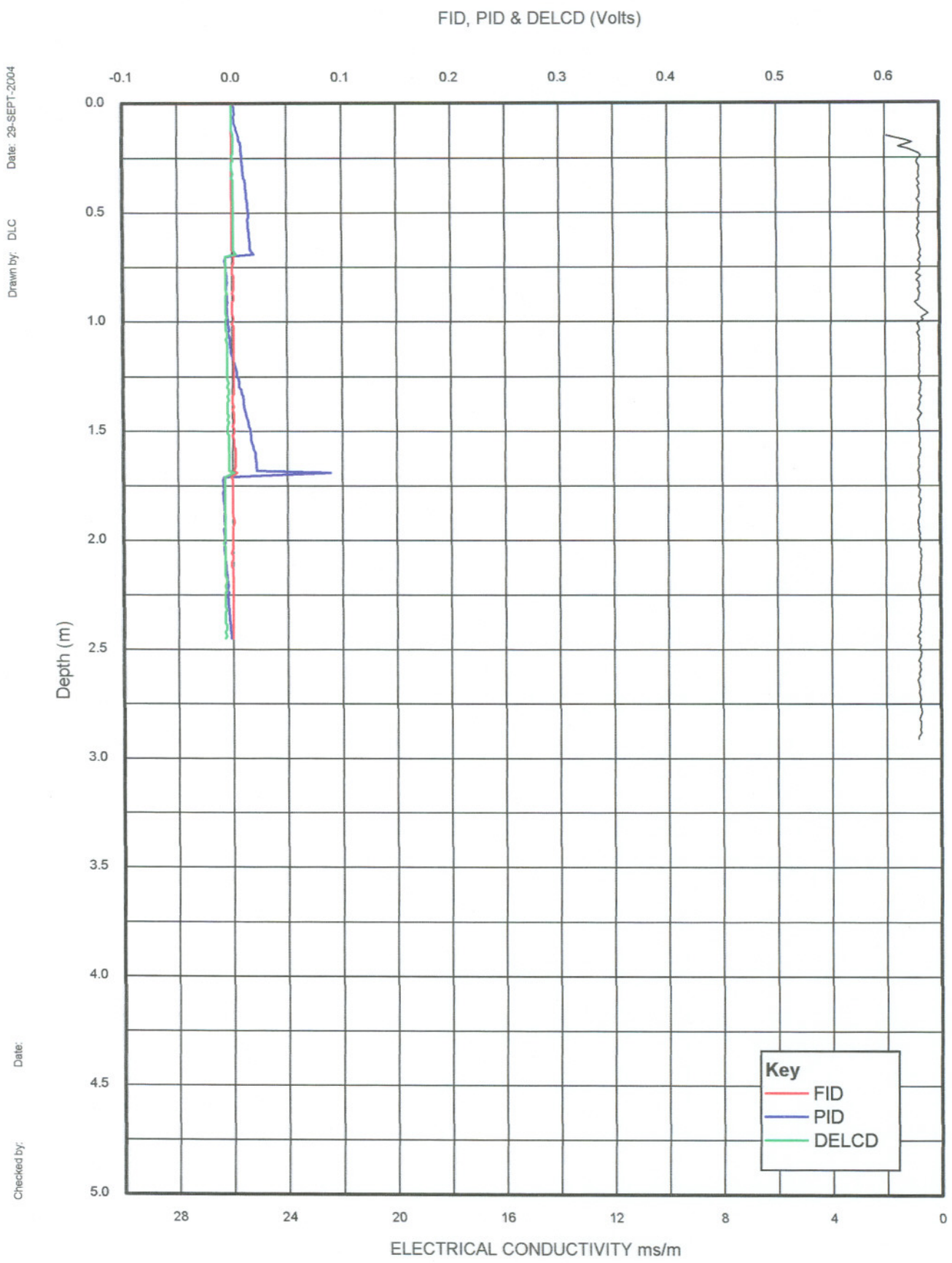

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K13

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KODAK, KIRKBY, nr LIVERPOOL

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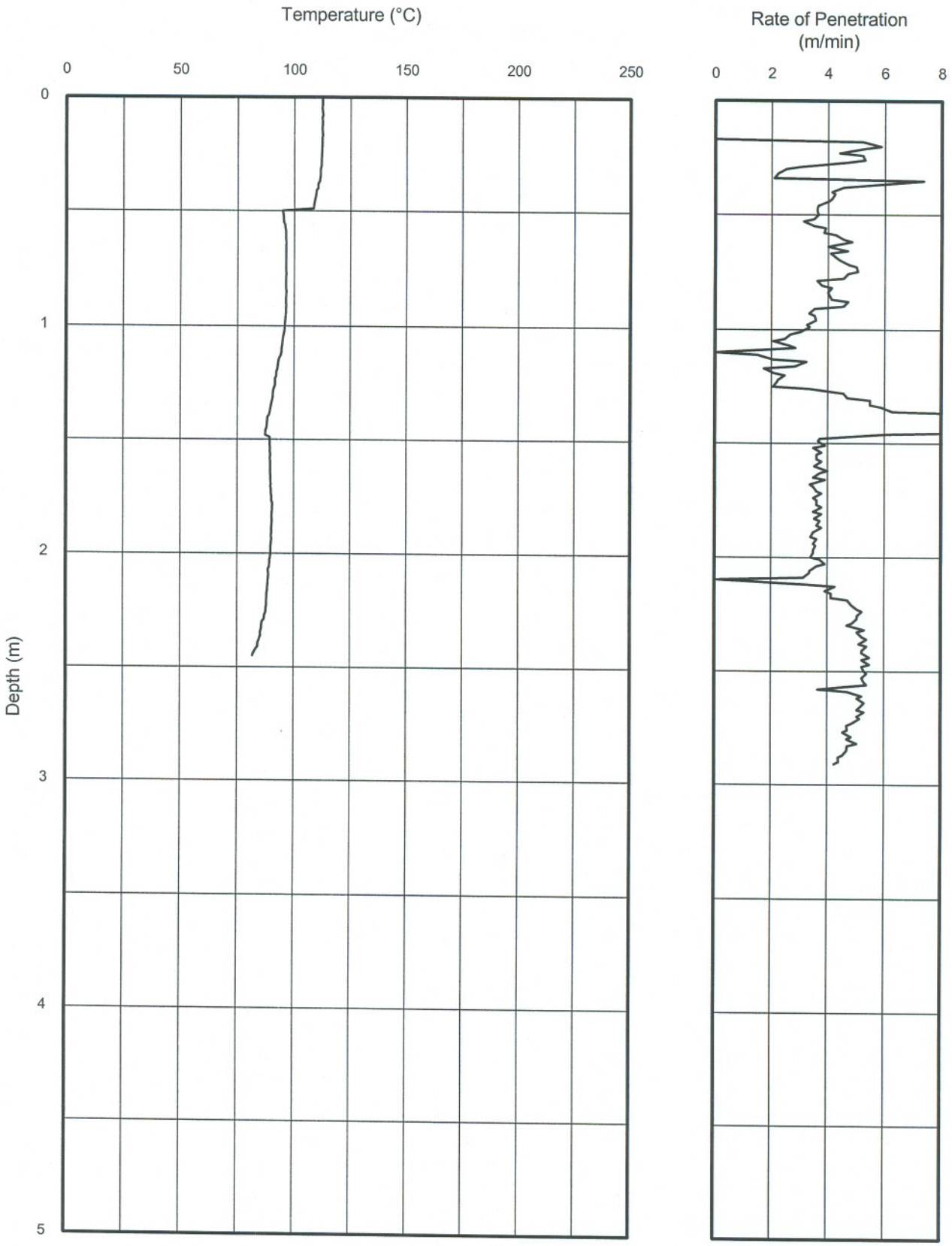

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K13

itle

Report No. : ENV043528

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KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
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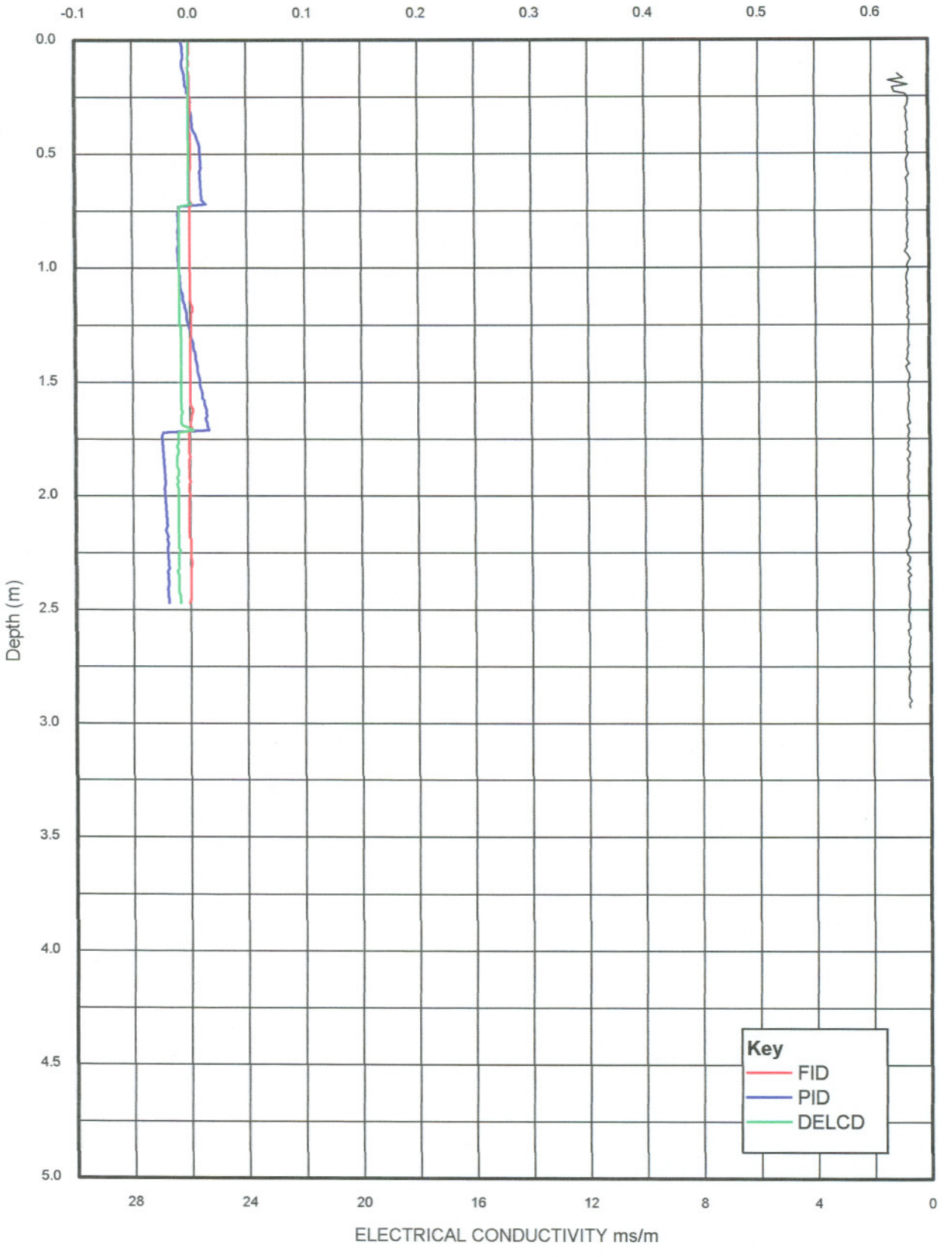

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K14

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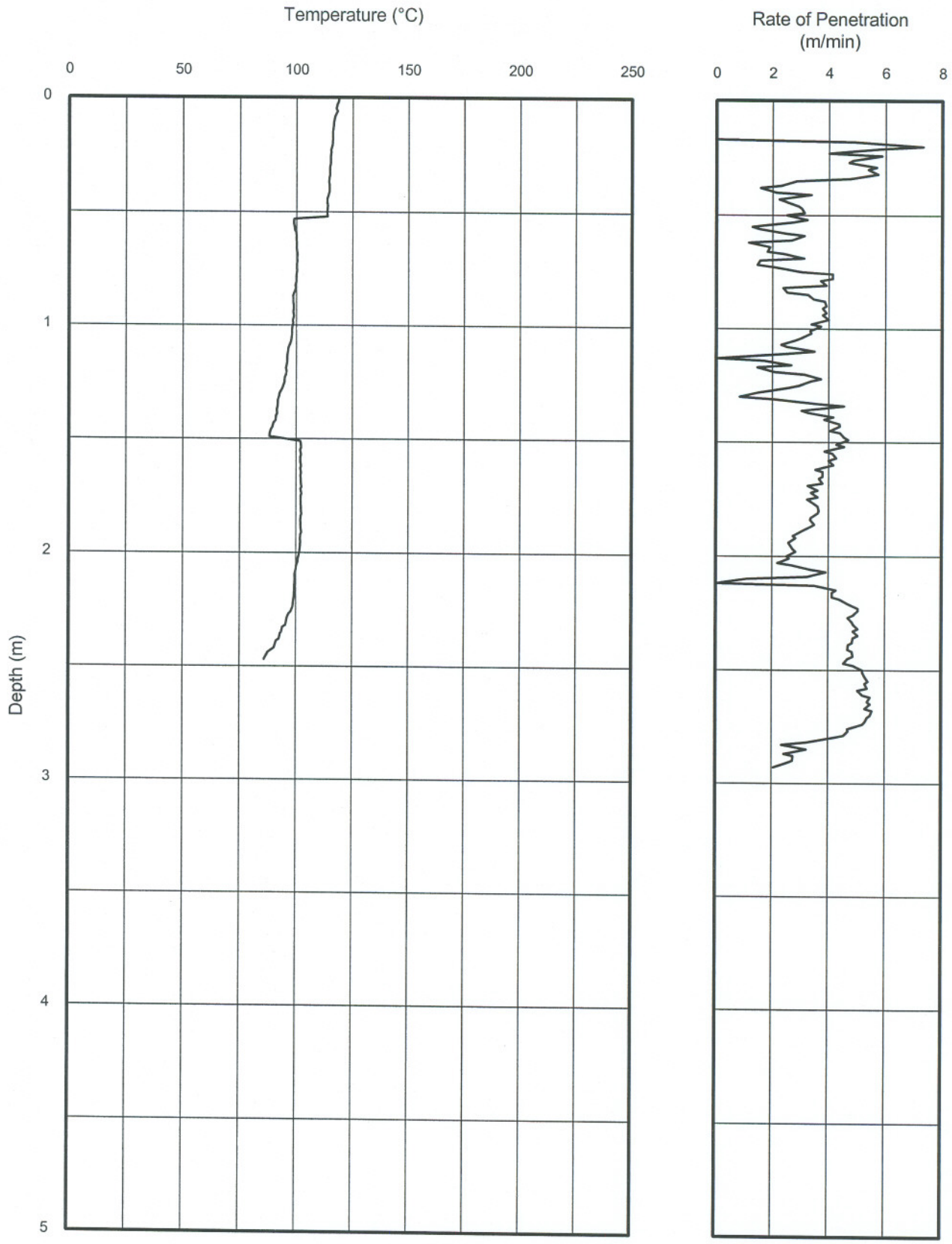

Date: 29-SEPT-2004
Drawn by: DLC
Date:
Checked by:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K14

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Report No. : ENV043528

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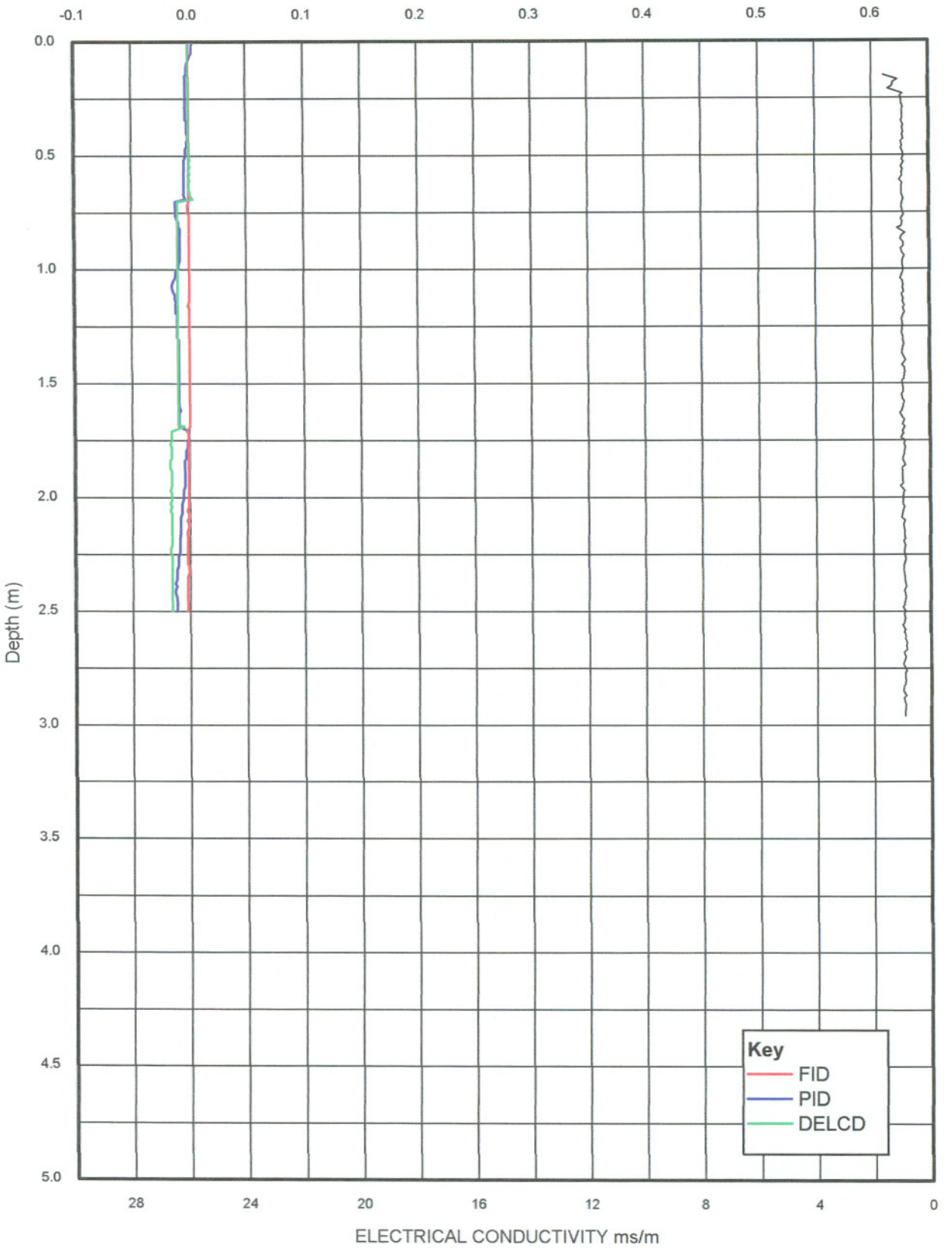
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K15

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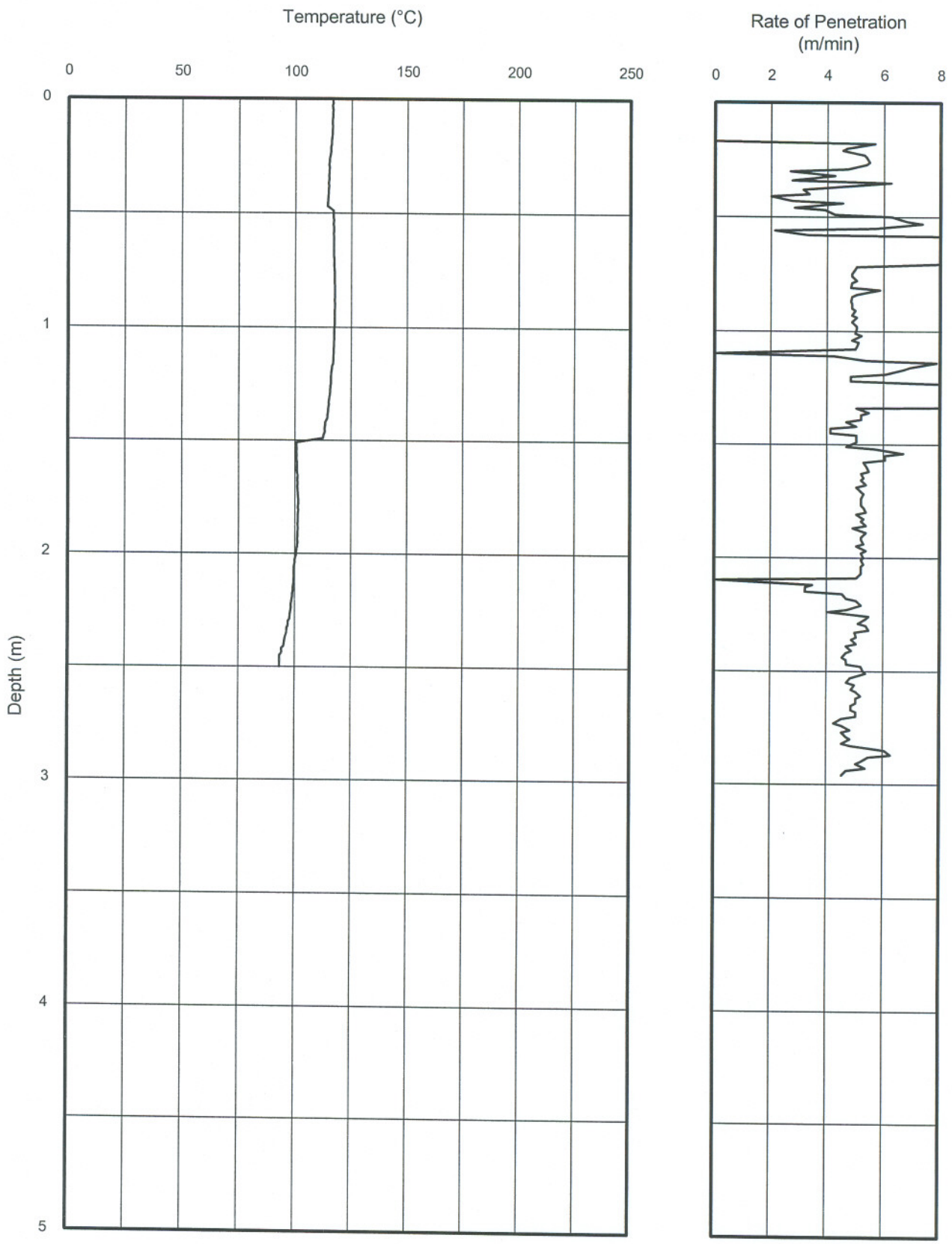
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K15

itle

Report No. : ENV043528

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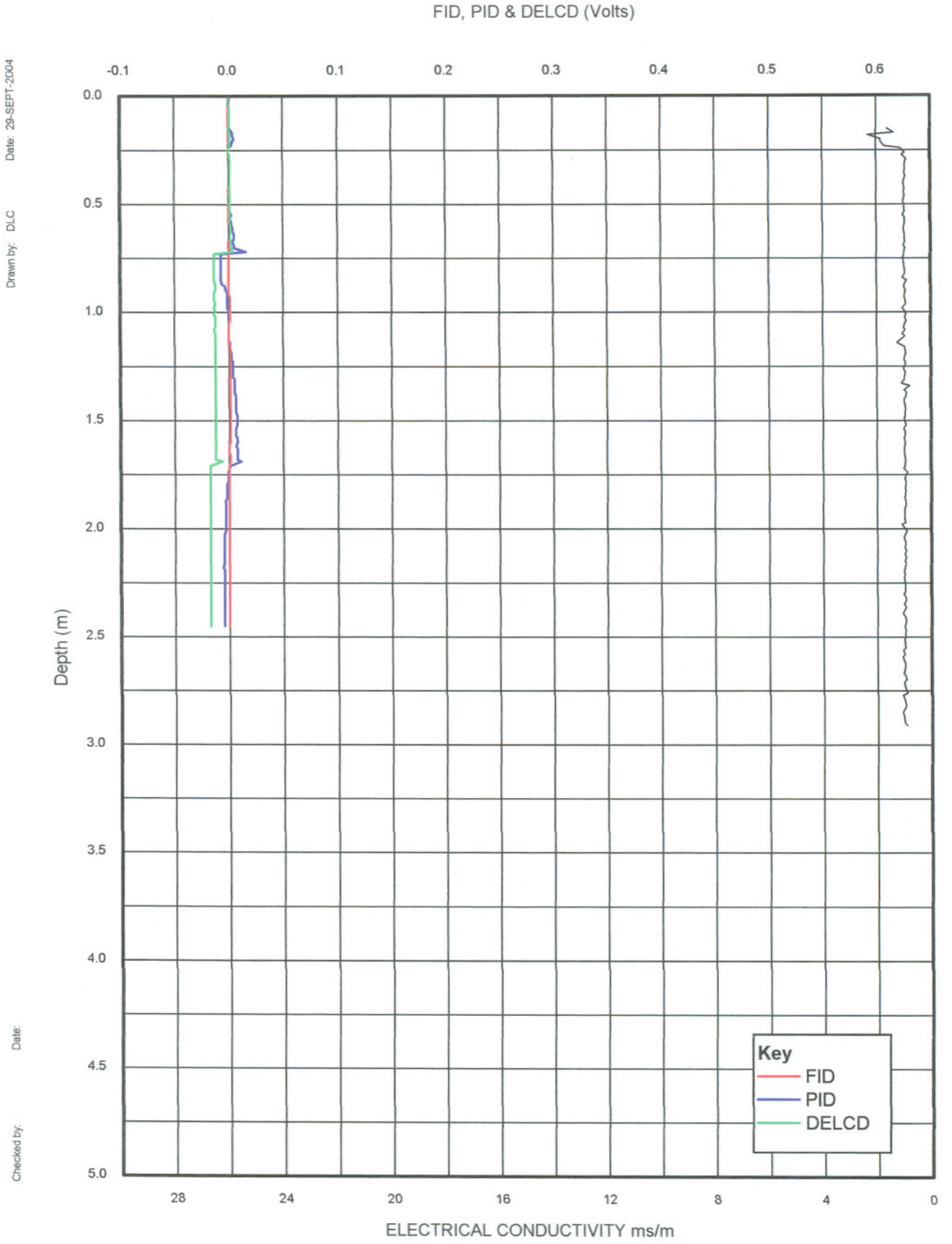
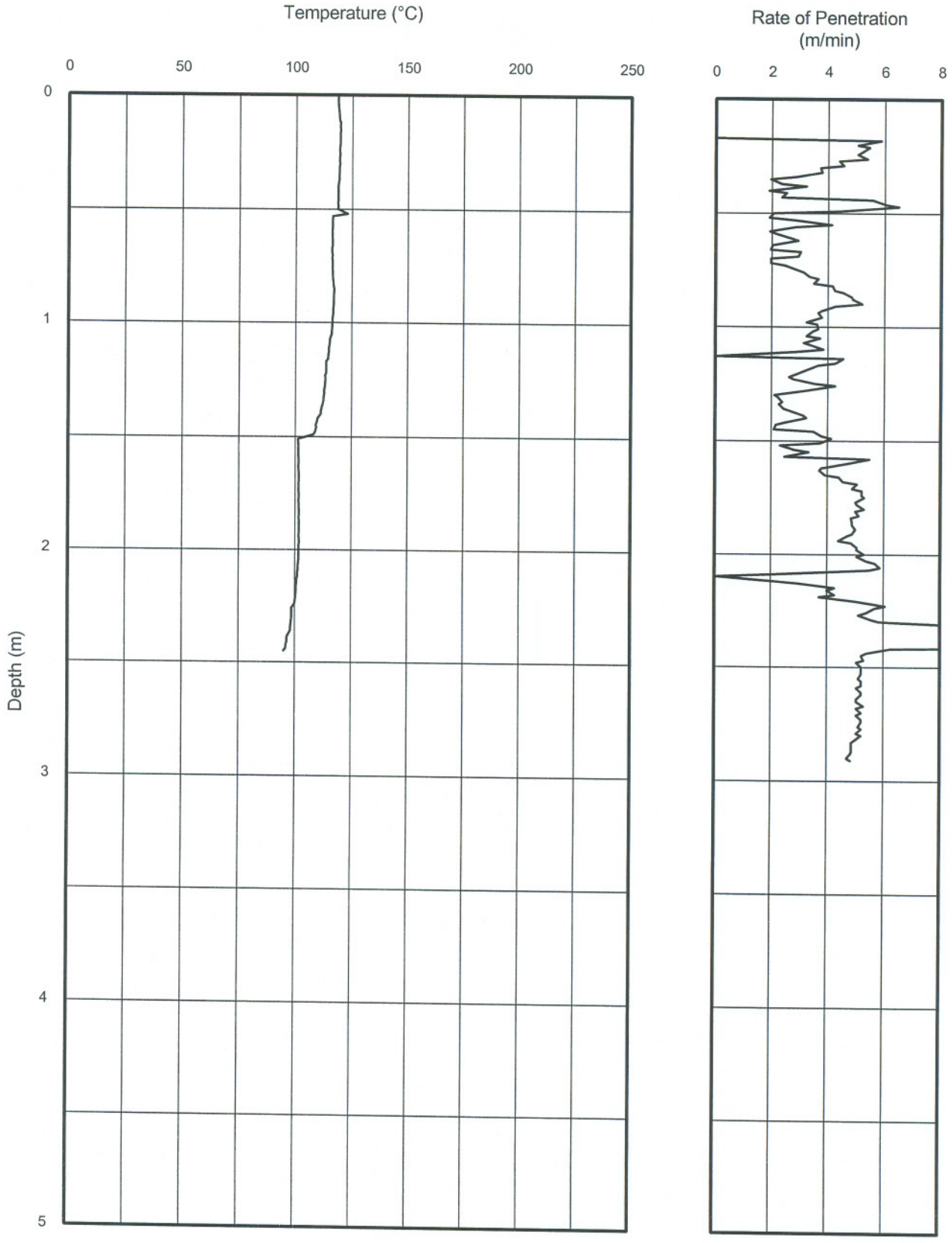


MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K16

CRA
KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K16

itle

Report No. : ENV043528

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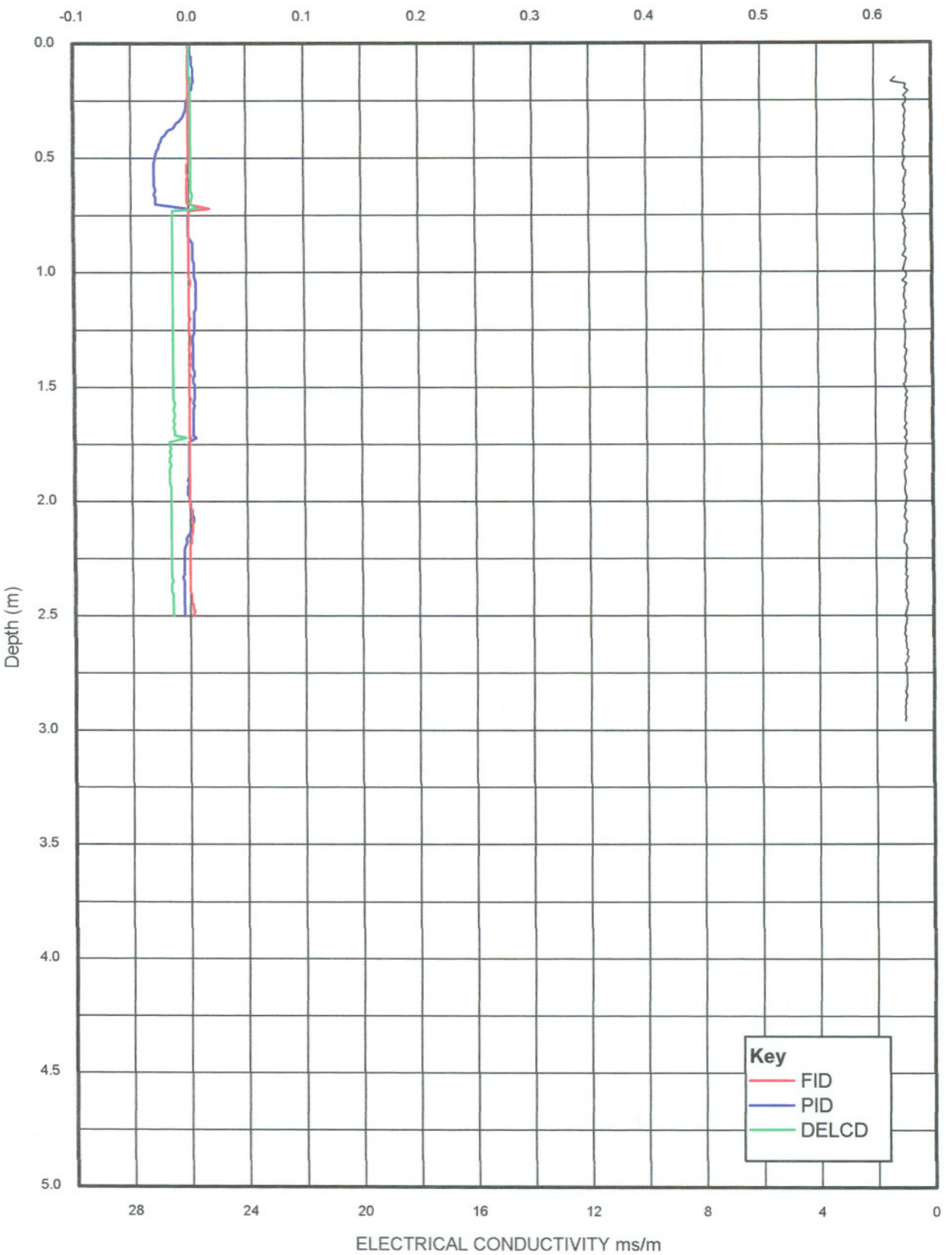
KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004
Drawn by: DLC
Date:
Checked by:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K17

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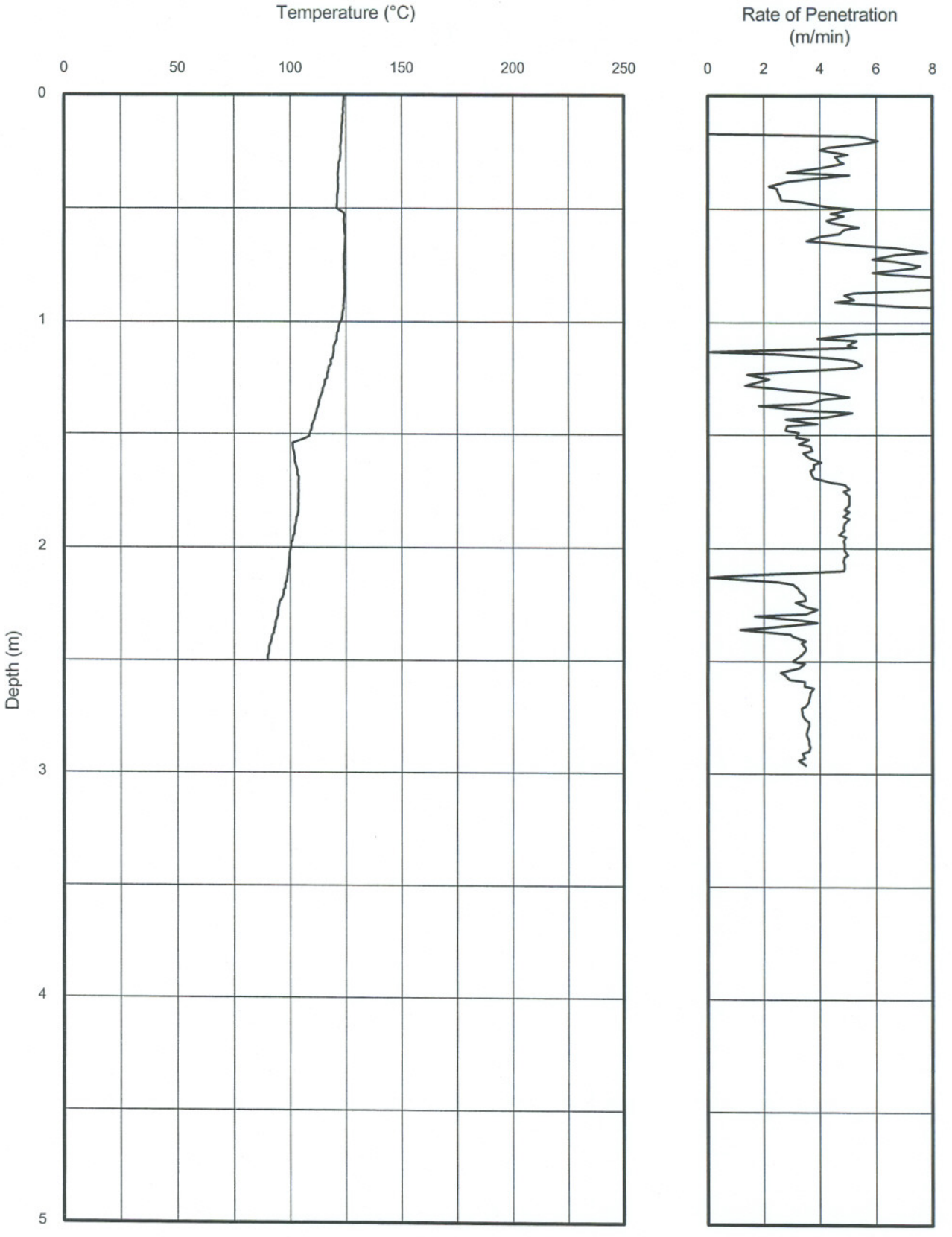
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K17

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Report No. : ENV043528

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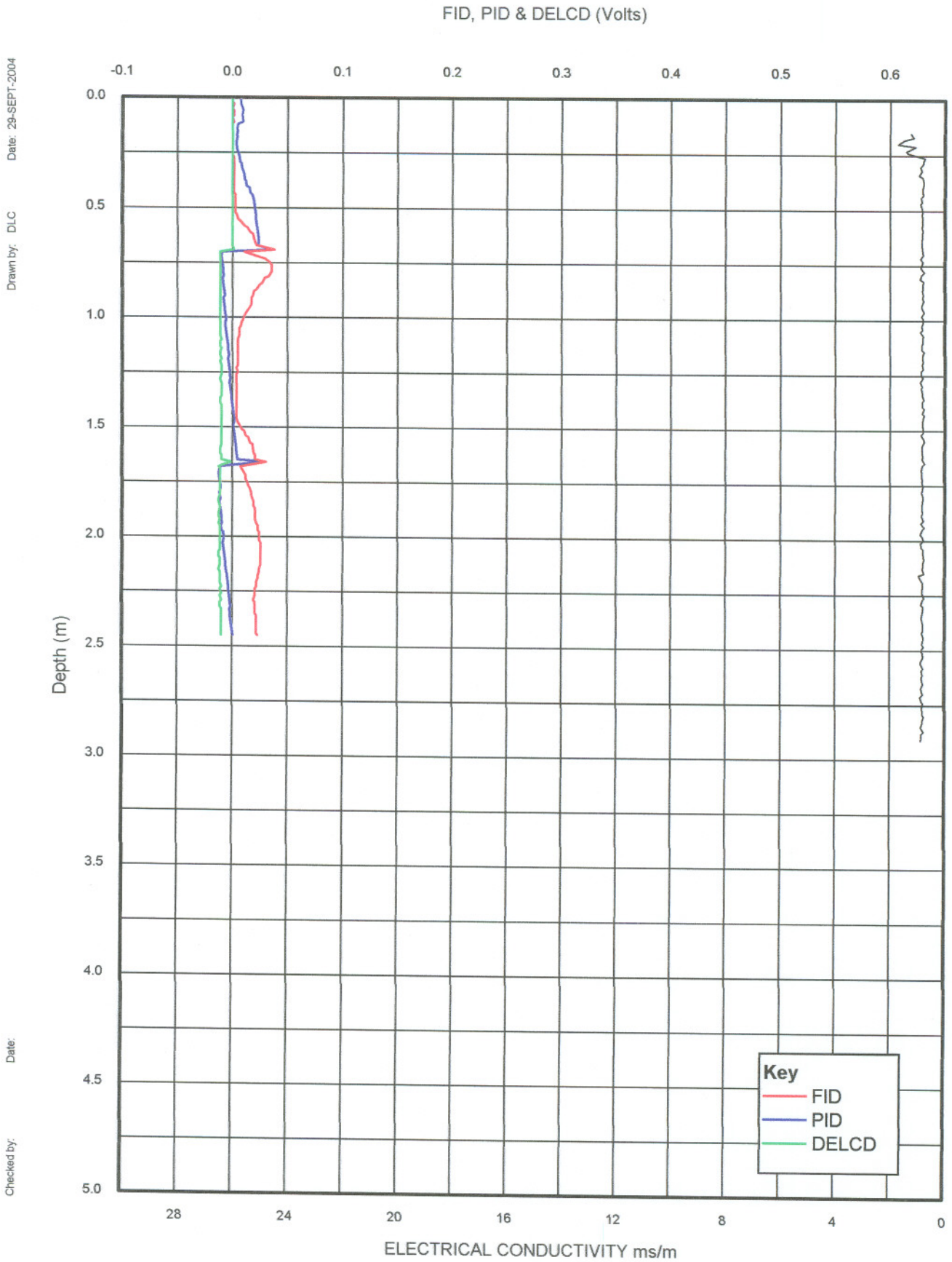
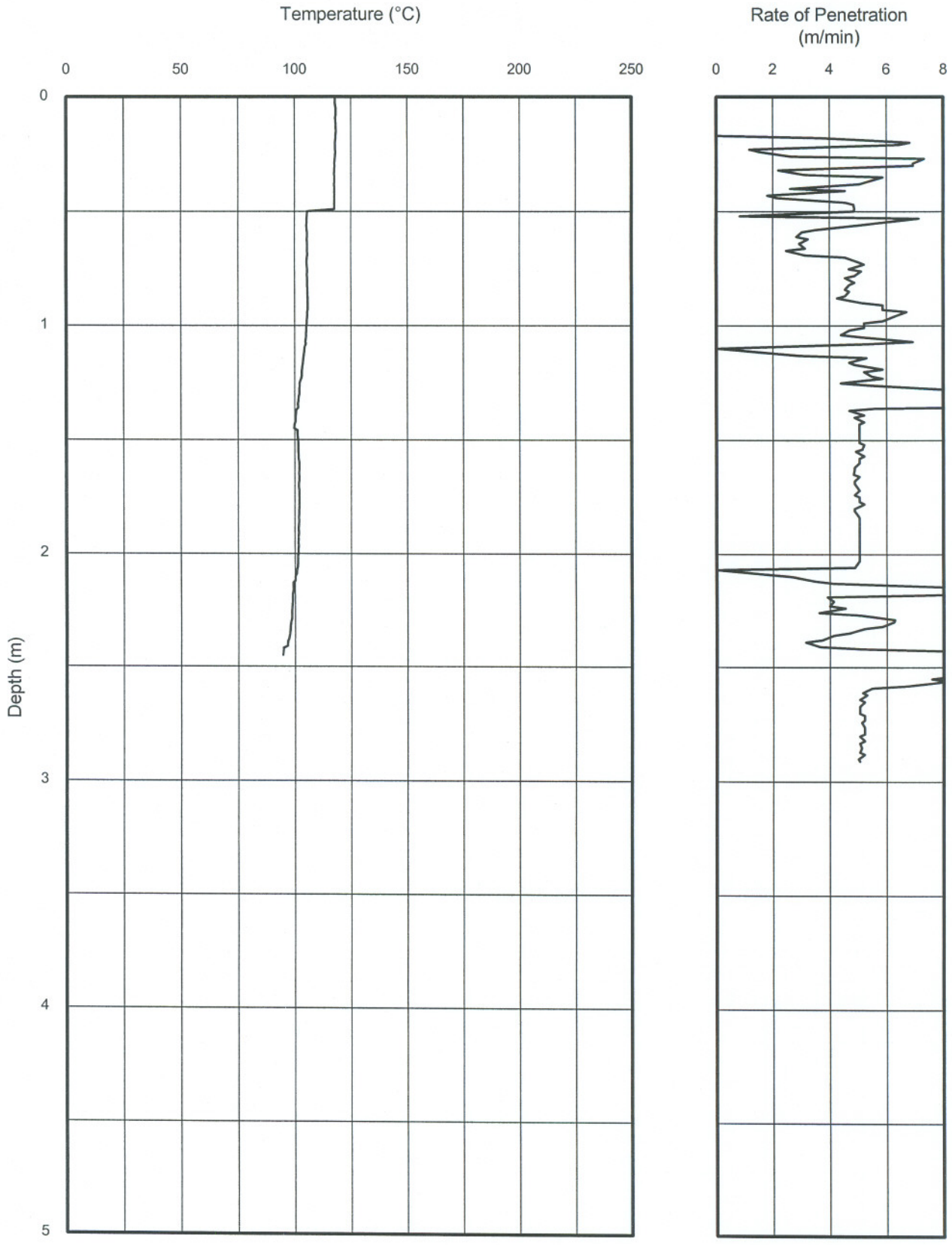


MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K18

CRA
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

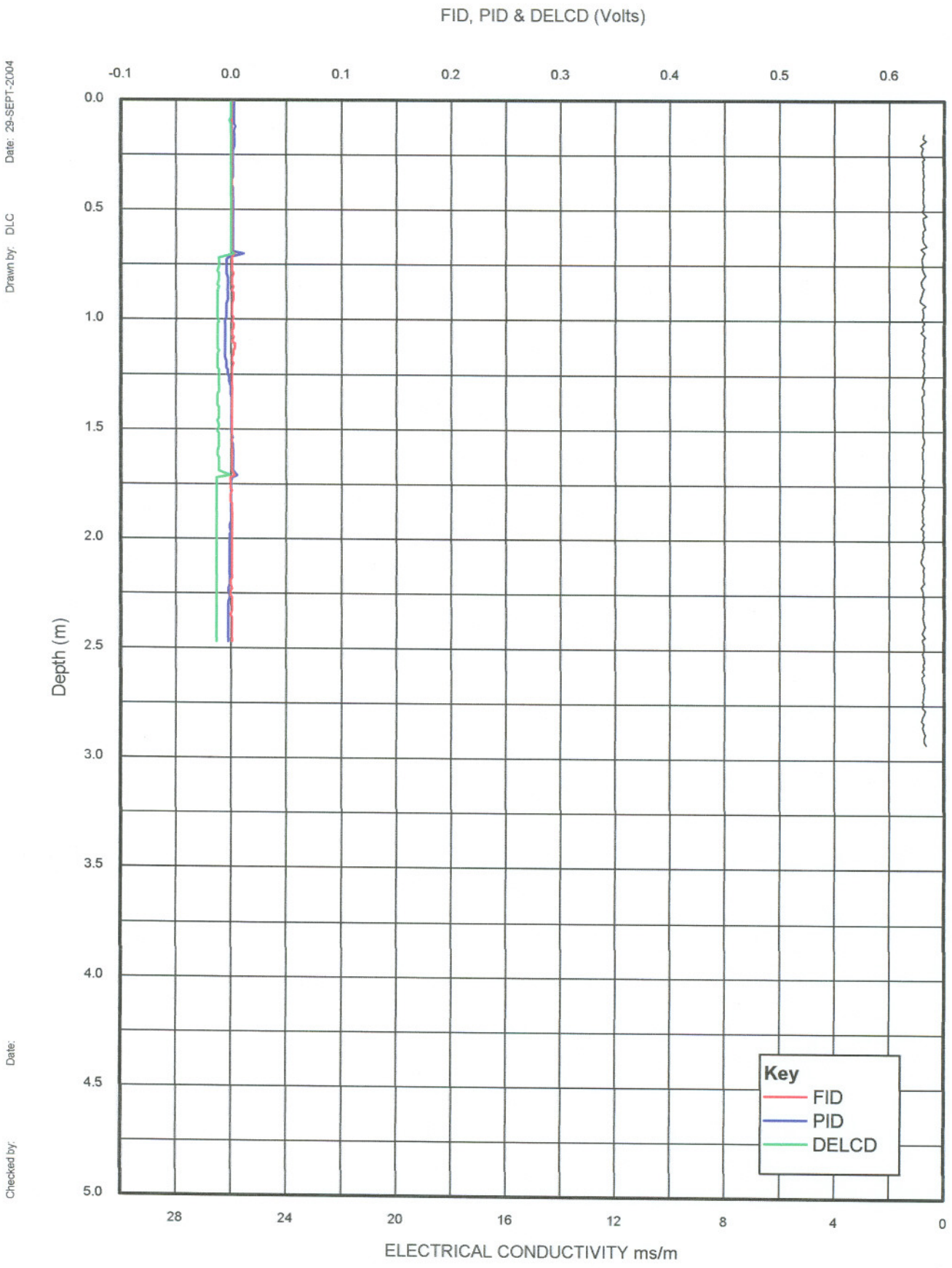
Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K18

itle

Report No. : ENV043528

CRA
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K19

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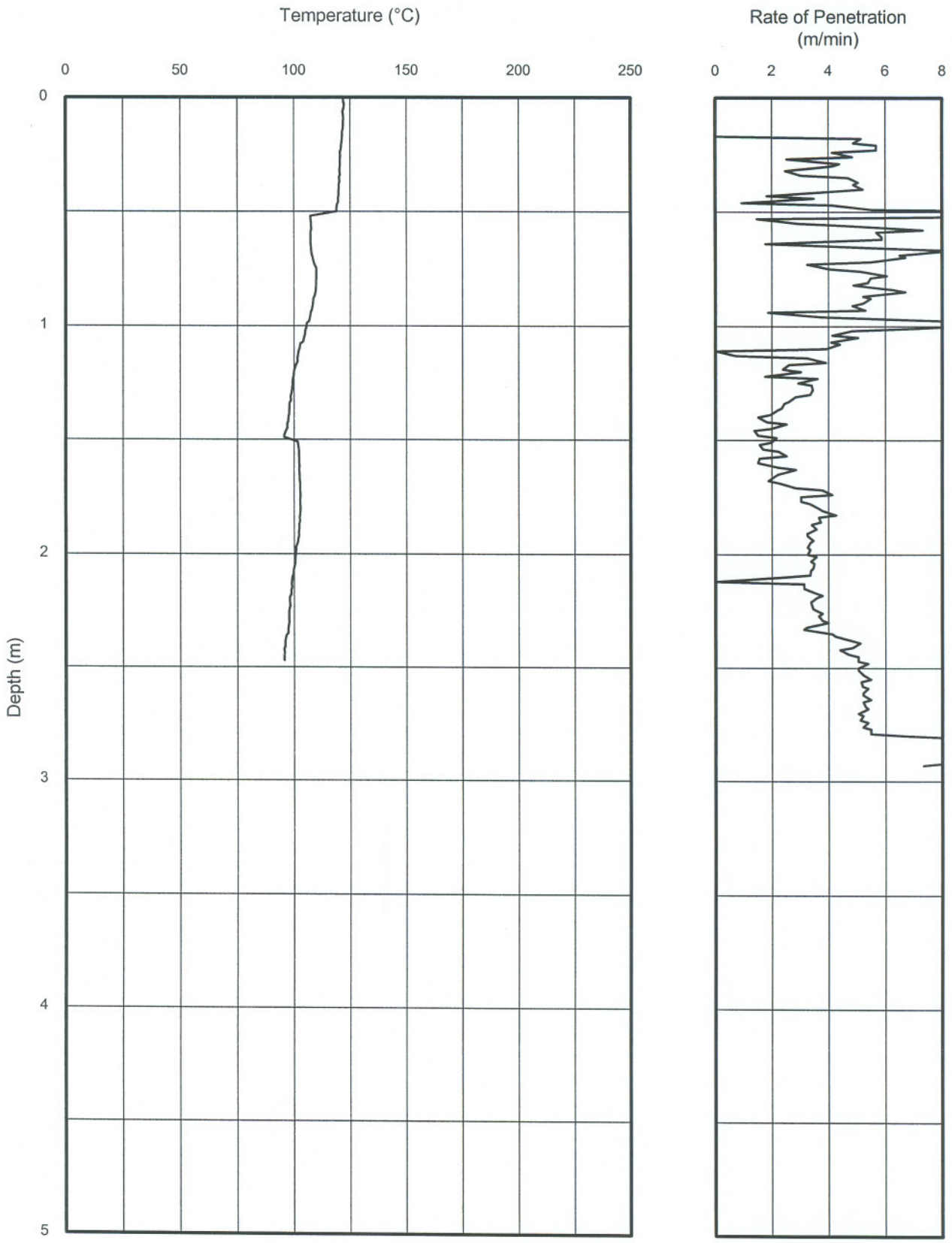
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

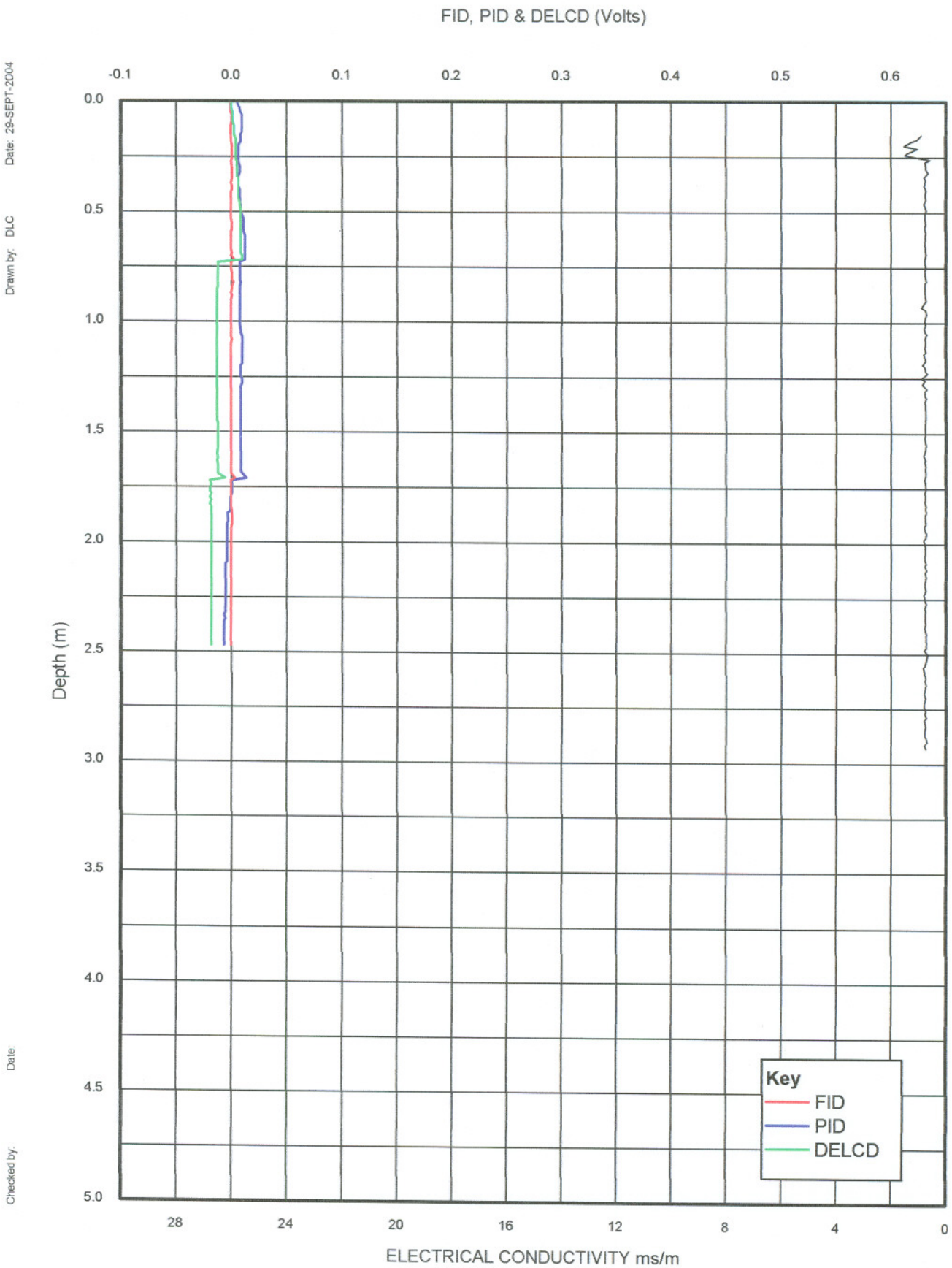
Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K19

itle

Report No. : ENV043528

CRA
KODAK, KIRKBY, nr LIVERPOOL

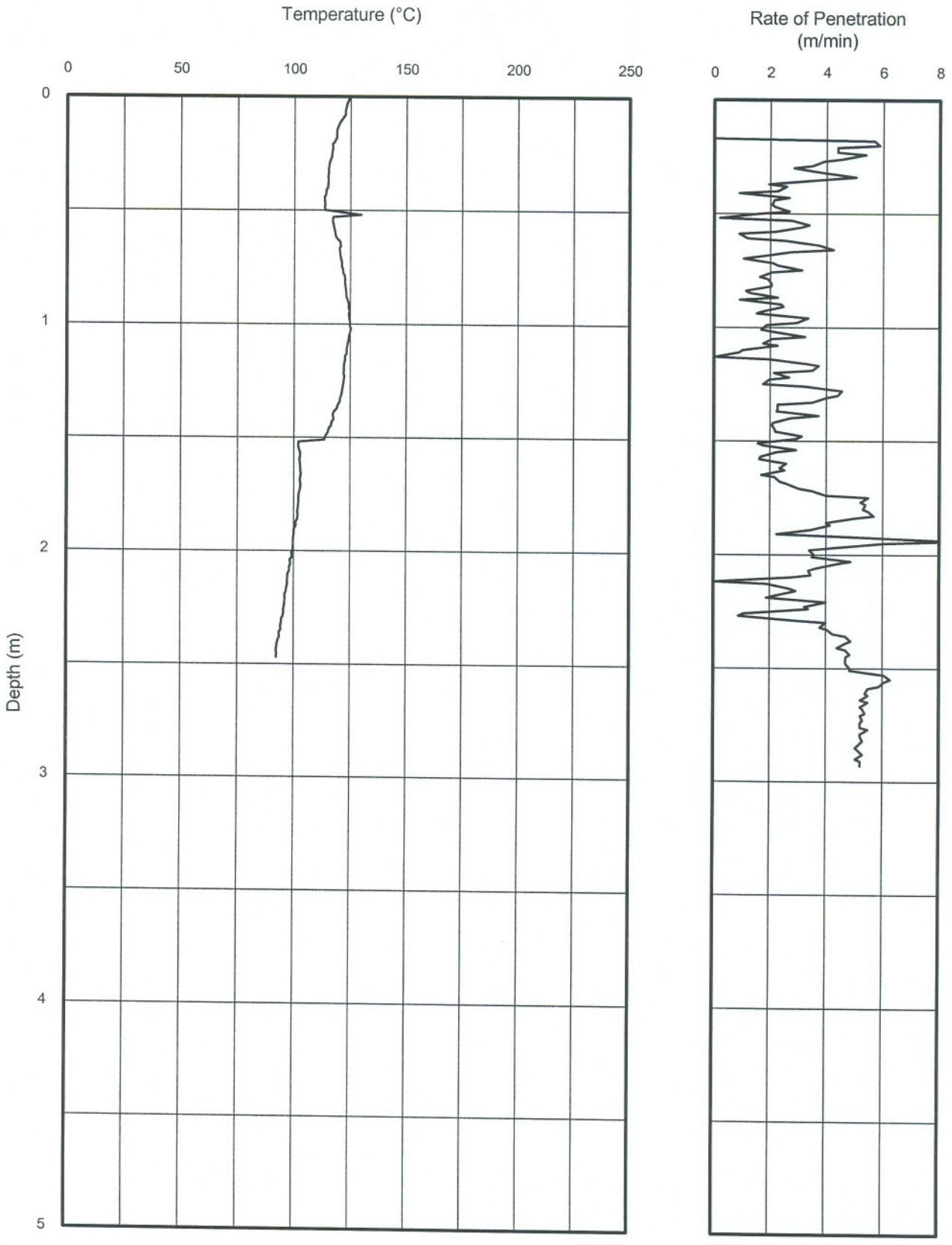


MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K20A

CRA
KODAK, KIRKBY, nr LIVERPOOL

Date: 29-SEPT-2004

Drawn by: DLC



Date:

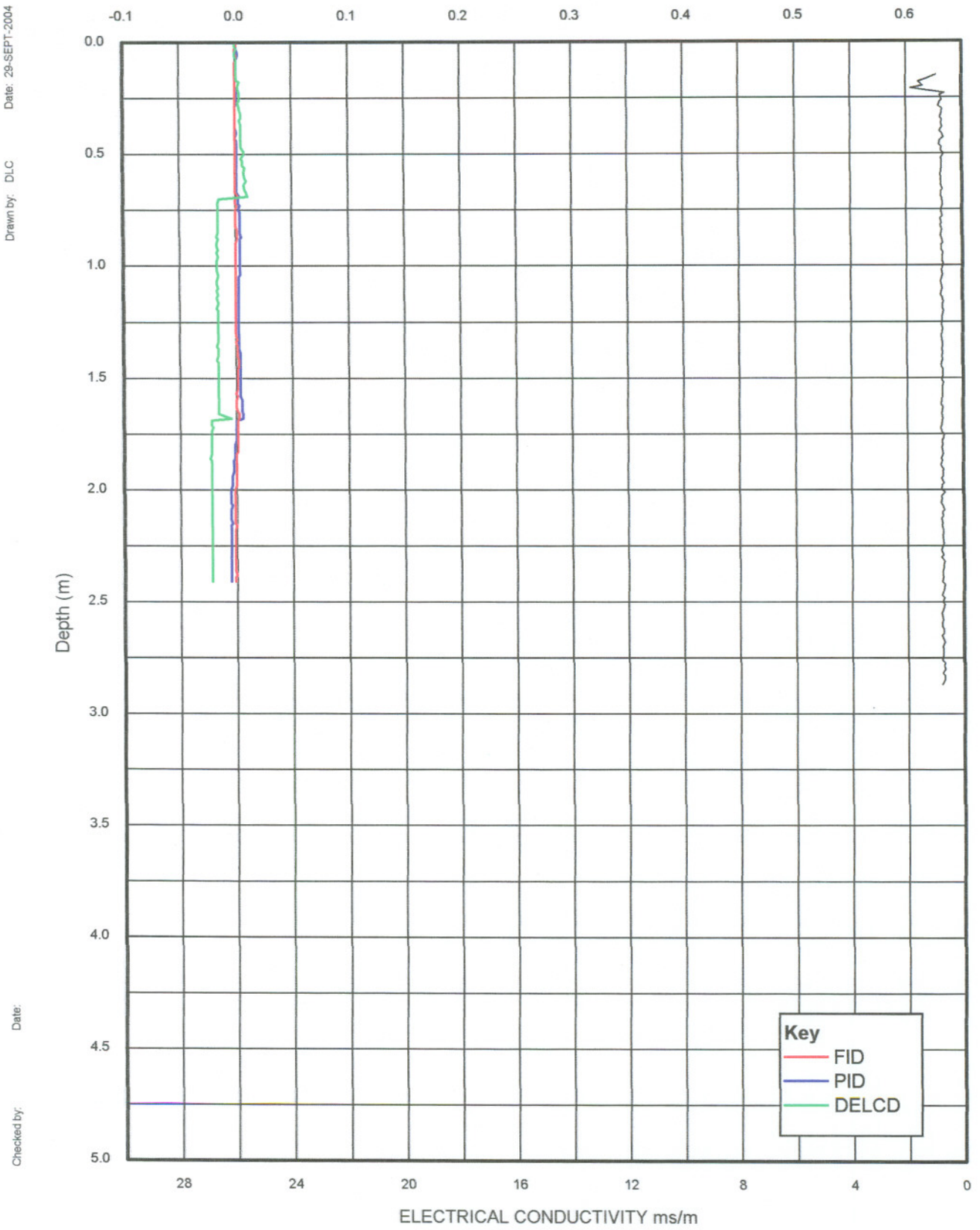
Checked by:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K20A

itle

Report No. : ENV043528

CRA
KODAK, KIRKBY, nr LIVERPOOL

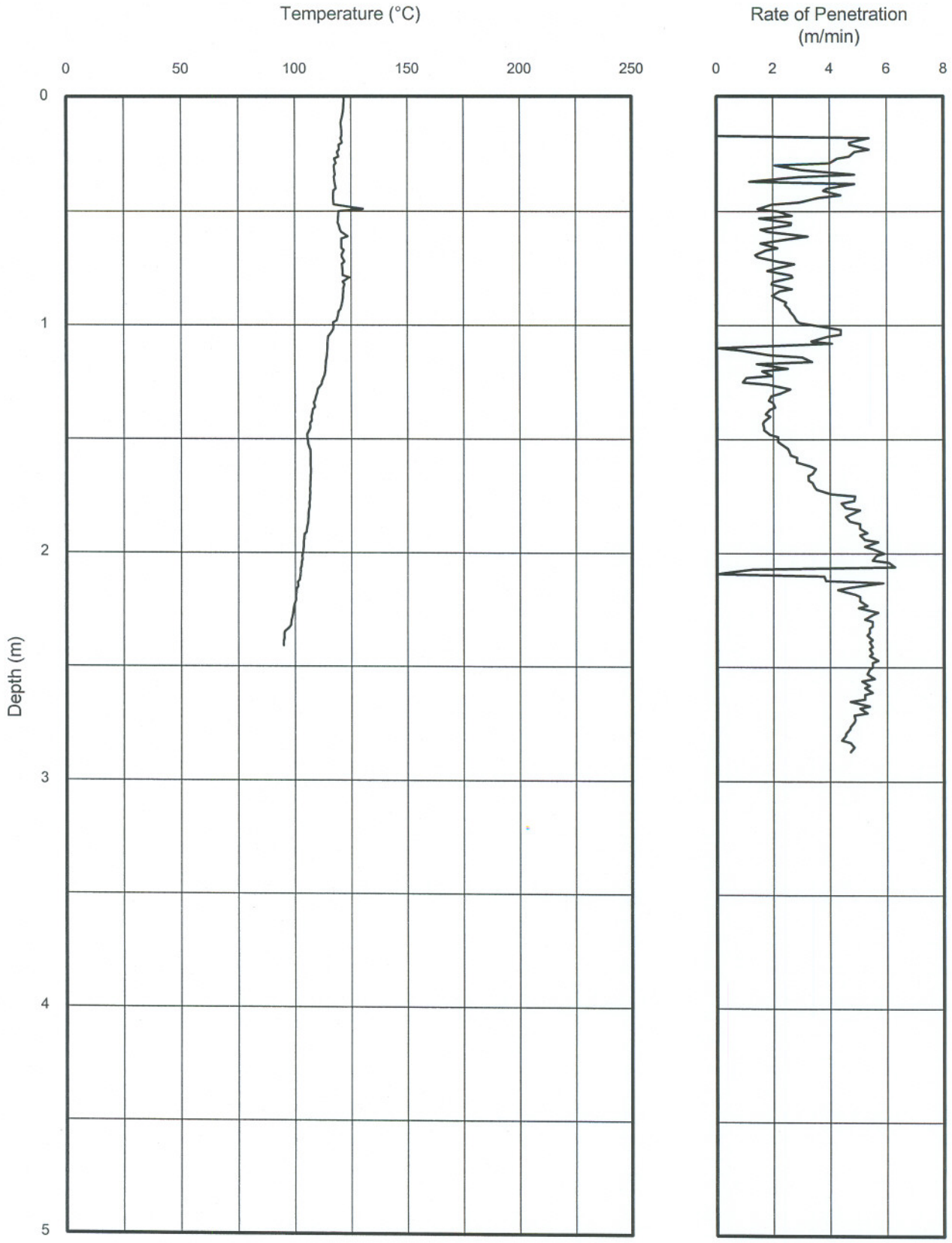


MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K21

CRA
KODAK, KIRKBY, nr LIVERPOOL

Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K21

itle

Report No. : ENV043528

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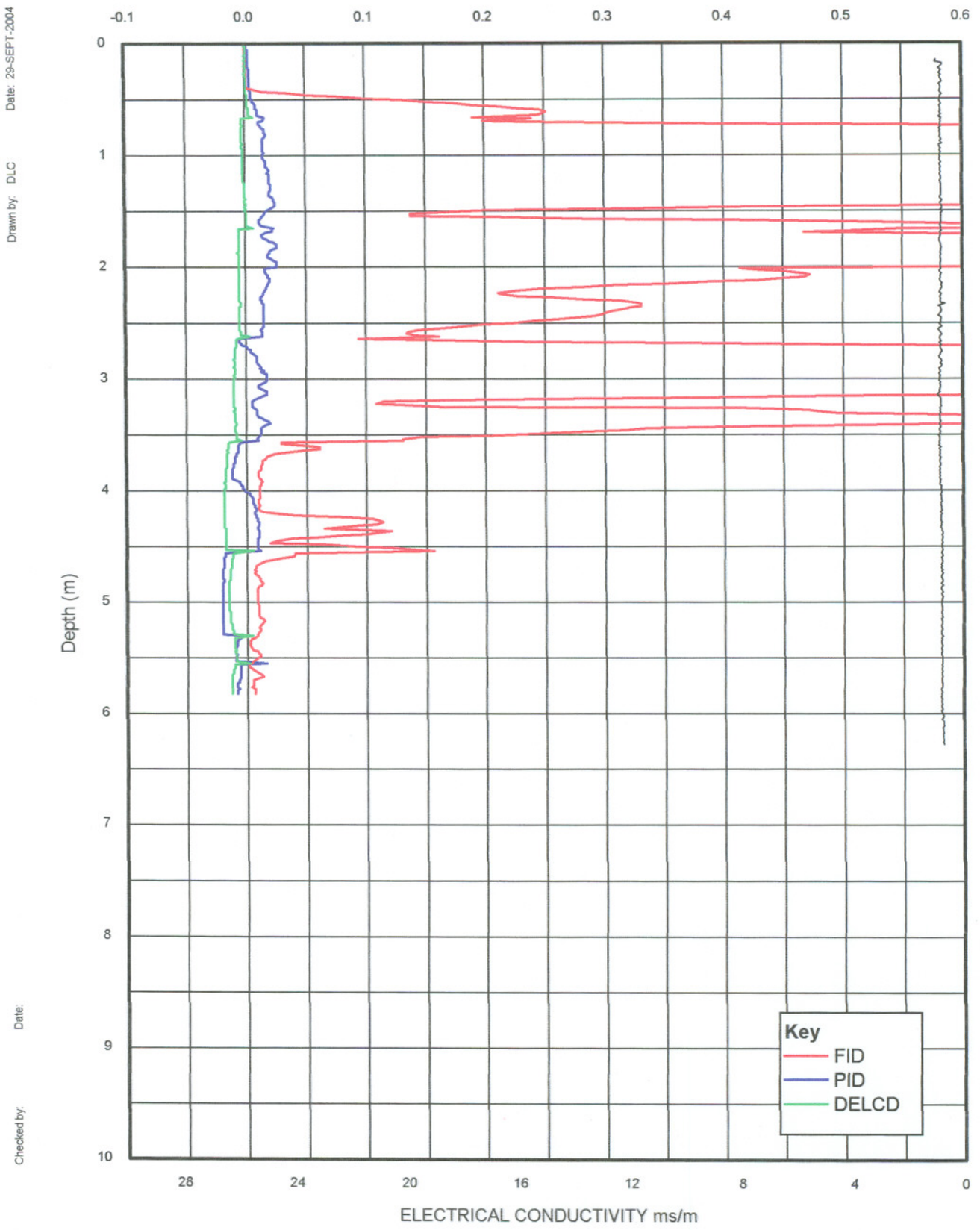
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K22

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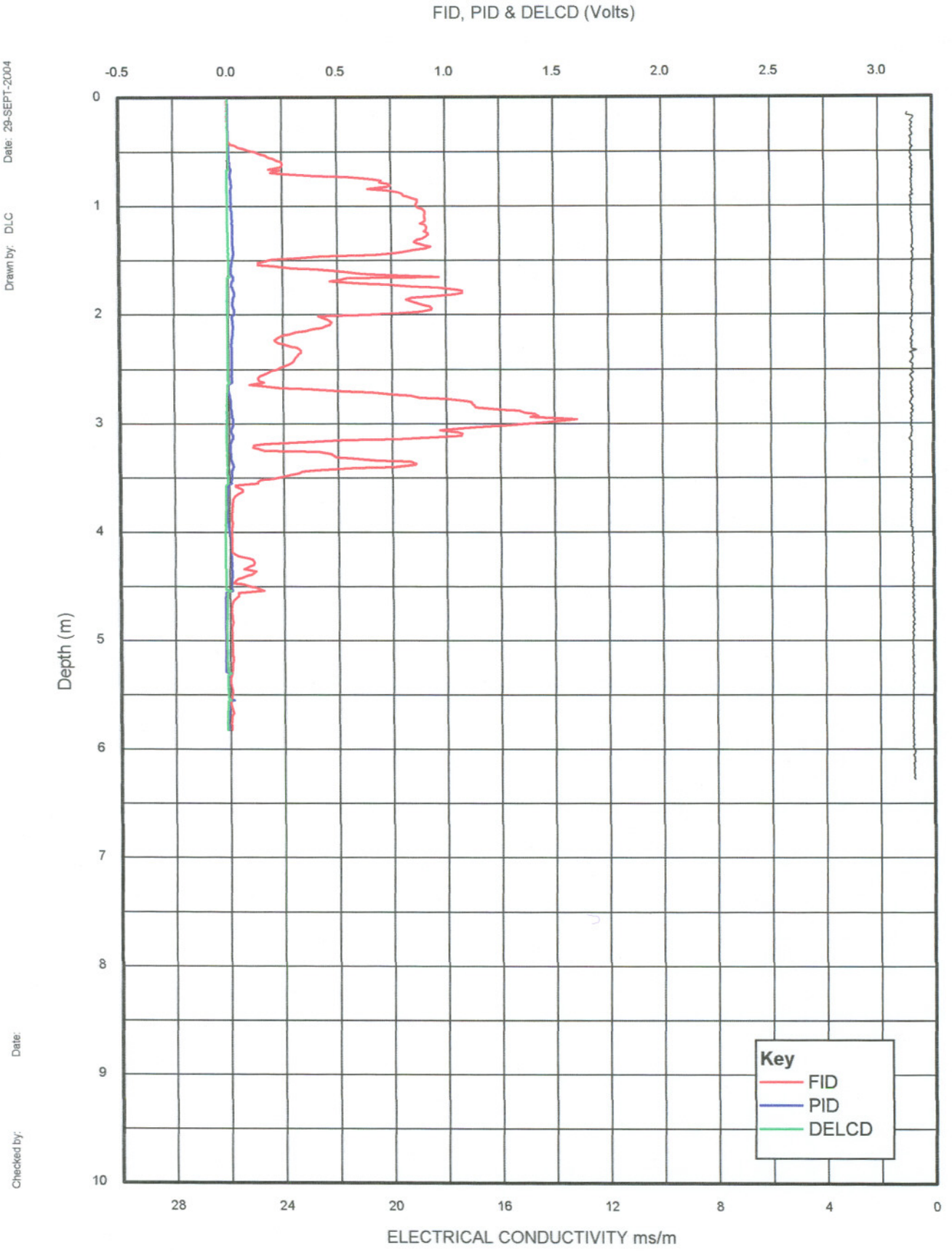
KODAK, KIRKBY, nr LIVERPOOL



MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K22

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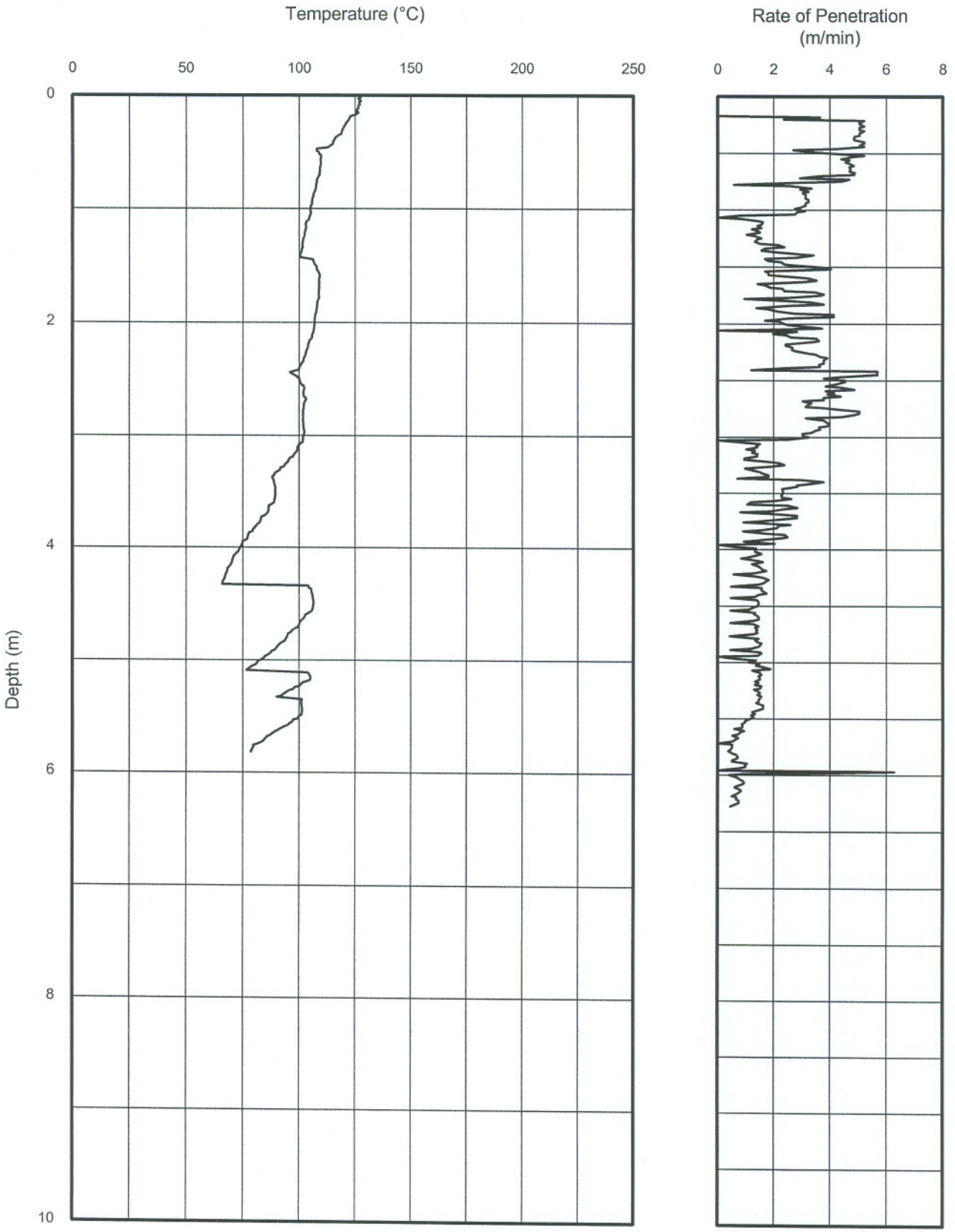
KODAK, KIRKBY, nr LIVERPOOL



Drawn by: DLC Date: 29-SEPT-2004

Checked by: Date:

MEMBRANE INTERFACE PROBE TEST RESULTS
TEST NO.K22

itle

Report No. : ENV043528

APPENDIX C

Geoprobe™ Soil Sampling Details

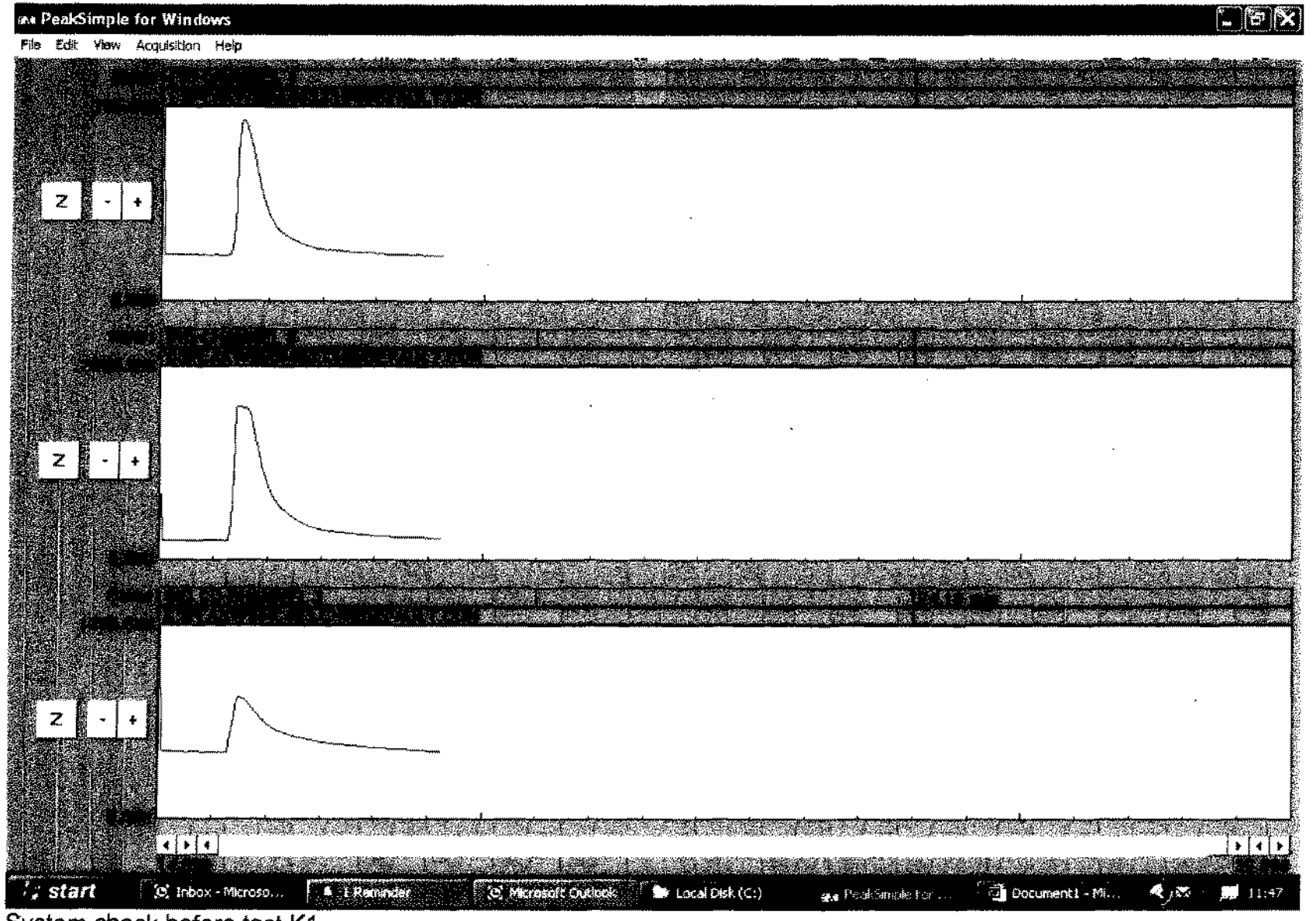
Table 1: Soil sample details

Test No.	Sample No.	Depth (m)	Remarks
WS 1	1	0.00-1.20	
	2	1.20-2.20	
	3	2.20-3.20	Van became stuck

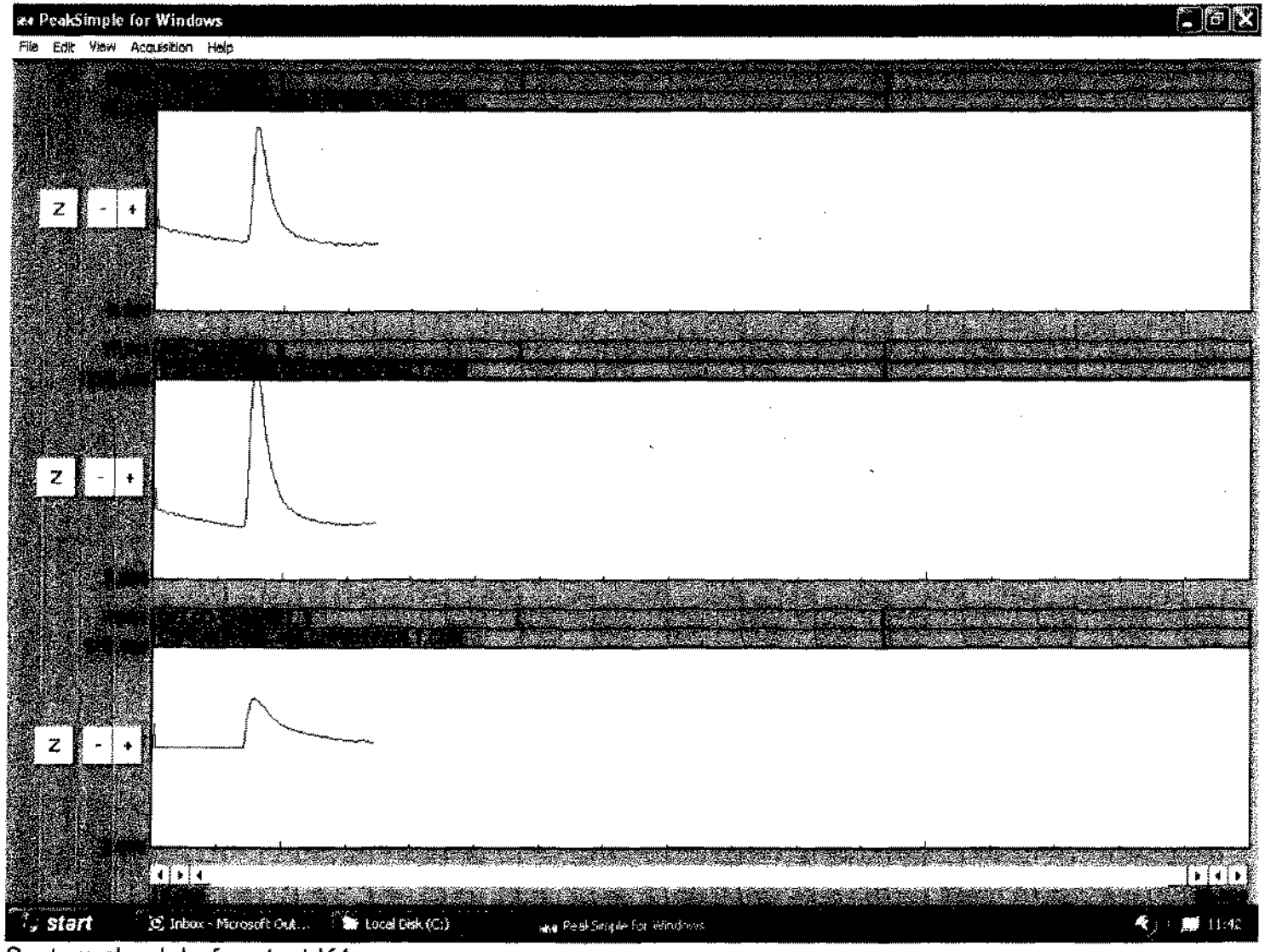
Table 1 – Summary of Geoprobe™ Soil Sampling

APPENDIX D

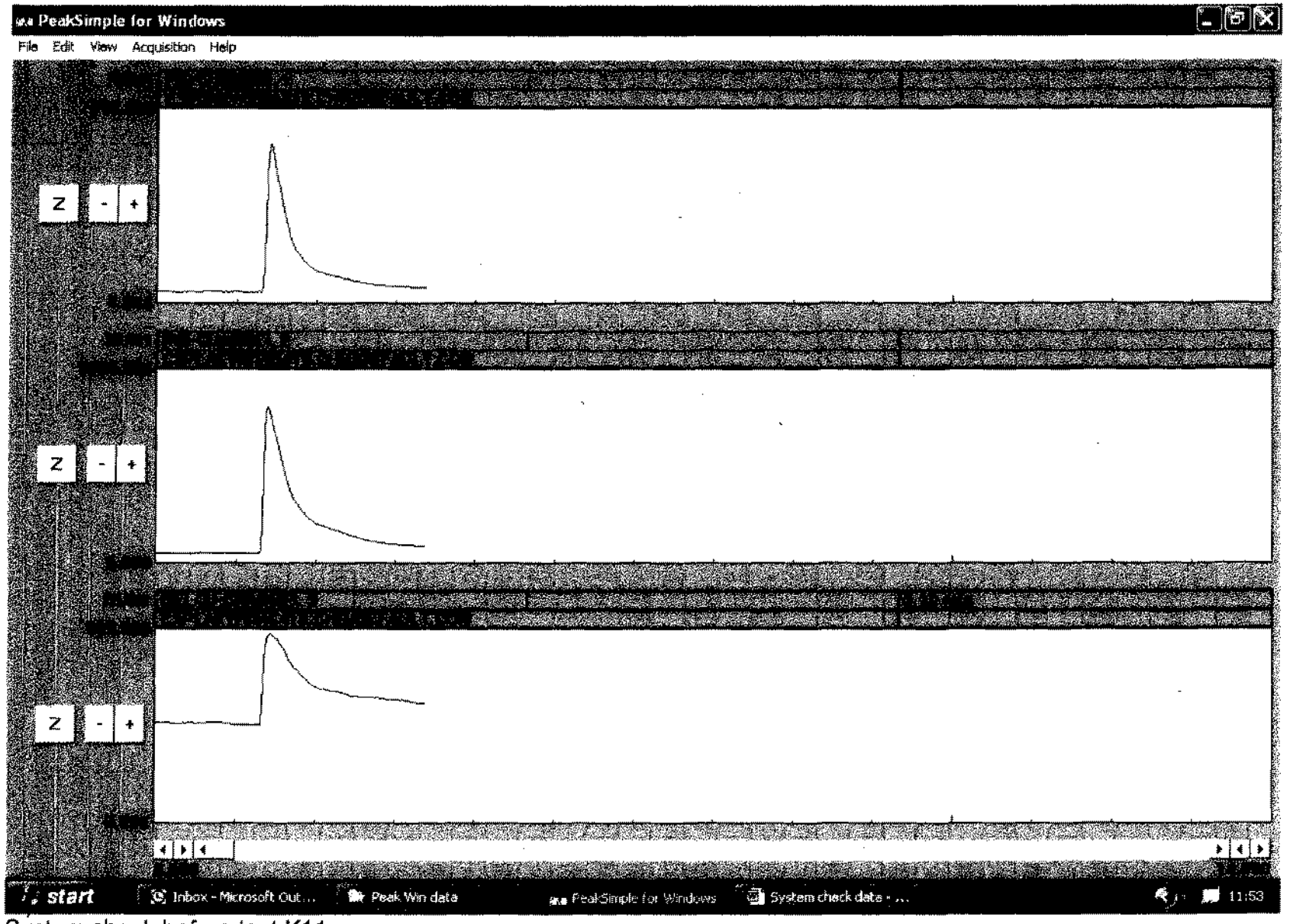
System Check



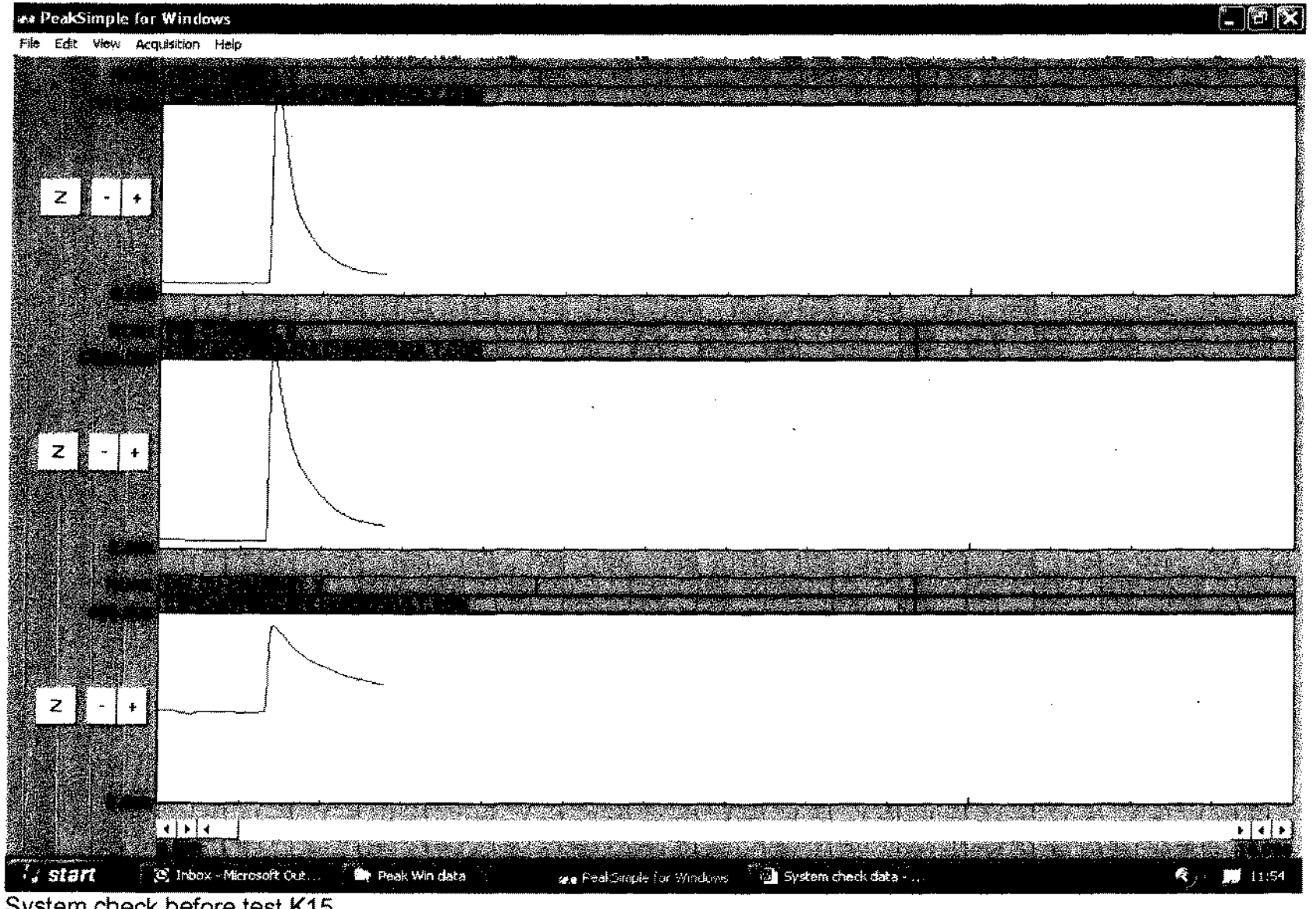
System check before test K1



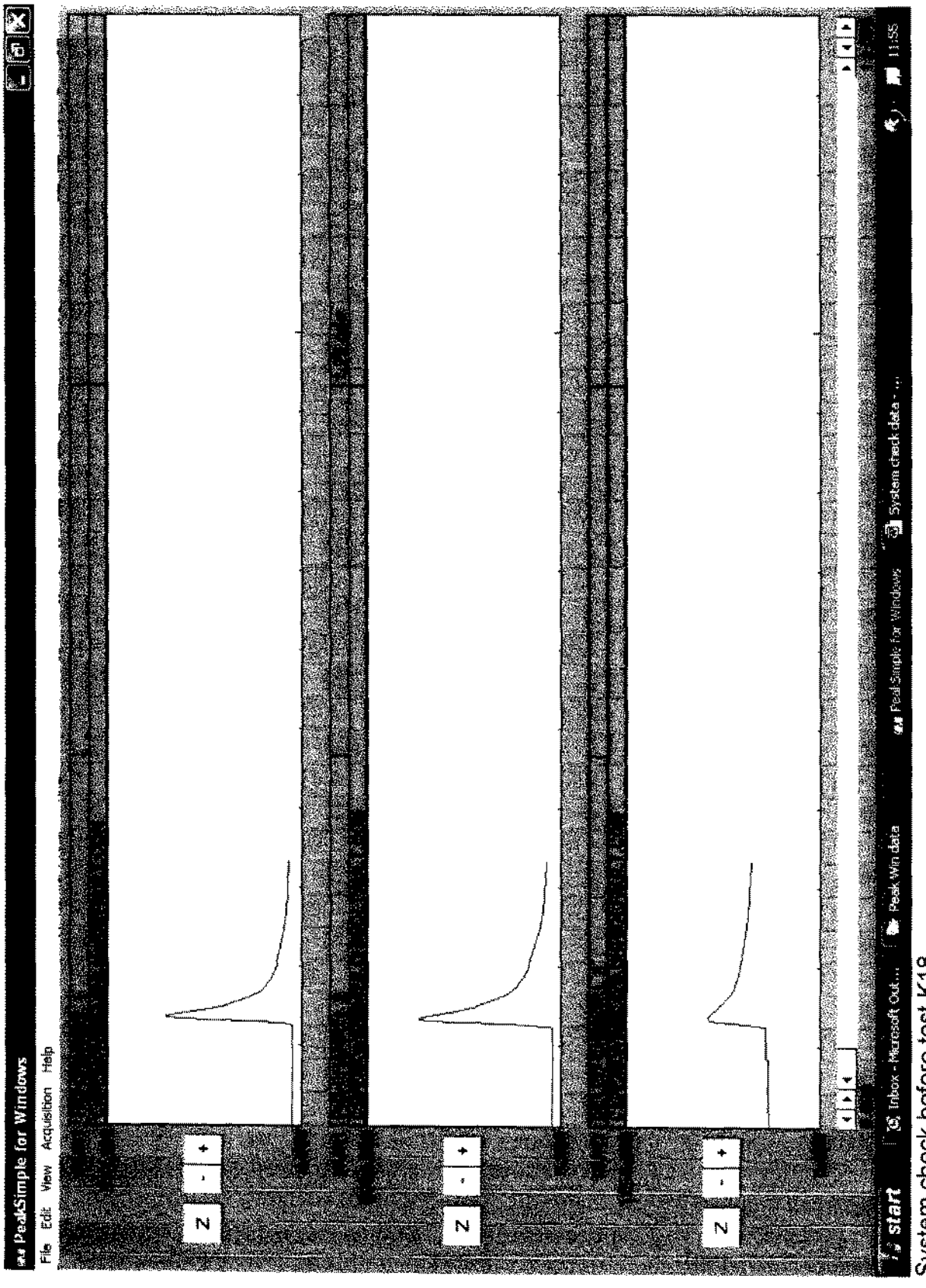
System check before test K4



System check before test K11



System check before test K15



System check before test K18

SOILS INVESTIGATION AT KODAK LTD, KIRKBY, NR LIVERPOOL	REPORT NO: ENV043528-1 DATE: 13th October 2004
CLIENT: CRA	

Appendix C

Soil and Groundwater Analytical Results

ALcontrol Geochem

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

Carbon Range C10-C40

Job Number : 04/15104/02/01
Client : Conestoga-Rovers & Ass. (UK) Ltd
Client Ref : 033154
Matrix [Units] : LIQUID [ug/l]

Sample No	Sample Identity	Depth	EPH	Interpretation
58	BH 1A (DEEP)		1211	biodegraded diesel
62	ABSTRACTION WELL		1163	biodegraded diesel

ALcontrol Geochem

Extractable Petroleum Hydrocarbons (EPH) By GC-FID

Carbon Range C10-C40

Job Number : 04/15104/02/01
Client : Conestoga-Rovers & Ass. (UK) Ltd
Client Ref : 033154
Matrix [Units] : SOLID [mg/kg]

All results expressed on a dry weight basis.

Sample No	Sample Identity	Depth	EPH	Interpretation
2	WS1	0.07-0.3	219	PAHs/Humic Acids
5	WS1	0.8-1.5	279	PAHs/Humic Acids
8	WS2	0.25-0.55	298	PAHs/Humic Acids
11	WS2	1.72-1.9	6	No Identification Possible
14	WS3	0.25-0.55	139	PAHs/Humic Acids
17	WS3	1.6-2.0	25	Poly Aromatic Hydrocarbons (PAHs)
20	WS4	1.1-1.25	87	Naturally Occurring Humic Acids
23	WS4	2-2.15	2	No Identification Possible
26	WS5	0.6-0.85	98	Naturally Occurring Humic Acids
29	WS5	1.1-1.3	14357	Used Engine Oil
32	WS6	1.15-1.25	273	PAHs/Humic Acids
35	WS6	2.4-2.6	4	No Identification Possible
38	WS7	0.75-0.9	102	PAHs/Humic Acids
41	WS8	0.5-0.6	257	PAHs/Humic Acids
44	WS8	1.05-1.15	75	Naturally Occurring Humic Acids
47	WS9	0.6-0.7	186	PAHs/Humic Acids
50	WS10	0.55-0.7	370	PAHs/Humic Acids
53	WS13	0.55-0.7	166	Naturally Occurring Humic Acids
56	WS17	1.05-1.35	3	No Identification Possible

Extractable Petroleum Hydrocarbons (formally Diesel Range Organics) :- Any compound extractable in n-hexane within the carbon range C10-C40, includes Aliphatic (Min Oil), Aromatic (PAHs) and naturally occurring compounds.

ALcontrol Geochem Analytical Services
Sample Descriptions

Job Number: 04/15104/02/01
Client: Conestoga-Rovers & Ass. (UK) Ltd
Client Ref : **33154**

Grain sizes

<0.063mm	Very Fine
0.1mm - 0.063mm	Fine
0.1mm - 2mm	Medium
2mm - 10mm	Coarse
>10mm	Very Coarse

Sample Identity	Depth (m)	Colour	Grain Size	Description	Batch
WS1	0.07-0.3	Dark Brown	0.1mm - 2mm	Top Soil with some Vegetation	1
WS1	0.8-1.5	Black	0.1mm - 2mm	Top Soil with some Stones	1
WS2	0.25-0.55	Black	0.1mm - 2mm	Top Soil	1
WS2	1.72-1.9	Black	0.1mm - 2mm	Gravel with some Stones	1
WS3	0.25-0.55	Dark Brown	0.1mm - 2mm	Top Soil with some Stones	1
WS3	1.6-2.0	Dark Brown	0.1mm - 2mm	Top Soil with some Vegetation	1
WS4	1.1-1.25	Dark Brown	0.1mm - 0.063mm	Top Soil	1
WS4	2-2.15	Dark Grey	0.1mm - 2mm	Clay	1
WS5	0.6-0.85	Black	0.1mm - 2mm	Top Soil	1
WS5	1.1-1.3	Dark Brown	0.1mm - 2mm	Top Soil with some Oil/Petroleum	1
WS6	1.15-1.25	Dark Brown	0.1mm - 2mm	Top Soil with some Vegetation	1
WS6	2.4-2.6	Light Brown	0.1mm - 0.063mm	Clay	1
WS7	0.75-0.9	Dark Brown	0.1mm - 2mm	Top Soil with some Vegetation	1
WS8	0.5-0.6	Dark Brown	0.1mm - 2mm	Top Soil	1
WS8	1.05-1.15	Dark Brown	0.1mm - 0.063mm	Top Soil with some Vegetation	1
WS9	0.6-0.7	Brown	0.1mm - 2mm	Top Soil with some Stones	1
WS10	0.55-0.7	Dark Brown	0.1mm - 2mm	Top Soil with some Hardcore/Rubble	1
WS13	0.55-0.7	Dark Brown	0.1mm - 0.063mm	Silty Clay	1
WS17	1.05-1.35	Light Brown	0.1mm - 0.063mm	Sand	1

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27		
Arsenic	2	4	3	15	1	2	<1	<1	<1	TM129#	<1 mg/kg
Cadmium	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM129#	<1 mg/kg
Chromium	33	46	17	60	28	24	28	45	20	TM129#	<1 mg/kg
Copper	44	43	37	112	24	28	24	18	23	TM129#	<1 mg/kg
Lead	89	34	35	23	25	49	18	6	19	TM129#	<1 mg/kg
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM129#	<1 mg/kg
Nickel	12	34	10	78	11	16	25	30	13	TM129#	<1 mg/kg
Selenium	<1	1	<1	2	2	<1	<1	1	<1	TM129#	<1 mg/kg
Silver	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM129#	<10 mg/kg
Zinc	165	89	70	111	64	54	51	52	34	TM129#	<1 mg/kg
Boron (Water Soluble)	<1	2	<1	1	<1	<1	<1	<1	<1	TM129#	<1 mg/kg
Total Cyanide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM153#M	<1 mg/kg
Free Cyanide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM153#M	<1 mg/kg
pH Value In Soil	7.10	7.43	7.10	6.90	7.28	7.29	7.14	7.73	6.92	TM133#	<1.00 pH Units
EPH (DRO) (C10-C40)	219	279	298	6	139	25	87	2	98	TM061#M	<1 mg/kg
PRO (C4-C10)	<10	13	19	196	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
PRO (C10-C12)	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Benzene	<10	<10	<10	29	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Toluene	<10	13	19	80	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Ethyl benzene	<10	<10	<10	25	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
m & p Xylene	<10	<10	<10	62	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
o Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
MTBE	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27		
SVOC											
Phenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Chlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Nitrophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Nitrophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dimethylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chloro-3-methylphenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4,6-Trichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4,5-Trichlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Pentachlorophenol	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,3-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,4-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,2-Dichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,2,4-Trichlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Nitrobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Azobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorobenzene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Naphthalene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Acenaphthylene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Acenaphthene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Fluorene	<100	<100	232	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Phenanthrene	<100	<100	2558	<100	<100	<100	129	<100	<100	TM143	<100 µg/kg
Anthracene	<100	<100	594	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Fluoranthene	224	228	2990	<100	201	<100	337	<100	270	TM143	<100 µg/kg
Pyrene	217	206	2179	<100	184	<100	287	<100	227	TM143	<100 µg/kg
Benzo(a)anthracene	<100	<100	926	<100	<100	<100	192	<100	129	TM143	<100 µg/kg
Chrysene	<100	<100	920	<100	<100	<100	206	<100	157	TM143	<100 µg/kg
Benzo(b)fluoranthene	143	<100	608	<100	122	<100	189	<100	142	TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27		
SVOC (cont)											
Benzo(k)fluoranthene	131	<100	657	<100	134	<100	177	<100	134	TM143	<100 µg/kg
Benzo(a)pyrene	145	<100	695	<100	123	<100	203	<100	153	TM143	<100 µg/kg
Indeno(1,2,3-cd)pyrene	<100	<100	373	<100	<100	<100	146	<100	<100	TM143	<100 µg/kg
Dibenzo(a,h)anthracene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Benzo(ghi)perylene	<100	<100	299	<100	<100	<100	124	<100	<100	TM143	<100 µg/kg
2-Chloronaphthalene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Methylnaphthalene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Carbazole	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Isophorone	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Dibenzofuran	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Dimethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Diethyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100	<100	1131	<100	TM143	<100 µg/kg
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chloroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
3-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Nitroaniline	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dinitrotoluene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,6-Dinitrotoluene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-chloroethyl)ether	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Bromophenylphenylether	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chlorophenylphenylether	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachloroethane	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorobutadiene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorocyclopentadiene	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-chloroethoxy)methane	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
N-nitrosodi-n-propylamine	<100	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27		
VOC											
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
trans-1-2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Dichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Carbon Disulphide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Methyl Tertiary Butyl Ether	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
cis-1-2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
2.2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.1.1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Benzene	<1	3	<1	4	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Carbontetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Dibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
cis-1-3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
trans-1-3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1.2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Toluene	<1	<1	<1	10	<1	<1	<1	1	<1	TM116[#M]	<1 ug/kg
1.3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
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* Subcontracted test
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Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27		
VOC (cont)											
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.1.1.2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
p/m-Xylene	<1	3	<1	5	<1	<1	<1	2	<1	TM116#	<1 ug/kg
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.1.2.2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
o-Xylene	<1	1	<1	3	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
4-Isopropyltoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.3.5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
1.4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg

All results expressed on a dry weight basis.

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Validated ☑
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ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS1	WS1	WS2	WS2	WS3	WS3	WS4	WS4	WS5	Method Code	LoD/Units
Depth (m)	0.07-0.3	0.8-1.5	0.25-0.55	1.72-1.9	0.25-0.55	1.6-2.0	1.1-1.25	2-2.15	0.6-0.85		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	**1-3**	**4-6**	**7-9**	**10-12**	**13-15**	**16-18**	**19-21**	**22-24**	**25-27**		
VOC (cont)											
Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

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Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
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* Subcontracted test
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Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54		
Arsenic	3	<1	<1	1	<1	<1	3	4	1	TM129#	<1 mg/kg
Cadmium	<1	<1	<1	2	<1	<1	1	4	<1	TM129#	<1 mg/kg
Chromium	48	28	58	35	34	11	16	23	41	TM129#	<1 mg/kg
Copper	51	22	19	43	26	6	23	25	23	TM129#	<1 mg/kg
Lead	110	27	4	47	31	8	50	86	24	TM129#	<1 mg/kg
Mercury	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM129#	<1 mg/kg
Nickel	25	16	41	26	20	4	12	17	24	TM129#	<1 mg/kg
Selenium	<1	2	<1	1	<1	1	1	1	2	TM129#	<1 mg/kg
Silver	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM129#	<10 mg/kg
Zinc	105	40	58	59	69	16	76	91	107	TM129#	<1 mg/kg
Boron (Water Soluble)	<1	<1	<1	<1	2	2	<1	<1	<1	TM129#	<1 mg/kg
Total Cyanide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM153#M	<1 mg/kg
Free Cyanide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM153#M	<1 mg/kg
pH Value In Soil	7.68	7.35	5.44	7.74	7.02	6.86	7.90	7.56	7.51	TM133#	<1.00 pH Units
EPH (DRO) (C10-C40)	14357	273	4	102	257	75	186	370	166	TM061#M	<1 mg/kg
PRO (C4-C10)	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
PRO (C10-C12)	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Toluene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
Ethyl benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
m & p Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
o Xylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg
MTBE	<10	<10	<10	<10	<10	<10	<10	<10	<10	TM089#	<10 ug/kg

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Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
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* Subcontracted test
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Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54		
SVOC											
Phenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Chlorophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Methylphenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Methylphenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Nitrophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Nitrophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dichlorophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dimethylphenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chloro-3-methylphenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4,6-Trichlorophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4,5-Trichlorophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Pentachlorophenol	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,3-Dichlorobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,4-Dichlorobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,2-Dichlorobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
1,2,4-Trichlorobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Nitrobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Azobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorobenzene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Naphthalene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Acenaphthylene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Acenaphthene	<500	<100	<100	<100	<100	<100	<100	378	<100	TM143	<100 µg/kg
Fluorene	<500	<100	<100	<100	<100	<100	<100	208	<100	TM143	<100 µg/kg
Phenanthrene	3113	<100	<100	161	147	<100	199	829	449	TM143	<100 µg/kg
Anthracene	<500	<100	<100	<100	<100	<100	<100	214	<100	TM143	<100 µg/kg
Fluoranthene	2645	<100	<100	378	219	<100	519	960	583	TM143	<100 µg/kg
Pyrene	2477	<100	<100	350	179	<100	493	773	538	TM143	<100 µg/kg
Benzo(a)anthracene	1272	<100	<100	197	116	<100	298	353	277	TM143	<100 µg/kg
Chrysene	2129	<100	<100	245	141	<100	346	394	357	TM143	<100 µg/kg
Benzo(b)fluoranthene	1078	<100	<100	234	133	<100	330	331	266	TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54		
SVOC (cont)											
Benzo(k)fluoranthene	1033	<100	<100	210	118	<100	312	308	249	TM143	<100 µg/kg
Benzo(a)pyrene	1182	<100	<100	250	127	<100	378	368	263	TM143	<100 µg/kg
Indeno(1,2,3-cd)pyrene	847	<100	<100	184	<100	<100	302	252	171	TM143	<100 µg/kg
Dibenzo(a,h)anthracene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Benzo(ghi)perylene	855	<100	<100	175	<100	<100	277	228	157	TM143	<100 µg/kg
2-Chloronaphthalene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Methylnaphthalene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Carbazole	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Isophorone	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Dibenzofuran	<500	<100	<100	<100	<100	<100	<100	134	<100	TM143	<100 µg/kg
Dimethyl phthalate	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Diethyl phthalate	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Di-n-butyl phthalate	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Di-n-Octyl phthalate	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-ethylhexyl) phthalate	<500	<100	<100	<100	<100	1047	<100	<100	<100	TM143	<100 µg/kg
Butylbenzyl phthalate	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chloroaniline	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2-Nitroaniline	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
3-Nitroaniline	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Nitroaniline	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,4-Dinitrotoluene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
2,6-Dinitrotoluene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-chloroethyl)ether	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Bromophenylphenylether	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
4-Chlorophenylphenylether	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachloroethane	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorobutadiene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Hexachlorocyclopentadiene	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
Bis(2-chloroethoxy)methane	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg
N-nitrosodi-n-propylamine	<500	<100	<100	<100	<100	<100	<100	<100	<100	TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54		
VOC											
Dichlorodifluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Vinyl Chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
trans-1-2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Dichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Carbon Disulphide	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Methyl Tertiary Butyl Ether	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
cis-1-2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
2.2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.1.1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Carbontetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Dibromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
1.2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
cis-1-3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
trans-1-3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.1.2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg
Toluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#M]	<1 ug/kg
1.3-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	28-30	31-33	34-36	37-39	40-42	43-45	46-48	49-51	52-54		
VOC (cont)											
Dibromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.1.1.2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
p/m-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.1.2.2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
o-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Isopropylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
2-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
4-Chlorotoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
4-Isopropyltoluene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.3.5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#M	<1 ug/kg
1.4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2-Dibromo-3-chloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.4-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
Naphthalene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg
1.2.3-Trichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116#	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS5	WS6	WS6	WS7	WS8	WS8	WS9	WS10	WS13	Method Code	LoD/Units
Depth (m)	1.1-1.3	1.15-1.25	2.4-2.6	0.75-0.9	0.5-0.6	1.05-1.15	0.6-0.7	0.55-0.7	0.55-0.7		
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
Sampled Date	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04	27.09.04		
Sample Received Date	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04	29.09.04		
Batch	1	1	1	1	1	1	1	1	1		
Sample Number(s)	**28-30**	**31-33**	**34-36**	**37-39**	**40-42**	**43-45**	**46-48**	**49-51**	**52-54**		
VOC (cont)											
Hexachlorobutadiene	<1	<1	<1	<1	<1	<1	<1	<1	<1	TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									Method Code	LoD/Units
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	55-57										
Arsenic	<1									TM129#	<1 mg/kg
Cadmium	<1									TM129#	<1 mg/kg
Chromium	5									TM129#	<1 mg/kg
Copper	<1									TM129#	<1 mg/kg
Lead	<1									TM129#	<1 mg/kg
Mercury	<1									TM129#	<1 mg/kg
Nickel	2									TM129#	<1 mg/kg
Selenium	1									TM129#	<1 mg/kg
Silver	<10									TM129#	<10 mg/kg
Zinc	3									TM129#	<1 mg/kg
Boron (Water Soluble)	<1									TM129#	<1 mg/kg
Total Cyanide	<1									TM153#M	<1 mg/kg
Free Cyanide	<1									TM153#M	<1 mg/kg
pH Value In Soil	7.72									TM133#	<1.00 pH Units
EPH (DRO) (C10-C40)	3									TM061#M	<1 mg/kg
PRO (C4-C10)	<10									TM089#	<10 ug/kg
PRO (C10-C12)	<10									TM089#	<10 ug/kg
Benzene	<10									TM089#	<10 ug/kg
Toluene	<10									TM089#	<10 ug/kg
Ethyl benzene	<10									TM089#	<10 ug/kg
m & p Xylene	<10									TM089#	<10 ug/kg
o Xylene	<10									TM089#	<10 ug/kg
MTBE	<10									TM089#	<10 ug/kg

All results expressed on a dry weight basis.

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Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
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Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									Method Code	LoD/Units
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	55-57										
SVOC											
Phenol	<100									TM143	<100 µg/kg
2-Chlorophenol	<100									TM143	<100 µg/kg
2-Methylphenol	<100									TM143	<100 µg/kg
4-Methylphenol	<100									TM143	<100 µg/kg
2-Nitrophenol	<100									TM143	<100 µg/kg
4-Nitrophenol	<100									TM143	<100 µg/kg
2,4-Dichlorophenol	<100									TM143	<100 µg/kg
2,4-Dimethylphenol	<100									TM143	<100 µg/kg
4-Chloro-3-methylphenol	<100									TM143	<100 µg/kg
2,4,6-Trichlorophenol	<100									TM143	<100 µg/kg
2,4,5-Trichlorophenol	<100									TM143	<100 µg/kg
Pentachlorophenol	<100									TM143	<100 µg/kg
1,3-Dichlorobenzene	<100									TM143	<100 µg/kg
1,4-Dichlorobenzene	<100									TM143	<100 µg/kg
1,2-Dichlorobenzene	<100									TM143	<100 µg/kg
1,2,4-Trichlorobenzene	<100									TM143	<100 µg/kg
Nitrobenzene	<100									TM143	<100 µg/kg
Azobenzene	<100									TM143	<100 µg/kg
Hexachlorobenzene	<100									TM143	<100 µg/kg
Naphthalene	<100									TM143	<100 µg/kg
Acenaphthylene	<100									TM143	<100 µg/kg
Acenaphthene	<100									TM143	<100 µg/kg
Fluorene	<100									TM143	<100 µg/kg
Phenanthrene	<100									TM143	<100 µg/kg
Anthracene	<100									TM143	<100 µg/kg
Fluoranthene	<100									TM143	<100 µg/kg
Pyrene	<100									TM143	<100 µg/kg
Benzo(a)anthracene	<100									TM143	<100 µg/kg
Chrysene	<100									TM143	<100 µg/kg
Benzo(b)fluoranthene	<100									TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									Method Code	LoD/Units
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	55-57										
SVOC (cont)											
Benzo(k)fluoranthene	<100									TM143	<100 µg/kg
Benzo(a)pyrene	<100									TM143	<100 µg/kg
Indeno(1,2,3-cd)pyrene	<100									TM143	<100 µg/kg
Dibenzo(a,h)anthracene	<100									TM143	<100 µg/kg
Benzo(ghi)perylene	<100									TM143	<100 µg/kg
2-Chloronaphthalene	<100									TM143	<100 µg/kg
2-Methylnaphthalene	<100									TM143	<100 µg/kg
Carbazole	<100									TM143	<100 µg/kg
Isophorone	<100									TM143	<100 µg/kg
Dibenzofuran	<100									TM143	<100 µg/kg
Dimethyl phthalate	<100									TM143	<100 µg/kg
Diethyl phthalate	<100									TM143	<100 µg/kg
Di-n-butyl phthalate	<100									TM143	<100 µg/kg
Di-n-Octyl phthalate	<100									TM143	<100 µg/kg
Bis(2-ethylhexyl) phthalate	<100									TM143	<100 µg/kg
Butylbenzyl phthalate	<100									TM143	<100 µg/kg
4-Chloroaniline	<100									TM143	<100 µg/kg
2-Nitroaniline	<100									TM143	<100 µg/kg
3-Nitroaniline	<100									TM143	<100 µg/kg
4-Nitroaniline	<100									TM143	<100 µg/kg
2,4-Dinitrotoluene	<100									TM143	<100 µg/kg
2,6-Dinitrotoluene	<100									TM143	<100 µg/kg
Bis(2-chloroethyl)ether	<100									TM143	<100 µg/kg
4-Bromophenylphenylether	<100									TM143	<100 µg/kg
4-Chlorophenylphenylether	<100									TM143	<100 µg/kg
Hexachloroethane	<100									TM143	<100 µg/kg
Hexachlorobutadiene	<100									TM143	<100 µg/kg
Hexachlorocyclopentadiene	<100									TM143	<100 µg/kg
Bis(2-chloroethoxy)methane	<100									TM143	<100 µg/kg
N-nitrosodi-n-propylamine	<100									TM143	<100 µg/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									**Method Code**	**LoD/Units**
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	**55-57**										
VOC											
Dichlorodifluoromethane	<1									TM116[#]	<1 ug/kg
Chloromethane	<1									TM116[#]	<1 ug/kg
Vinyl Chloride	<1									TM116[#M]	<1 ug/kg
Bromomethane	<1									TM116[#]	<1 ug/kg
Chloroethane	<1									TM116[#]	<1 ug/kg
Trichlorofluoromethane	<1									TM116[#M]	<1 ug/kg
trans-1-2-Dichloroethene	<1									TM116[#]	<1 ug/kg
Dichloromethane	<1									TM116[#]	<1 ug/kg
Carbon Disulphide	<1									TM116[#M]	<1 ug/kg
1.1-Dichloroethene	<1									TM116[#M]	<1 ug/kg
1.1-Dichloroethane	<1									TM116[#M]	<1 ug/kg
Methyl Tertiary Butyl Ether	<1									TM116[#]	<1 ug/kg
cis-1-2-Dichloroethene	<1									TM116[#M]	<1 ug/kg
Bromochloromethane	<1									TM116[#]	<1 ug/kg
Chloroform	<1									TM116[#]	<1 ug/kg
2.2-Dichloropropane	<1									TM116[#]	<1 ug/kg
1.2-Dichloroethane	<1									TM116[#]	<1 ug/kg
1.1.1-Trichloroethane	<1									TM116[#M]	<1 ug/kg
1.1-Dichloropropene	<1									TM116[#M]	<1 ug/kg
Benzene	<1									TM116[#M]	<1 ug/kg
Carbontetrachloride	<1									TM116[#M]	<1 ug/kg
Dibromomethane	<1									TM116[#]	<1 ug/kg
1.2-Dichloropropane	<1									TM116[#M]	<1 ug/kg
Bromodichloromethane	<1									TM116[#M]	<1 ug/kg
Trichloroethene	<1									TM116[#M]	<1 ug/kg
cis-1-3-Dichloropropene	<1									TM116[#M]	<1 ug/kg
trans-1-3-Dichloropropene	<1									TM116[#M]	<1 ug/kg
1.1.2-Trichloroethane	<1									TM116[#]	<1 ug/kg
Toluene	<1									TM116[#M]	<1 ug/kg
1.3-Dichloropropane	<1									TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									Method Code	LoD/Units
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	55-57										
VOC (cont)											
Dibromochloromethane	<1									TM116[#]	<1 ug/kg
1.2-Dibromoethane	<1									TM116[#]	<1 ug/kg
Tetrachloroethene	<1									TM116[#]	<1 ug/kg
1.1.1.2-Tetrachloroethane	<1									TM116[#M]	<1 ug/kg
Chlorobenzene	<1									TM116[#M]	<1 ug/kg
Ethylbenzene	<1									TM116[#]	<1 ug/kg
p/m-Xylene	<1									TM116[#]	<1 ug/kg
Bromoform	<1									TM116[#]	<1 ug/kg
Styrene	<1									TM116[#]	<1 ug/kg
1.1.2.2-Tetrachloroethane	<1									TM116[#]	<1 ug/kg
o-Xylene	<1									TM116[#]	<1 ug/kg
1.2.3-Trichloropropane	<1									TM116[#]	<1 ug/kg
Isopropylbenzene	<1									TM116[#]	<1 ug/kg
Bromobenzene	<1									TM116[#M]	<1 ug/kg
2-Chlorotoluene	<1									TM116[#]	<1 ug/kg
Propylbenzene	<1									TM116[#]	<1 ug/kg
4-Chlorotoluene	<1									TM116[#]	<1 ug/kg
1.2.4-Trimethylbenzene	<1									TM116[#]	<1 ug/kg
4-Isopropyltoluene	<1									TM116[#]	<1 ug/kg
1.3.5-Trimethylbenzene	<1									TM116[#]	<1 ug/kg
1.2-Dichlorobenzene	<1									TM116[#M]	<1 ug/kg
1.4-Dichlorobenzene	<1									TM116[#]	<1 ug/kg
sec-Butylbenzene	<1									TM116[#]	<1 ug/kg
tert-Butylbenzene	<1									TM116[#]	<1 ug/kg
1.3-Dichlorobenzene	<1									TM116[#]	<1 ug/kg
n-Butylbenzene	<1									TM116[#]	<1 ug/kg
1.2-Dibromo-3-chloropropane	<1									TM116[#]	<1 ug/kg
1.2.4-Trichlorobenzene	<1									TM116[#]	<1 ug/kg
Naphthalene	<1									TM116[#]	<1 ug/kg
1.2.3-Trichlorobenzene	<1									TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

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ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** SOLID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	WS17									**Method Code**	**LoD/Units**
Depth (m)	1.05-1.35										
Sample Type	SOIL										
Sampled Date	27.09.04										
Sample Received Date	29.09.04										
Batch	1										
Sample Number(s)	**55-57**										
VOC (cont)											
Hexachlorobutadiene	<1									TM116[#]	<1 ug/kg

All results expressed on a dry weight basis.

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	62-65	58-61									
Arsenic Dissolved (ICP-MS)	<1	13								TM152#	<1 ug/l
Boron Dissolved (ICP-MS)	<10	<10								TM152#	<10 ug/l
Cadmium Dissolved (ICP-MS)	<0.4	<0.4								TM152#	<0.4 ug/l
Chromium Dissolved (ICP-MS)	2	<1								TM152#	<1 ug/l
Copper Dissolved (ICP-MS)	2	4								TM152#	<1 ug/l
Lead Dissolved (ICP-MS)	<1	<1								TM152#	<1 ug/l
Nickel Dissolved (ICP-MS)	5	20								TM152#	<1 ug/l
Selenium Dissolved (ICP-MS)	<1	3								TM152#	<1 ug/l
Silver Dissolved (ICP-MS)	<1	<1								TM152#	<1 ug/l
Zinc Dissolved (ICP-MS)	36	29								TM152#	<3 ug/l
Mercury Dissolved (CVAAS)	<0.05	<0.05								TM127#	<0.05 ug/l
Total Cyanide	<0.05	<0.05								TM153#	<0.05 mg/l
Free Cyanide	<0.05	<0.05								TM153#	<0.05 mg/l
pH Value In Water	7.98	7.48								TM133#	<1.00 pH Units
EPH (DRO) (C10-C40)	1163	1211								TM061#	<10 ug/l
PRO (C4-C10)	<10	<10								TM089#	<10 ug/l
PRO (C10-C12)	<10	<10								TM089#	<10 ug/l
Benzene	<10	<10								TM089#	<10 ug/l
Toluene	<10	<10								TM089#	<10 ug/l
Ethyl benzene	<10	<10								TM089#	<10 ug/l
m & p Xylene	<10	<10								TM089#	<10 ug/l
o Xylene	<10	<10								TM089#	<10 ug/l
MTBE	<10	<10								TM089#	<10 ug/l

Date 14.10.2004

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Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
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* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	62-65	58-61									
SVOC											
Phenol	<1	<1								TM143	<1 µg/l
2-Chlorophenol	<1	<1								TM143	<1 µg/l
2-Methylphenol	<1	<1								TM143	<1 µg/l
4-Methylphenol	<1	<1								TM143	<1 µg/l
2-Nitrophenol	<1	<1								TM143	<1 µg/l
4-Nitrophenol	<1	<1								TM143	<1 µg/l
2,4-Dichlorophenol	<1	<1								TM143	<1 µg/l
2,4-Dimethylphenol	<1	<1								TM143	<1 µg/l
4-Chloro-3-methylphenol	<1	<1								TM143	<1 µg/l
2,4,6-Trichlorophenol	<1	<1								TM143	<1 µg/l
2,4,5-Trichlorophenol	<1	<1								TM143	<1 µg/l
Pentachlorophenol	<1	<1								TM143	<1 µg/l
1,3-Dichlorobenzene	<1	<1								TM143	<1 µg/l
1,4-Dichlorobenzene	<1	<1								TM143	<1 µg/l
1,2-Dichlorobenzene	<1	<1								TM143	<1 µg/l
1,2,4-Trichlorobenzene	<1	<1								TM143	<1 µg/l
Nitrobenzene	<1	<1								TM143	<1 µg/l
Azobenzene	<1	<1								TM143	<1 µg/l
Hexachlorobenzene	<1	<1								TM143	<1 µg/l
Naphthalene	<1	<1								TM143	<1 µg/l
Acenaphthylene	<1	<1								TM143	<1 µg/l
Acenaphthene	<1	<1								TM143	<1 µg/l
Fluorene	<1	<1								TM143	<1 µg/l
Phenanthrene	<1	<1								TM143	<1 µg/l
Anthracene	<1	<1								TM143	<1 µg/l
Fluoranthene	<1	<1								TM143	<1 µg/l
Pyrene	<1	<1								TM143	<1 µg/l
Benzo(a)anthracene	<1	<1								TM143	<1 µg/l
Chrysene	<1	<1								TM143	<1 µg/l
Benzo(b)fluoranthene	<1	<1								TM143	<1 µg/l

Date 14.10.2004

Validated ☑
Preliminary ☐

ALcontrol Geochem Analytical Services
Table Of Results

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	62-65	58-61									
SVOC (cont)											
Benzo(k)fluoranthene	<1	<1								TM143	<1 µg/l
Benzo(a)pyrene	<1	<1								TM143	<1 µg/l
Indeno(1,2,3-cd)pyrene	<1	<1								TM143	<1 µg/l
Dibenzo(a,h)anthracene	<1	<1								TM143	<1 µg/l
Benzo(ghi)perylene	<1	<1								TM143	<1 µg/l
2-Chloronaphthalene	<1	<1								TM143	<1 µg/l
2-Methylnaphthalene	<1	<1								TM143	<1 µg/l
Carbazole	<1	<1								TM143	<1 µg/l
Isophorone	<1	<1								TM143	<1 µg/l
Dibenzofuran	<1	<1								TM143	<1 µg/l
Dimethyl phthalate	<1	<1								TM143	<1 µg/l
Diethyl phthalate	<1	<1								TM143	<1 µg/l
Di-n-butyl phthalate	<1	<1								TM143	<1 µg/l
Di-n-Octyl phthalate	<1	<1								TM143	<1 µg/l
Bis(2-ethylhexyl) phthalate	<1	<1								TM143	<1 µg/l
Butylbenzyl phthalate	<1	<1								TM143	<1 µg/l
4-Chloroaniline	<1	<1								TM143	<1 µg/l
2-Nitroaniline	<1	<1								TM143	<1 µg/l
3-Nitroaniline	<1	<1								TM143	<1 µg/l
4-Nitroaniline	<1	<1								TM143	<1 µg/l
2,4-Dinitrotoluene	<1	<1								TM143	<1 µg/l
2,6-Dinitrotoluene	<1	<1								TM143	<1 µg/l
Bis(2-chloroethyl)ether	<1	<1								TM143	<1 µg/l
4-Bromophenylphenylether	<1	<1								TM143	<1 µg/l
4-Chlorophenylphenylether	<1	<1								TM143	<1 µg/l
Hexachloroethane	<1	<1								TM143	<1 µg/l
Hexachlorobutadiene	<1	<1								TM143	<1 µg/l
Hexachlorocyclopentadiene	<1	<1								TM143	<1 µg/l
Bis(2-chloroethoxy)methane	<1	<1								TM143	<1 µg/l
N-nitrosodi-n-propylamine	<1	<1								TM143	<1 µg/l

Date 14.10.2004

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	**62-65**	**58-61**									
VOC											
Dichlorodifluoromethane	<1	<1								TM116#	<1 ug/l
Chloromethane	<1	<1								TM116#	<1 ug/l
Vinyl Chloride	<1	<1								TM116#	<1 ug/l
Bromomethane	<1	<1								TM116#	<1 ug/l
Chloroethane	<1	<1								TM116#	<1 ug/l
Trichlorofluoromethane	<1	<1								TM116#	<1 ug/l
trans-1-2-Dichloroethene	<1	<1								TM116#	<1 ug/l
Dichloromethane	<1	<1								TM116#	<1 ug/l
Carbon Disulphide	<1	<1								TM116#	<1 ug/l
1.1-Dichloroethene	<1	<1								TM116#	<1 ug/l
1.1-Dichloroethane	<1	<1								TM116#	<1 ug/l
Methyl Tertiary Butyl Ether	<1	<1								TM116#	<1 ug/l
cis-1-2-Dichloroethene	<1	<1								TM116#	<1 ug/l
Bromochloromethane	<1	<1								TM116#	<1 ug/l
Chloroform	<1	<1								TM116#	<1 ug/l
2.2-Dichloropropane	<1	<1								TM116#	<1 ug/l
1.2-Dichloroethane	<1	<1								TM116#	<1 ug/l
1.1.1-Trichloroethane	<1	<1								TM116#	<1 ug/l
1.1-Dichloropropene	<1	<1								TM116#	<1 ug/l
Benzene	<1	<1								TM116#	<1 ug/l
Carbontetrachloride	<1	<1								TM116#	<1 ug/l
Dibromomethane	<1	<1								TM116#	<1 ug/l
1.2-Dichloropropane	<1	<1								TM116#	<1 ug/l
Bromodichloromethane	<1	<1								TM116#	<1 ug/l
Trichloroethene	<1	<1								TM116#	<1 ug/l
cis-1-3-Dichloropropene	<1	<1								TM116#	<1 ug/l
trans-1-3-Dichloropropene	<1	<1								TM116#	<1 ug/l
1.1.2-Trichloroethane	<1	<1								TM116#	<1 ug/l
Toluene	<1	<1								TM116#	<1 ug/l
1.3-Dichloropropane	<1	<1								TM116#	<1 ug/l

Date 14.10.2004

Validated ☑
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ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	62-65	58-61									
VOC (cont)											
Dibromochloromethane	<1	<1								TM116#	<1 ug/l
1.2-Dibromoethane	<1	<1								TM116#	<1 ug/l
Tetrachloroethene	<1	<1								TM116#	<1 ug/l
1.1.1.2-Tetrachloroethane	<1	<1								TM116#	<1 ug/l
Chlorobenzene	<1	<1								TM116#	<1 ug/l
Ethylbenzene	<1	<1								TM116#	<1 ug/l
p/m-Xylene	<1	<1								TM116#	<1 ug/l
Bromoform	<1	<1								TM116#	<1 ug/l
Styrene	<1	<1								TM116#	<1 ug/l
1.1.2.2-Tetrachloroethane	<1	<1								TM116#	<1 ug/l
o-Xylene	<1	<1								TM116#	<1 ug/l
1.2.3-Trichloropropane	<1	<1								TM116#	<1 ug/l
Isopropylbenzene	<1	<1								TM116#	<1 ug/l
Bromobenzene	<1	<1								TM116#	<1 ug/l
2-Chlorotoluene	<1	<1								TM116#	<1 ug/l
Propylbenzene	<1	<1								TM116#	<1 ug/l
4-Chlorotoluene	<1	<1								TM116#	<1 ug/l
1.2.4-Trimethylbenzene	<1	<1								TM116#	<1 ug/l
4-Isopropyltoluene	<1	<1								TM116#	<1 ug/l
1.3.5-Trimethylbenzene	<1	<1								TM116#	<1 ug/l
1.2-Dichlorobenzene	<1	<1								TM116#	<1 ug/l
1.4-Dichlorobenzene	<1	<1								TM116#	<1 ug/l
sec-Butylbenzene	<1	<1								TM116#	<1 ug/l
tert-Butylbenzene	<1	<1								TM116#	<1 ug/l
1.3-Dichlorobenzene	<1	<1								TM116#	<1 ug/l
n-Butylbenzene	<1	<1								TM116#	<1 ug/l
1.2-Dibromo-3-chloropropane	<1	<1								TM116#	<1 ug/l
1.2.4-Trichlorobenzene	<1	<1								TM116#	<1 ug/l
Naphthalene	<1	<1								TM116#	<1 ug/l
1.2.3-Trichlorobenzene	<1	<1								TM116#	<1 ug/l

Date 14.10.2004

Validated ✓
Preliminary

ALcontrol Geochem Analytical Services
Table Of Results

[#] ISO 17025 accredited
[M] MCERTS accredited
* Subcontracted test
» Shown on prev. report

Job Number: 04/15104/02/01 **Matrix:** LIQUID
Client: Conestoga-Rovers & Ass. (UK) Ltd **Location:** KIRKBY
Client Ref. No.: 033154 **Client Contact:** Ian Lightfoot

Sample Identity	ABSTRACTION WELL	BH 1A (DEEP)								Method Code	LoD/Units
Depth (m)											
Sample Type	WATER	WATER									
Sampled Date	27.09.04	27.09.04									
Sample Received Date	29.09.04	29.09.04									
Batch	1	1									
Sample Number(s)	**62-65**	**58-61**									
VOC (cont)											
Hexachlorobutadiene	<1	<1								TM116[#]	<1 ug/l

Date 14.10.2004

ALcontrol Geochem Analytical Services
Table Of Results - Appendix

Job Number: 04/15104/02/01
Client: Conestoga-Rovers & Ass. (UK) Ltd
Client Ref. No.: 33154

Report Key :

NDP	No Determination Possible	*	Subcontracted test
NFD	No Fibres Detected	»	Result previously reported (Incremental reports only)
#	ISO 17025 accredited	M	MCERTS Accredited
		EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control.

Summary of Method Codes contained within report :

Method No.	Reference	Description	ISO 17025 Accredited	MCERTS Accredited	Wet/Dry Sample [1]
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	Y	N	NA
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	Y	Y	DRY
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C10)	Y	N	WET
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	N	N	WET
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	Y	N	WET
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS	Y	Y	WET
TM127	Method 3112B, AWWA/APHA, 20th Ed., 1999	The Determination of Trace Level Mercury in Aqueous Media and Soil Extracts by Atomic Absorption Spectroscopy	Y	N	NA
TM129	Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B	Determination of Metal Cations by IRIS Emission Spectrometer	Y	N	DRY
TM133	BS 1377: Part 3 1990	Determination of pH in Soil and Water using the GLpH pH Meter	Y	N	WET
TM143	Modified: US EPA Method 8270C	Determination of Semivolatile Organic Compounds by GC-MS	N	N	WET
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS	Y	N	NA
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Y	N	NA
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	Y	Y	WET

[1] Applies to Solid samples only. **DRY** indicates samples have been dried at 35°C. **NA** = not applicable.

ALcontrol Geochem Analytical Services
Table Of Results - Appendix

Job Number: 04/15104/02/01
Client: Conestoga-Rovers & Ass. (UK) Ltd
Client Ref. No.: 33154

Summary of Coolbox temperatures

Batch No.	Coolbox Temperature (°C)
1	10

FINAL REPORT
TYPE II/III ASBESTOS SURVEY

KODAK LTD SITE
ACORNFIELD ROAD, KIRKBY, LIVERPOOL, UK

PREPARED FOR KODAK LTD, CHEMICAL MANUFACTURING

FEBRUARY 2007
REF. NO. 933389(1)
This report is printed on recycled paper.

EXECUTIVE SUMMARY

CMEC Demolition (CMEC) at the request of Kodak Ltd. Chemical Manufacturing, completed a Type II/III Asbestos Survey of buildings located at the Acornfield Road, Kirkby, Liverpool, UK site (the Site). Conestoga-Rovers & Associates (Europe) Limited (CRA), at the request of CMEC, assisted with the survey.

Field activities associated with the asbestos survey were conducted between the 8th and the 26th of January 2007.

The survey was conducted on all Site buildings, exterior pipework and plant. The survey involved a review of previous asbestos reports to confirm the presence and quantity of the asbestos recorded and to validate and assess the quality of any asbestos abatement.

The purpose of the survey was to locate and describe, as far as reasonably practical, all asbestos containing materials (ACMs) on Site and to quantify the amount of ACM present on Site for future demolition, renovation or refurbishment of the Site buildings and infrastructure. The survey and associated sampling activities were conducted in accordance with the HSE guidance (MDHS 100) Surveying, Sampling and Assessment of Asbestos-Containing Materials (July 2001).

A total of 333 suspect asbestos samples were submitted to the laboratory for bulk analysis. A total of 78 samples were confirmed as asbestos containing material consisting either of chrysotile or amosite. The asbestos containing material present on Site measures approximately 19,048m^2 in total. The following asbestos was identified:

Zone B1:

- Building 82 reported approximately 13m^2 of amosite board and 1m^2 of chrysotile composite; and
- Building 86 had 2m^2 of chrysotile asbestos gasket.

Zone D:

- Building 41 had 13,713 m^2 of chrysotile asbestos board, Building 42 had 925 m^2 of chrysotile asbestos board; and
- Building 66 had 24 linear metres of chrysotile cement downpipes.

Zone E:

- Building 43 reported chrysotile asbestos rope glazing and 175 linear metres of pipe with chrysotile asbestos residue (remnants of a poor abatement).

Zone F1:

- Building 8 reported 12m^2 of chrysotile board, 150m^2 of amosite board and 170m^2 of chrysotile cement boarding;
- Building 9 had 66m^2 of chrysotile cement board;
- Building 11 reported 4m^2 of chrysotile cement board;

- Building 20 reported 402m^2 of chrysotile board, 20m^2 of amosite/chrysotile board and 450m^2 of chrysotile cement board; and
- Building 38 reported 705m^2 of chrysotile board, 9.5m^2 of amosite/chrysotile board, 5,546m^2 of chrysotile cement board, 507m^2 of ceiling with residual limpet, amosite/chrysotile lagging and chrysotile rope glazing around the north lights.

Zone F2:

- Building 49 reported 580m^2 of chrysotile board;
- Building 61 had 1 chrysotile gasket and Building 64 had an amosite cistern and 2m^2 of chrysotile floor tile.

Eastman Building

The Eastman Building reported 163m^2 of chrysotile wall board, 120m^2 of chrysotile flooring, chrysotile tape in the electrical boxes, amosite duct insulation and chrysotile residue on overhead pipes.

Exterior Pipework

None of the samples collected from the pipe scraping reported asbestos. Two chrysotile containing gaskets were found within the pipework during the exterior pipework survey. Other gaskets not accessible may also be asbestos containing.

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION 2

2.1 SITE LOCATION AND SETTING 2
2.2 SURROUNDING LAND USE 2

3.0 ZONE DESCRIPTIONS 3

3.1 ZONE A1 3
3.2 ZONE A2 3
3.3 ZONE B1 3
3.4 ZONE B2 3
3.5 ZONE C1 3
3.6 ZONE C2 3
3.7 ZONE D 4
3.8 ZONE E 4
3.9 ZONE F 4
3.10 ZONE F2 4
3.11 EASTMAN CHEMICALS 4
3.12 PIPEWORK 4

4.0 METHODOLOGY 5

5.0 SUMMARY OF PERTINENT FINDINGS 6

5.1 ZONE A1 6
5.2 ZONE A2 6
5.3 ZONE B1 6
5.4 ZONE B2 7
5.5 ZONE C1 7
5.6 ZONE C2 7
5.7 ZONE D 7
5.8 ZONE E 7
5.9 ZONE F1 8
5.10 ZONE F2 9
5.11 ZONE G – EASTMAN CHEMICALS 9
5.12 ZONE H – PIPEWORK 10

6.0 RE-DEVELOPMENT CONSIDERATIONS AND RECOMMENDATIONS.. 11

7.0 CONCLUSIONS 12

8.0 REFERENCES 13

LIST OF FIGURES
(Following Report)

Figure 1	Site Location Plan
Figure 2	Site Layout Plan with Investigation Zones and Building Numbers
Figure 3	Type II and Type III Asbestos Survey Areas

TABLES
(Within Report)

Table 1	Summary of Activity

TABLES
(Following Report)

Table 1	Potential ACM Sample Survey Samples
Table 2	Summary of Confirmed ACM Sample Results

APPENDICES

Appendix A1	Zone A1 Sample Locations
Appendix A2	Zone A2 Sample Locations
Appendix B1	Zone B1 Sample Locations
Appendix B2	Zone B2 Sample Locations
Appendix C1	Zone C1 Sample Locations
Appendix D	Zone D Sample Locations
Appendix E	Zone E Sample Locations
Appendix F1	Zone F1 Sample Locations
Appendix F2	Zone F2 Sample Locations
Appendix G	Eastman Chemicals Building Sample Locations
Appendix H	Pipework Sample Locations
Appendix I	Laboratory Certificates
Appendix J	Limitations
Appendix K	Asbestos Surveying, Sampling and Assessment

1.0 INTRODUCTION

CMEC Demolition (CMEC) at the request of Kodak Ltd. Chemical Manufacturing, completed a Type II/III Asbestos Survey of buildings located at the Acornfield Road, Kirkby, Liverpool, UK Site (the Site). Conestoga-Rovers & Associates (Europe) Limited (CRA), at the request of CMEC, assisted with the survey. The Site location is shown on Figure 1.

The purpose of the survey was to locate and describe, as far as reasonably practical, all asbestos containing materials (ACMs) and to quantify the amount of ACM present on Site for future demolition, renovation or refurbishment of the Site buildings and infrastructure.

The Site is divided into 11 Zones (Figure 2); one of which is the Silver Nitrate Plant that was not included in the scope of this survey. Figure 3 shows the specific areas where Type II and Type III surveys were performed.

Reports of previous Type II asbestos surveys and asbestos removal activities were provided by Kodak to CMEC/CRA. Between 1984 and 1985, asbestos abatement was conducted in several Site buildings. The previous Type II surveys were reviewed and the presence/absence of asbestos recorded in these reports was confirmed and the quality of abatement work verified by CMEC/CRA.

Analytical Services for this survey were provided by Monitor Environmental Limited laboratory located in Nottingham, which is a UKAS accredited laboratory. The materials sampled were analysed to determine asbestos type using Polarised Light Microscopy (PLM). A copy of the laboratory analytical report is included as Appendix I.

Field activities associated with the ACM survey were conducted between the 8th and the 26th of January 2007. Field activities completed as part of the ACM survey included the following:

- Inspection to identify potential ACM at the Site;
- Excavation of trial pits;
- Sampling of potential ACM;
- Quantification of potential ACM; and
- Laboratory assessment and classification of ACM.

This report provides a description of the field activities undertaken during the ACM survey, and summarises all analytical data for the collected samples and provides an estimate of the quantity of ACM present at the Site. Information regarding the types of ACM surveys conducted and the different types of commonly found asbestos are detailed in Appendix K.

2.0 SITE DESCRIPTION

2.1 SITE LOCATION AND SETTING

The Site is situated at National Grid Reference SJ 438 987 on the eastern margin of the Knowsley Industrial Park, approximately 2km to the east of Kirkby and 12.5km northeast from the centre of Liverpool. A Site location map is given as Figure 1.

There are approximately 45 buildings on the Site, the total area of which is 37 acres (including car parking). The buildings comprise a mixture of office, service and process buildings which were constructed at various between the 1950s and the 1990s. There are also a number of disused plant and storage buildings located on Site. Plant areas are served by a number of bulk chemical storage facilities and a dedicated drum storage compound. The Site has a comprehensive network of access roads (streets and avenues), areas of open grass to the north (playing field) and southeast and a staff car park immediately west of Acornfield Road.

2.2 SURROUNDING LAND USE

The immediate area surrounding the Site is a mixture of relatively flat farmland to the east (Kirkby Moss), part of which consists of a reclaimed waste disposal tip, with other commercial/industrial premises on the Knowsley Industrial Park to the north and west and an area of woodland to the south (Charley Wood). The northwest corner of Knowsley Park is approximately 2.25km to the south of the Site.

The nearest residential housing to the Site is located approximately 1km to the south. A larger residential housing estate (Northwood) is located approximately 1.25km to the west of the Site.

3.0 ZONE DESCRIPTIONS

The Site has been divided into several zones for the purpose of the asbestos survey. The zones are shown on Figure 2.

3.1 ZONE A1

The area is covered in hard-standing and located in the southwest corner of the Site. The wastewater treatment plant is housed in Zone A1. There are five large tanks, one main building and three smaller sheds in this area, as well as extensive pipework.

3.2 ZONE A2

Zone A2 is located east of the Eastman Chemicals Building in the northwest corner of the Site. The High Pressure Laboratory (Building 27) and the Waste Solvent Store (Building 30) are the only buildings in this zone. Pipework is also present in this zone.

3.3 ZONE B1

Zone B1 is located between the eastern boundary of the Site and East Avenue. Four exterior plant areas and a four-storey S.C.D. Facilities building (Building 82) covers most of this zone. Pipework is also present in this zone.

3.4 ZONE B2

Zone B2 is located north of South Street and includes the solvent recovery area (Area 37, 50 and 54), the relay plant (Building 15) and the neutralise pit and pump house (Area 11). This area is covered in hard-standing and contains three buildings. Pipework is also present in this zone.

3.5 ZONE C1

Zone C1 is located east of Zone B2, between Third Street and South Street. This zone houses the solvent storage area and has no buildings. Pipework is also present in this zone.

3.6 ZONE C2

Zone C2 is located in the southeast corner of the Site and consists of a large area of hard-standing with no buildings.

3.7 ZONE D

Zone D is located in the central area of the Site and is transected by Third Street and Central Avenue. There are twelve buildings of various sizes in this zone, as well as pipework.

3.8 ZONE E

Zone E lies between Central Avenue, East Avenue, First Street and North Street. A large warehouse (building 43) is attached to new building (Building 93) constructed in the 1990s. Five smaller buildings are also contained in this zone, as well as pipework.

3.9 ZONE F

Zone F1 is located along West Avenue between North Street and South Street. The three-storey Building 38 occupies most of this zone. A guard house (Building 80) and visitor's reception (Building 96) are located to the North of this zone. A canteen (Building 20), a two-storey administration building (Building 39) and six smaller buildings, including the laundry (Building 9) and two-storey laboratory (Building 8) are located south of Building 38, along west avenue. Pipework is also present in this zone.

3.10 ZONE F2

Zone F2 is located in the northeast corner. Zone F2 contains mostly hard-standing areas used for storage. Two buildings and three pump houses are present within Zone F2.

3.11 EASTMAN CHEMICALS

The Eastman Chemicals compound is in the northwest corner of the Site. This section solely relates to L- shaped Building 33, The Eastman Building.

3.12 PIPEWORK

The pipework section is all exterior overhead pipework and exterior plant throughout the Site. This includes gaskets on plant and any material obtained from scraping underneath lagging on pipes.

4.0 METHODOLOGY

The survey was conducted in accordance with HSE guidance (MDHS 100) Surveying, Sampling and Assessment of Asbestos-Containing Materials (HSE, 2001).

Most areas of the buildings were accessible to CRA at the time of the asbestos survey. All building material was inspected for suspect ACM in each building. A total of 333 suspect ACM samples were collected and submitted to the laboratory for analysis.

The sample areas were first wetted down to minimize the disturbance of the ACM and to prevent the generation of dust and debris. A small piece of material was then hand-cut and placed in a sealable polythene bag.

The casing and lagging were removed before pipework scrapings were taken. Pipework can be highly variable; inspection of pipework included notation of repair or replacement of pipe sections within a given length of pipe. The number of samples taken is often linked to the end use of the inspected Site.

One-metre deep trial pits were excavated adjacent to tanks and bunds to assess whether ACM had been used to cast the tanks or their support platforms. Where necessary, the hard-standing layer was broken through, and then a pit was excavated to 1.0m or the bottom of the bund, whichever was shallowest.

Each sample was labelled with a unique identifier for submission to the laboratory. The extent (area) of the suspect ACM was recorded for each area. In addition, photographs of the sampling locations were taken. Sample location data sheets and photographs for each sample collected are provided in Appendices A1 through H following this report.

5.0 SUMMARY OF PERTINENT FINDINGS

A total of 333 suspect ACM samples were collected from the Site buildings, plant infrastructure and pipework and submitted to the laboratory for bulk asbestos analysis in order to quantify the amount and location of ACM on site, as well as to assess their condition. Table 1 below summarises the investigation activity for each zone.

Table 1: Summary of Investigation Activity and ACM Detections Delineated by Zone.

Zone	Samples Submitted	ACM Detected	Trial Pits
A1	3	0	5
A2	4	0	2
B1	110	4	3
B2	2	0	4
C1	-	-	7
D	20	9	-
E	19	3	-
F1	96	44	-
F2	14	5	-
Eastman	22	11	-
Pipework	43	2	-

A detailed list of all suspect asbestos samples collected for each zone is provided in Table 1, following this report. The samples determined as containing asbestos material by the laboratory is summarised in Table 2, following this report.

5.1 ZONE A1

No ACM was found.

5.2 ZONE A2

No ACM was found.

5.3 ZONE B1

Building 82

On the ground floor of Building 82, a 1m^2 chrysotile seal and 12 m^2 of amosite panels on a fume cupboard bay were found (Appendix B1 , Fig 2). An amosite cistern was identified in the gents' toilet on the mezzanine floor of Building 82 (Appendix B1, Fig 3). Other similar cistern located throughout the Site may also contain asbestos.

Building 86
A 2m^2 chrysotile gasket was found in Area 86 (Appendix B1, Fig 8). Other gaskets not accessible may also contain asbestos.

5.4 ZONE B2

Shed 11 was identified as containing a chrysotile cement roof measuring approximately 4m^2 of (Appendix B2, Fig 1).

5.5 ZONE C1

No ACM was found.

5.6 ZONE C2

No ACM was found.

5.7 ZONE D

Building 41
Approximately 476 m^2 of wall board in the eastern stores of building 41 contained chrysotile asbestos. The roof in the workshop area, measuring approximately 6,400 m^2 was determined to be made of chrysotile asbestos. (Appendix D, Fig 1)

Building 42
The ceiling board in the contractor's mess of Building 42 was determined to be composed of chrysotile asbestos and measures approximately 925 m^2 (Appendix D, Fig 2).

Building 66
Four cement down pipes were determined to be composed of chrysotile asbestos cement. Each pipe measures approximately six linear metres (Appendix D, Fig 5).

5.8 ZONE E

Building 43
The northern lights in the warehouse of Building 43 and the exterior canopy connecting Building 43 and Building 38 contain chrysotile asbestos rope as window glazing. A pipe scraping sample collected along the pipe located within the western wall of building 43 was determined as containing chrysotile asbestos residue leftover from incomplete abatement work. The pipe measures approximately 175 linear metres (Appendix E, Fig 1).

5.9 ZONE F1

Building 8

The eastern stairwell in Building 8 contains approximately 12m² of chrysotile ceiling board (underneath the stairs) and 16m² of amosite wall board (Appendix F1, Fig 1). On the first floor of Building 8, the corrugated roof, measuring approximately 162 m², was reported as containing chrysotile asbestos and approximately 134 m² of amosite wall board was reported around the weigh room, meeting room and northern offices (Appendix F1,Fig 2). The roof of the plant room roof is composed of chrysotile board measuring approximately 8m² (Appendix F1, Fig 3).

Building 9

The roof of Building 9, measuring approximately 66m², was reported as containing chrysotile asbestos cement board (Appendix F1, Figure 4).

Area 11

The roof of the small shed located in Area 11 was reported as containing chrysotile cement board roof and measures approximately 4m² (Appendix F1, Fig 5).

Building 20

Building 20 was reported as containing approximately 450m² of chrysotile roofing material, chrysotile asbestos cement in the ladies' room flue pipe and 20m² of amosite/chrysotile composite board lining in the incinerator (Appendix F1, Fig 5).

Building 38

The entire warehouse roof of Building 38 was reported as containing chrysotile asbestos. The glazing around the windows of northern lights was reported as containing chrysotile asbestos. Approximately 595 m² of chrysotile board was found in the ladies' locker room, in the label bench area and around the outside of the canteen. Three square metres of chrysotile/amosite composite fascia board were also found around the canteen exterior. Pipe scrapings revealed chrysotile asbestos under clean fibreglass lagging on pipes in the calorifier room and the service duct adjacent to the lift. (Appendix F1, Fig 8)

On the first floor of Building 38, approximately 1460 m² of chrysotile ceiling board was found (Appendix F1, Fig 9).

On the second floor of Building 38, the 495 m² laboratory ceiling had residual amosite/chrysotile composite asbestos between the ceiling boards, leftover from incomplete asbestos abatement work. The residual asbestos is sealed with paint. The corridor along the northern side was determined to contain 12m² of amosite/chrysotile composite limpet on the ceiling. Approximately 50 linear metres of pipework was reported as containing traces of amosite and chrysotile asbestos within the north corridor, leftover from incomplete abatement work. (Appendix F1, Fig 10)

The northern light end panels on the roof of Building 38 were determined to contain approximately 112m^2 of chrysotile board. The lift room roof contains 20m^2 of chrysotile asbestos cement board. (Appendix F1, Fig 10)

Building 39
Approximately 530m^2 of chrysotile floor tiles were found underneath the carpet on the ground floor of Building 39. The ceiling board on the north stair is made of chrysotile cement board; this appears to extend over the entire first floor area of 530m^2. (Appendix F1, Fig 11)

5.10 ZONE F2

Building 49
Fifty linear metres of soffit board and 1540m^2 of roofing board were found to contain chrysotile asbestos (Appendix F2, Fig 1).

Building 61
Loose gaskets in Building 61 contained chrysotile asbestos (Appendix F2, Fig 2).

Building 64
An amosite cistern and 2m^2 of chrysotile floor tile were found in Building 64 (Appendix F2, Fig 3).

5.11 ZONE G – EASTMAN CHEMICALS

Northern Ground Floor
A wall in the break room, measuring approximately 12m^2, was determined to be composed of chrysotile asbestos. The blue floor tile, located in the main corridor measuring approximately 60m^2 was reported as containing chrysotile asbestos. Chrysotile asbestos tape was identified present behind breakers in the electrical cabinet. Duct insulation in the NMR transformer room was reported as containing amosite asbestos. A fume cupboard, located in the southwest laboratory, was reported to contain approximately 21m^2 of chrysotile asbestos board. (Appendix G, Fig 1).

Southern Ground Floor
The 140m^2 ceiling in the P.E.T. lab was reported as containing chrysotile asbestos (Appendix G, Fig 2).

First Floor
The 60m^2 of blue tile in the first floor corridor was reported as containing composite chrysotile material. A pipe scraping revealed the presence of chrysotile asbestos under new lagging. (Appendix G, Fig 3)

Second Floor

Two samples of the dividing wall, measuring approximately 12m^2, between the visitor offices and the northern laboratory fume cupboard was identified as containng chrysotile asbestos (Appendix G, Fig 4).

5.12 ZONE H – PIPEWORK

None of the overhead pipes tested positive for ACM. Two gaskets contained chrysotile asbestos (Appendix H Fig 1). Other gaskets which were not accessible may contain asbestos.

6.0 RE-DEVELOPMENT CONSIDERATIONS AND RECOMMENDATIONS

All demolition work / refurbishment in areas where asbestos was identified must be conducted by a licensed contractor under the Control of Asbestos at Work Regulations (CAWR) 2002 work. The asbestos waste is subject to waste management controls (i.e. the ACM requires to be labelled as hazardous goods during transport, transported by a licensed hazardous waste carrier and disposed of at a licensed waste disposal facility) as set out in the Hazardous Waste (England and Wales) Regulations 2005.

Condition 2 of Regulation 4 of the Asbestos (Licensing) Regulations (1983) (SI 1983 No. 1649) as amended by SI 1998 No. 3233) requires the licensed asbestos worker to notify the enforcing authority at least 14 days prior to working with asbestos insulation, coating and insulation.

Construction, (Design and Management) Regulations 1994 (CDM) applies during abatement / demolishing of buildings since all demolition and dismantling work falls under CDM unless the work will last 30 days or less and involve less than five people on Site at any one time.

Items identified as asbestos-containing should be removed prior to demolition work, where possible, in order to eliminate potential health risks to the contractors. If any suspect material (not identified during the survey) is uncovered during the demolition work, it should be treated as asbestos containing material, sealed and left intact, until proven otherwise by analysis. It is recommended that a suitably competent person is present on Site during any demolition work in case any suspect ACM is found.

7.0 CONCLUSIONS

CMEC/CRA conducted Type II/III ACM survey of the Kodak Acornfield Road, Kirkby, Liverpool Site. The survey was undertaken to determine the presence and extent of ACM on Site prior to refurbishment of the building. The field portion of the survey was undertaken between the 8th and the 26th of January 2007.

In each of the buildings surveyed, the flooring material, exterior, interior and partition walls, ceiling, roofing material, plant and pipework were inspected for the presence of suspect ACM. A total of 333 samples were submitted to the laboratory for bulk analysis and 78 samples were identified as containing asbestos.

In Zone B1, Building 82 had 13m^2 of amosite board and 1m^2 of chrysotile composite. Building 86 had 2m^2 of chrysotile asbestos gasket.

In Zone D, Building 41 had 13,713 m^2 of chrysotile asbestos board, Building 42 had 925 m^2 of chrysotile asbestos board and Building 66 had 24 linear metres of chrysotile cement down pipe.

In Zone E, chrysotile asbestos rope glazing and 175 linear metres of pipe contaminated with chrysotile asbestos was found.

In Zone F1, 12m^2 of chrysotile board, 150m^2 of amosite board and 170m^2 of chrysotile cement board were located in Building 8. Building 9 had 66m^2 of chrysotile cement board and Building 11 had 4m^2 of chrysotile cement board. In Building 20 there was 402m^2 of chrysotile board, 20m^2 of amosite/chrysotile board and 450m^2 of chrysotile cement board. In Building 38, 705m^2 of chrysotile board, 9.5m^2 of amosite/chrysotile board, 5,546m^2 of chrysotile cement board, 507m^2 of ceiling with residual limpet, amosite/chrysotile lagging and chrysotile rope glazing were found.

In Zone F2, Building 49 had 580m^2 of chrysotile board, Building 61 had 1 chrysotile gasket and Building 64 had an amosite cistern and 2m^2 of chrysotile floor tile.

The Eastman Building had 163m^2 of chrysotile wall board, 120m^2 of chrysotile flooring, chrysotile tape in the electrical boxes, amosite duct insulation and chrysotile residue on recently lagged overhead pipes.

8.0 REFERENCES

1. HSE, 2001. Methods for Determination of Hazardous Substances (MDHS) 100. Surveying, sampling and assessment of asbestos-containing materials. Health and Safety Executive. July.

2. Control of Asbestos at Work Regulations 2002, Statutory Instrument No. 2675.

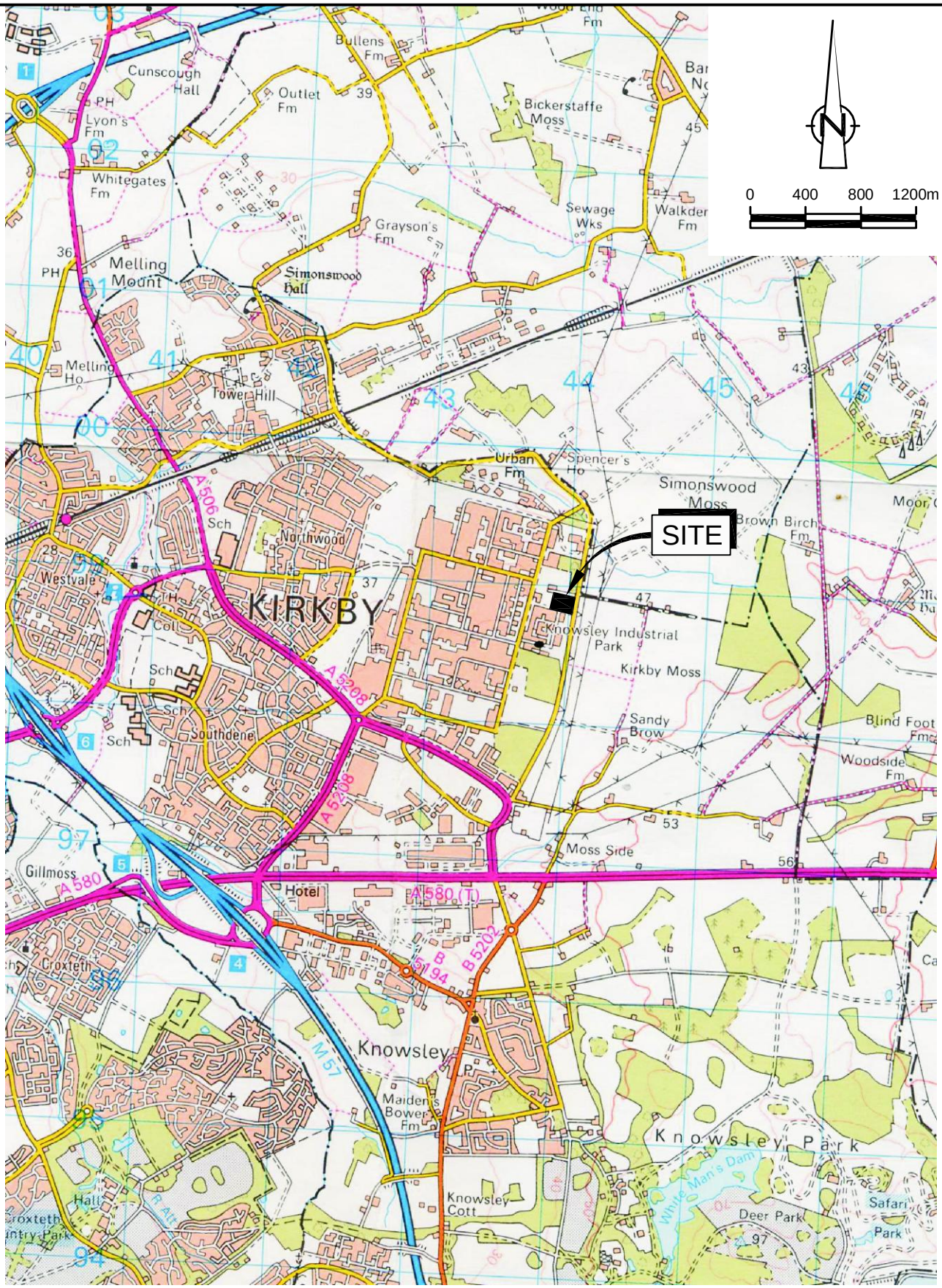
3. HSG150- Health and Safety in Construction (ISBN 071621065), HSE, 2006

4. The Hazardous Waste Regulations (England and Wales), Regulations, 2005

5. The Construction (Design and Management) Regulations 1994 No. 3140

6. Asbestos (Licensing) Regulations (1983) 1998, Health and Safety Statutory Instrument 3233.

FIGURES



SOURCE: ORDNANCE SURVEY

Figure 1

SITE LOCATION PLAN
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

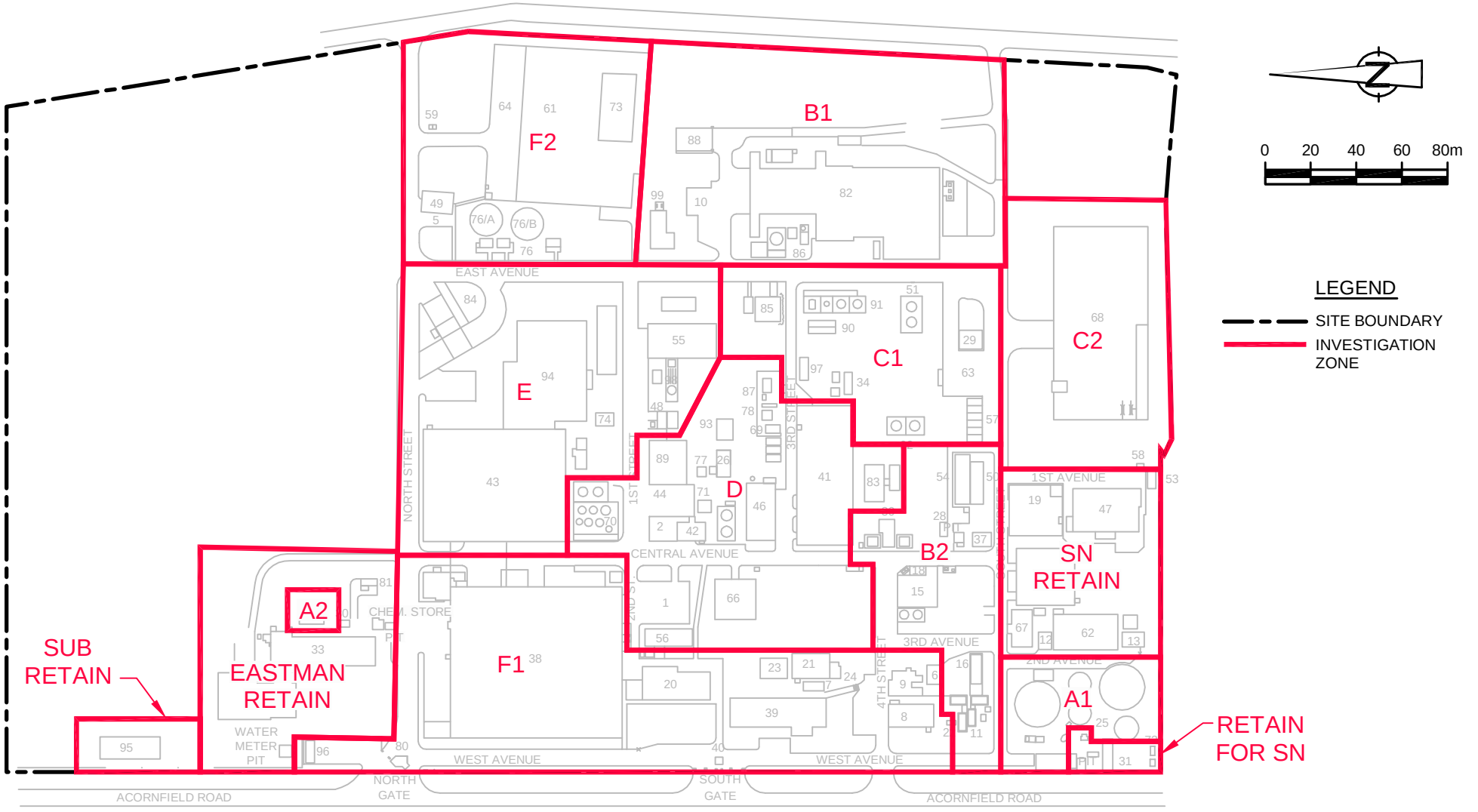


Figure 2

INVESTIGATION ZONES
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

933389-00(001)GN-WA036 FEB 01/2007

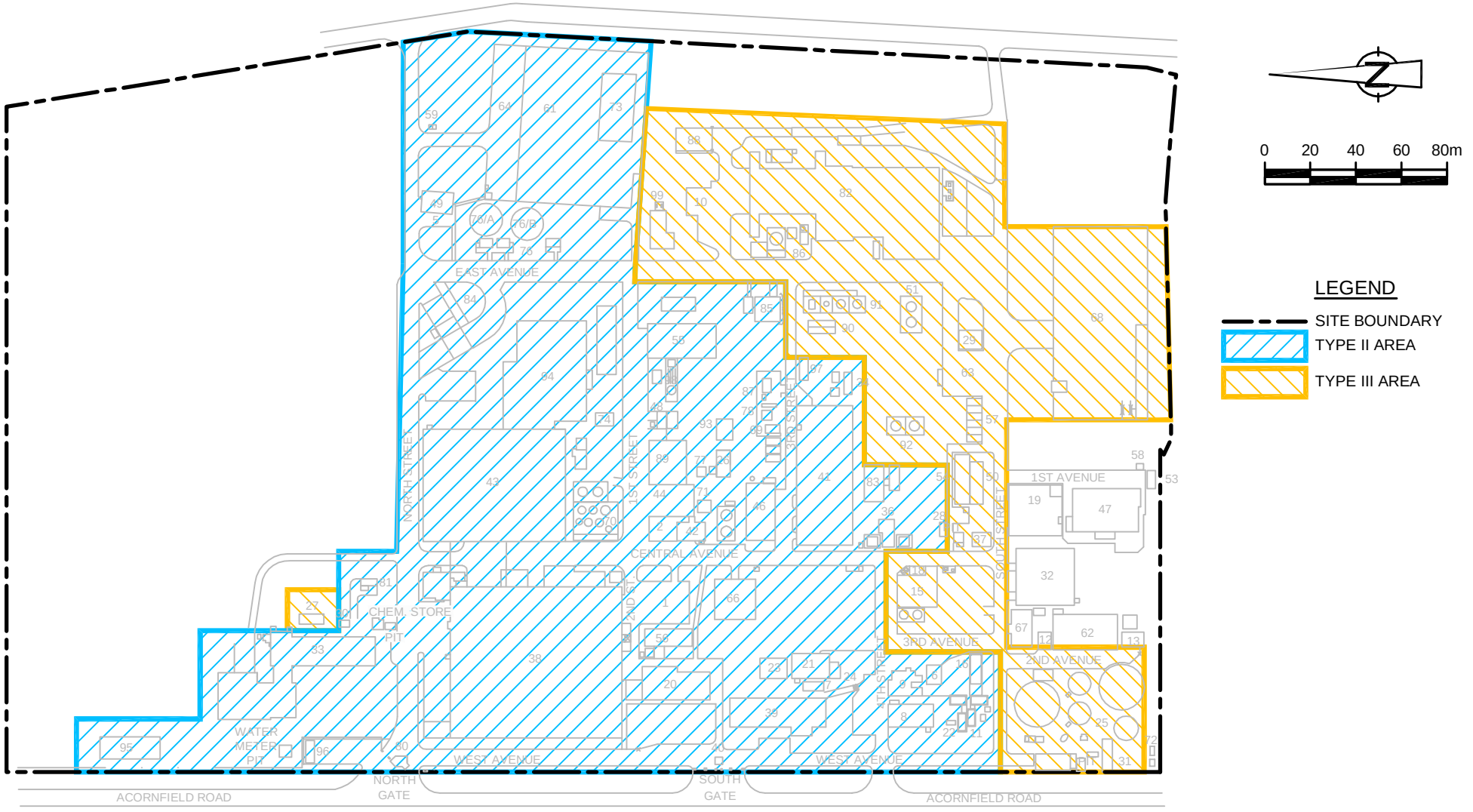


Figure 3

TYPE II / III INVESTIGATION AREAS
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

933389-00(001)GN-WA037 FEB 01/2007

TABLES

TABLE 1: POTENTIAL ACM SAMPLE SURVEY SAMPLES

Area	Building No.	Sample ID	Date Sampled	Floor/Offices	Location	Material
A1	B25	A1-B25-EXT-ROOF-001	15/01/2007	roof	roof	roofing felt
		A1-B25-EXT-00-001	15/01/2007	ground	west of aeration tank 2	pipe residue
		A1-B25-EXT-00-002	15/01/2007	ground	south of settlement tank 2	pipe residue
A2	B27	A2-B27-INT-001	19/01/2007	ground	overhead pipe near emergency door	pipe scraping
		A2-B27-EXT-001	19/01/2007	roof	Pipe on roof	pipe scraping
		A2-B27-EXT-002	19/01/2007	roof	roof	pipe scraping
		A2-B27-EXT-003	19/01/2007	roof	roof	roof felt
	B82	B1-82-INT-00-001	10/01/2007	ground floor	Main entrance brown linoleum	Flooring
		B1-82-INT-00-002	10/01/2007	ground floor	Main entrance black skirting	Flooring
		B1-82-INT-00-003	10/01/2007	ground floor	Main entrance RHS Fusebox	Board
		B1-82-INT-00-004	10/01/2007	ground floor	Main entrance board to boxing	Board
		B1-82-INT-00-005	10/01/2007	ground floor	Main entrance board above suspended ceiling	Board
		B1-82-INT-00-006	10/01/2007	ground floor	Outside lockers - Suspended ceiling panels	Board
		B1-82-INT-00-007	10/01/2007	ground floor	Corridor outside lockers - Grey floor tiles	Flooring
		B1-82-INT-00-008	10/01/2007	ground floor	Outside lockers - Notice board in corridor	Board
		B1-82-INT-00-009	10/01/2007	ground floor	Balance room - Lab/office blue linoleum	Flooring
		B1-82-INT-00-010	10/01/2007	ground floor	Lab - RHS Sink pad	Bitumen
		B1-82-INT-00-011	10/01/2007	ground floor	Lab - LHS Drainer pad (RHS of room)	Bitumen
		B1-82-INT-00-012	10/01/2007	ground floor	Lab - RHS Drainer pad (RHS of room)	Bitumen
		B1-82-INT-00-013	10/01/2007	ground floor	Lab - Sink pad (Middle of room)	Bitumen
		B1-82-INT-00-014	10/01/2007	ground floor	Lab - Drainer pad (Middle of room)	Bitumen
		B1-82-INT-00-015	10/01/2007	ground floor	Lab - Sink pad (LHS of room)	Bitumen
		B1-82-INT-00-016	10/01/2007	ground floor	Lab - Notice board to RHS of wall	Board
		B1-82-INT-00-017	10/01/2007	ground floor	Lab - Notice board to HHS of wall	Board
		B1-82-INT-00-018	10/01/2007	ground floor	Locker room - Linoleum	Flooring
		B1-82-INT-00-019	10/01/2007	ground floor	Sprayed coating to ceiling beams	Sprayed coating
		B1-82-INT-00-020	10/01/2007	ground floor	Workshop - Panels to service riser	Board
		B1-82-INT-00-021	10/01/2007	ground floor	Workshop - Loose gaskets (Pale blue)	Gasket
		B1-82-INT-00-022	10/01/2007	ground floor	Workshop - Dark blue linoleum	Flooring
		B1-82-INT-00-023	10/01/2007	ground floor	Northend - Grey/glitter linoleum	Flooring
		B1-82-INT-00-024	10/01/2007	ground floor	Northend - flooring	Composite
		B1-82-INT-00-025	10/01/2007	ground floor	Gasket to valve between firepoint & HV3202	Gasket
		B1-82-INT-00-026	10/01/2007	ground floor	Northend - VD17 Glycol tank	Insulation
		B1-82-INT-00-027	10/01/2007	ground floor	Northend - Seal to blanking plate between VI004 & VI003	Textile
		B1-82-INT-00-028	10/01/2007	ground floor	Northend - Coating to pipe rack below gantry	Textured coating
		B1-82-INT-00-029	10/01/2007	1st floor	Mezzanine Floor - Green linoleum to entrance corridor	Flooring
		B1-82-INT-00-030	10/01/2007	1st floor	Mezzanine Floor - Grey linoleum to corridors	Flooring
		B1-82-INT-00-097	15/01/2007	1st floor	Sprayed coating to beams. Lift area	Sprayed Coating
		B1-82-INT-00-098	15/01/2007	1st floor	Pipe lagging V0441 manufacturing	Pipe lagging
		B1-82-INT-00-099	15/01/2007	1st floor	Pipe lagging AV4139 Manufacturing	Pipe lagging
		B1-82-INT-00-114	15/01/2007	1st floor	Board to middle loft hatch foremans hut	Board
		B1-82-INT-00-115	15/01/2007	1st floor	Red linoleum foremans hut	Flooring
		B1-82-INT-00-116	15/01/2007	1st floor	Board to RHS loft hatch foremans hut	Board
		B1-82-INT-00-117	15/01/2007	1st floor	Board to LHS loft hatch foremans hut	Board
		B1-82-INT-00-124	15/01/2007	1st floor	Panels to LHS & RHS fume cupboards lab	Board
		B1-82-INT-00-125	15/01/2007	1st floor	Brown linoleum below LHS & RHS fume cupboard	Flooring
		B1-82-INT-00-126	15/01/2007	1st floor	Worktop to fume cupboard LHS & RHS lab	Board
		B1-82-INT-00-127	15/01/2007	1st floor	Panels to middle fume cupboadr Lab	Board
		B1-82-INT-00-128	15/01/2007	1st floor	Ceiling board	Board
		B1-82-INT-00-129	15/01/2007	1st floor	Debris to pipework	Debris
		B1-82-INT-01-031	11/01/2007	1st floor	Mezzanine Floor - Black skirting to corridors	Composite
		B1-82-INT-01-032	11/01/2007	1st floor	Mezzanine Floor - Notice board in long corridor	Board
		B1-82-INT-01-033	11/01/2007	1st floor	Mezzanine Floor - Cistern to gents toilet	Re-inforced plastic
		B1-82-INT-01-034	11/01/2007	1st floor	Mezzanine Floor - Kitchen sink pad	Bitumen
		B1-82-INT-01-035	11/01/2007	1st floor	Mezzanine Floor - Grey linoleum to kitchen	Flooring
		B1-82-INT-01-036	11/01/2007	1st floor	Mezzanine Floor - Pipework above suspended kitchen ceiling	Sprayed coating
		B1-82-INT-01-037	11/01/2007	1st floor	Mezzanine Floor - Beams above suspended kitchen ceiling	Sprayed coating
		B1-82-INT-01-038	11/01/2007	1st floor	Mezzanine Floor - Notice board LHS of window wall to open plan office	Board
		B1-82-INT-01-039	11/01/2007	1st floor	Mezzanine Floor - Notice board RHS of window wall to open plan office	Board
		B1-82-INT-01-040	11/01/2007	1st floor	Mezzanine Floor - Notice board rear wall to open plan office	Board
		B1-82-INT-01-054	11/01/2007	1st floor	Manufacturing - Ins to flange middle pipework	Insulation
		B1-82-INT-01-051	11/01/2007	1st floor	Computer room - Large grey floor tiles	Flooring
		B1-82-INT-01-052	11/01/2007	1st floor	Computer room - Stair nosings	Composite
		B1-82-INT-01-053	11/01/2007	1st floor	Coating to exposed pipe RHS of HV0468 manufacturing	Coating
		B1-82-INT-01-100	15/01/2007	1st floor	Sprayed coating to beams manufactoring above gantry	Sprayed Coating
		B1-82-INT-01-101	15/01/2007	1st floor	Gasket between K1051 & ANIC1222	Gasket
		B1-82-INT-01-102	15/01/2007	1st floor	Pipe lagging & cdi manufactoring	Pipe lagging
		B1-82-INT-01-103	15/01/2007	1st floor	Pipe lagging by AV2112b manufactoring	Pipe lagging
		B1-82-INT-01-104	15/01/2007	1st floor	panel to ceiling around cable riser manufactoring	Board
		B1-82-INT-02-130	15/01/2007	2nd floor	Board to ceiling	Board
		B1-82-INT-02-131	15/01/2007	2nd floor	Filler between concrete ceiling slabs	Sealant
		B1-82-INT-02-041	11/01/2007	2nd floor	Office corridor - Notice board to RHS	Board
		B1-82-INT-02-042	11/01/2007	2nd floor	Main corridor - red linoleum	Flooring
		B1-82-INT-02-043	11/01/2007	2nd floor	Main corridor - Black skirting	Composite
		B1-82-INT-02-044	11/01/2007	2nd floor	Kitchen & canteen - Light grey vinyl floor tiles	Flooring
		B1-82-INT-02-045	11/01/2007	2nd floor	Control room - Dark grey vinyl floor tiles	Flooring
		B1-82-INT-02-046	11/01/2007	2nd floor	Kitchen - LHS Drainer pad	Bitumen
		B1-82-INT-02-047	11/01/2007	2nd floor	Kitchen - RHS Drainer pad	Bitumen
		B1-82-INT-02-048	11/01/2007	2nd floor	Gents - Toilet cistern	Reinforced plastic
		B1-82-INT-02-049	11/01/2007	2nd floor	Shift Supervisors & office - Black linoleum	Flooring
		B1-82-INT-02-050	11/01/2007	2nd floor	Canteen - Dark grey vinyl floor tile	Flooring
		B1-82-INT-02-088	15/01/2007	2nd floor	Sprayed coating to beams 1stFloor manufactoring	Sprayed Coating
		B1-82-INT-02-089	15/01/2007	2nd floor	Pipe lagging dryer condensed - solvent to receiver	Pipe lagging
		B1-82-INT-02-090	15/01/2007	2nd floor	Pipe lagging U2501reactor R5	Pipe lagging
		B1-82-INT-02-091	15/01/2007	2nd floor	Pipe lagging V11201 reactor p34	Pipe lagging
		B1-82-INT-02-092	15/01/2007	2nd floor	Sprayed coating to beams 1stFloor manufacturing	Sprayed Coating
		B1-82-INT-02-093	15/01/2007	2nd floor	Debris to pipework 15/16 above scaffold	Debris
		B1-82-INT-02-094	15/01/2007	2nd floor	Gasket RHS dryer condensed solvent receiver	Gasket
		B1-82-INT-02-095	15/01/2007	2nd floor	Gasket to pipework 1st floor manufacturing	Gasket
		B1-82-INT-02-096	15/01/2007	2nd floor	Sealant to cable rises 1st floor manufacturing	Sealant
		B1-82-INT-03-077	15/01/2007	3rd floor	Wall panels around pipework - north end	Board
		B1-82-INT-03-078	15/01/2007	3rd floor	Coating to pipework by AV1140 Manufacturing	Coating
		B1-82-INT-03-079	15/01/2007	3rd floor	Coating to high level pipe D131	Coating
		B1-82-INT-03-080	15/01/2007	3rd floor	Coating to low level pipe D129	Debris
		B1-82-INT-03-081	15/01/2007	3rd floor	Grey linoleum D133 & corridor between D133 & D125	Linoleum
		B1-82-INT-03-082	15/01/2007	3rd floor	Bitumen to step - D126	Bitumen
		B1-82-INT-03-083	15/01/2007	3rd floor	Panel to side of fire exit door 125	Board
		B1-82-INT-03-084	15/01/2007	3rd floor	Coating to electric cables plant room east wall	Sealant
		B1-82-INT-03-085	15/01/2007	3rd floor	Selant to floor plant room east wall	Sealant
		B1-82-INT-03-086	15/01/2007	3rd floor	Debris to waterpump 7801B plant room	Debris
		B1-82-INT-03-105	15/01/2007	3rd floor	Pipe lagging to HV3121 Manufacturing	Pipe lagging
		B1-82-INT-03-106	15/01/2007	3rd floor	Pipe lagging by AV2151	Pipe lagging
		B1-82-INT-03-107	15/01/2007	3rd floor	Pipe lagging by H1031 solvent chiller	Pipe lagging
		B1-82-INT-03-108	15/01/2007	3rd floor	Coating to beams manufactoring by drum melter	Coating

Area	Building No.	Sample ID	Date Sampled	Floor/Offices	Location	Material
		B1-82-INT-03-109	15/01/2007	3rd floor	Coating to beams manufacturing D124	Coating
		B1-82-INT-03-110	15/01/2007	3rd floor	Gasket by AV0209 manufacturing	Gasket
		B1-82-INT-03-111	15/01/2007	3rd floor	Gasket by H1031 manufacturing	Gasket
		B1-82-EXT-04-087	15/01/2007	4th floor	Bitumen flooring to roof	Bitumen
		B1-82-INT-04-112	15/01/2007	4th floor	Gasket vertical pipe LS rear of WK6102	Gasket
		B1-82-INT-04-113	15/01/2007	4th floor	Gasket rear of WK6101	Gasket
		B1-82-INT-99-118	15/01/2007		Panels to clears & walls Area 99 - control room	Board
		B1-82-INT-99-119	15/01/2007		Grey linoleum	Flooring
		B1-82-EXT-00-120	15/01/2007	-	Gasket to EX9 seal pet	Gasket
		B1-82-EXT-121	15/01/2007	-	Sealant to cables	Sealant
		B1-82-EXT-122	15/01/2007	-	Bitumen to roof	Bitumen
		B1-82-EXT-123	15/01/2007	-	Panels to shelter	Board
	B86	B1-86-EXT-00-120	15/01/2007	ground	Gasket to EX9 seal pet	Gasket
B2	**B11**	B2-B11-Shed	23/01/2007	roof	roof (northwest corner)	cement
	B37	B2-B37-EXT-001	23/01/2007	roof	northwest corner of roof	Felt
		D-B41-INT-00-001-NG	09/01/2007	ground	Store Roof	Cement
		D-B41-INT-00-002-NG	09/01/2007	ground	Corridor	Cement
		D-B41-INT-00-003-NG	09/01/2007	ground	Store Doorway	Board
		D-B41-INT-00-004-NG	09/01/2007	ground	Info Store	Board
	41	D-B41-INT-00-005-NG	09/01/2007	ground	Instrument Workshop	Board
		D-B41-INT-00-006-NG	10/01/2007	ground	Various locations	sink pad
		D-B41-INT-00-007-NG	09/01/2007	ground	Fork Lift Truck Bay	Cement
		D-B41-INT-00-009-NG	09/01/2007	ground	Near Welding Shop	Cement
		D-B41-INT-00-008-NG	09/01/2007	ground	West office area	Board
D	**42**	D-B42-INT-00-001-NG	09/01/2007	ground	Contractor Mess	Cement
		D-B42-EXT-001AG	10/01/2007	-	Roof	Roof felt
	46	D-46-INT-00-001-NG	09/01/2007	ground	SE Lab/Offices	Floor Tile
		D-46-INT-00-002-NG	09/01/2007	ground	Pipe Under Boiler 2	Debris
	56	D-B56-EXT-001AG	10/01/2007	-	Roof	Roof felt
	66	D-B66-EXT-00-001-AG	09/01/2007	ground	Down Pipe (E and W)	Cement
		D-B66-INT-00-001NG	09/01/2007	ground	Interior Southern wall	Lagging
	83	D-B83-INT-00-001 - NG	09/01/2007	ground	Men's Locker room	Floor Tile
		D-B83-INT-00-002- NG	09/01/2007	ground	Drying Room	Board
	93	D-B93-INT-00-001	09/01/2007	ground		Fibre
		E - B38/43-EXT-01	19/01/2007	roof	Northern Lights	Rope Glazing
		E-B43-INT-00-001	19/01/2007	ground	Northern Lights	Rope Glazing
		E-B43-INT-00-002	19/01/2007	ground	Along western wall	Residue (pipe scraping)
		E-B43-INT-00-003	19/01/2007	ground	Insulation	None Detected
	43	E-B43-INT-00-004	19/01/2007	ground	Textured coating	None Detected
		E-43-INT-00-073PT	12/01/2007	ground	Hallway and misc. rooms	Green Linoleum
		E-43-INT-00-074PT	12/01/2007	ground	Ladies toilets	Red Linoleum
		E-43-INT-00-075PT	12/01/2007	ground	Break room	Gray Linoleum
		E-43-INT-00-076PT	12/01/2007	ground	Kitchen	Beige Linoleum
E		E-B43-EXT-001	23/01/2007	roof	SW Corner	Felt
	48	E-B48-EXT-001AG	10/01/2007	roof	roof	roofing felt
	55	E-B55-EXT-001	23/01/2007		roof - northwest corner	roofing felt
		E-74-INT-00-148PT	18/01/2007	ground	Development Laboratory	sink liner
	74	E-74-INT-00-149PT	18/01/2007	ground	Development Laboratory	sink liner
		E-74-INT-00-150PT	18/01/2007	ground	Development Laboratory	blue linoleum
		E-84-INT-00-144	17/01/2007	ground	Ceiling panels to switch room	Board
	84	E-84-EXT-00-145	17/01/2007	roof	Bitumen roof liner to switch room roof	Bitumen
		E-84-EXT-00-146	17/01/2007	roof	Bitumen roof liner & store	Bitumen
		E-84-INT-00-147	17/01/2007	ground	Loose board LHS wall to store	Board
		F1-B8-INT-00-001	19/01/2007	ground	Stairwell Ceiling	Cement
		F1-B8-INT-00-002	19/01/2007	ground	Stairwell wall	Board
		F1-B8-INT-01-002	19/01/2007	first	Exterior board around top of weighing room and meeting room	Board
	8	F1-B8-INT-01-003	19/01/2007	first	Interior board around top of weighing room and meeting room	Board
		F1-B8-INT-01-004	19/01/2007	first	Board above chromatography lab door	Board
		F1-B8-INT-01-005	19/01/2007	first	Wall board in east storeroom	Board
		F1-B8-INT-01-006	19/01/2007	first	Roofing material, Entire ceiling of first floor	Cement
		F1-B8-INT-ROOF-001	19/01/2007	roof	Roofing in roof-top plant room	Cement
	9	F1-B9-INT-00-001	19/01/2007	ground	SM roof	Cement
	11	F1-B11-Shed	19/01/2007	N/A	Shed	Cement
		F1-20-INT-00-055PT	11/01/2007	ground	Canteen/Eating Area	interior ceiling panels
		F1-20-INT-00-056PT	11/01/2007	ground	Canteen/Main Entrance/Eating Area	grey linoleum
		F1-20-INT-00-057PT	11/01/2007	ground	Black Edging to bottom of Wall	canteen/gents/main entrance/kitchen
		F1-20-INT-00-058PT	11/01/2007	ground	Canteen/gents	Beige Linoleum
		F1-20-INT-00-059PT	11/01/2007	ground	Canteen/Ladies	Flue pipe above incinerator
		F1-20-INT-00-060PT	11/01/2007	ground	Canteen/Ladies	Liner inside incinerator
		F1-20-INT-00-061PT	11/01/2007	ground	Canteen/Ladies	Beige linoleum
		F1-20-INT-00-062PT	11/01/2007	ground	Canteen/Eating Area	Pink Linoleum
		F1-20-INT-00-063PT	11/01/2007	ground	Canteen/Eating Area	Blue Linoleum
		F1-20-INT-00-064PT	11/01/2007	ground	Canteen/Eating Area	Green sparkly linoleum
		F1-20-INT-00-065PT	12/01/2007	ground	Canteen/Kitchen	Green sparkly linoleum
		F1-20-INT-00-066PT	12/01/2007	ground	Canteen/Kitchen	sink liner
	20	F1-20-INT-00-067PT	12/01/2007	ground	Canteen/Kitchen	Woven seal to Blodgett oven door
		F1-20-INT-00-068PT	12/01/2007	ground	Canteen/Kitchen	Beige linoleum
		F1-20-INT-00-069PT	12/01/2007	ground	Canteen/Kitchen	Beige linoleum
		F1-20-INT-00-070PT	12/01/2007	ground	Canteen/Kitchen	Pink linoleum
		F1-20-INT-00-071PT	12/01/2007	ground	Canteen/Kitchen	Boxing above door
		F1-20-INT-00-072PT	12/01/2007	ground	Canteen/Buffet Room & store	Green vinyl floor tiles
		F1-20-INT-00-055	11/01/2007	ground	Ceiling above suspended ceiling	Cement
		F1-20-INT-00-059	11/01/2007	ground	Ladies WC - Flue pipe	Cement
		F1-20-INT-00-060	11/01/2007	ground	Incinerator - Liner	Board
F1		F1-B20-EXT-001-NG	23/01/2007	Ext window	window (north side)	window caulking
		F1-B20-EXT-002-NG	23/01/2007	roof	roof (west side)	roof felt (exterior)
		F1-B20-EXT-003-NG	23/01/2007	roof	roof (west side)	cement panel boarding (int)
	21	F1-B21-EXT-001-NG	23/01/2007	-	window (east side)	window caulking
		F1-B38-INT-00-005NG	10/01/2007	ground	Women's Room Cupboard	Board
		F1-B38-INT-00-006NG	10/01/2007	ground	Women's Room Roof	Board
		F1-B38-INT-00-010NG	10/01/2007	ground	Calorifier Room	Residue
		F1-B38-INT-00-012NG	10/01/2007	ground	Label Bench Area	Board
		F1-B38-INT-00-013NG	10/01/2007	ground	NW N Lights	Rope Glazing
		F1-B38-INT-00-014NG	10/01/2007	ground	Warehouse Ceiling	Board
		F1-B38-INT-00-015NG	10/01/2007	ground	Canteen (Floor 1)	Wall Board
		F1-B38-INT-00-016NG	10/01/2007	ground	Canteen (Floor 1)	Fascia Board
		F1-B38-INT-00-017NG	10/01/2007	ground	Alcove under Canteen (Floor 1)	Board
		F1-B38-INT-00-019	11/01/2007	ground	Warehouse Ceiling (pallet rack area)	Cement
		F1-B38-INT-00-021	11/01/2007	ground	Warehouse Ceiling (central)	Cement
		F1-B38-INT-00-022	11/01/2007	1st to 2nd	Pipes	Lagging
		F1-B38-INT-00-023	11/01/2007	1st to 2nd	Pipes	Lagging
		F1-B38-INT-01-001NG	10/01/2007	first	Conference Room Store	Cement
		F1-B38-INT-01-002NG	10/01/2007	first	Conference Room	Cement
		F1-B38-INT-02-001NG	10/01/2007	second	East Stair Ceiling	Board
		F1-B38-INT-02-004NG	10/01/2007	second	Corridor by Solution Mixing Room	Residue
		F1-B38-INT-02-007	11/01/2007	second	Ceiling in corridor between lift & misc.room	asbestos spray (limpet)

Area	Building No.	Sample ID	Date Sampled	Floor/Offices	Location	Material
		F1-B38-INT-02-008	11/01/2007	second	Ceiling in corridor between lift & misc.room	asbestos spray (limpet)
		F1-B38-INT-02-009	11/01/2007	second	Ceiling in corridor between lift & misc.room	Residue
		F1-B38-INT-02-10	11/01/2007	second	Laboratory	Residual spray (limpet)
		F1-B38-INT-02-11	11/01/2007	second	Laboratory	Residual spray (limpet)
		F1-B38-INT-02-12	11/01/2007	second	Ceiling in miscellaneous section	Residual spray (limpet)
		F1-B38-EXT-ROOF-NL1	10/01/2007	roof	N Lights End Panels	Cement
		F1-B38-EXT-ROOF-NL2	10/01/2007	roof	N Lights End Panels	Board
		F1-B38-INT-ROOF-01NG	10/01/2007	roof	Roof	Cement
		F1-B39-INT-00-001SZ	11/01/2007	ground	SW Corner of Lobby	Floor Tile
	39	F1-B39-INT-00-002SZ	11/01/2007	ground	Corridor near Cleaner's Cupboard	Floor Tile
		F1-B39-INT-00-003SZ	11/01/2007	ground	W Office off of Corridor	Floor Tile
		F1-B39-INT-00-005SZ	11/01/2007	ground	Ceiling of N Stair	Cement Board
	49	F2-B49-EXT-OO1	23/01/2007	Roof	Western Side	Soffit Board
		F2-B49-EXT-OO2	23/01/2007	Roof	Western Side	Board
	61	F2-61-EXT-00-143	17/01/2007	ground	Loose gaskets	Gasket
		F2-64-INT-00-136PT	17/01/2007	ground	DECON UNIT	GREY LINOLEUM
		F2-64-INT-00-137PT	17/01/2007	ground	OFFICE-STORE	BLACK LINOLEUM
	64	F2-64-INT-00-138	17/01/2007	ground	Office RHS cistern	Re-inforced plastic
F2		F2-64-INT-00-139PT	17/01/2007	ground	LHS OFFICE	GREY LINOLEUM
		F2-64-EXT-00-140PT	17/01/2007	ground	PAINT STORE	LINER
		F2-64-INT-00-141	17/01/2007	ground	White vinyl floor tiles LHS store	Flooring
	73	F2-73-INT-00-142PT	17/01/2007	ground	STORE	RED WALL PANELS TO LHS WALL
		F2-76-EXT-00-132PT	17/01/2007	ground	FIRE PUMP HOUSE NO. 3	ROOF LINER
	76	F2-76-EXT-00-133PT	17/01/2007	ground	FIRE PUMP HOUSE NO. 2	ROOF LINER
		F2-76-EXT-00-134PT	17/01/2007	ground	FIRE PUMP HOUSE NO. 1	ROOF LINER
		F2-76-EXT-00-135PT	17/01/2007	ground	FIRE PUMP HOUSE NO. 4	ROOF LINER
		B33-INT-00-001	18/01/2007	ground	Wallboard between PET Lab and Southern workshop	Board
		B33-INT-00-002	18/01/2007	ground	Interior paneled ceiling in PPL1	ceiling
		B33-INT-00-003	18/01/2007	ground	Dividing wall between PPL1 and PPL2	Textured white paint
		B33-INT-00-004	18/01/2007	ground	Northern stairway	Black stair nosing
		B33-INT-00-005	22/01/2007	ground	Break room	wall board
		B33-INT-00-006	22/01/2007	ground	Corridor	blue floor tile
		B33-INT-00-007	22/01/2007	ground	Corridor/NMR Transformer room	duct insulation
		B33-INT-00-008	22/01/2007	ground	Corridor/NMR Transformer room	duct insulation
		B33-INT-00-009	22/01/2007	ground	Laboratory / fume cupboard	board within fumehood
	Eastman Building	B33-INT-00-010 & 011	22/01/2007	ground	overhead pipes in hallway	pipe scraping
		B33-INT-00-012	22/01/1900	ground	Corridor/Electrical cabinet	tape
		B33-INT-01-001	18/01/2007	first	Corridor	blue tile
		B33-INT-01-003	18/01/2007	first	Corridor/overhead pipes	pipe scraping
		B33-INT-02-001	18/01/2007	second	Dividing wall between visitor offices & laboratory	wall board
		B33-INT-02-002	18/01/2007	second	same as above	wall board
		B33-INT-02-003	18/01/2007	second	Adjacent lift	floor tiles
		B33-INT-ROOF-001	18/01/2007	roof	Adjacent lift room	pipe scraping
		B33-INT-rOOF-002	18/01/2007	roof	Adjacent lift room	pipe scraping
		B33-EXT-001 & 002	23/01/2007	-	panels underneath windows	painted red panels underneath windows
		PW-001	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-002	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-003	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-004	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-005	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-006	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-007	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-008	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-009	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-010	24/01/2007	-	Western South Street	Residue (pipe scraping)
		PW-011	24/01/2007	-	Within area 37	Residue (pipe scraping)
		PW-012	24/01/2007	-	Within area 37	Residue (pipe scraping)
		PW-013	24/01/2007	-	East of Building 15.	Residue (pipe scraping)
		PW-014	24/01/2007	-	North of Building 15 near Central Ave.	Residue (pipe scraping)
		PW-015	24/01/2007	-	North of Building 15 near Central Ave.	Residue (pipe scraping)
		PW-016	24/01/2007	-	North of Building 15 near Central Ave.	Residue (pipe scraping)
		PW-017	24/01/2007	-	Large top pipe north of Building 15.	Residue (pipe scraping)
		PW-018	24/01/2007	-	Small bottom pipe north of Building 15.	Residue (pipe scraping)
		PW-019	24/01/2007	-	Junction of Fourth Street and Third Ave.	Residue (pipe scraping)
		PW-020	24/01/2007	-	Northeast corner of Building 9 on Fourth St.	Residue (pipe scraping)
		PW-021	24/01/2007	-	Northwest corner of Building 9 on Fourth St.	Residue (pipe scraping)
	Pipework (Throughout site)	PW-022	24/01/2007	-	Second floor of Area 37 near stairs.	Residue (pipe scraping)
		PW-023	24/01/2007	-	Northern end of the first floor in Area 37.	Residue (pipe scraping)
		PW-024	24/01/2007	-	Southwestern end of the first floor in Area 37.	Residue (pipe scraping)
		PW-025	24/01/2007	-	Near southeast corner of Building 37.	Residue (pipe scraping)
		PW-026	24/01/2007	-	Central Avenue - Small top pipe on west side near Building 41.	Residue (pipe scraping)
		PW-027	24/01/2007	-	Central Avenue - Small bottom pipe on west side near Building 41.	Residue (pipe scraping)
		PW-028	24/01/2007	-	Central Avenue - Large pipe entering Building 46.	Residue (pipe scraping)
		PW-029	24/01/2007	-	Central Avenue - Small pipe on east side of pipe bridge.	Residue (pipe scraping)
		PW-030	25/01/2007	-	Central Avenue - Adjacent building 38	Residue (pipe scraping)
		PW-031	25/01/2007	-	Central Avenue - Adjacent building 38	Residue (pipe scraping)
		PW-032	25/01/2007	-	Central Avenue - Adjacent building 38	Residue (pipe scraping)
		PW-033	25/01/2007	-	Central Avenue - Adjacent building 38	Residue (pipe scraping)
		PW-034	25/01/2007	-	Central Avenue - Adjacent building 38	Residue (pipe scraping)
		PW-035	25/01/2007	-	Central Avenue - Adjacent building 38, beneath canopy	Residue (pipe scraping)
		PW-036	25/01/2007	-	Adjacent Eastman Building	Residue (pipe scraping)
		PW-037	25/01/2007	-	Adjacent Eastman Building	Residue (pipe scraping)
		PW-038	25/01/2007	-	North of Building 39	Residue (pipe scraping)
		PW-039	25/01/2007	-	North of Building 8	Residue (pipe scraping)
		PW-040	25/01/2007	-	Second group in from south; small and large pipe lagged together	Residue (pipe scraping)
		PW-041	25/01/2007	-	Second in from the north.	Residue (pipe scraping)
		Gasket-001	24/01/2007	-	Near third avenue and second street	Gasket
		Gasket-002	24/01/2007	-	Near third avenue and second street	Gasket

TABLE 2: SUMMARY OF CONFIRMED ACM SAMPLE RESULTS

Area	Building No.	Sample ID	Floor/Offices	Location	Material	Asbestos Type	Condition	Quantity
B1	B82	B1-82-INT-00-027	ground	Northend - Seal to blanking plate between VI004 &	Textile	Chrysotile	Fair	1
		B1-82-INT-00-127	ground	Panels to Middle Fume Cupboard	Board	Amosite	Fair	12
							Ground Floor Total	**13**
		B1-82-INT-01-033	first	Mezzanine Floor - Cistern to gents toilet	Re-inforced plastic	Amosite	Fair	1
							First Floor Total	**1**
							Building Total	**14**
	B86	B1-86-EXT-00-120	ground	Gasket to EX9 seal pet	Gasket	Chrysotile	Fair	2
							Building Total	**2**
D	41	D-B41-INT-00-001-NG	ground	Store Roof	Cement	Chrysotile	Good	72
		D-B41-INT-00-002-NG	ground	Corridor	Cement	Chrysotile	Good	325
		D-B41-INT-00-003-NG	ground	Store Doorway	Board	Chrysotile	Excellent	70
		D-B41-INT-00-004-NG	ground	Info Store	Board	Chrysotile	Good	9
		D-B41-INT-00-005-NG	ground	Instrument Wkshp	Board	Chrysotile	Good	12
		D-B41-INT-00-007-NG and 008NG	ground	Fork Lift Truck Bay	Cement	Chrysotile	Good	6400
							Building Total	**6,888**
	42	D-B42-INT-00-001-NG	ground	Contractor Mess	Cement	Chrysotile	Good	925
							Building Total	**925**
	66	D-B66-EXT-00-001-AG	ground	Down Pipe (E and W) x 4	Cement	Chrysotile	Good	6
							Building Total	**6**
E	43	E - B38 / 43-EXT-01	N / A	Northern Lights	Rope Glazing	Chrysotile	Good	-
		E-B43-INT-00-001	ground	Northern Lights	Rope Glazing	Chrysotile	Good	-
		E-B43-INT-00-002	ground	Pipe along western wall	Residue (pipe scraping)	Chrysotile	Good	40
							Building Total	**40**
F1	8	F1-B8-INT-00-001	ground	Stairwell Ceiling	Cement	Chrysotile	Good	12
		F1-B8-INT-00-002	ground	Stairwell wall	Board	Amosite	Good	16
							Building Total	**28**
		F1-B8-INT-01-002	first	Exterior board around top of weighing room and r	Board	Amosite	Good	30
		F1-B8-INT-01-003	first	Interior board around top of weighing room and r	Board	Amosite	Good	48
		F1-B8-INT-01-004	first	Board above chromatography lab door	Board	Amosite	Good	28
		F1-B8-INT-01-005	first	Wall board in east storeroom	Board	Amosite	Good	28
		F1-B8-INT-01-006	first	Roofing material, Entire ceiling of first floor	Cement	Chrysotile	Fair	162
							First Floor Total	**296**
		F1-B8-INT-ROOF-001	roof	Roofing in roof-top plant room	Cement	Chrysotile	Good	8
							Roof Total	**8**
							Building Total	**304**
	9	F1-B9-INT-00-001	ground	SM roof	Cement	Chrysotile	Fair	66
							Building Total	**66**
	11	F1-B11-Shed	N / A	Shed	Cement	Chrysotile	Good	4
							Building Total	**4**
	20	F1-20-INT-00-055 & F1-B20-EXT-003	ground	Ceiling above suspended ceiling & roof (west side)	cement panel boarding (int)	Chrysotile	good	400
		F1-20-INT-00-059	ground	Ladies WC - Flue pipe	Cement	Chrysotile	Fair	2
		F1-20-INT-00-060	ground	Incinerator - Liner	Board	Amosite & Chrysotile	Fair	20
							Building Total	**422**
	38	F1-B38-INT-00-005NG	ground	Women's Room Cupboard	Board	Amosite / Chrysotile	Good	2
		F1-B38-INT-00-006NG	ground	Women's Room Roof	Board	Chrysotile	Good	440
		F1-B38-INT-00-010NG	ground	Calorifier Room	Residue (pipe scraping)	Chrysotile	Poor	10
		F1-B38-INT-00-012NG	ground	Label Bench Area	Board	Chrysotile	Good	125
		F1-B38-INT-00-013NG	ground	NW N Lights	Rope Glazing	Chrysotile	Good	-
		F1-B38-INT-00-014NG, 019 and 021	ground	Warehouse Ceiling	Board	Chrysotile	Good	4065
		F1-B38-INT-00-015NG	ground	Canteen (Floor 1)	Wall Board	Chrysotile	Good	24
		F1-B38-INT-00-016NG	ground	Canteen (Floor 1)	Fascia Board	Amosite / Chrysotile	Good	3
		F1-B38-INT-00-017NG	ground	Alcove under Canteen (Floor 1)	Board	Chrysotile	Good	4
		F1-B38-INT-00-022	1st to 2nd	Pipes	Lagging	Amosite / Chrysotile	Fair	10
		F1-B38-INT-00-023	1st to 2nd	Pipes	Lagging	Amosite / Chrysotile	Fair	-
							Ground Floor Total	**4,683**
		F1-B38-INT-01-001NG	first	Conference Room Store	Cement	Chrysotile	Good	1,218
		F1-B38-INT-01-002NG	first	Conference Room	Cement	Chrysotile	Poor to Fair	243
							First Floor Total	**1,461**
		F1-B38-INT-02-001NG	second	East Stair Ceiling	Board	Amosite / Chrysotile	Poor	4.5
		F1-B38-INT-02-004NG	second	Corridor by Solution Mixing Room	Residue (pipe scraping)	Amosite / Chrysotile	Poor	50
		F1-B38-INT-02-007 to 009	second	Ceiling in corridor between lift & misc.room	asbestos spray (limpet)	Amosite / Chrysotile	Fair	12
		F1-B38-INT-02-10 to 012	second	Laboratory	Residual spray (limpet)	Amosite / Chrysotile	Good	495
							Second Floor Total	**562**
		F1-B38-EXT-ROOF-NL1	roof	N Lights Exterior End Panels	Cement	Chrysotile	Fair	112
		F1-B38-EXT-ROOF-NL2	roof	N Lights Interior End Panels	Board	Chrysotile	Fair	112
		F1-B38-INT-ROOF-01NG	roof	Roof	Cement	Chrysotile	Good	20
							Roof Total	**244**
							Building Total	**6,950**
	39	F1-B39-INT-00-001SZ to 003SZ	ground	SW Corner of Lobby	Floor Tile	Chrysotile	Good	530
		F1-B39-INT-00-005SZ	ground	Ceiling of N Stair	Cement Board	Chrysotile	Good	530
							Building Total	**1,060**
		F2-B49-EXT-OO1	Roof	Western Side	Soffit Board	Chrysotile	Poor	60
		F2-B49-EXT-OO2	Roof	Western Side	Board	Chrysotile	Fair	1540
							Building Total	**1,600**
	61	F2-61-EXT-00-143	ground	Loose gaskets	Gasket	Chrysotile	Fair	1
							Building Total	**1**
	64	F2-64-INT-00-138	ground	Office RHS cistern	Re-inforced plastic	Amosite	Fair	1
		F2-64-INT-00-141	ground	White vinyl floor tiles LHS store	Flooring	Chrysotile	Fair	2
							Building Total	**3**
Eastman Chemicals		B33-INT-00-002	ground	Interior paneled ceiling in PPL1	ceiling	Chrysotile	Excellent	140
		B33-INT-00-005	ground	Break room	wall board	Chrysotile	Good	12
		B33-INT-00-006	ground	Corridor	blue floor tile	Chrysotile	Good	60
		B33-INT-00-007	ground	Corridor / NMR Transformer room	duct insulation	Amosite	Poor	20
		B33-INT-00-008	ground	Corridor / NMR Transformer room	duct insulation	Amosite	Poor	-
		B33-INT-00-009	ground	Laboratory / fume cupboard	board within fumehood	Chrysotile	Good	21
		B33-INT-00-012	ground	Corridor / Electrical cabinet	tape	Chrysotile	Good	0.25
							Ground Floor Total	**253**
		B33-INT-01-001	first	Corridor	blue tile	Chrysotile	Good	60
		B33-INT-01-003	first	Corridor / overhead pipes	Residue (pipe scraping)	Chrysotile	Good	25
							First Floor Total	**85**
		B33-INT-02-001 and 002	second	Dividing wall between visitor offices & laboratory	wall board	Chrysotile	Fair	12
							Second Floor Total	**12**
							Building Total	**350**
Pipe Work		Gas-001	-	Near third avenue and second street	Gasket	Chrysotile	-	0.25
		Gas-002	-	Near third avenue and second street	Gasket	Chrysotile	-	0.25
							Pipework Total	**1**
							TOTAL FOR SITE (m^2):	**18,663**

APPENDICES

APPENDIX A1

ZONE A1
SAMPLE LOCATIONS

BUILDING 25

EXTERIOR

SAMPLE ID: A1-B25-EXT-00-001	**DATE SAMPLED:** 15/01/2007
BUILDING : B25 (WASTE WATER TREATMENT PLANT)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: PIPE RESIDUE	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH METAL CASING	**CONDITION:** GOOD
QUANTITY : 60 LINEAR m	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Most pipes in the waste water treatment plant (WWTP) are plastic and would not contain asbestos. The sampled pipe is metal and runs throughout the WWTP and was sampled in two places.

SAMPLE ID: A1-B25-EXT-00-002	**DATE SAMPLED:** 15/01/2007
BUILDING : B25 (WASTE WATER TREATMENT PLANT)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: PIPE RESIDUE	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH METAL CASING	**CONDITION:** GOOD
QUANTITY : 60 LINEAR m	

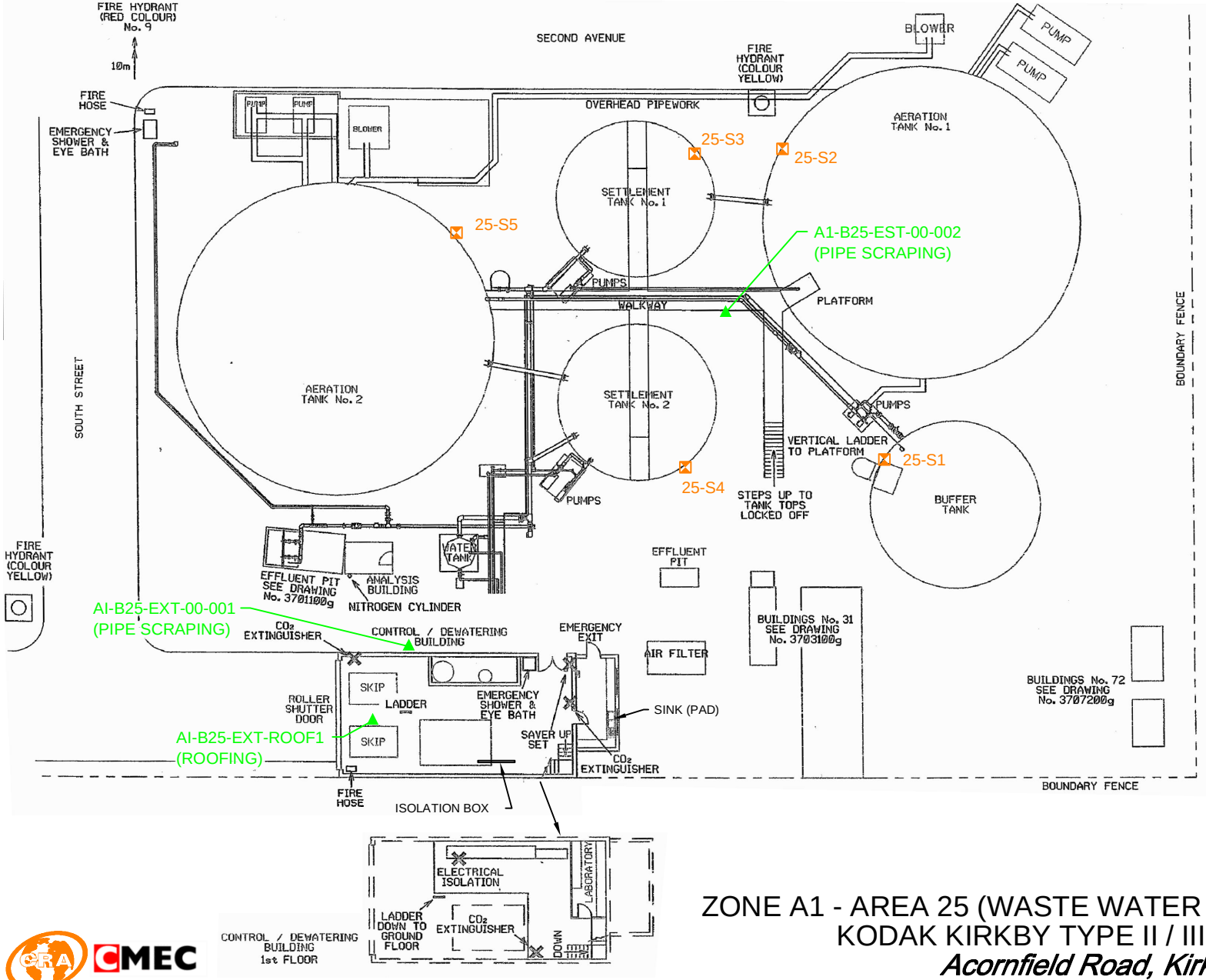
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Most pipes in the waste water treatment plant (WWTP) are plastic and would not contain asbestos. The sampled pipe is metal and runs throughout the WWTP and was sampled in two places.

SAMPLE ID: A1-B25-EXT-ROOF-001	**DATE SAMPLED:** 15/01/2007
BUILDING : B25 (WASTE WATER TREATMENT PLANT)	**FLOOR/ROOM No/LOCATION:** ROOF
SAMPLE DESCRIPTION: BLACK ROOFING FELT	
SURFACE TREATMENT: TAR AND GRAVEL COVERING	**CONDITION:** GOOD
QUANTITY : 147 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



N.T.S.

LEGEND

- SAMPLE LOCATION
- TRIAL PIT LOCATION

Appendix A1 Figure 1

ZONE A1 - AREA 25 (WASTE WATER TREATMENT PLANT)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

APPENDIX A2

ZONE A2
SAMPLE LOCATIONS

BUILDING 27

SAMPLE ID: A2-B27-INT-001	**DATE SAMPLED:** 19/01/2007
BUILDING: 27 (HIGH PRESSURE LABORATORY)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/OVERHEAD PIPE NEAR EMERGENCY EXIT DOOR
SAMPLE DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: PIPE COVERED WITH NEW FIBREGLASS INSULATION	**CONDITION:** GOOD
QUANTITY: 6 linear m	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Most pipes were observed to be new copper pipes with no debris. One older pipe was observed and sampled for the former presence of asbestos containing lagging.

SAMPLE ID: A2-B27-EXT-001	**DATE SAMPLED:** 19/01/2007
BUILDING: 27 (HIGH PRESSURE LABORATORY)	**FLOOR/ROOM No/LOCATION:** ROOF OF BUILDING
SAMPLE DESCRIPTION: ROOF FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 42 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: A2-B27-EXT-002	**DATE SAMPLED:** 19/01/2007
BUILDING: 27 (HIGH PRESSURE LABORATORY)	**FLOOR/ROOM No/LOCATION:** ROOF OF BUILDING
SAMPLE DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY:	

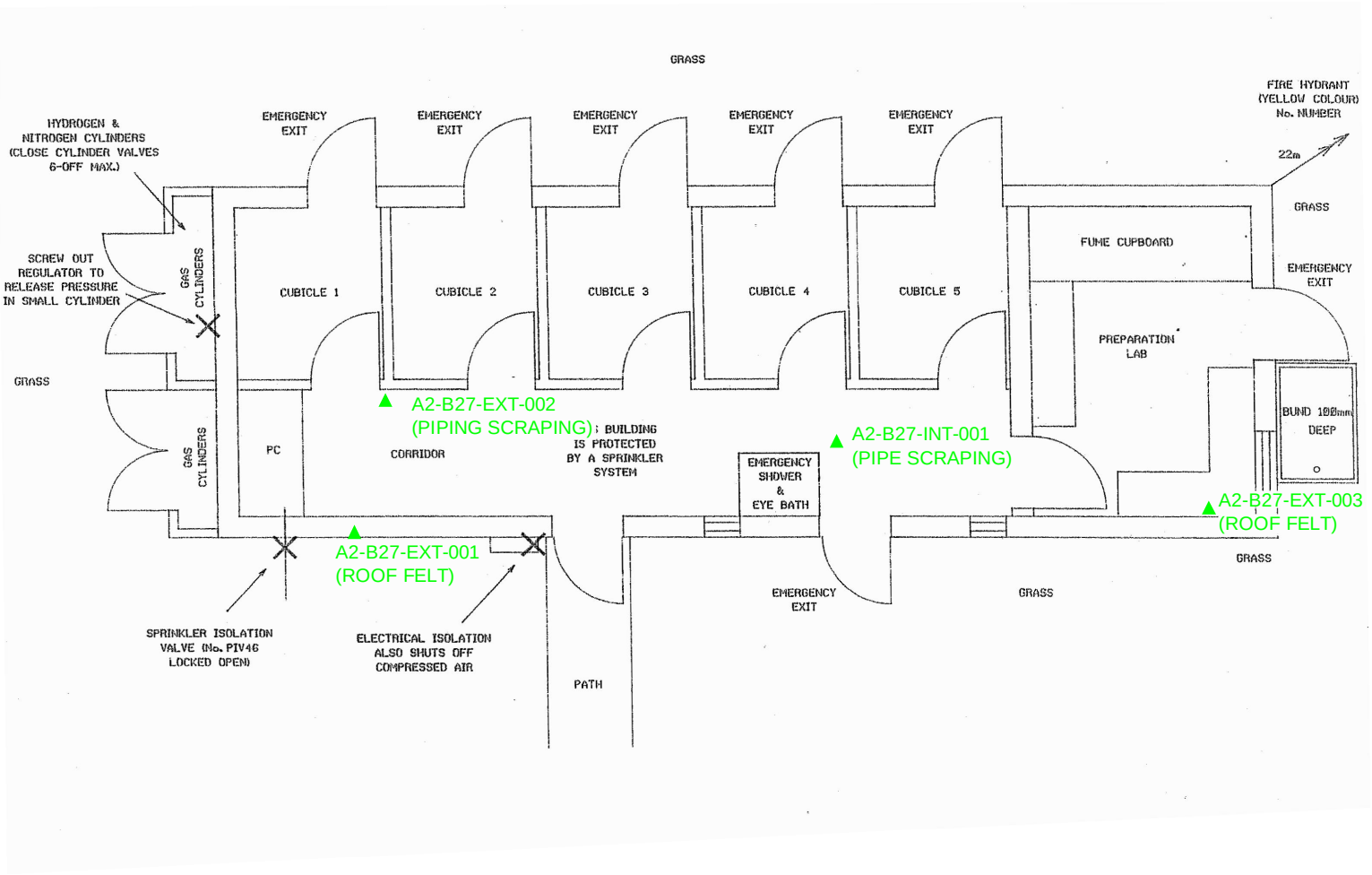
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: A2-B27-EXT-003	**DATE SAMPLED:** 23/01/2007
BUILDING: 27 (HIGH PRESSURE LABORATORY)	**FLOOR/ROOM No/LOCATION:** ROOF OF BUILDING
SAMPLE DESCRIPTION: ROOF FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 42 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



N.T.S.

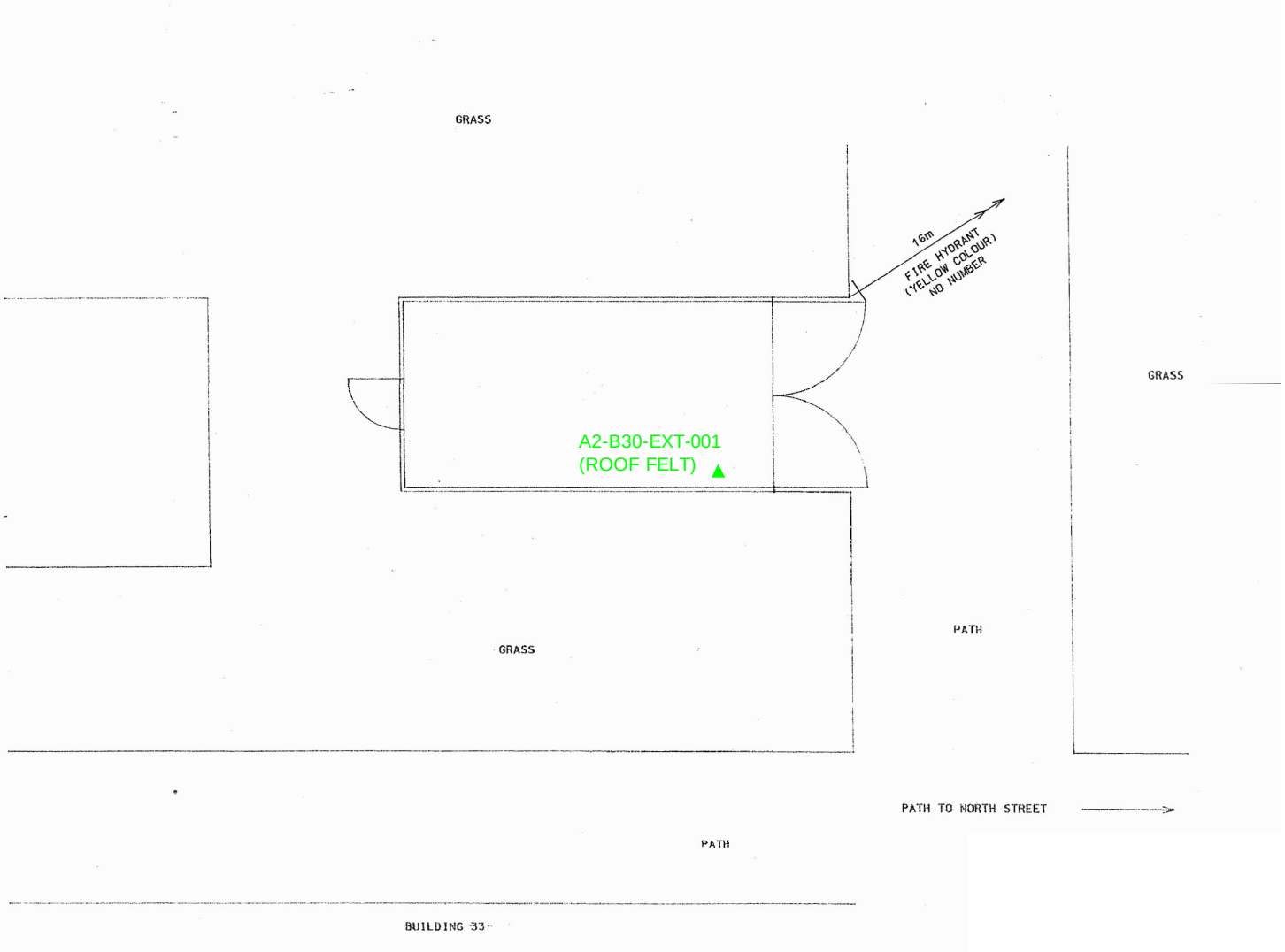
LEGEND

▲ SAMPLE LOCATION

Appendix A2 Figure 1

ZONE A2 - AREA 27 (HIGH PRESSURE LABORARTORY)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix A2 Figure 2

ZONE A2 - AREA 30 (WASTE SOLVENT STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX B1

ZONE B1
SAMPLE LOCATIONS

BUILDING 82

GROUND FLOOR

SAMPLE ID: B1-82-INT-00-001PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MAIN ENTRANCE & CORRIDOR OPPOSITE TOILETS
PRODUCT DESCRIPTION: BROWN LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 60 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-002PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MAIN ENTRANCE & CORRIDOR OPPOSITE TOILETS
PRODUCT DESCRIPTION: BLACK RE-INFORCED PLASTIC TO BOTTOM OF WALLS	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 108 Linear metres	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-003PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MAINTENANCE
PRODUCT DESCRIPTION: BOARD AROUND FUSEBOX/ALARM BOX	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-004PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MAIN ENTRANCE
PRODUCT DESCRIPTION: BOARD ABOVE MAIN DOORS	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 6 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-005PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MAIN ENTRANCE
PRODUCT DESCRIPTION: BOARD ABOVE SUSPENDED CEILING, CENTRE OF ROOM & AROUND STAIRWELL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-006PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No /LOCATION:** 00 (GROUND FLOOR) / CORRIDOR OUTSIDE LOCKERS & CORRIDOR OPPOSITE TOILETS
PRODUCT DESCRIPTION: BOARD TO LOWER CEILING	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 25 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-007PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CORRIDOR OUTSIDE LOCKERS
PRODUCT DESCRIPTION: GREY VINYL FLOOR TILES	
SURFACE TREATM ENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-008PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LO CATION:** 00 (GROUND FLOOR) / CORRIDOR OUTSIDE LOCKER
PRODUCT DESCRIPTION: NOTICE BOARD	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

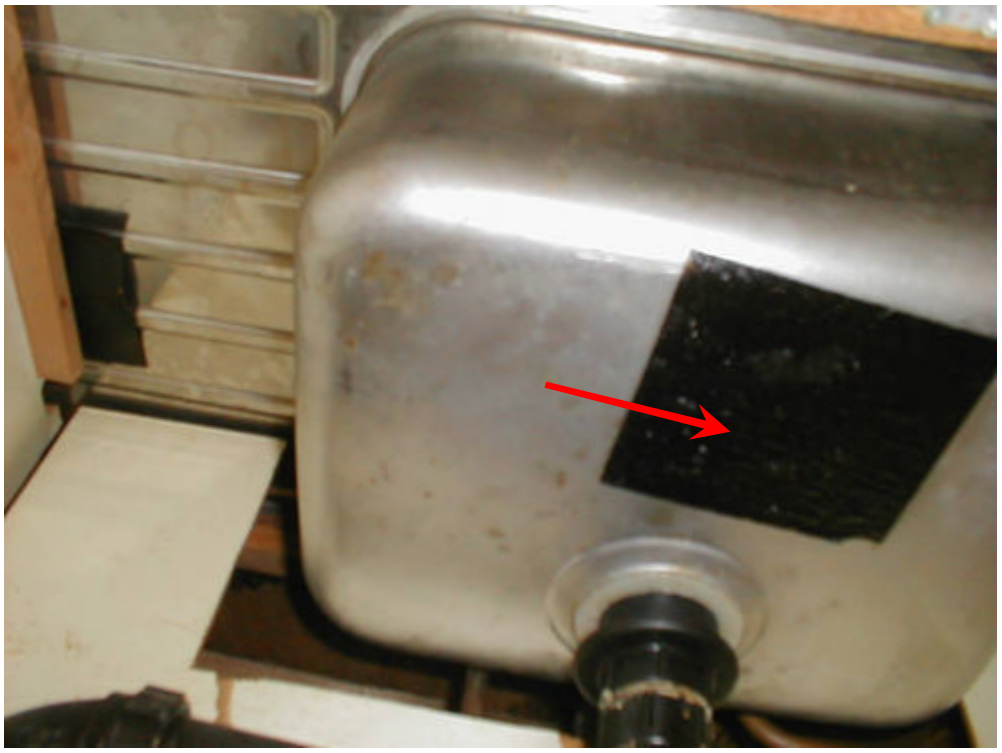
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-009PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY & OFFICE & BALANCE ROOM
PRODUCT DESCRIPTION: BLUE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 122 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

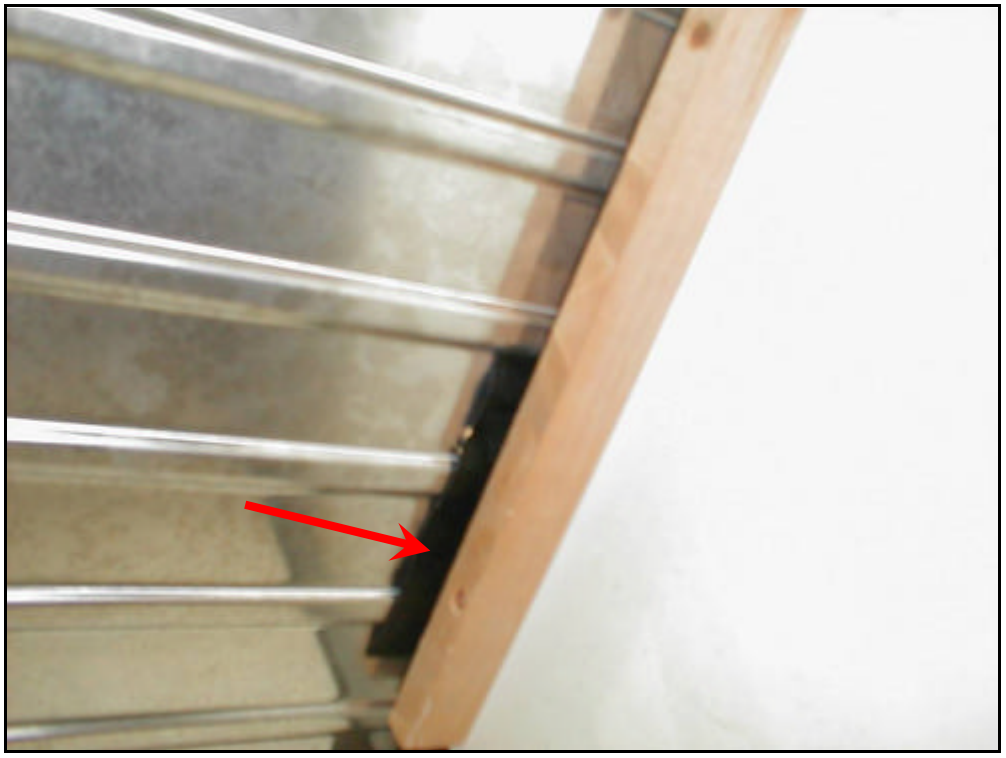
SAMPLE ID: B1-82-INT-00-010PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BITUMEN SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

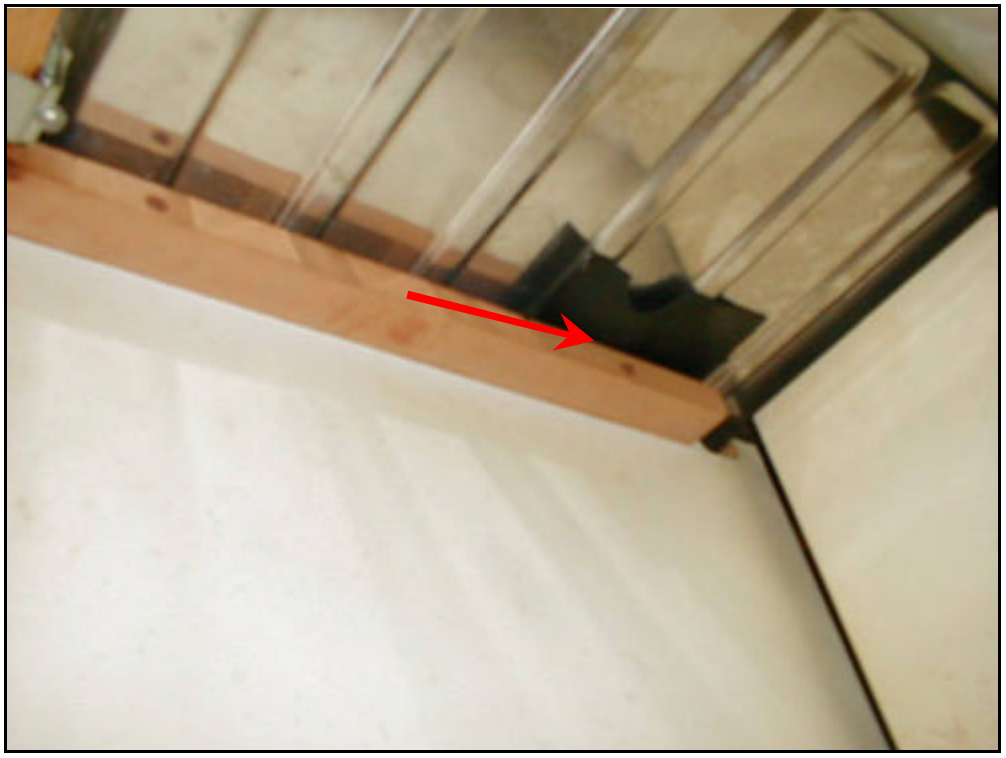
SAMPLE ID: B1-82-INT-00-011PT	**DATE SAMP LED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BITUMEN LHS DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-012PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BITUMEN RHS DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

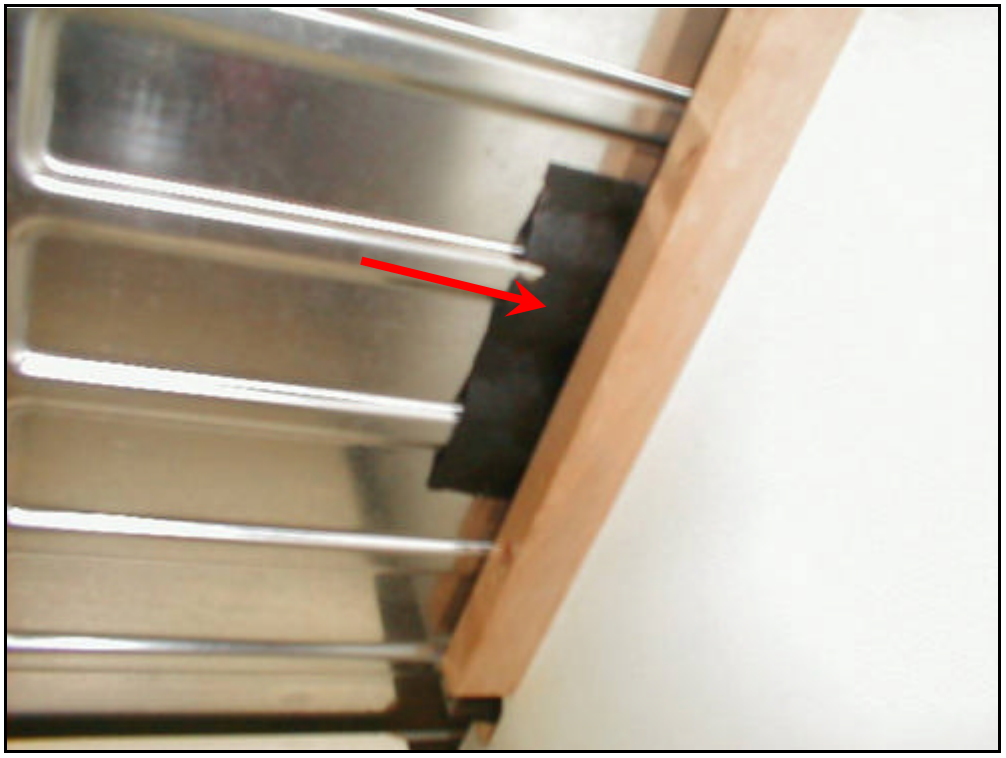
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-013PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BITUMEN MIDDLE SINK – SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-014PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BITUMEN RHS MIDDLE SINK - DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

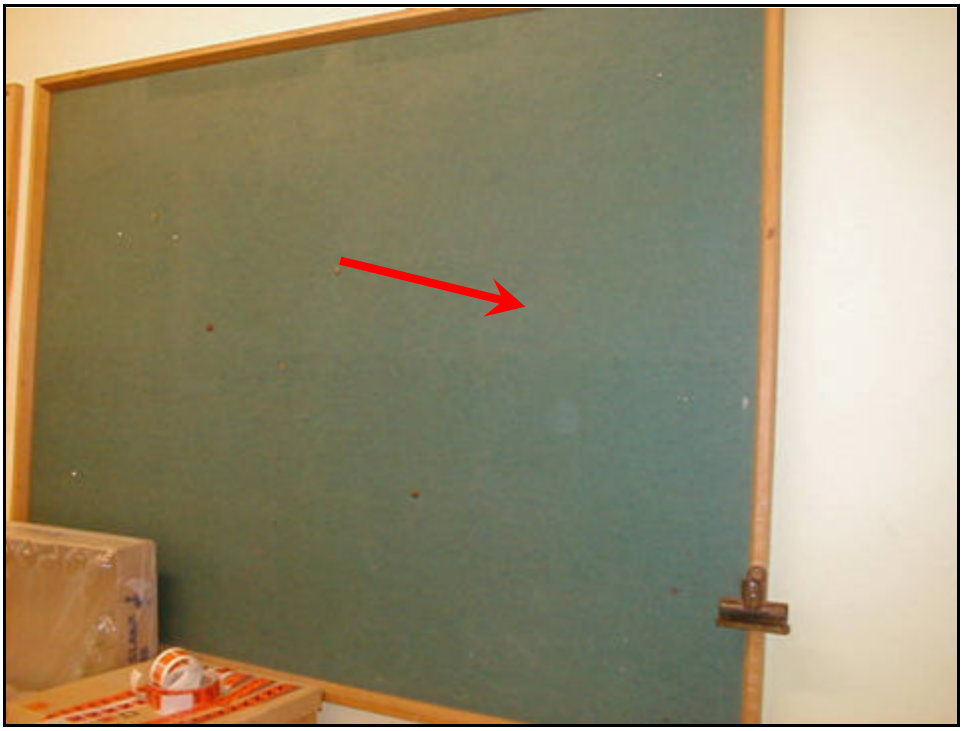
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-015PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORA TORY
PRODUCT DESCRIPTION: BITUMEN LHS SINK - SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

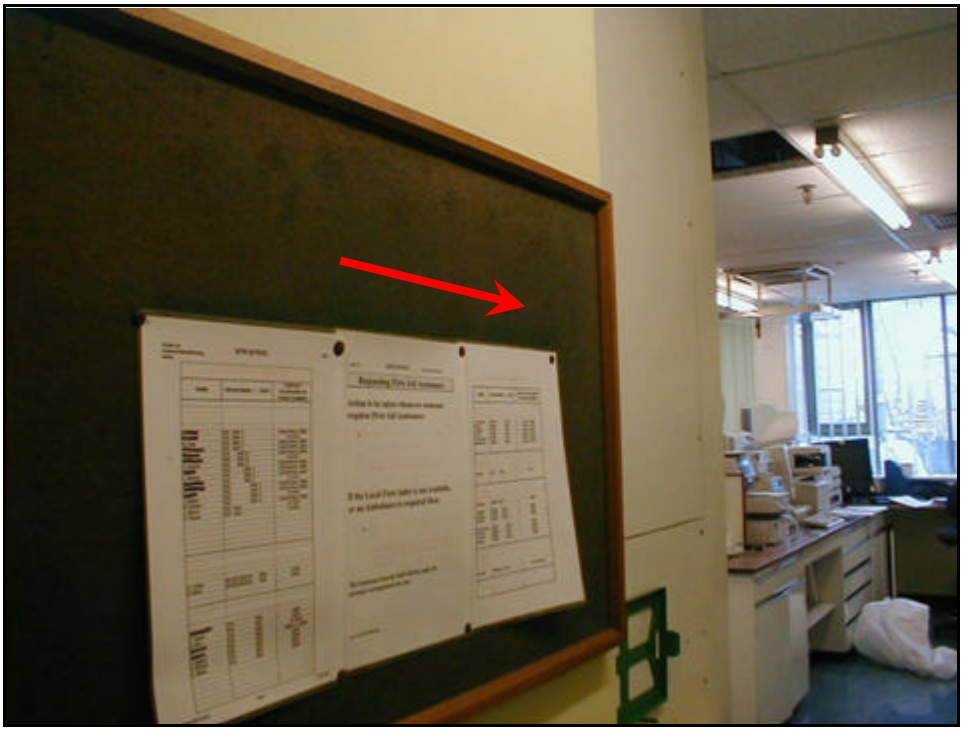
SAMPLE ID: B1-82-INT-00-016PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: RHS NOTICE BOARD TO WALL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-017PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: LHS NOTICE BOARD TO WALL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

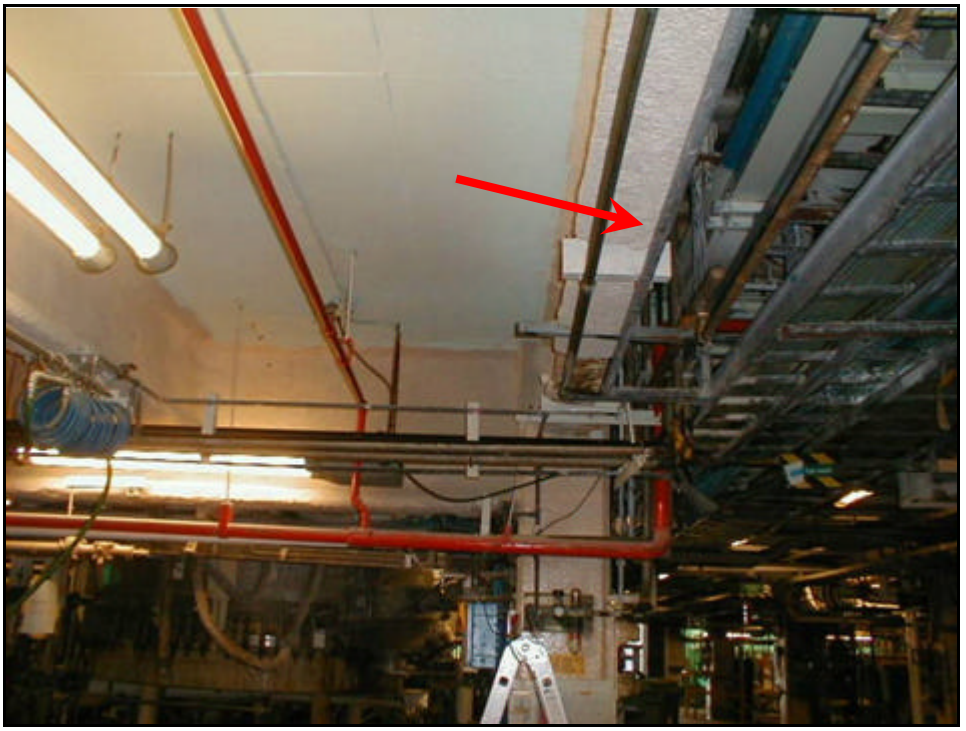
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-018PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LOCKER ROOM
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 75m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

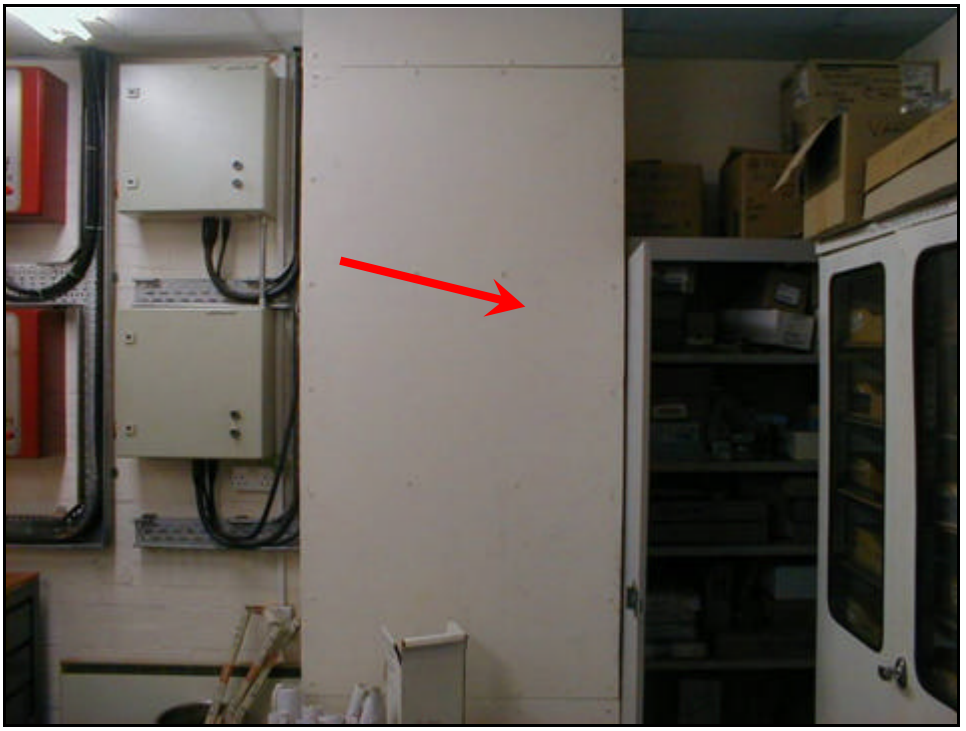
SAMPLE ID: B1-82-INT-00-019PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / ALL ROOMS EXCEPT MAIN ENTRANCE
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD/FAIR
QUANTITY:	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-020PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / WORKSHOP
PRODUCT DESCRIPTION: PANELS TO SERVICE RISER	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 7 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-021PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / WORKSHOP
PRODUCT DESCRIPTION: LOOSE GASKET TO FAR BENCH	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-022PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / WORKSHOP
PRODUCT DESCRIPTION: BLUE LINOLEUM	
SURFACE TREATM ENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

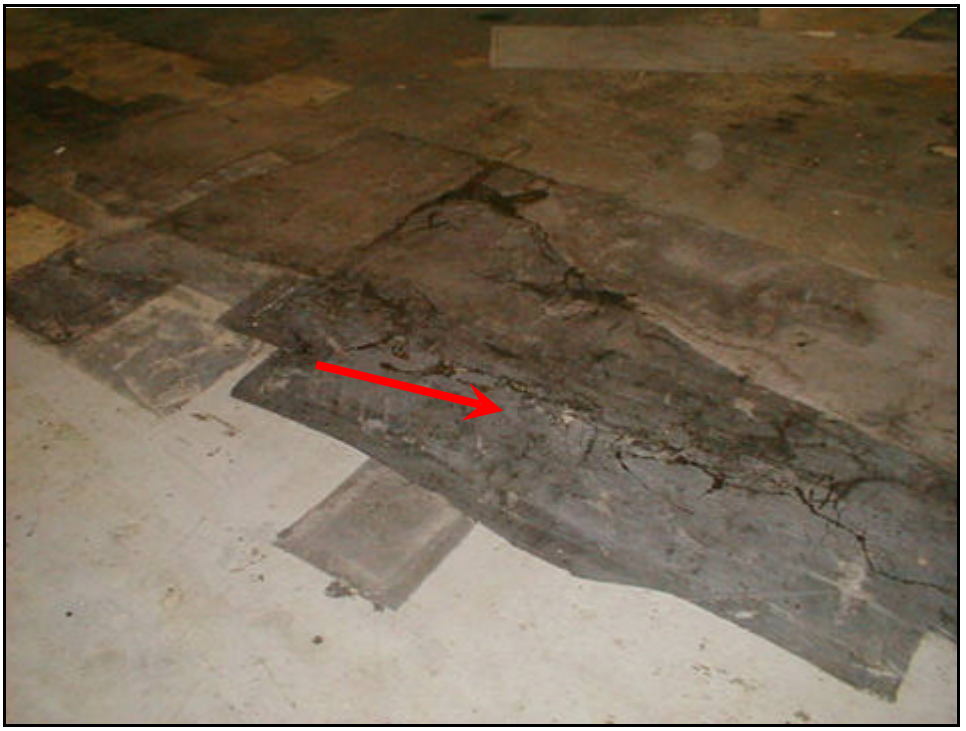
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-023PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GREY SPARKLY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

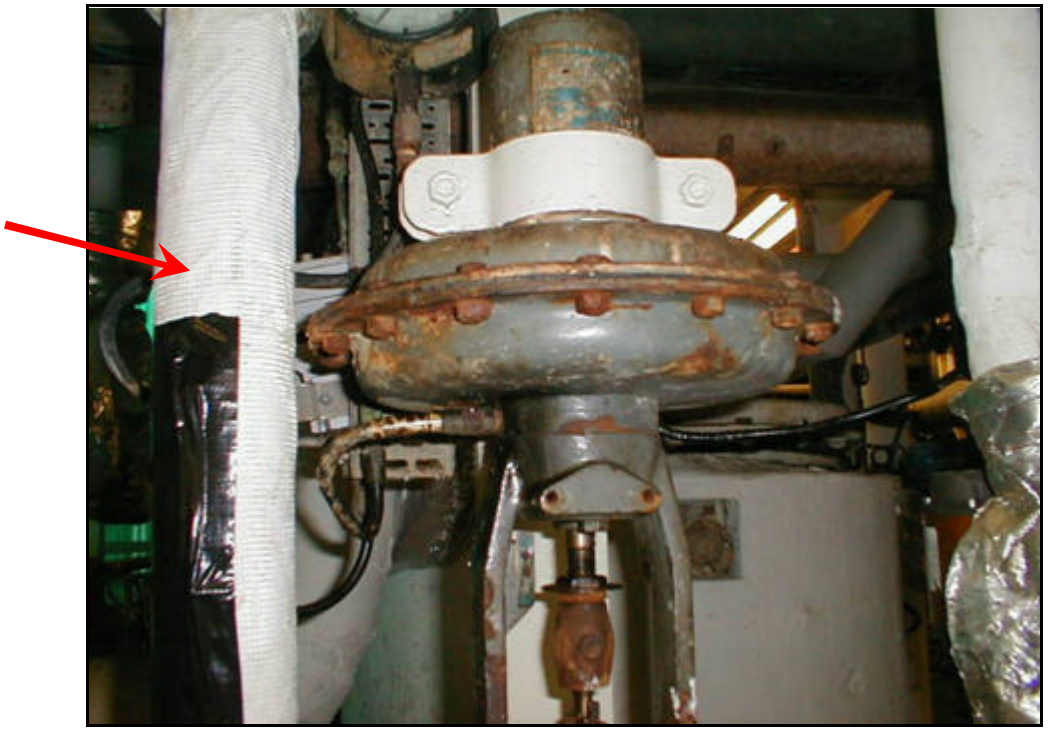
SAMPLE ID: B1-82-INT-00-024PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: BITUMEN FLOORING	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 20 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-025PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET TO VALVE BETWEEN FIRE POINT AND HV3202	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** GOOD
QUANTITY: 4 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

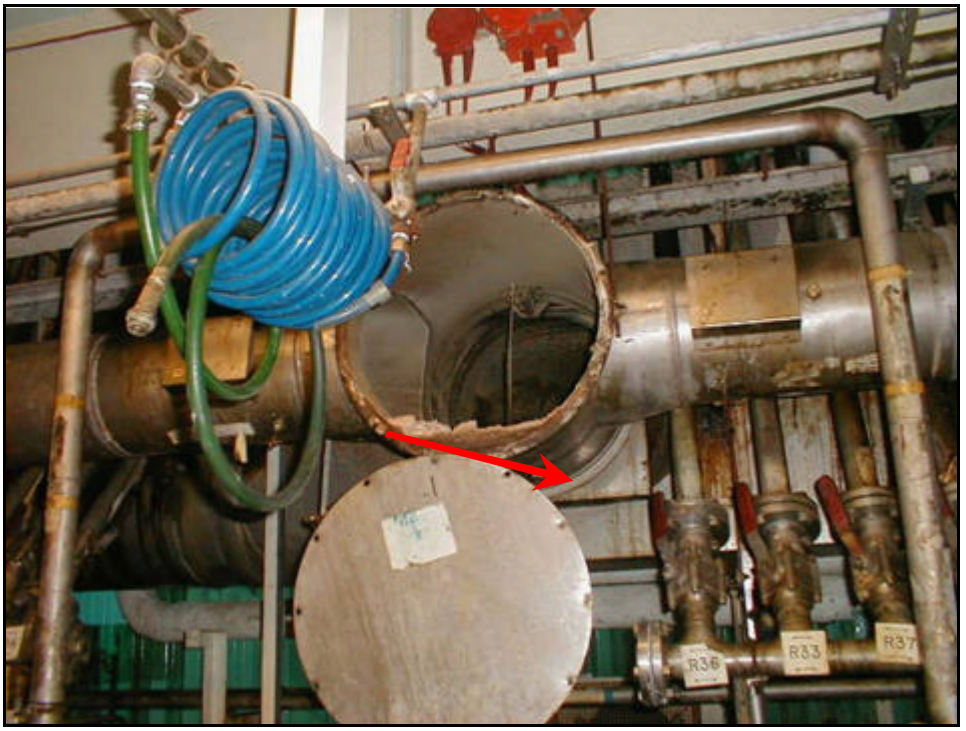
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-026PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: F017 GLYCOL TANK – INSULATION TO SIDE OF CYLINDER	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** GOOD
QUANTITY: 4 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

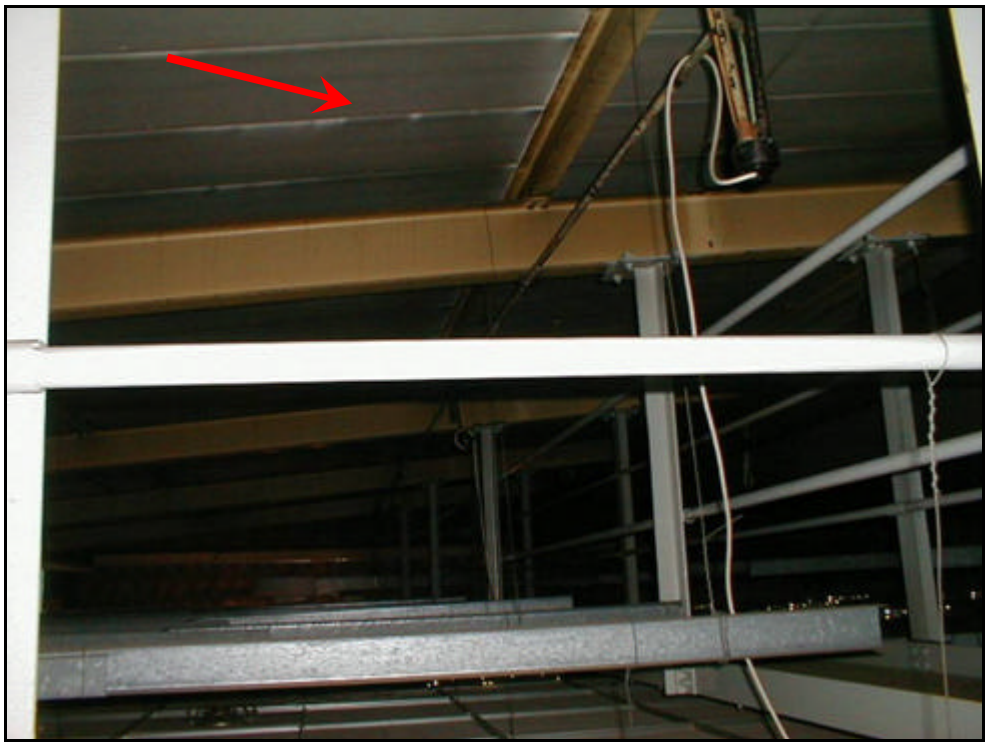
SAMPLE ID: B1-82-INT-00-027PT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: SEAL TO UNCOVERED BLANKING PLATE BETWEEN V1004 & V1003	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-055PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / ALL ROOMS
PRODUCT DESCRIPTION: CEILING PANELS	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 400 m^2	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-056PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / MAIN ENTRANCE & EATING AREA
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

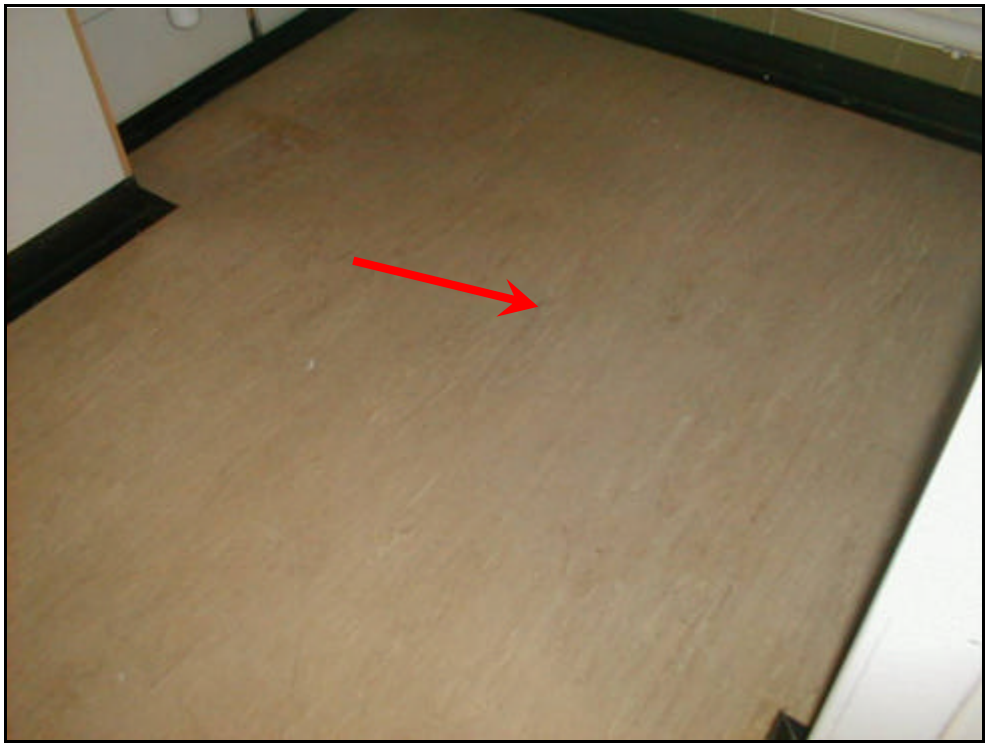
COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-057PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / GENTS 7 MAIN ENTRANCE & KITCHEN RHS ENTRANCE
PRODUCT DESCRIPTION: BLACK EDGING TO BOTTOM OF WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 100 Linear metres	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-058PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / GENTS
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-059PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / LADIES
PRODUCT DESCRIPTION: FLUE PIPE ABOVE INCINERATOR	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-060PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / LADIES
PRODUCT DESCRIPTION: LINER INSIDE INCINERATOR	
SURFACE TREATMENT: UNSEA LED	**CONDITION:** GOOD
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED AMOSITE & CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-061PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / STORE
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-062PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: PINK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 50 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-063PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: BLUE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

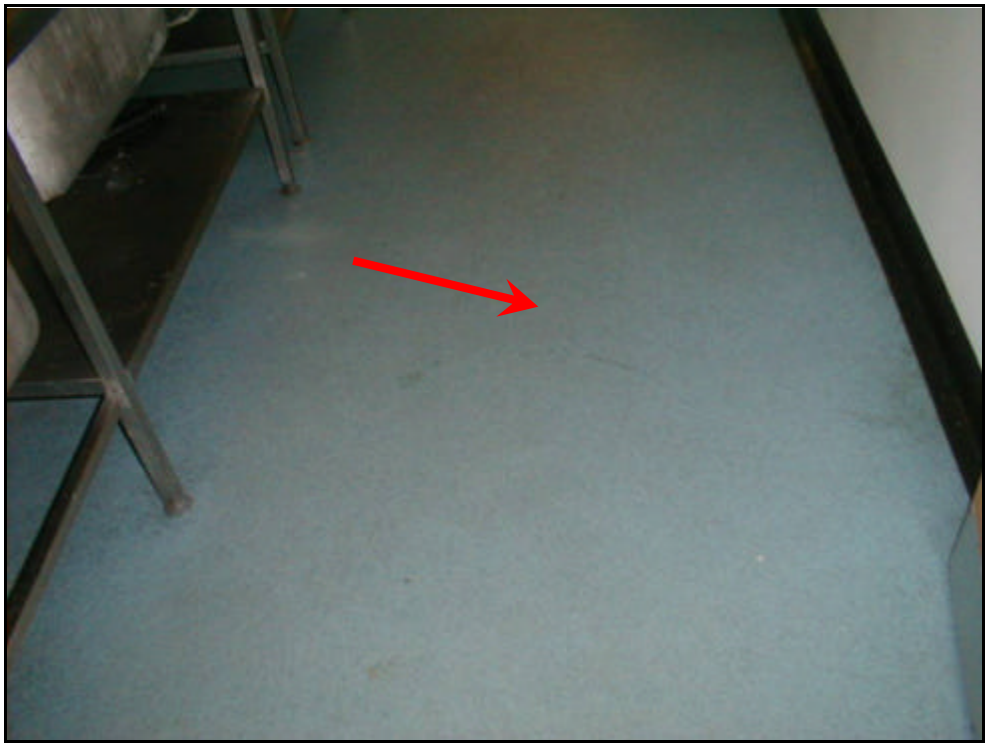
COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-064PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: GREEN SPARKLY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-065PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: GREEN SPARKLY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 20 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-066PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-067PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: WOVEN SEAL TO BLODGETT OVEN DOOR	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-068PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-069PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 3 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-070PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: PINK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-071PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BOXING ABOVE DOORS	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

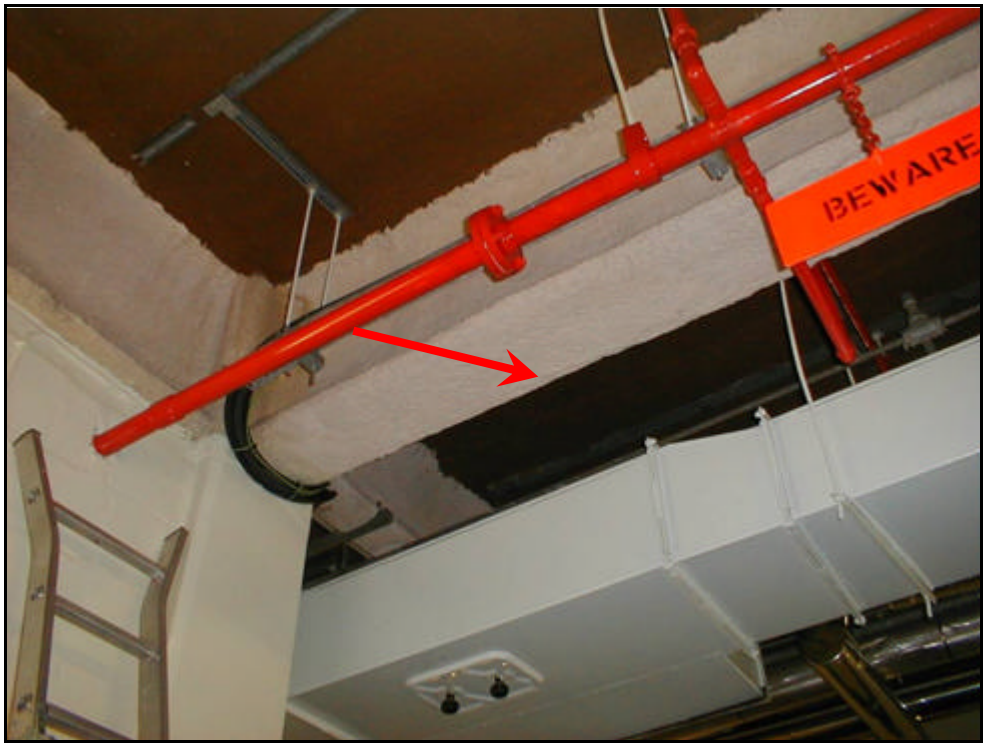
COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-072PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / BUFFET ROOM & STORE
PRODUCT DESCRIPTION: GREEN VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 100 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

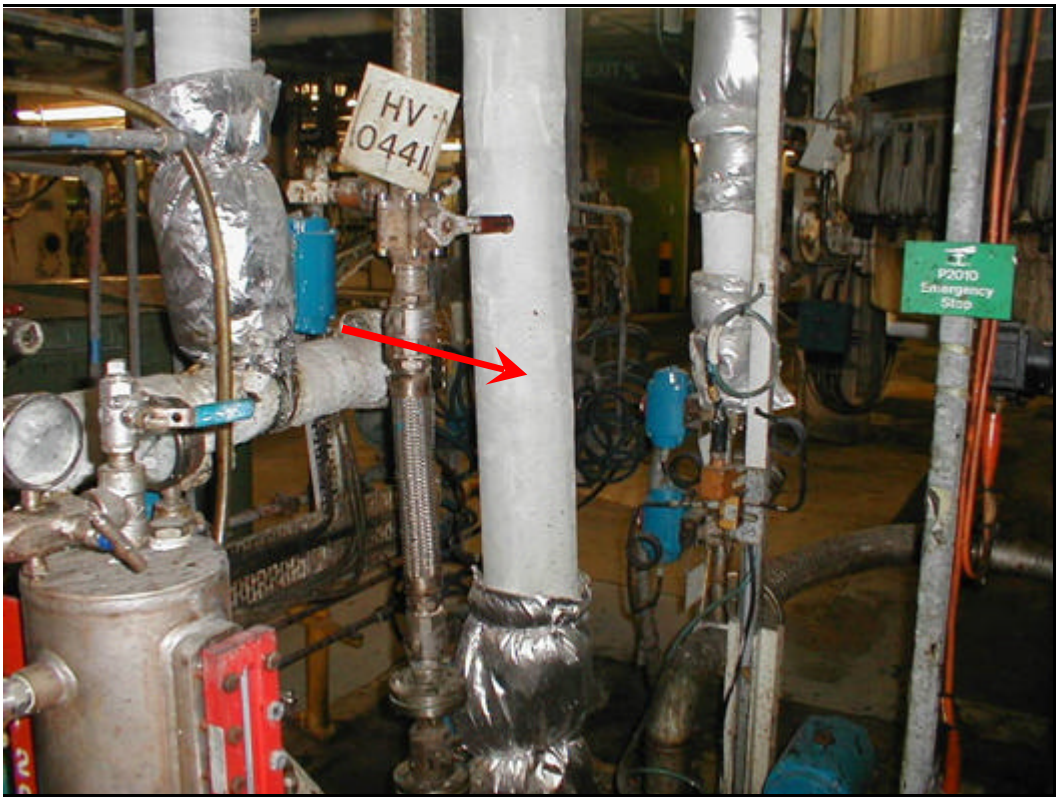
SAMPLE ID: B1-82-INT-00-097PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LIFT AREA
PRODUCT DESCRIPTION: SPRA Y COATING TO BEAMS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: 100 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-098PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY HV0441	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** POOR
QUANTITY: 4 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-099PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY AV4139	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** POOR
QUANTITY: 8 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

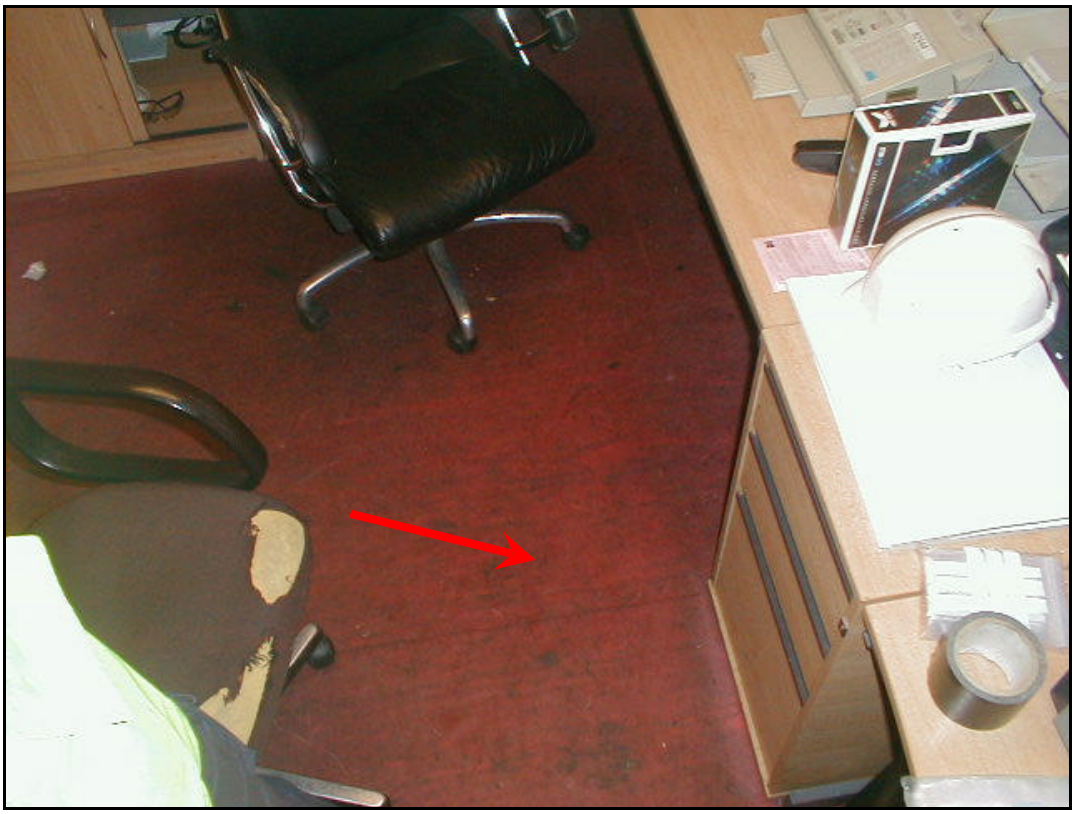
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-114PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LOFT ABOVE FOREMAN'S HUT
PRODUCT DESCRIPTION: BOARD TO MIDDLE LOFT HATCH	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-115PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / FOREMAN'S HUT
PRODUCT DESCRIPTION: RED LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 24 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

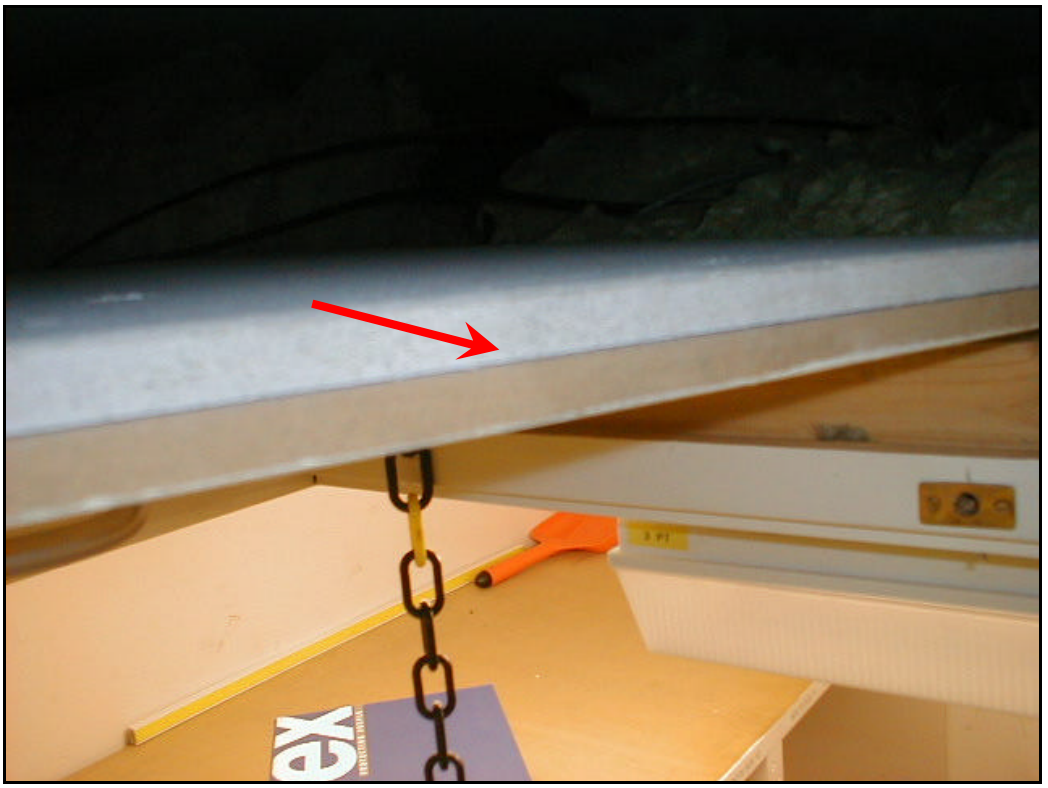
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-116PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LOFT ABOVE FOREMAN'S HUT
PRODUCT DESCRIPTION: BOARD TO RHS LOFT HATCH	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-117PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LOFT ABOVE FOREMAN'S HUT
PRODUCT DESCRIPTION: BOARD TO LHS LOFT HATCH	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-124PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: PANELS TO SIDES OF LHS AND MIDDLE FUME CUPBOARDS BEHIND METAL PANEL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 12 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

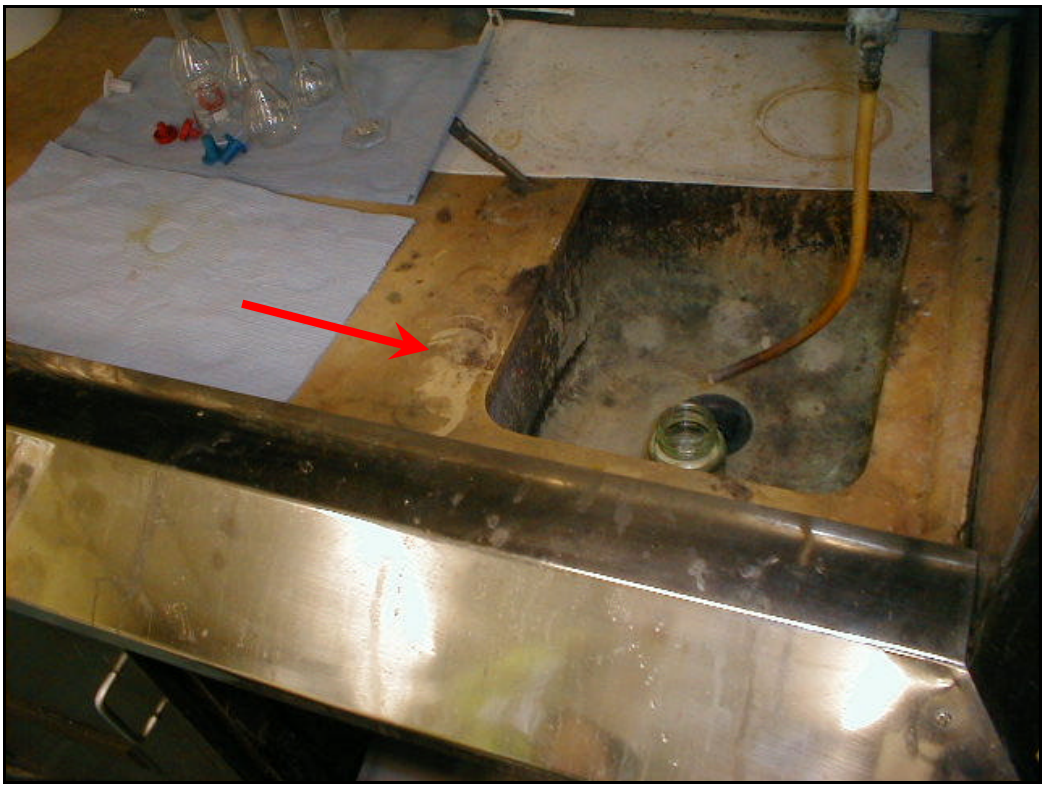
COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-125PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: BROWN LINOLEUM TO ALL FUME CUPBOARDS	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** MED
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-126PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: WORKTOP TO LHS AND MIDDLE FUME CUPBOARDS	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 6 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-127PT	**DATE SAMPLED:** 16/01/2007
BUILDING : 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LABORATORY
PRODUCT DESCRIPTION: PANELS TO SIDES OF RHS AND MIDDLE RIGHT FUME CUPBOARDS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 12 m^2	

ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-128PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / WAREHOUSE
PRODUCT DESCRIPTION: CEILING PANELS	
SURFACE TREATMENT: SEALED	**CONDITION:** FAIR
QUANTITY: 400 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-129PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / WAREHOUSE
PRODUCT DESCRIPTION: PIPE DEBRIS TO HIGH LEVEL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** HIGH
QUANTITY: 1 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-130PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PANELS TO PIPEWORK TO CEILING	
SURFACE TREATMENT: UNSEALED	**CONDITION:** MED
QUANTITY: 3 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-131PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: FILLER TO CEILING	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 50 m^2	

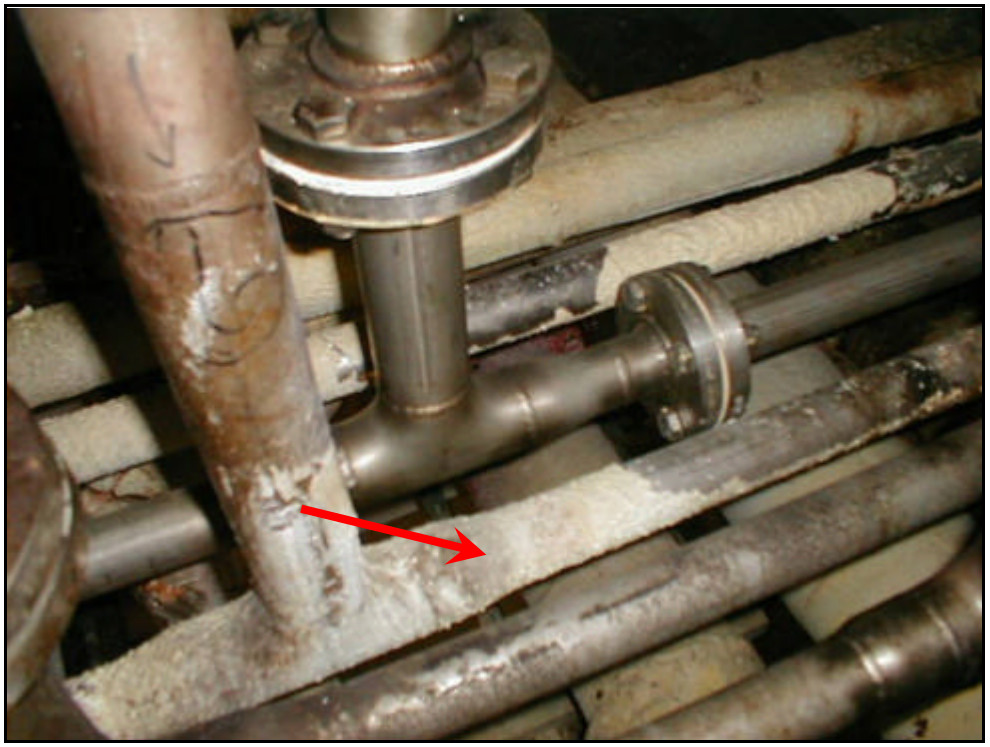
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 82

MEZZANINE FLOOR

SAMPLE ID: B1-82-INT-01-028PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / LABORATORY
PRODUCT DESCRIPTION: COATING TO PIPE IN PIPE RACK UNDER GANTRY	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-029PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / ENTRANCE CORRIDOR
PRODUCT DESCRIPTION: GREEN VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-030PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / PRINT M/C'S/LONG CORRIDOR/CORRIDOR OPPOSITE LADIES CHANGING ROOM
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 50 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-031PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / CORRIDOR OPPOSITE LADIES CHANGING ROOM & LONG CORRIDOR
PRODUCT DESCRIPTION: BLACK SKIRTING TO BASE OF WALLS	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 40 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-032PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / LONG CORRIDOR
PRODUCT DESCRIPTION: NOTICE BOARD TO WALL	
SURFACE TREATMENT: UNSEALED	**COND ITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-033PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MALE TOILET
PRODUCT DESCRIPTION: CISTERN ON WALL ABOVE TOILET	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-034PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / KITCHEN
PRODUCT DESCRIPTION: SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-035PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / KITCHEN
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 12 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

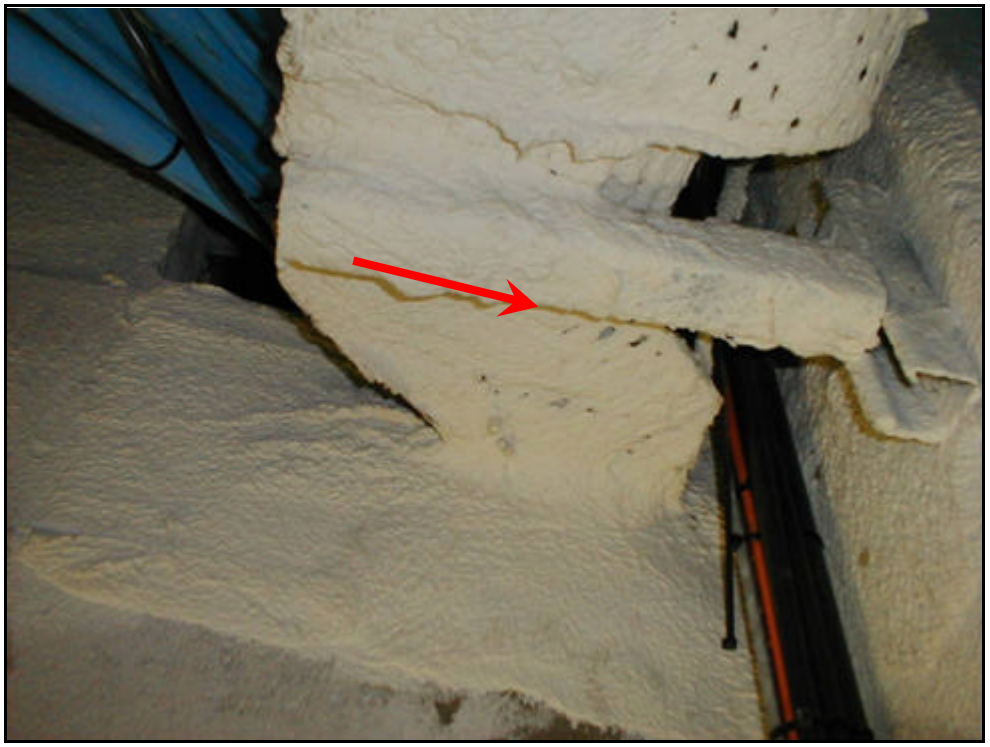
COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-036PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / KITCHEN
PRODUCT DESCRIPTION: SPRAY COATING TO PIPEWORK ABOVE SUSPENDED CEILING	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

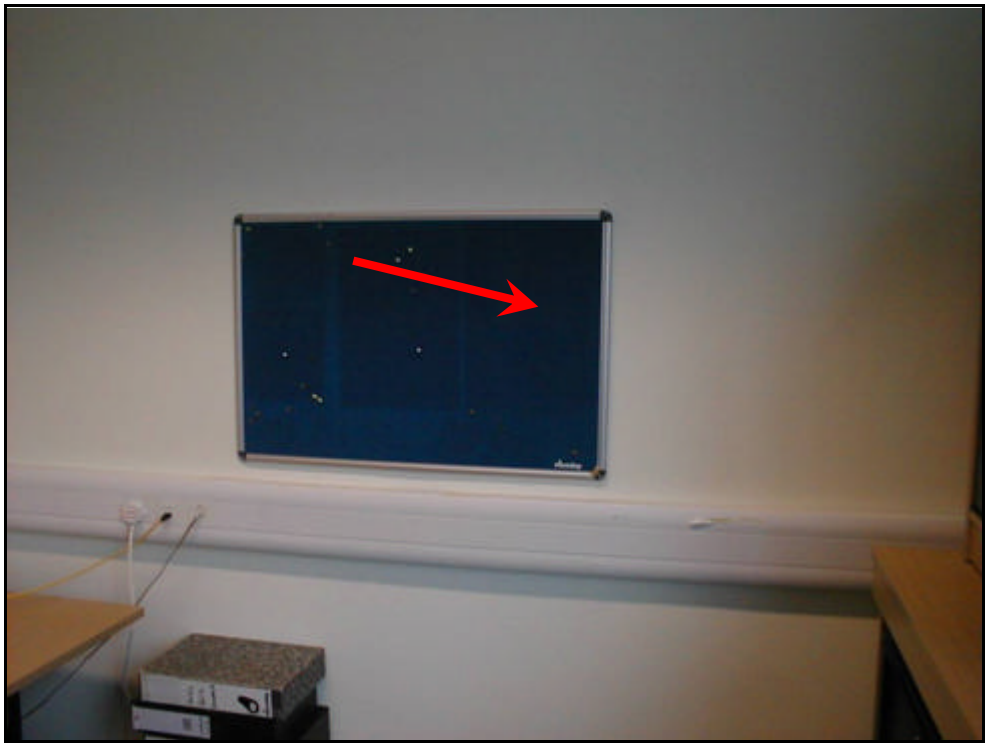
SAMPLE ID: B1-82-INT-01-037PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / ALL AREAS EXCEPT SERVICE DUCT
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS ABOVE SUSPENDED CEILING	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: <100 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-038PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / OPEN PLAN OFFICE
PRODUCT DESCRIPTION: NOTICE BOARD TO WALL LHS OF WINDOWS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

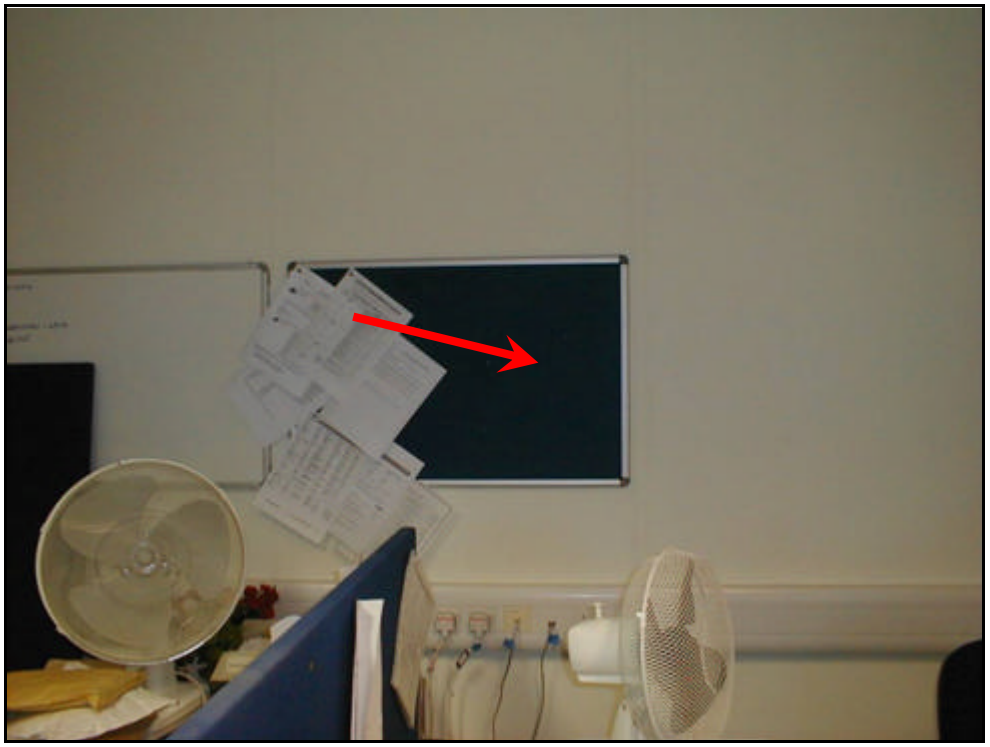
COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-039PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / OPEN PLAN OFFICE
PRODUCT DESCRIPTION: NOTICE BOARD TO WALL RHS OF WINDOWS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

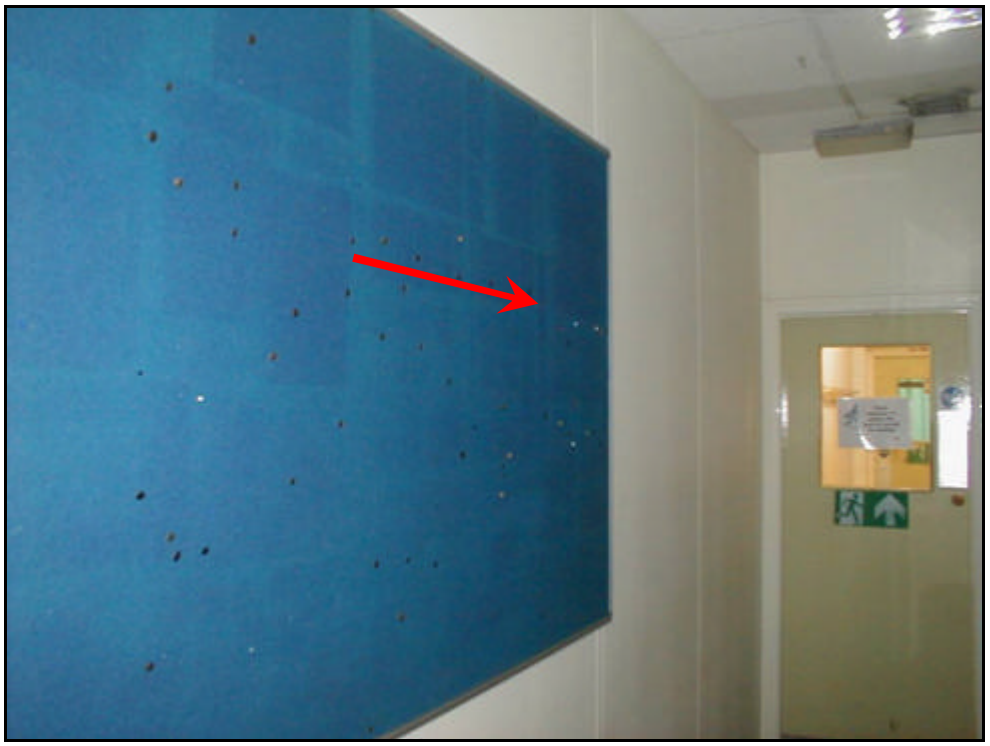
SAMPLE ID: B1-82-INT-01-040PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / OPEN PLAN OFFICE
PRODUCT DESCRIPTION: NOTICE BOARD TO REAR WALL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

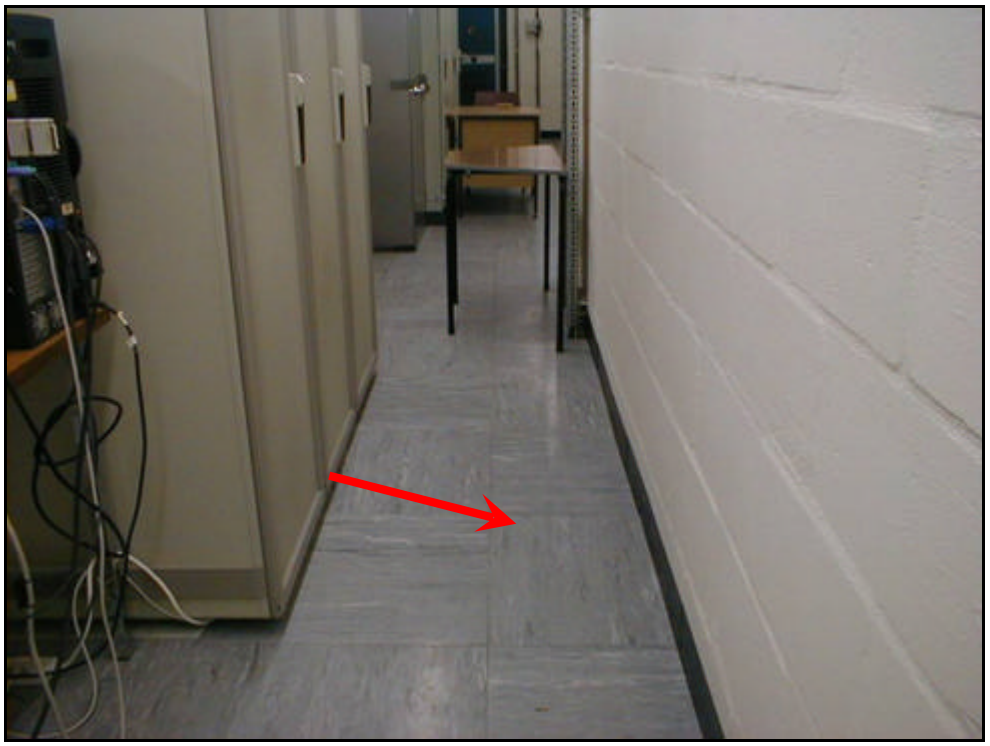
SAMPLE ID: B1-82-INT-01-041PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / OFFICE CORRIDOR
PRODUCT DESCRIPTION: NOTICE BOARD TO RHS WALL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

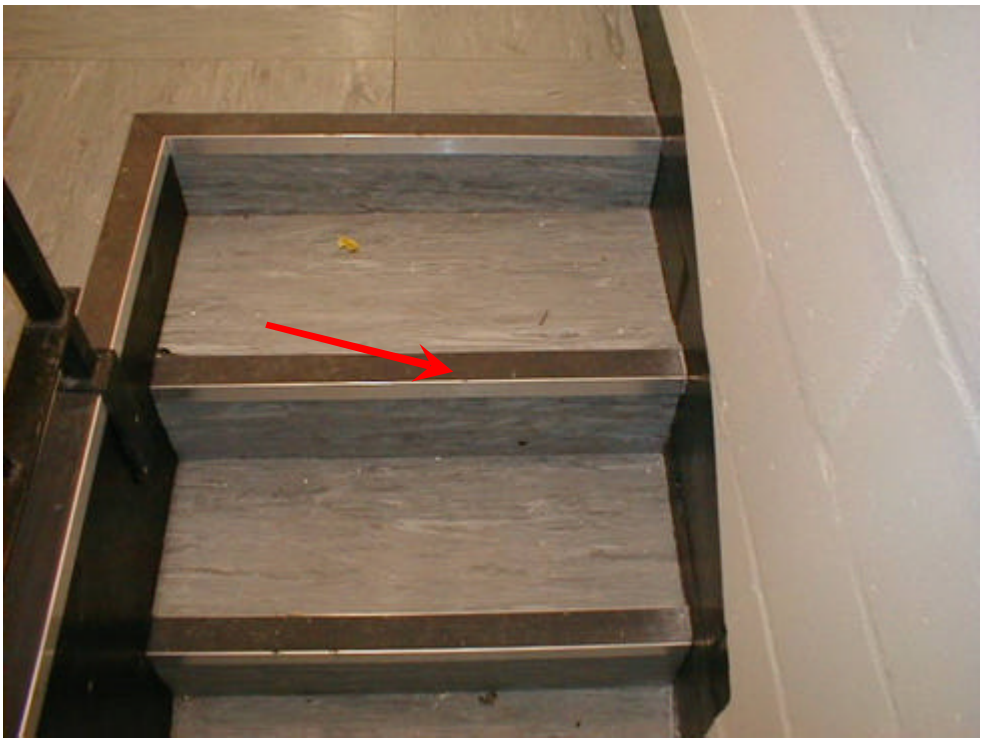
SAMPLE ID: B1-82-INT-01-051PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / COMPUTER ROOM
PRODUCT DESCRIPTION: GREY VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 50 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-052PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / COMPUTER ROOM
PRODUCT DESCRIPTION: STAIR NOSINGS	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 5 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

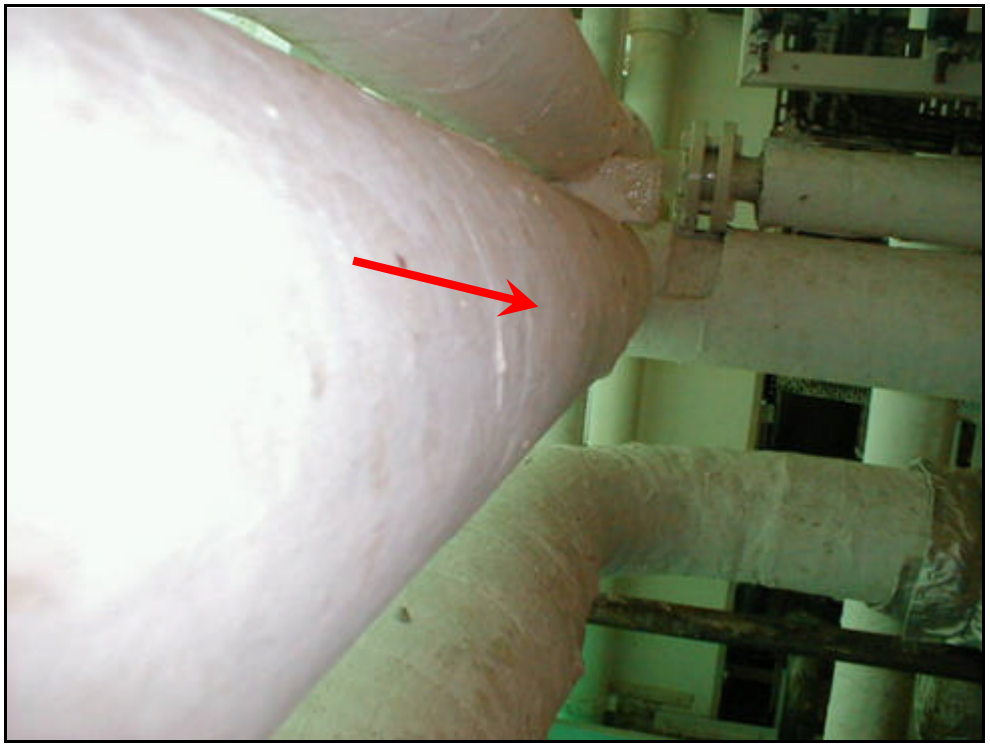
COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-053PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: COATING TO EXPOSED PIPE RHS OF HV0468	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: 3 linear metres	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

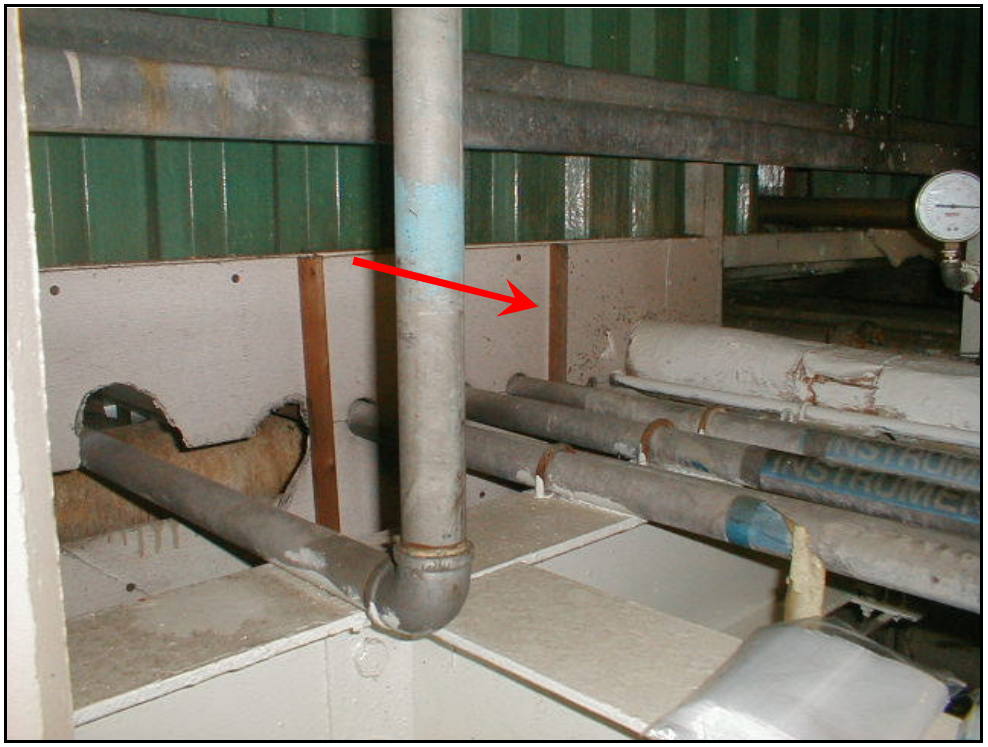
SAMPLE ID: B1-82-INT-01-054PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: INSULATION TO PIPE LG MIDDLE PIPEWORK BELOW V23-V24	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** GOOD
QUANTITY: 5 Linear metres	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

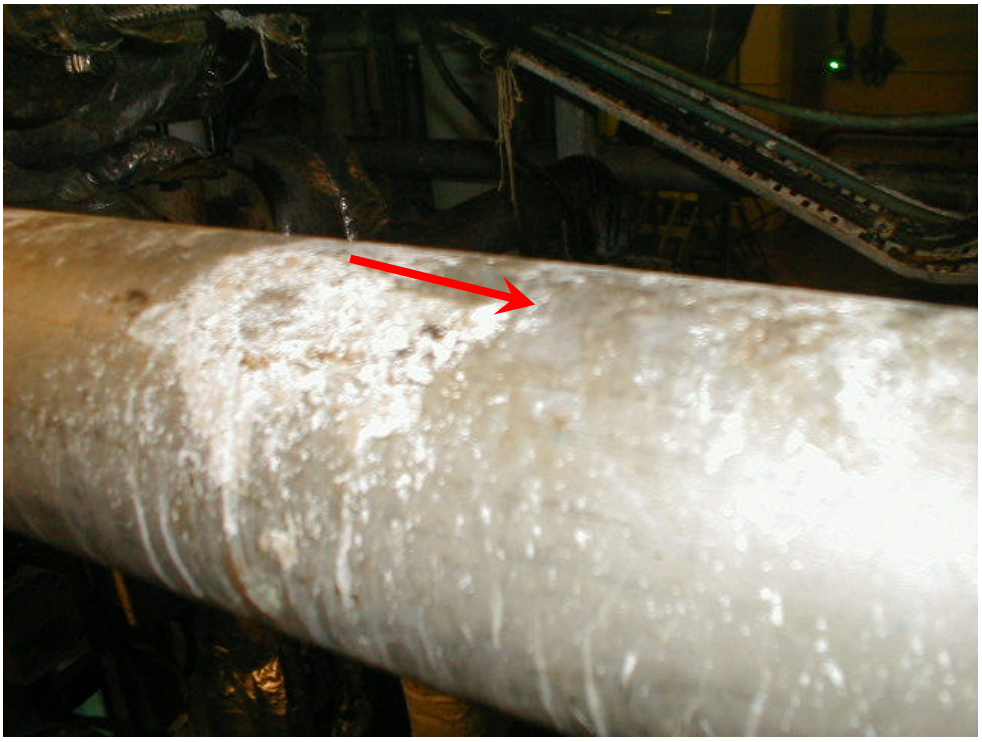
SAMPLE ID: B1-82-INT-01-077PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PANELS TO WALLS AROUND PIPEWORK TO NORTH END PIPE RACK	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 8 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-078PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: COATING TO HIGH LEVEL PIPE WORK TO EXPOSED HORIZONTAL PIPE AT AV1140	
SURFACE TREATMENT: PARTIAL SEAL	**CONDITION:** FAIR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

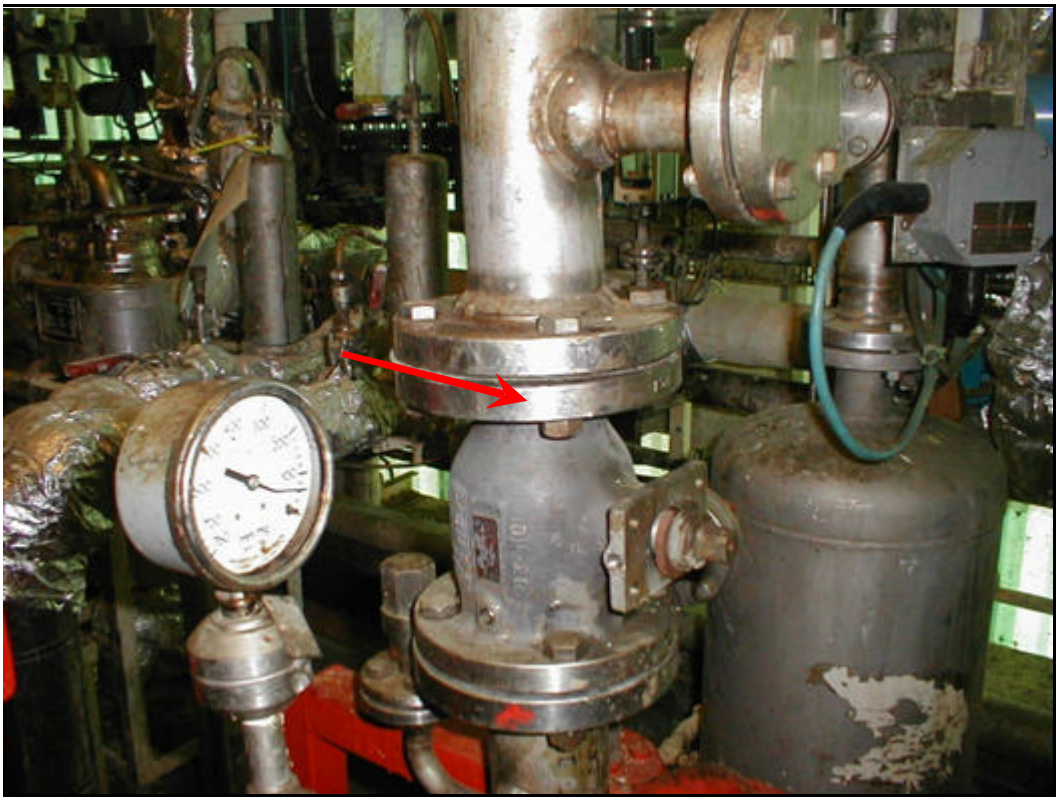
COMMENTS: NONE

SAMPLE ID: B1-82-INT-01-100PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS ABOVE GANTRY	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: 100 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

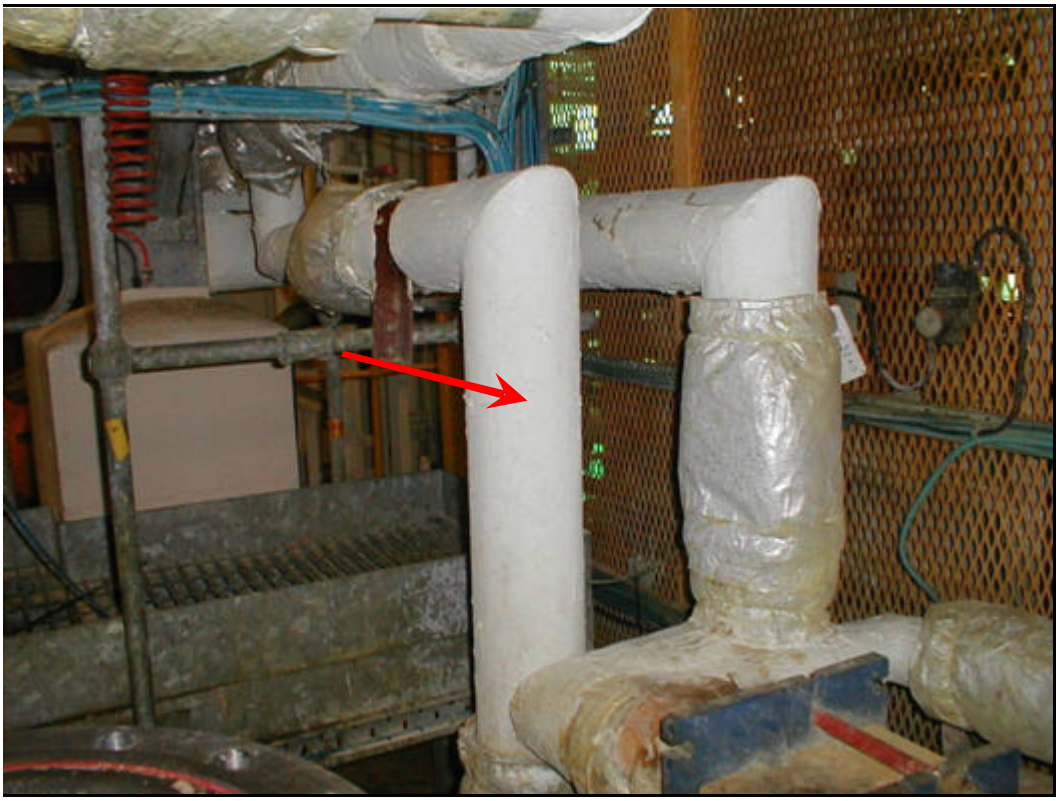
SAMPLE ID: B1-82-INT-01-101PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET BETWEEN K1051 AND ANIC 1222	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

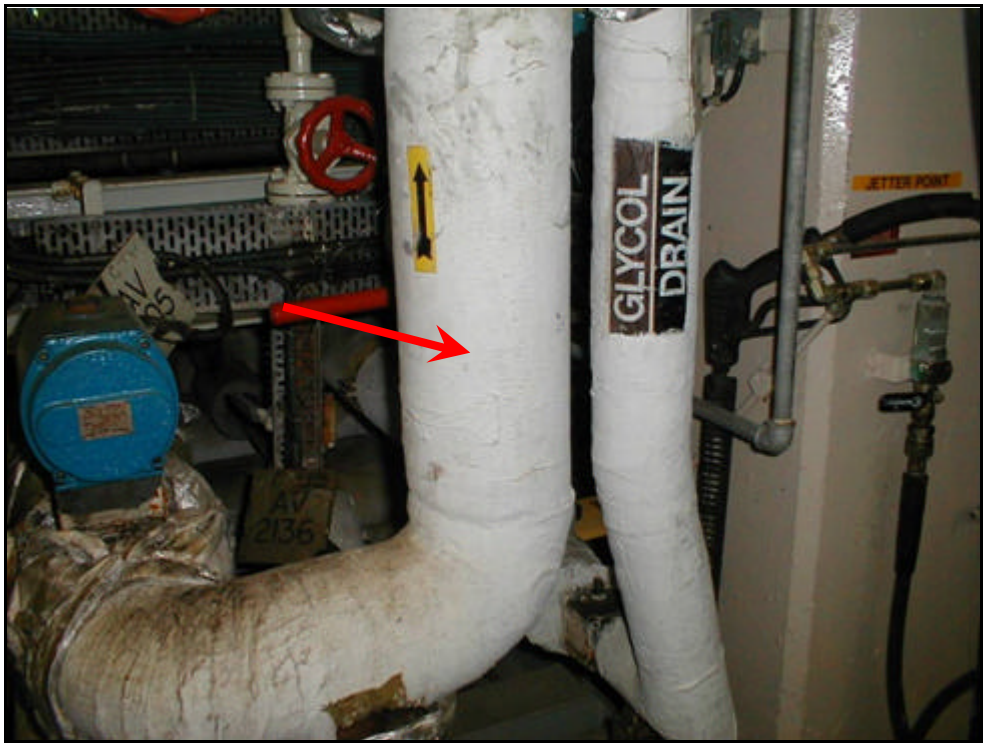
SAMPLE ID: B1-82-INT-01-102PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING TO CD1	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** FAIR
QUANTITY: 3 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

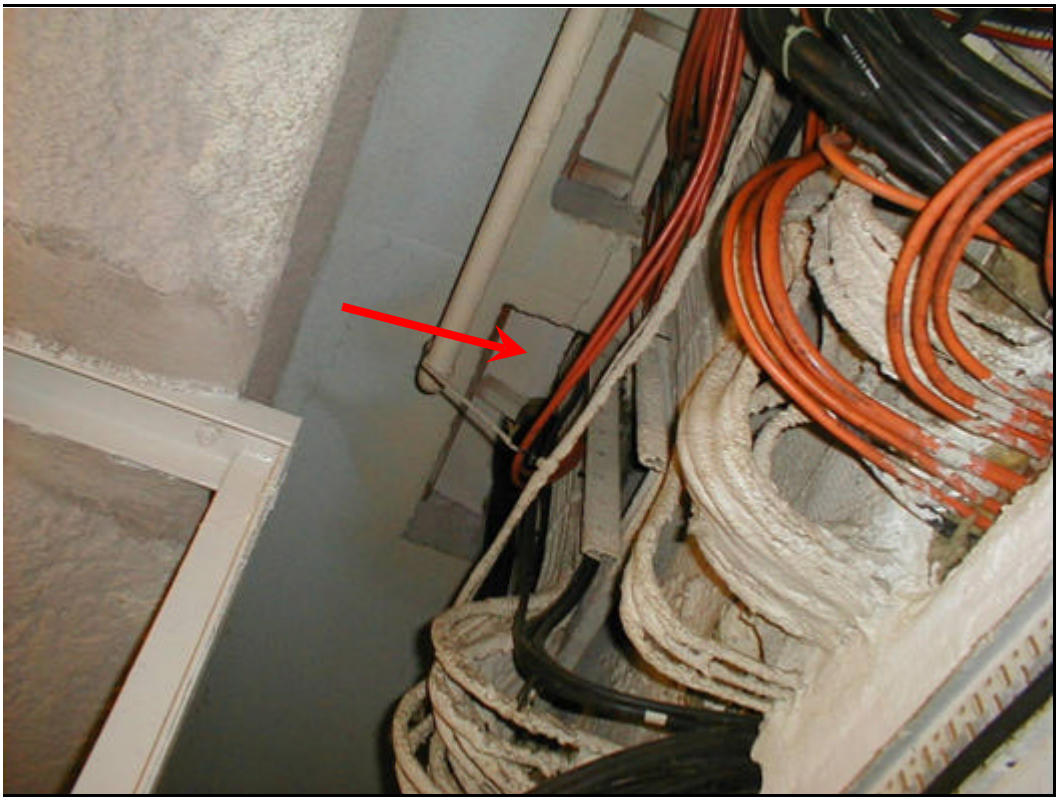
SAMPLE ID: B1-82-INT-01-103PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY AV2112B	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 5 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-01-104PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 01 (MEZZANINE FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PANEL TO CABLE RISER TO CEILING	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 82

FIRST FLOOR

SAMPLE ID: B1-82-INT-02-042PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MAIN CORRIDOR & BATTERY CHARGING BAY
PRODUCT DESCRIPTION: RED LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 40 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-043PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MAIN CORRIDOR & CONFERENCE ROOM & ELECTRICAL ISOLATION ROOM
PRODUCT DESCRIPTION: BLACK SKIRTING TO BOTTOMOF WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 100 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-044PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) /KITCHEN
PRODUCT DESCRIPTION: LIGHT GREY VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-045PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) /CANTEEN & SMOKING ROOM & ELECTRICAL ISOLATION ROOM
PRODUCT DESCRIPTION: DARK GREY VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 50 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-046PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / KITCHEN
PRODUCT DESCRIPTION: LHS DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-047PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / KITCHEN
PRODUCT DESCRIPTION: RHS DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-048PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MALE TOILET
PRODUCT DESCRIPTION: TOILET CISTERN TO WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-049PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / SHIFT SUPERVISOR'S OFFICE & MAIN OFFICE
PRODUCT DESCRIPTION: BLACK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 40 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

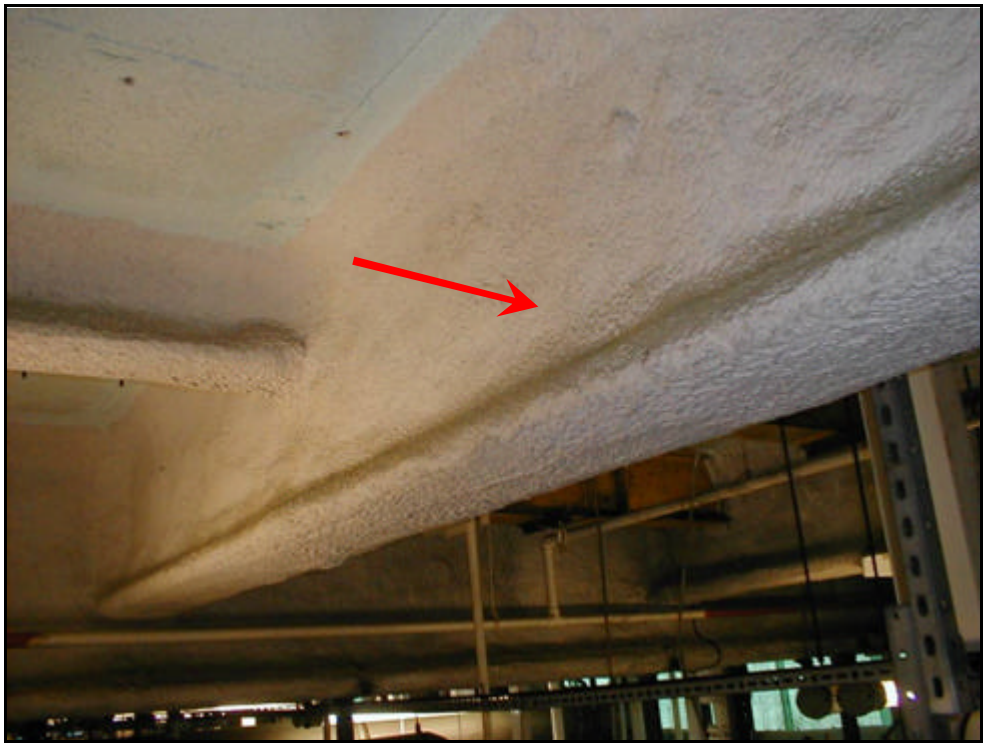
COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-050PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / CONTROL ROOM
PRODUCT DESCRIPTION: DARK GREY VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 40 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-088PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS	
SURFACE TREATMENT: INSULATION	**CONDITION:** POOR
QUANTITY: 300 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-089PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING TO DRYER CONDENSED SOLVENT TO RECEIVER	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** POOR
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-090PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATIO N:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING TO V2501 REACTOR R5	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** POOR
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-091PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING TOV1201 REACTOR R34	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** POOR
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-092PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SPRAY COATING TO HIGH LEVEL BEAMS	
SURFACE TREATMENT: SEALED	**CONDITION:** POOR
QUANTITY: 100 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

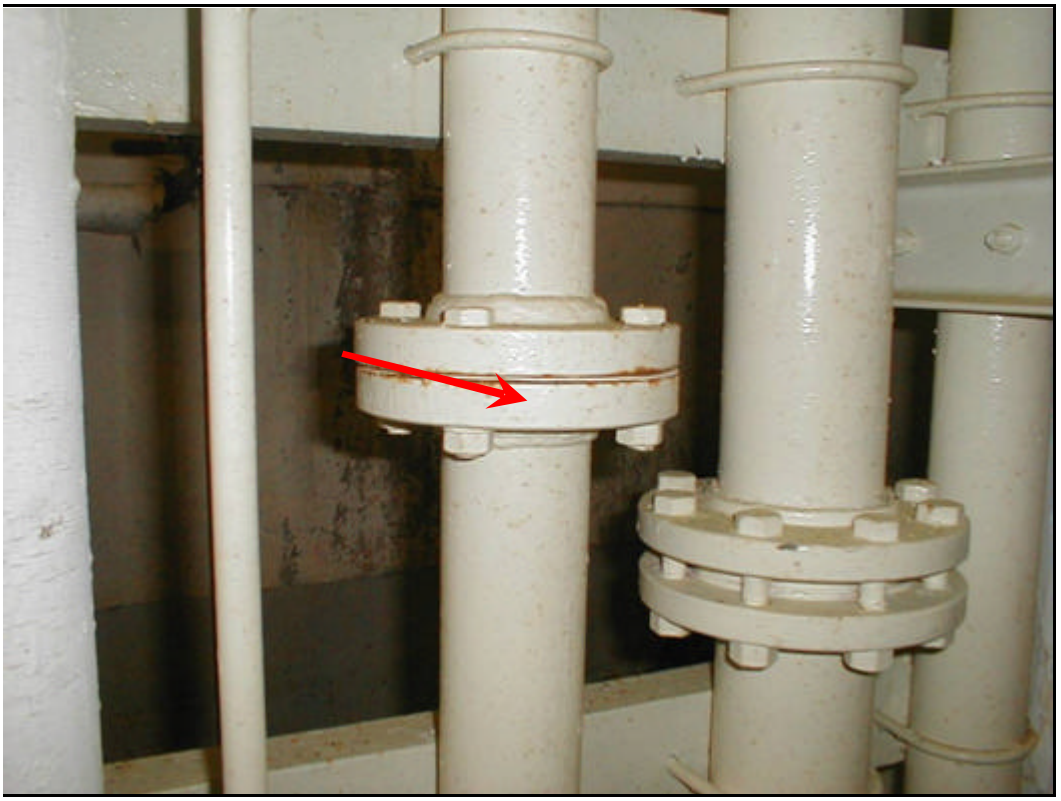
COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-093PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: DEBRIS TO PIPE WORK 15/16 ABOVE SCAFFOLD	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

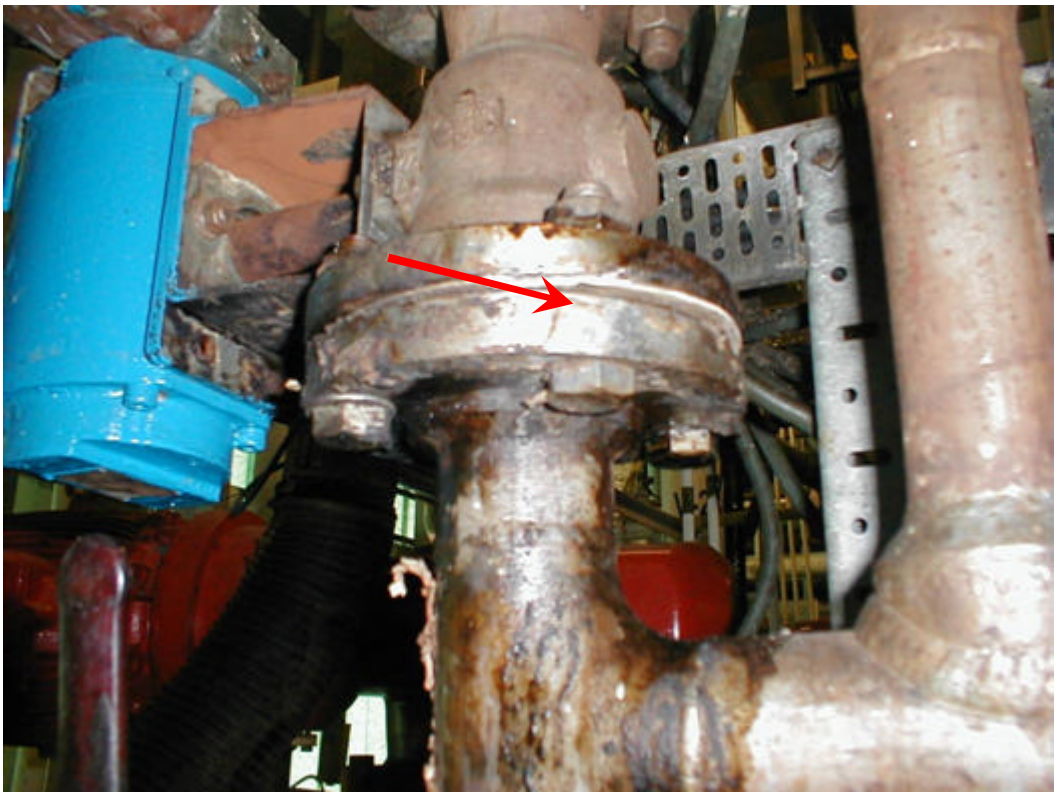
SAMPLE ID: B1-82-INT-02-094PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET, RHS OF DRYER CONDENSED SOLVENT TO RECEIVER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-095PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET, LHS OF AV2279	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-02-096PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 02 (FIRST FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SEALANT TO FLOOR OF CABLE RISER	
SURFACE TREATMENT: SEALED	**CONDITION:** POOR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 82

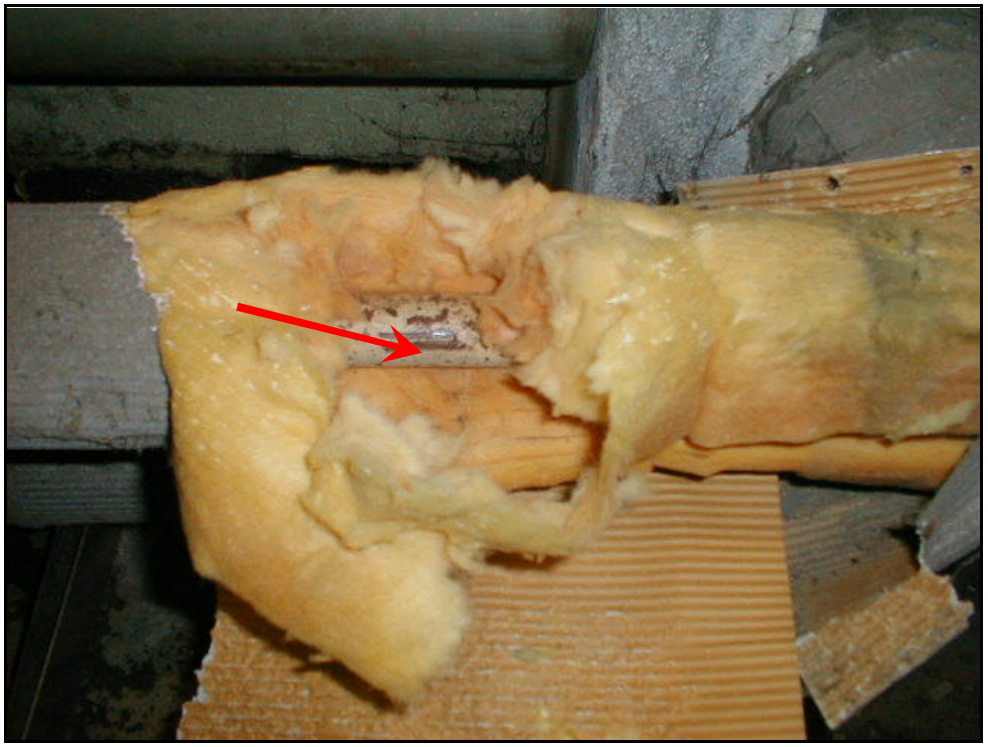
SECOND FLOOR

SAMPLE ID: B1-82-EXT-03-079PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / D131
PRODUCT DESCRIPTION: COATING TO HIGH LEVEL PIPE	
SURFACE TREATMENT: PARTIAL SEAL	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-080PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / D129
PRODUCT DESCRIPTION: COATING TO LOW LEVEL HORIZONTAL PIPE	
SURFACE TREATMENT: PARTIAL SEAL	**CONDITION:** FAIR
QUANTITY: 4 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-081PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / D133 & CORRIDOR BETWEEN D125 AND D133
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-082PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / D126 & D127
PRODUCT DESCRIPTION: BITUMEN TO STEP	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 6 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

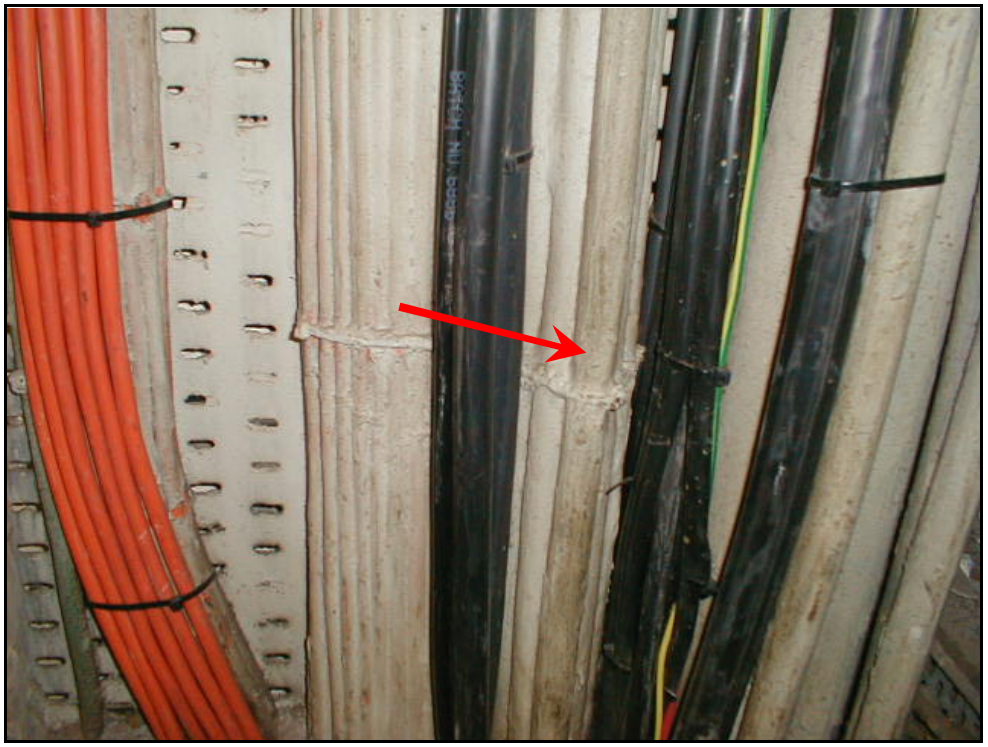
COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-083PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / D125
PRODUCT DESCRIPTION: PANEL TO WALL, RHS OF DOOR	
SURFACE TREATMENT: UNSEALED	**CONDITION:** POOR
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

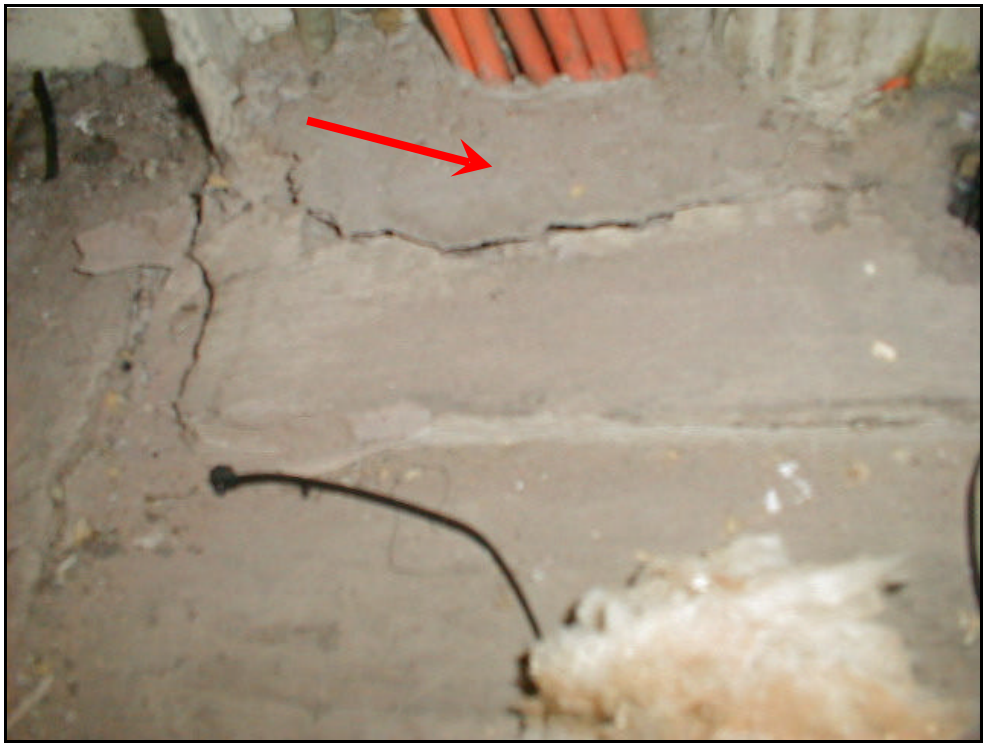
SAMPLE ID: B1-82-EXT-03-084PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / PLANT ROOM
PRODUCT DESCRIPTION: COATING TO ELECTRIC CABLES BOTTOM OF EAST WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-085PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING & PLANT ROOM
PRODUCT DESCRIPTION: FLOOR SEAL TO BOTTOM OF CABLES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-086PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / PLANT ROOM
PRODUCT DESCRIPTION: DEBRIS TO PIPE BY WP7801B	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

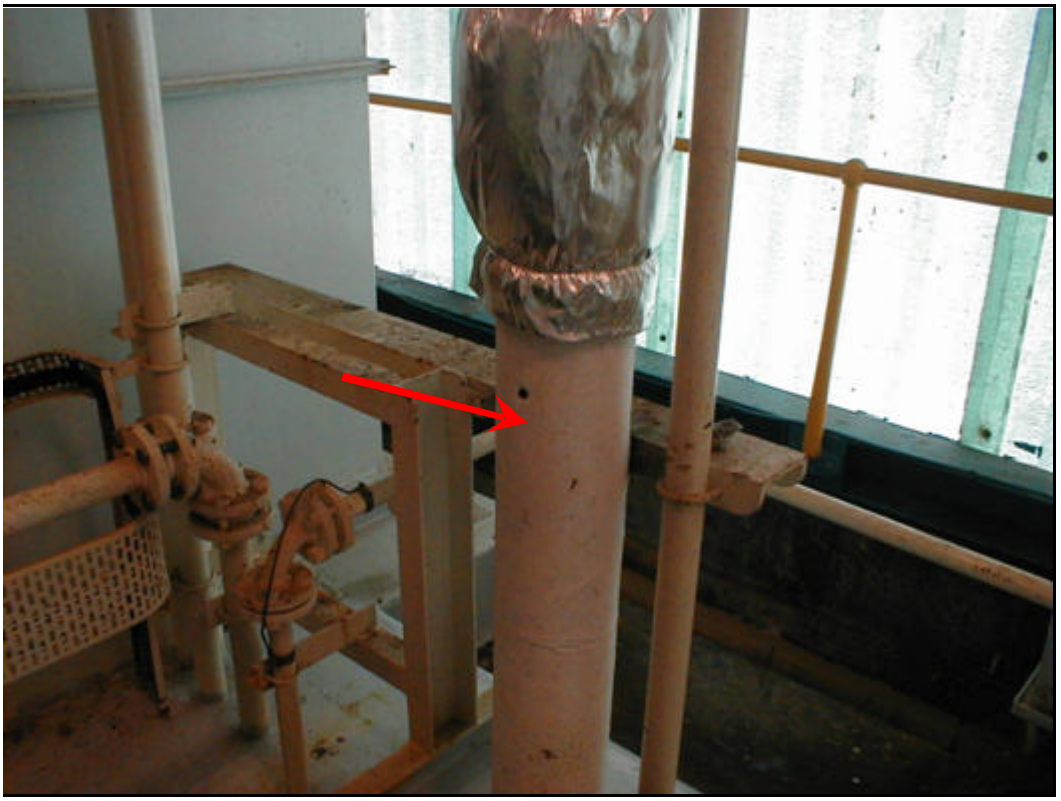
COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-105PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY HV3121	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** FAIR
QUANTITY : 3 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-106PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY AV2151	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** FAIR
QUANTITY: 5 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

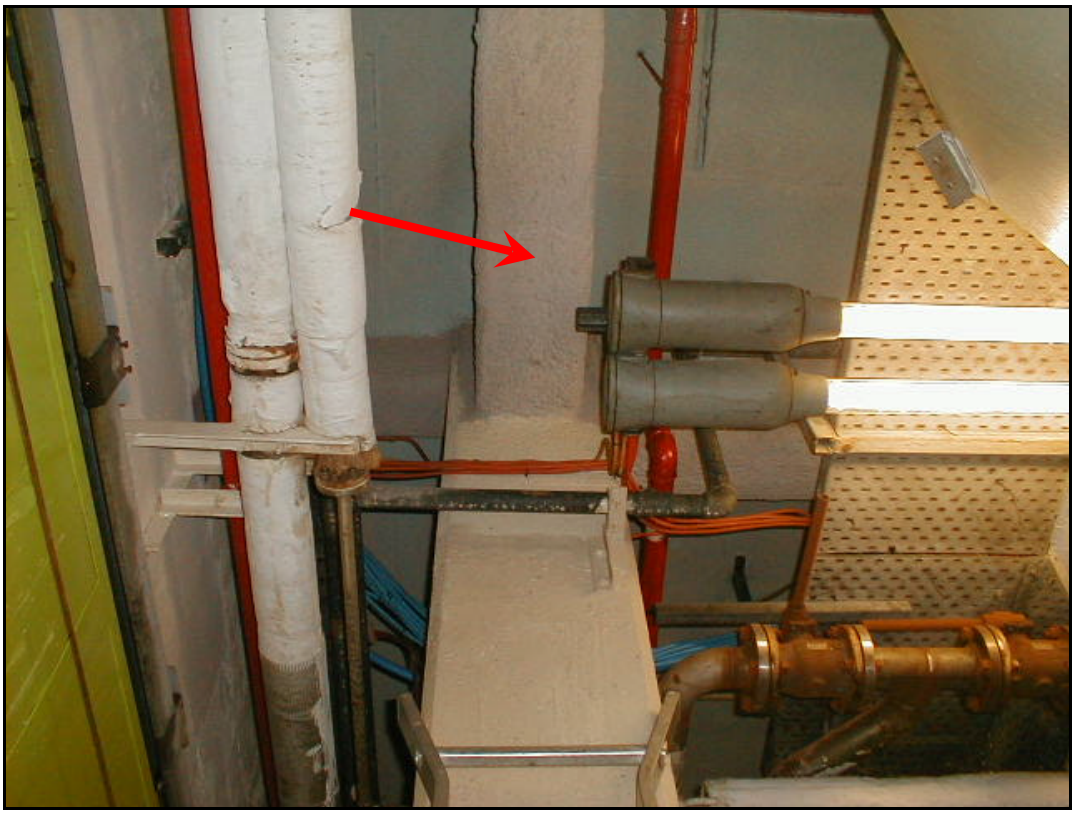
SAMPLE ID: B1-82-EXT-03-107PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: PIPE LAGGING BY H1031	
SURFACE TREATMENT: ENCAPSULATED	**CONDITION:** FAIR
QUANTITY: 5 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

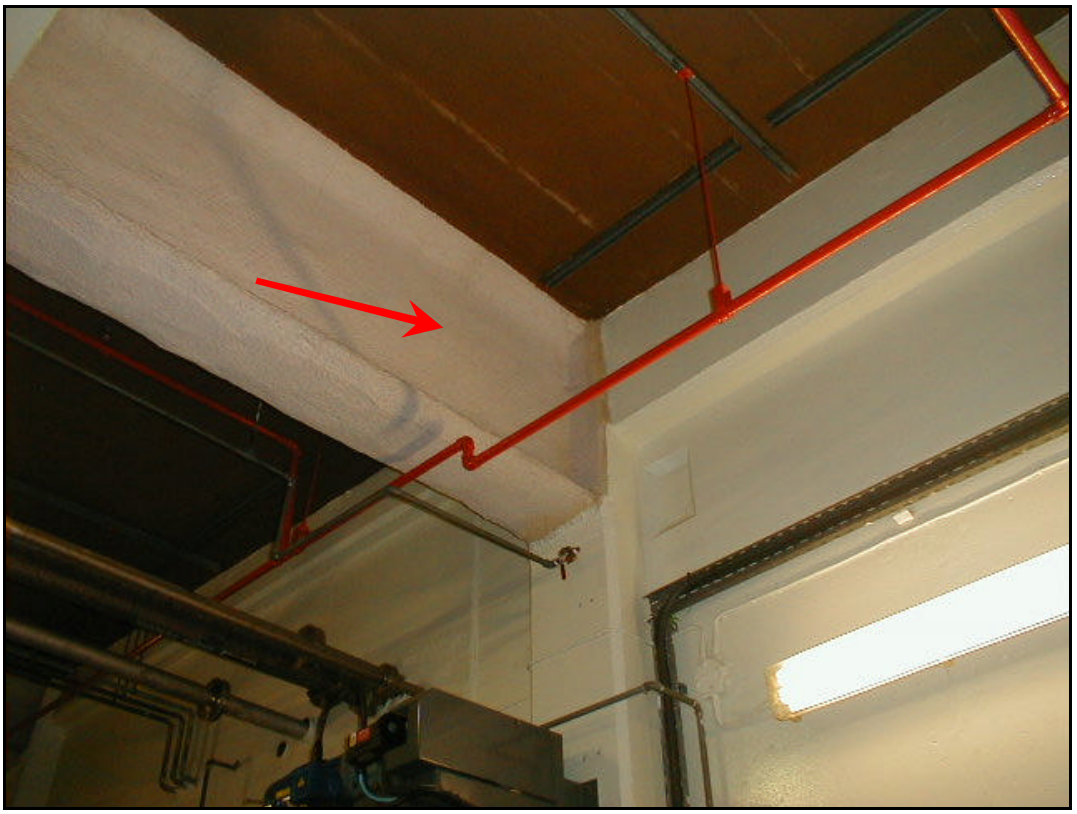
SAMPLE ID: B1-82-EXT-03-108PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS BY DRUMMELTER	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 100 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

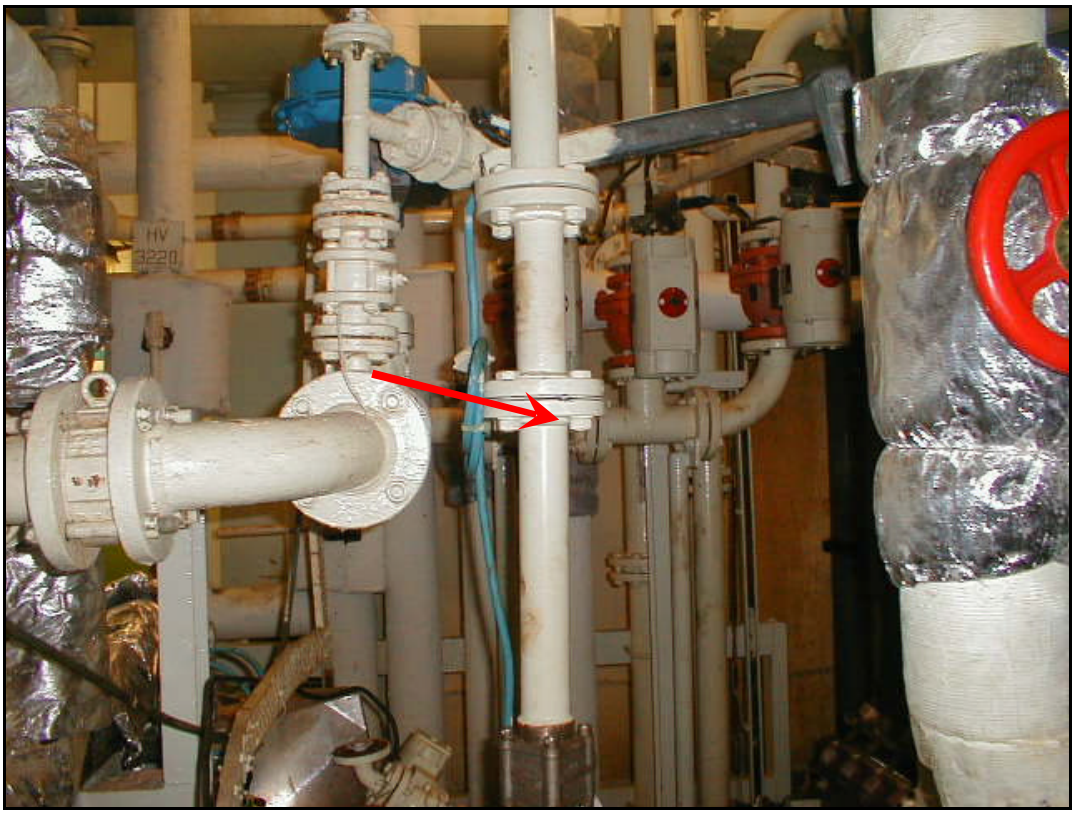
SAMPLE ID: B1-82-EXT-03-109PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: SPRAY COATING TO BEAMS	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 100 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

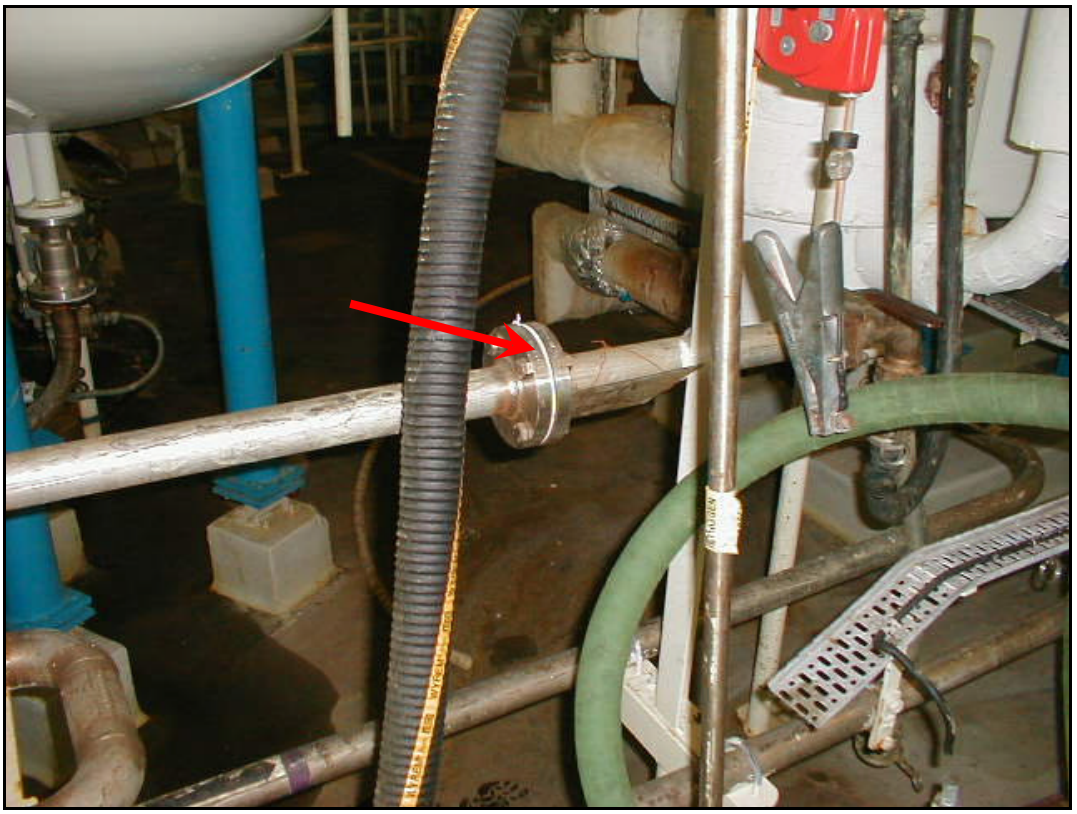
SAMPLE ID: B1-82-EXT-03-110PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET TO PIPE BY AV0209	
SURFACE TREATM ENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-03-111PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 03 (SECOND FLOOR) / MANUFACTURING
PRODUCT DESCRIPTION: GASKET TO PIPE BY H10B1	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: <1 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 82

ROOF

SAMPLE ID: B1-82-EXT-04-087PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 04 (ROOF)
PRODUCT DESCRIPTION: FLOORING	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 200 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-04-112PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 04 (ROOF)
PRODUCT DESCRIPTION: GASKET TO VERTICAL PIPE, LHS REAR OF WK6102	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: <1 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-EXT-04-113PT	**DATE SAMPLED:** 15/01/2007
BUILDING: 82	**FLOOR/ROOM No/LOCATION:** 04 (ROOF)
PRODUCT DESCRIPTION: GASKET, REAR OF WK6101	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 86

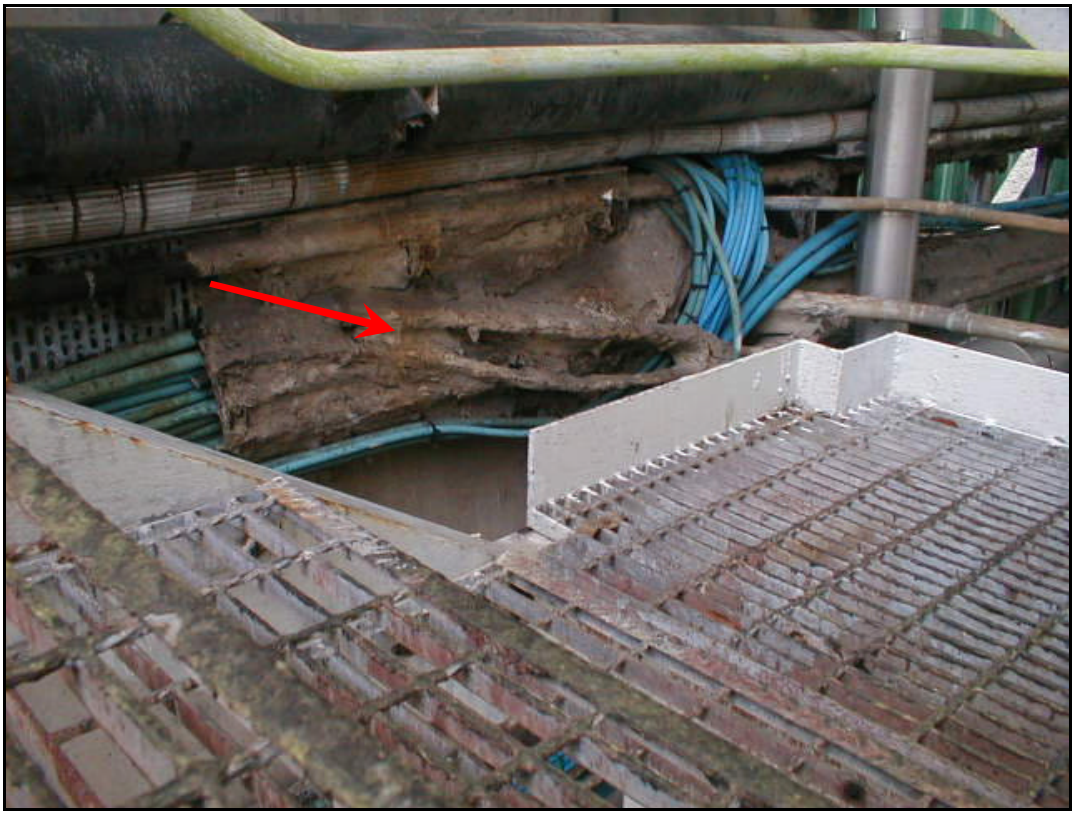
SAMPLE ID: B1-86-EXT-00-120PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 86	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / EXTERNAL
PRODUCT DESCRIPTION: GASKET TO EXG SEAL POT	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 88

SAMPLE ID: B1-82-INT-00-121PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 88	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / EXTERNAL 2 STOREY STRUCTURE TO REAR OF 82
PRODUCT DESCRIPTION: SEALENT TO CABLE ABOVE METAL STAIRWAY, RHS OF STRUCTURE	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 2 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-122PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 88	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / SUBSTATION, REAR OF 82
PRODUCT DESCRIP TION: BITUMEN TO ROOF	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-82-INT-00-123PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 88	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / SUBSTATION, REAR OF 82
PRODUCT DESCRIPTION: PANELS TO SHELTER, REAR OF SUBSTATION	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 3 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 99

SAMPLE ID: B1-99-INT-00-118PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 99	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / K82 RTO CONTROL ROOM
PRODUCT DESCRIPTION: PANELS TO DOORS, WALLS AND CEILINGS	
SURFACE TREATMENT: PAINTED	**CONDITION:** FAIR
QUANTITY: 60 m^2	

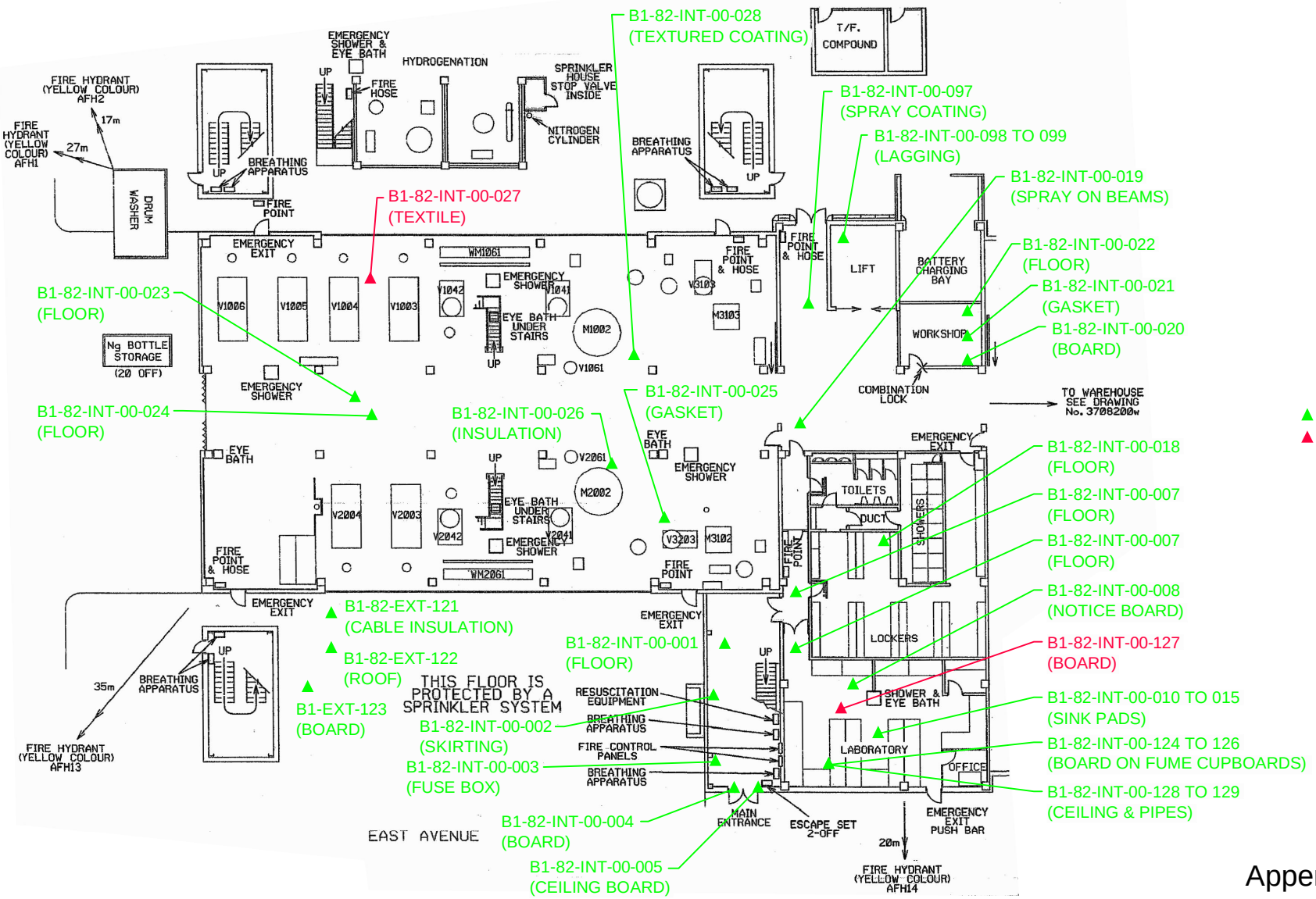
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B1-99-INT-00-119PT	**DATE SAMPLED:** 16/01/2007
BUILDING: 99	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / K82 RTO CONTROL ROOM
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

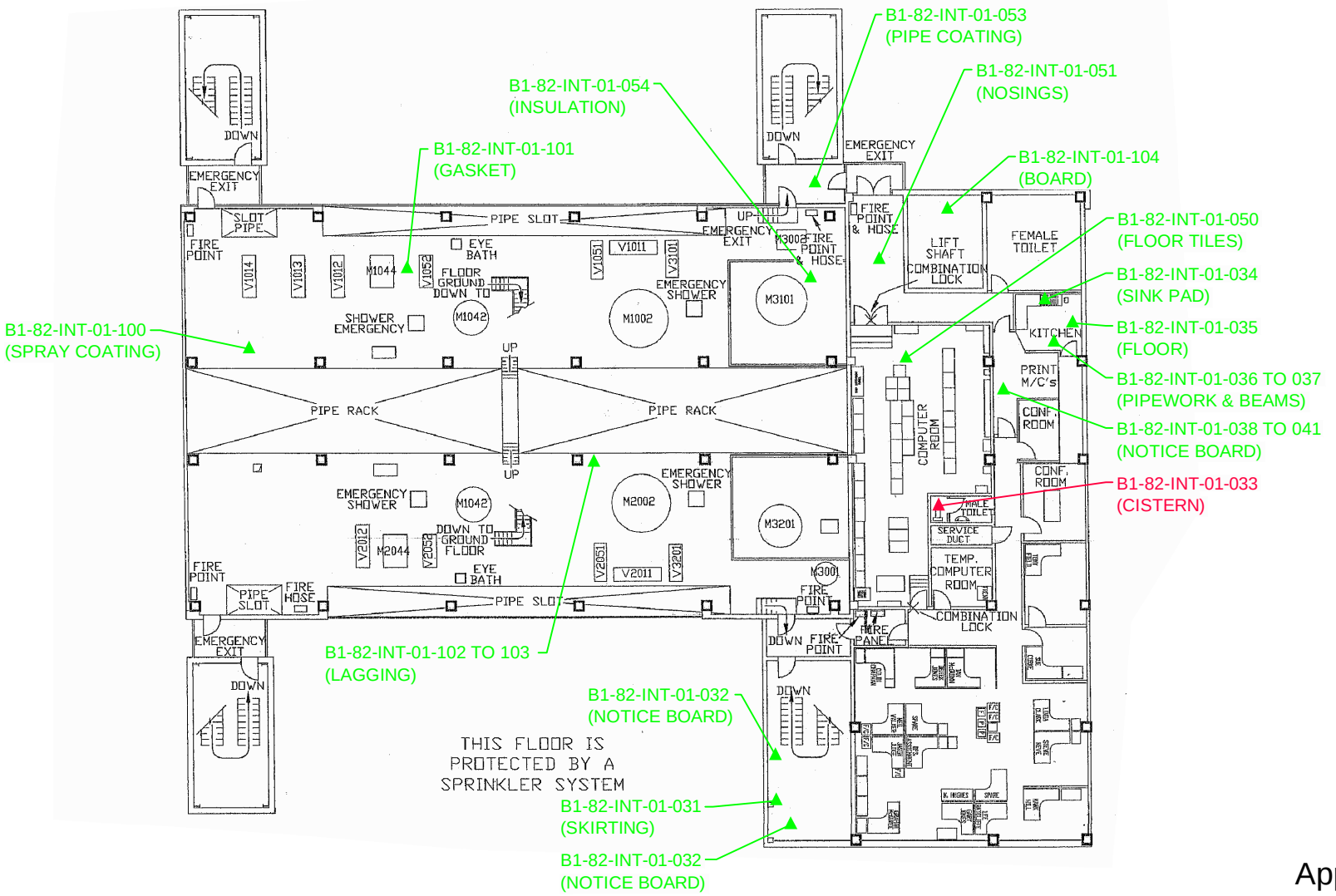
COMMENTS : NONE



Appendix B1 Figure 2

ZONE B1 - AREA B82 (S.C.D. FACILITIES - GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

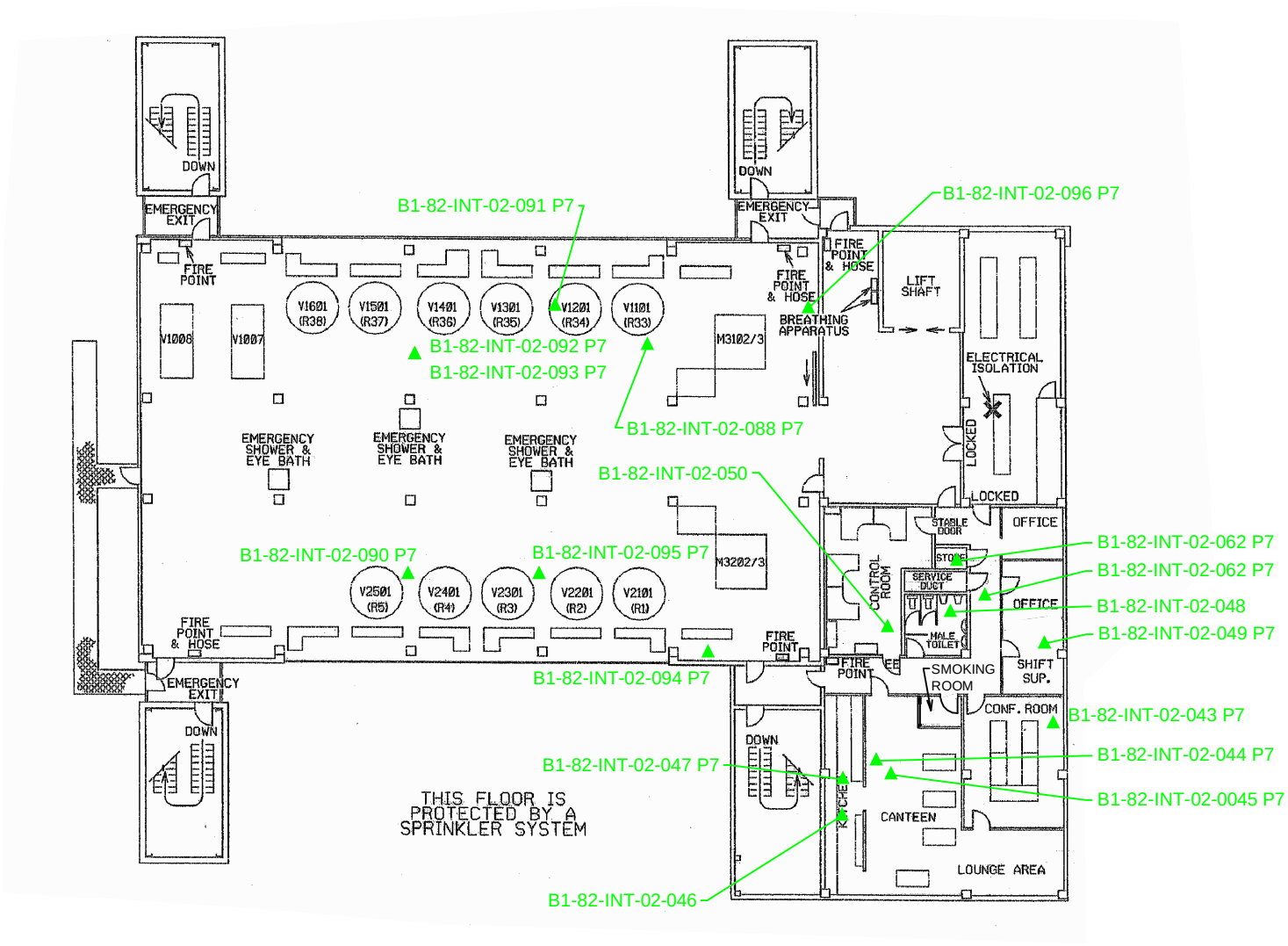
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix B1 Figure 3

ZONE B1 - AREA B82 (S.C.D. FACILITIES - MEZZANINE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

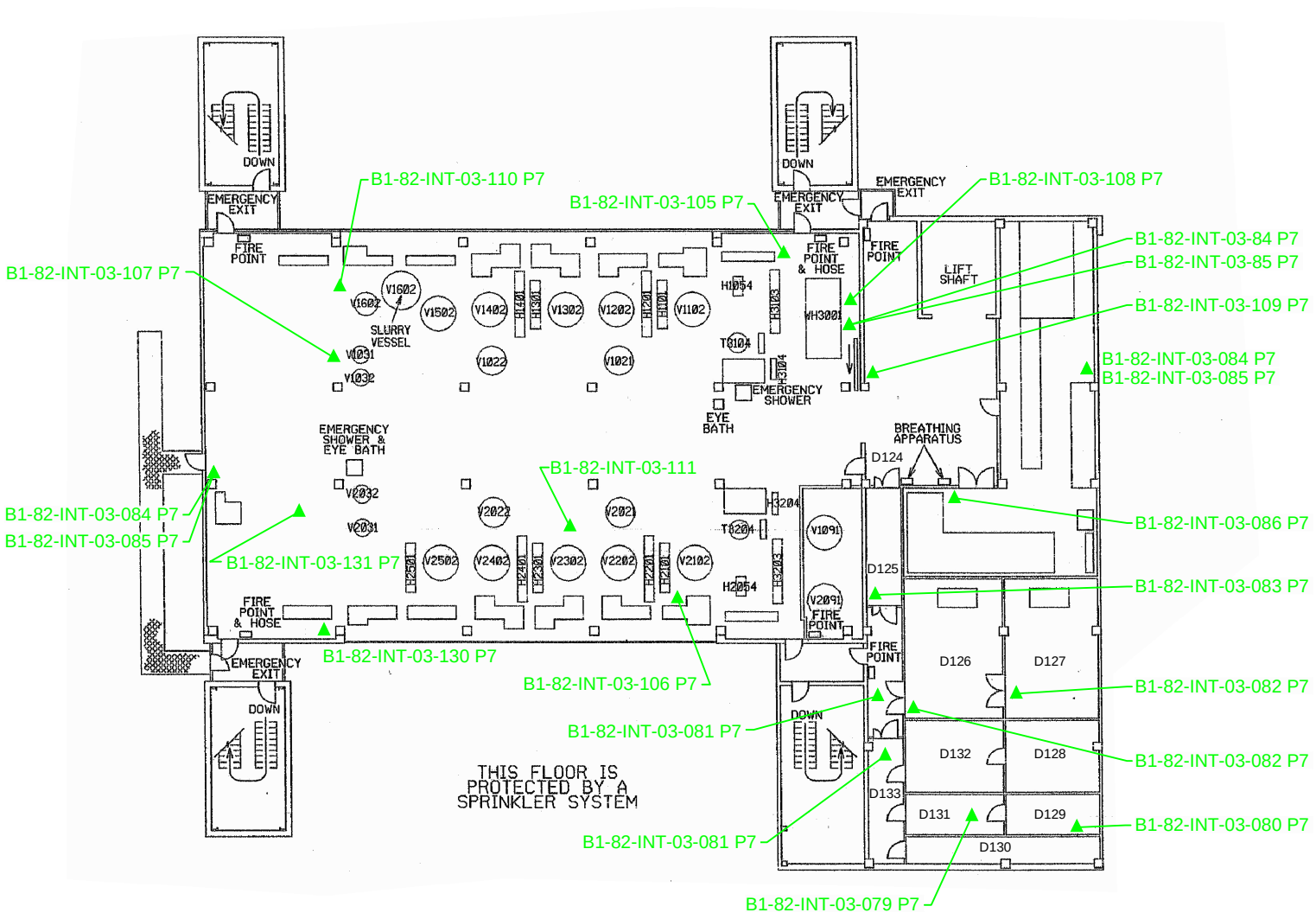
LEGEND

▲ SAMPLE LOCATION

Appendix B1 Figure 4

ZONE B1 - AREA B82 (S.C.D. FACILITIES - FIRST FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

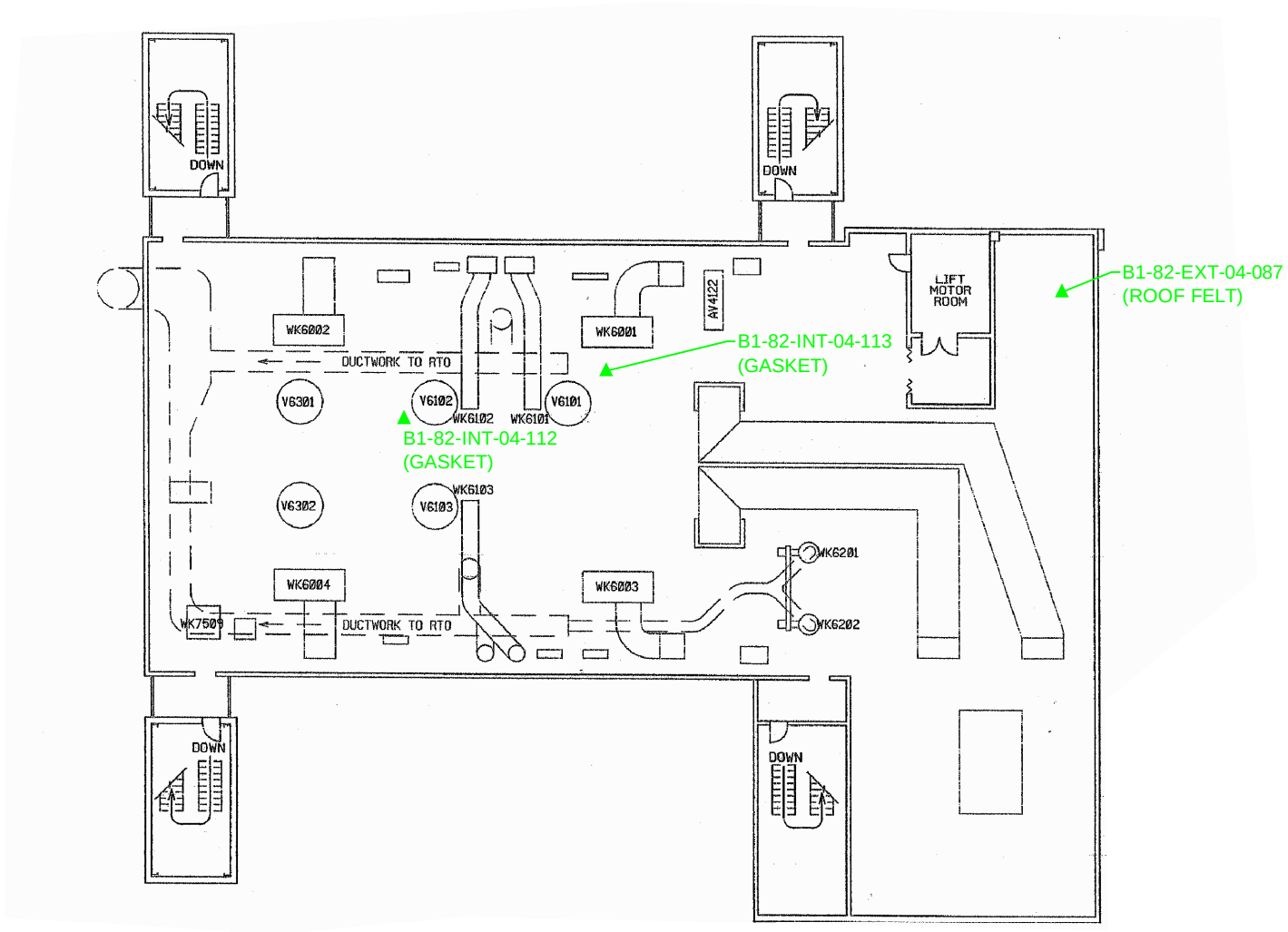
LEGEND

▲ SAMPLE LOCATION

Appendix B1 Figure 5

ZONE B1 - AREA B82 (S.C.D. FACILITIES - SECOND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

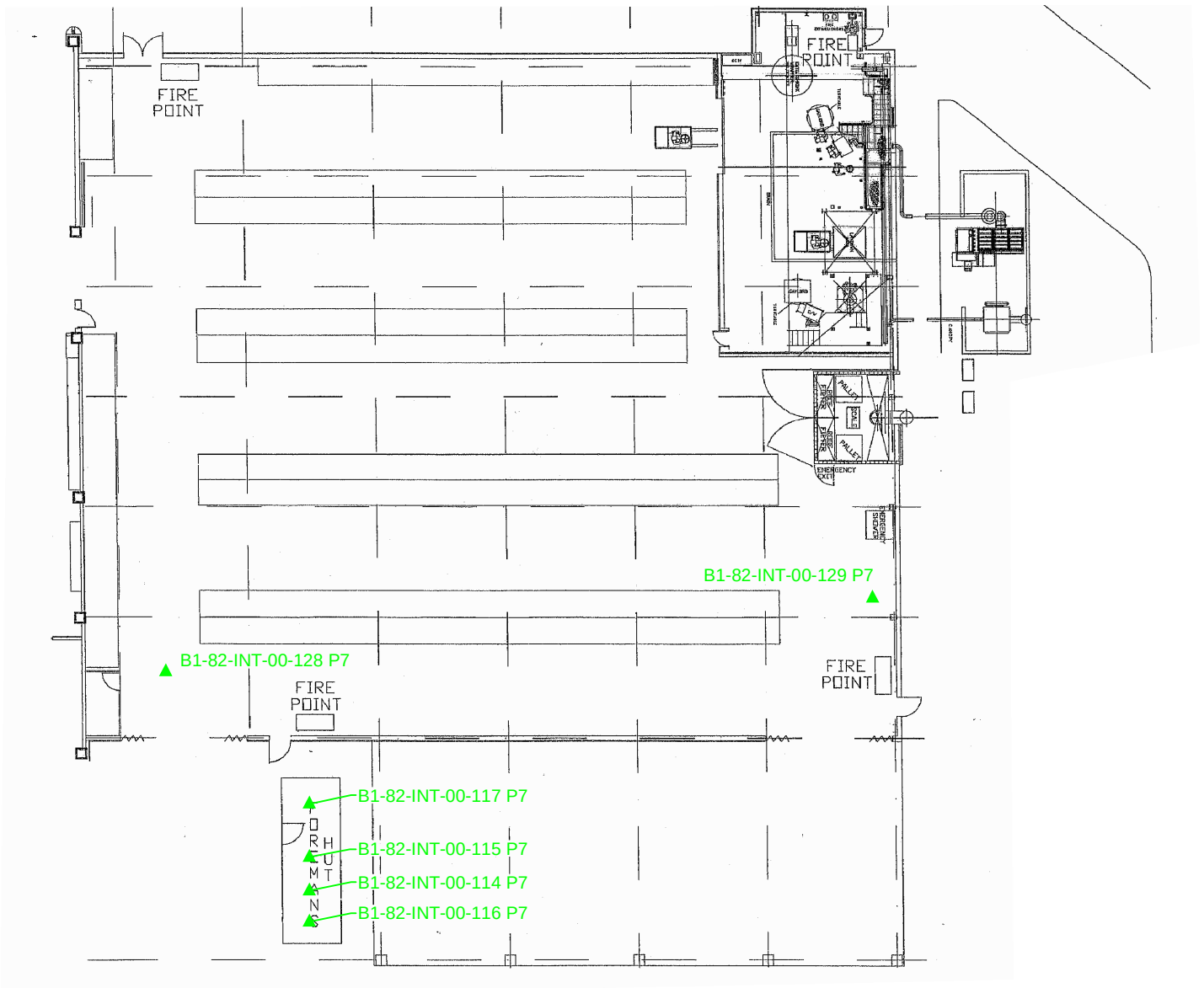
LEGEND

▲ SAMPLE LOCATION

Appendix B1 Figure 6

ZONE B1 - AREA B82 (S.C.D. FACILITIES - ROOF)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

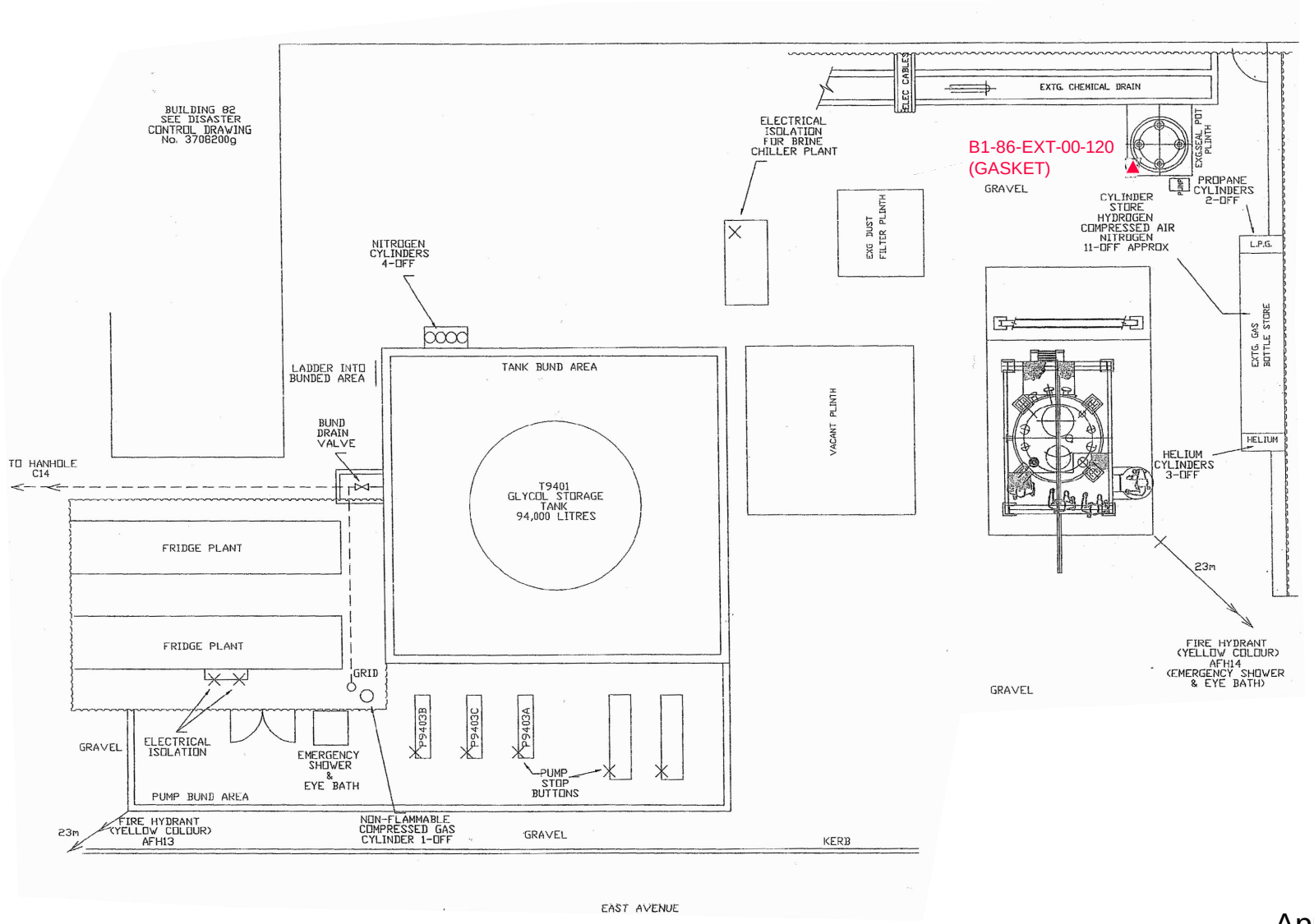
LEGEND

▲ SAMPLE LOCATION

Appendix B1 Figure 7

ZONE B1 - AREA B82 (S.C.D. FACILITIES - WAREHOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

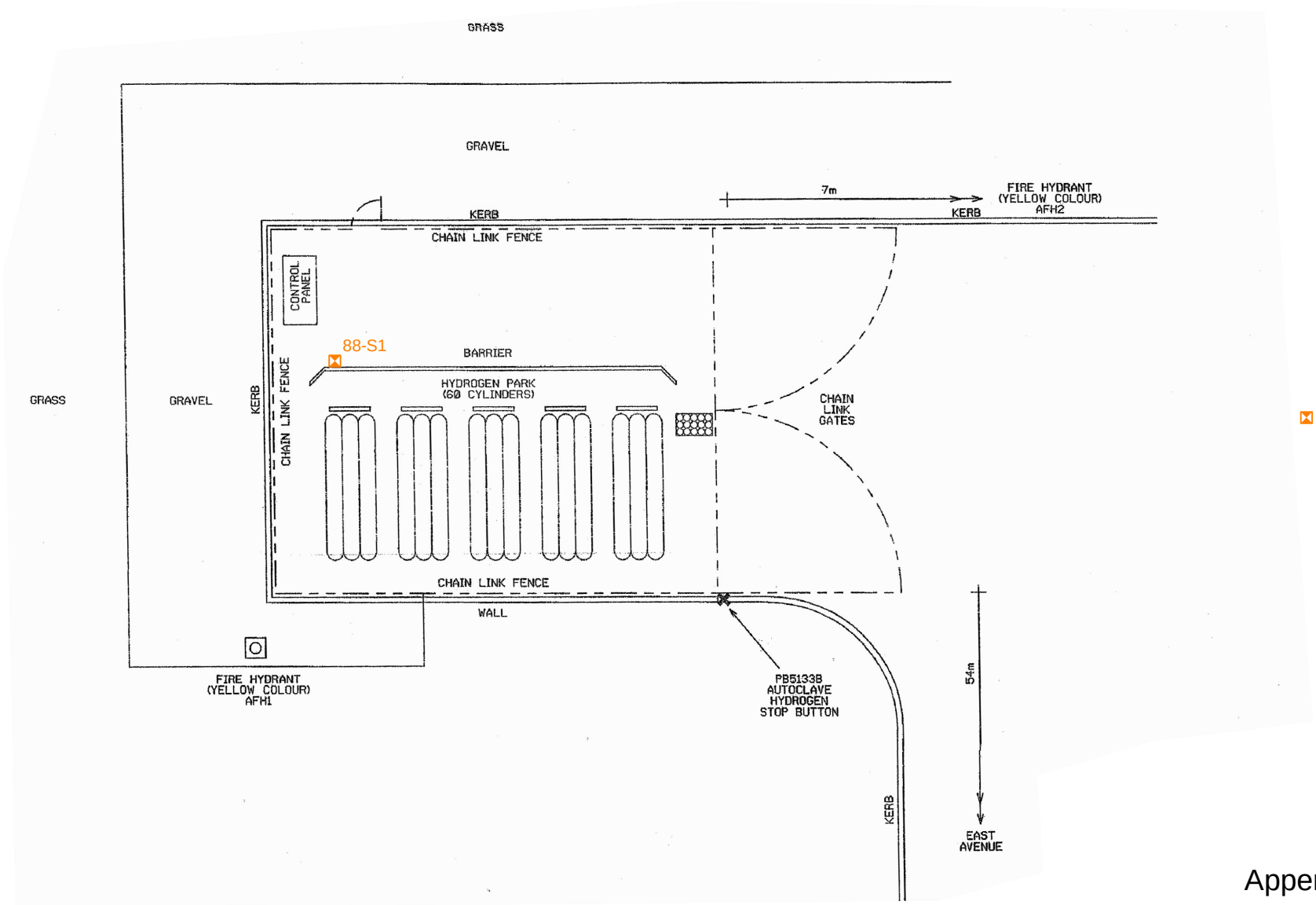
LEGEND

▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix B1 Figure 8

ZONE B1 - AREA B86 (GLYCOL REFRIDGERATION PLANT
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

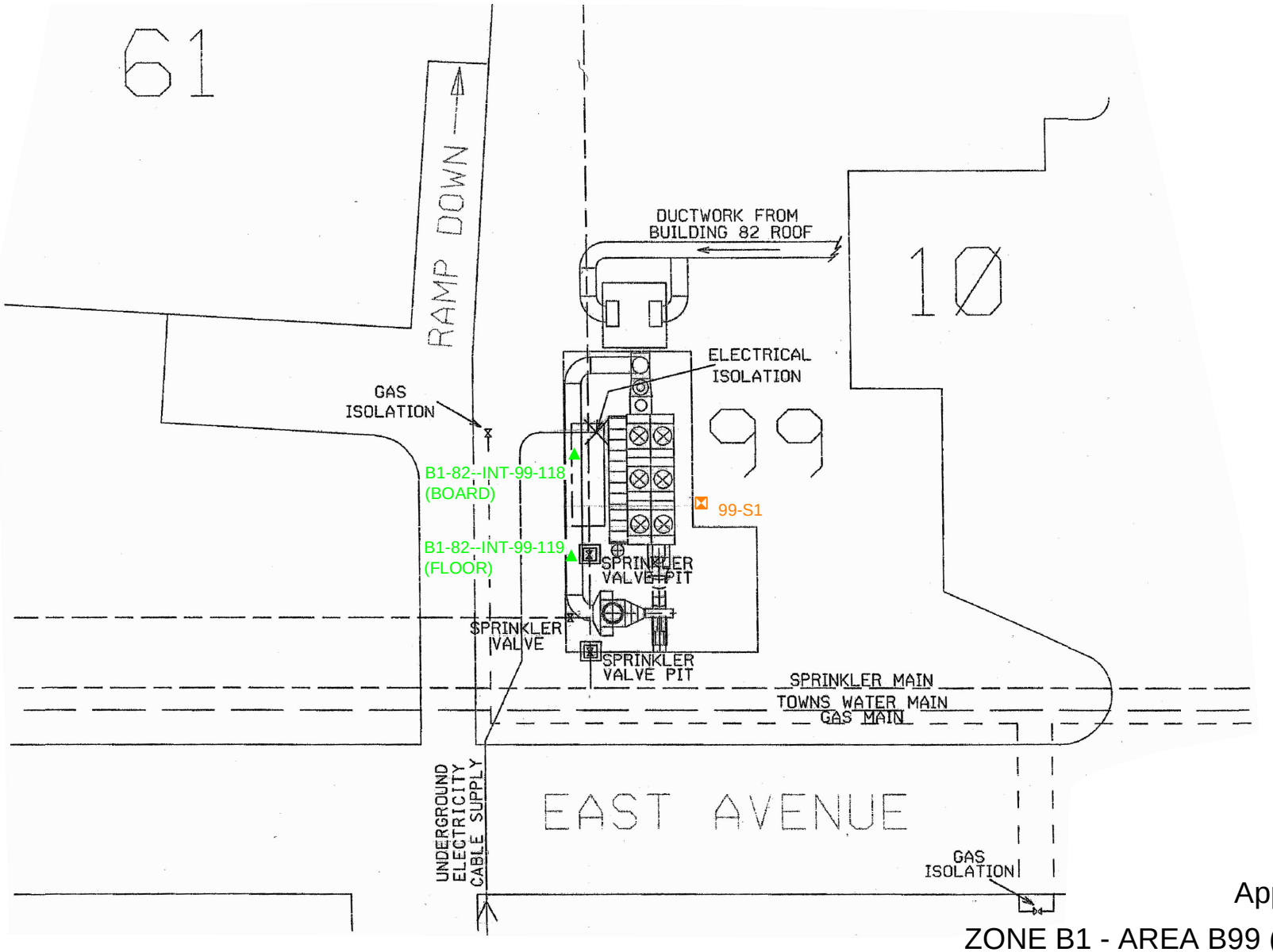
LEGEND

TRIAL PIT LOCATION

Appendix B1 Figure 9

ZONE B1 - AREA B88 (HYDROGEN PARK)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

- SAMPLE LOCATION
- TRIAL PIT LOCATION

Appendix B1 Figure 10

ZONE B1 - AREA B99 (RTO COMPOUND)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX B2

ZONE B2
SAMPLE LOCATIONS

BUILDING 11

SAMPLE ID: B2-B11-SHED	**DATE SAMPLED:** 15/01/2007
BUILDING: SHED NEAR WWTP	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
PRODUCT DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 4m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

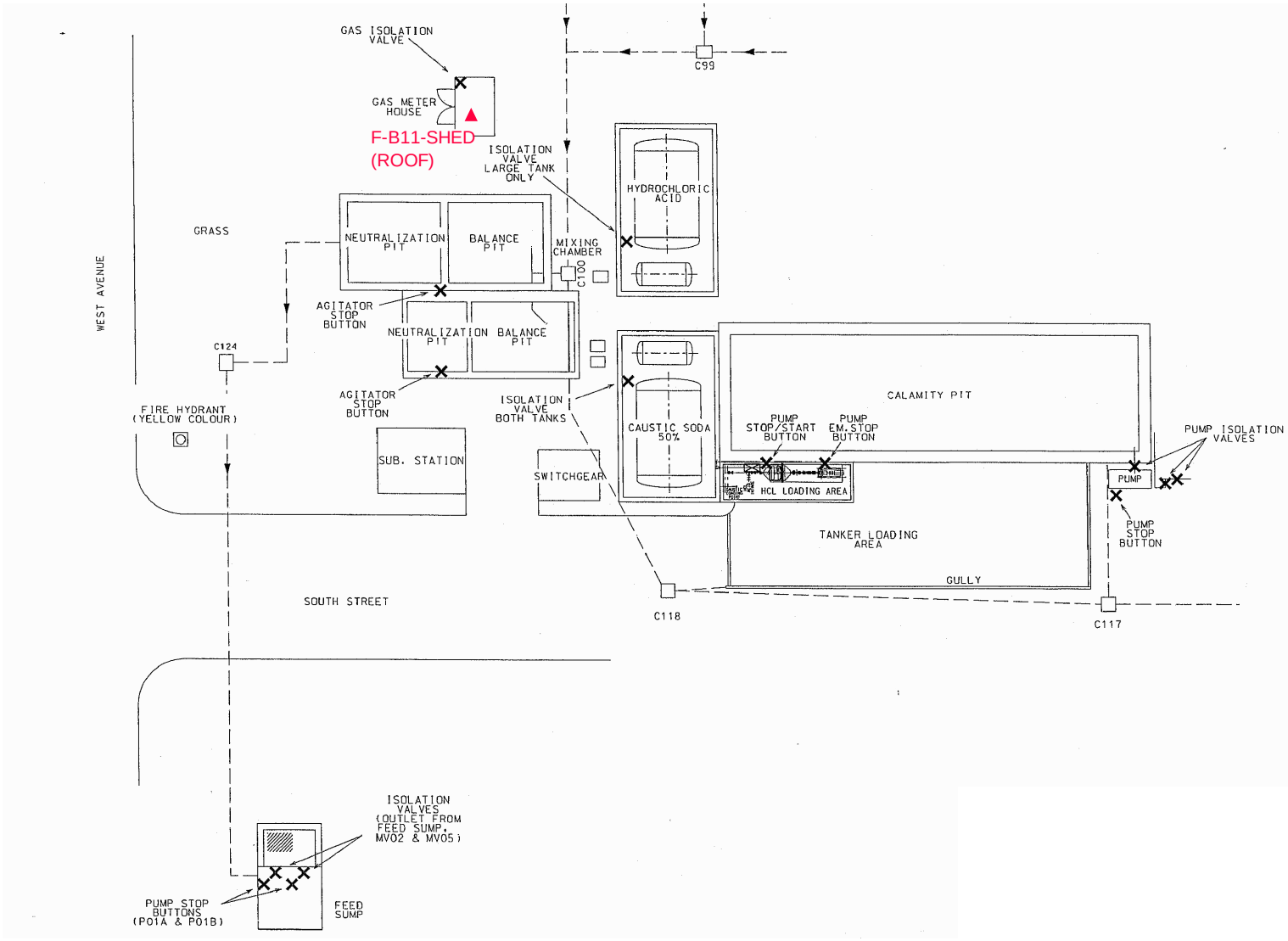
COMMENTS : The shed was not listed on the remit for this type II survey; asbestos roofing material is suspected and has been recorded.

BUILDING 37

SAMPLE ID: B2-B37-EXT-001	**DATE SAMPLED:** 23/01/2007
BUILDING: 37 (JEFF'S SHED)	**FLOOR/ROOM No/LOCATION:** ROOF / NW CORNER
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 25 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



N.T.S.

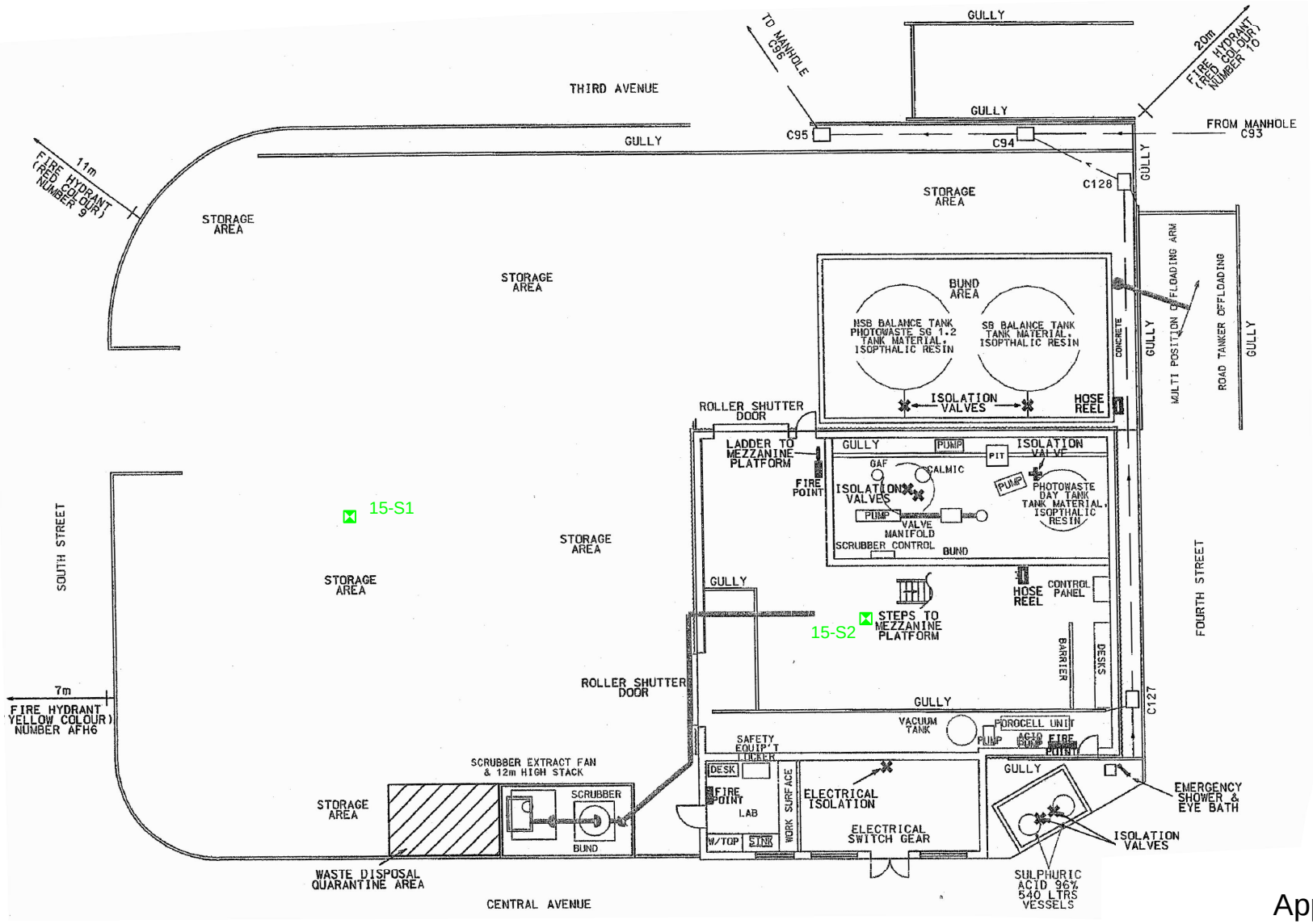
LEGEND

▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix B2 Figure 1

ZONE B2 - AREA SHED 11 (NEUTRALIZATION PIT AND PUMP HOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



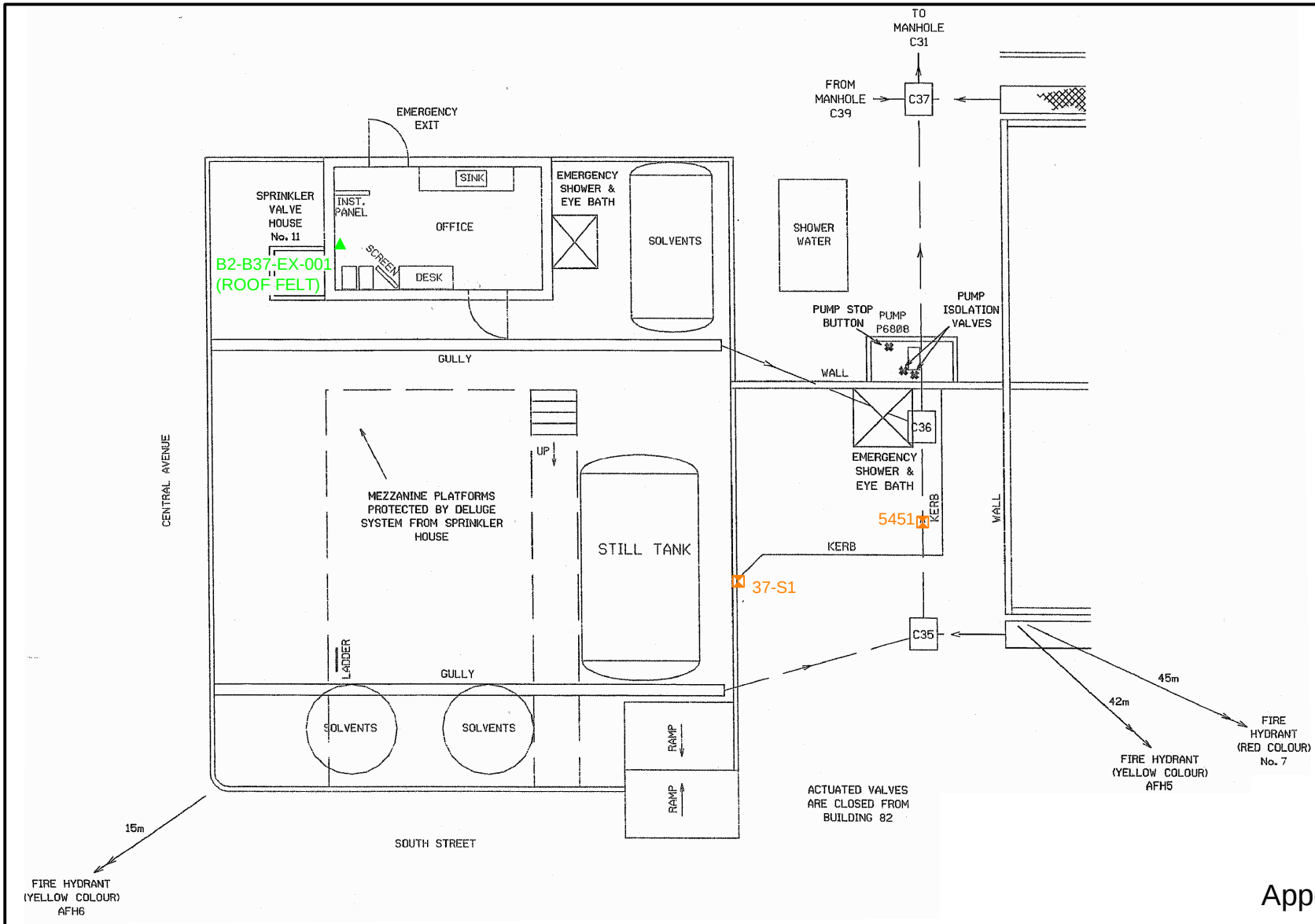
N.T.S.

LEGEND

TRIAL PIT LOCATION

Appendix B2 Figure 2

AREA B15 (RELAY PLANT - GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



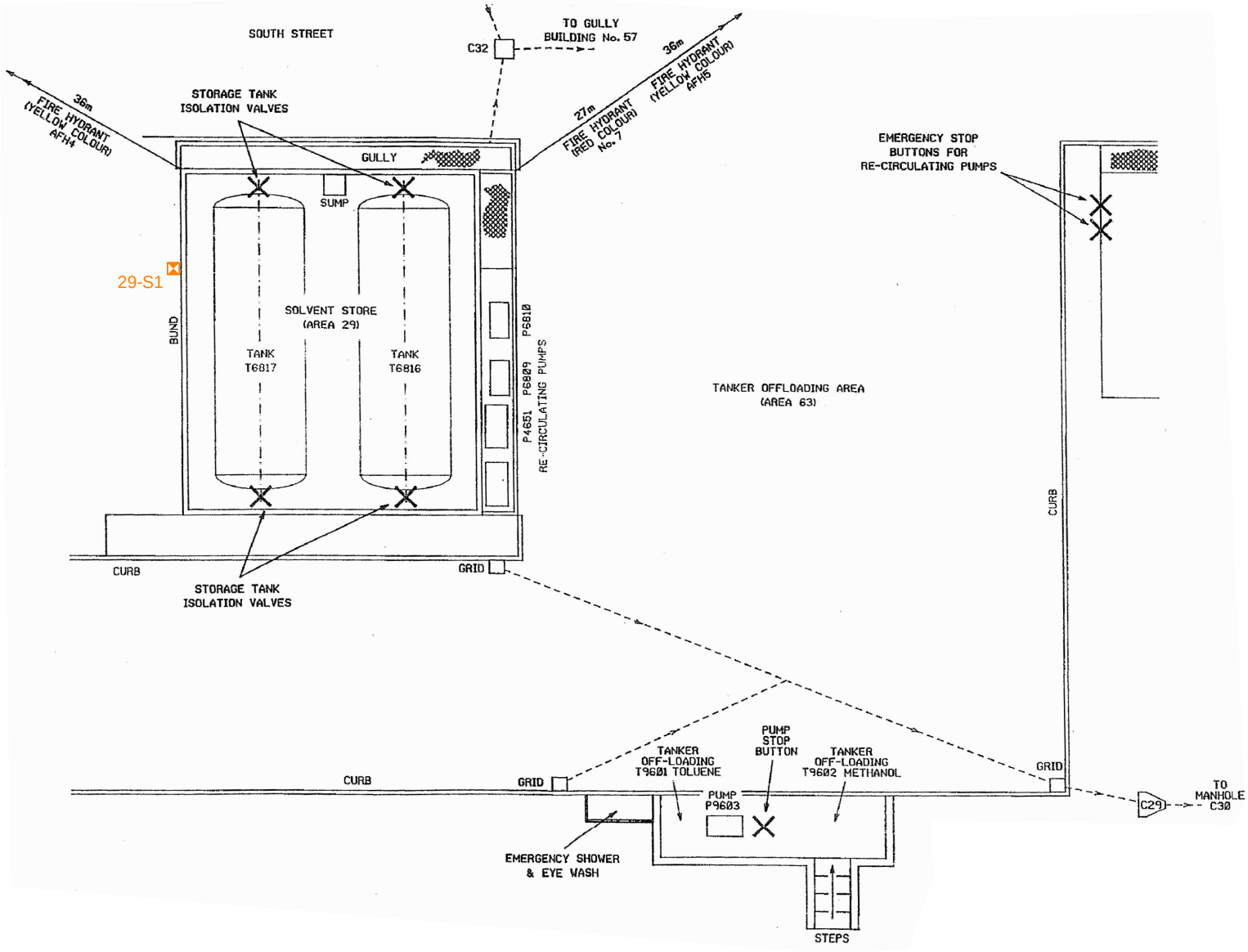
Appendix B2 Figure 3

ZONE B2 - AREA B37 (SOLVENT RECOVERY)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX C1

ZONE C1
SAMPLE LOCATIONS



N.T.S.

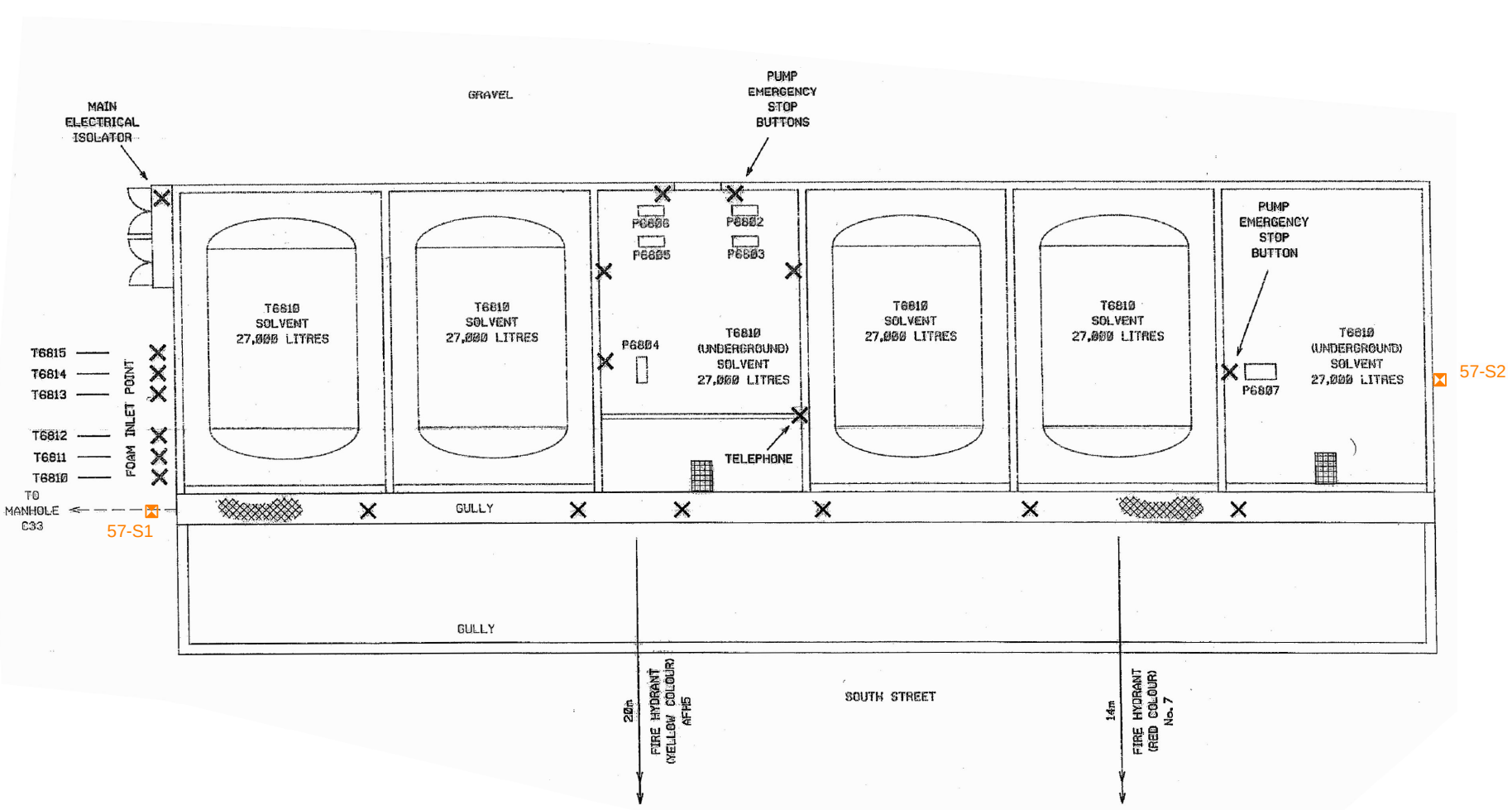
LEGEND

TRIAL PIT LOCATION

Appendix C1 Figure 1

ZONE C1 - AREA A29 (SOLVENT STORE & TANKER OFFLOADING)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

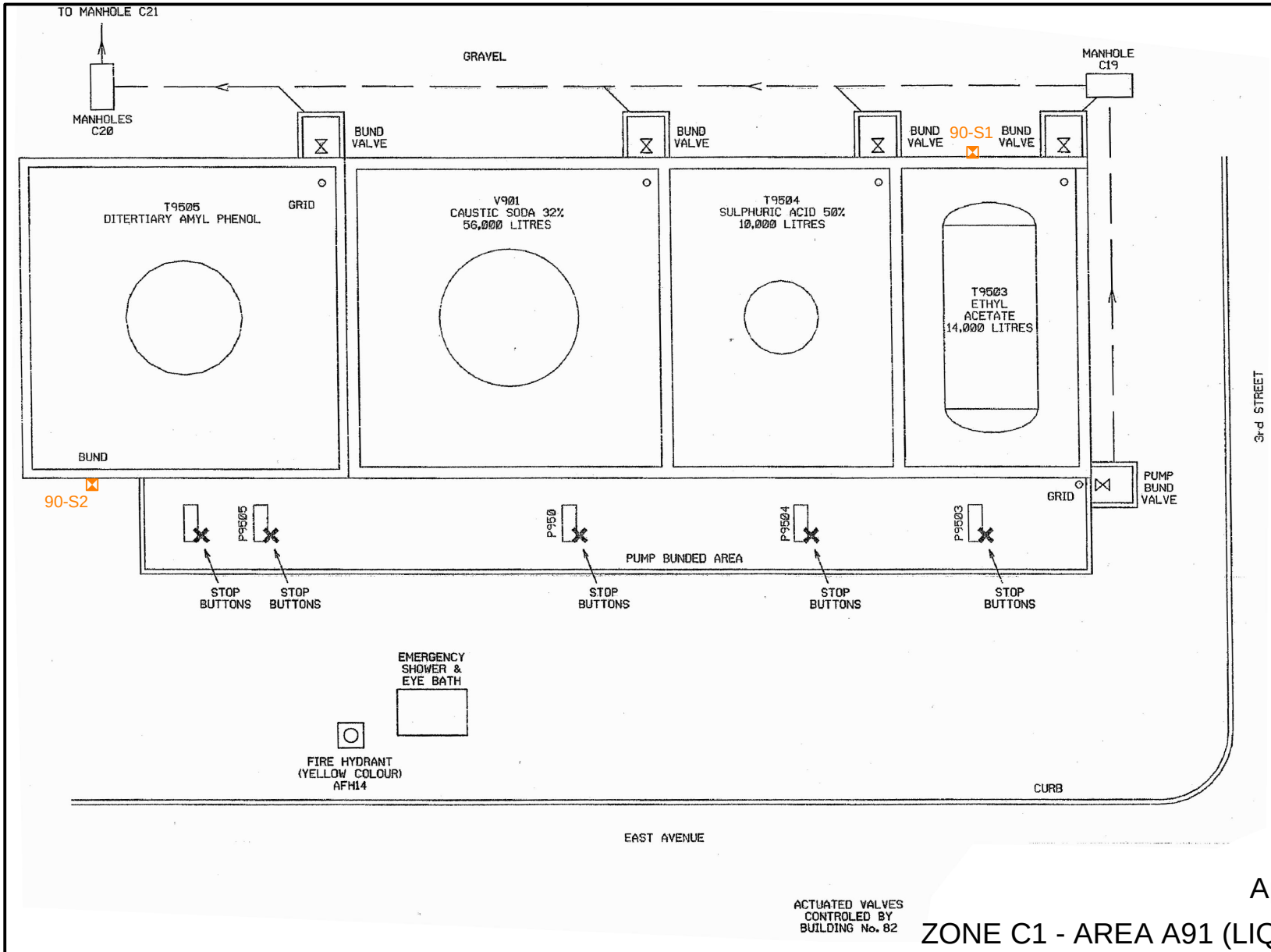
LEGEND

TRIAL PIT LOCATION

Appendix C1 Figure 2

ZONE C1 - AREA A57 (CLEAN SOLVENTS)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

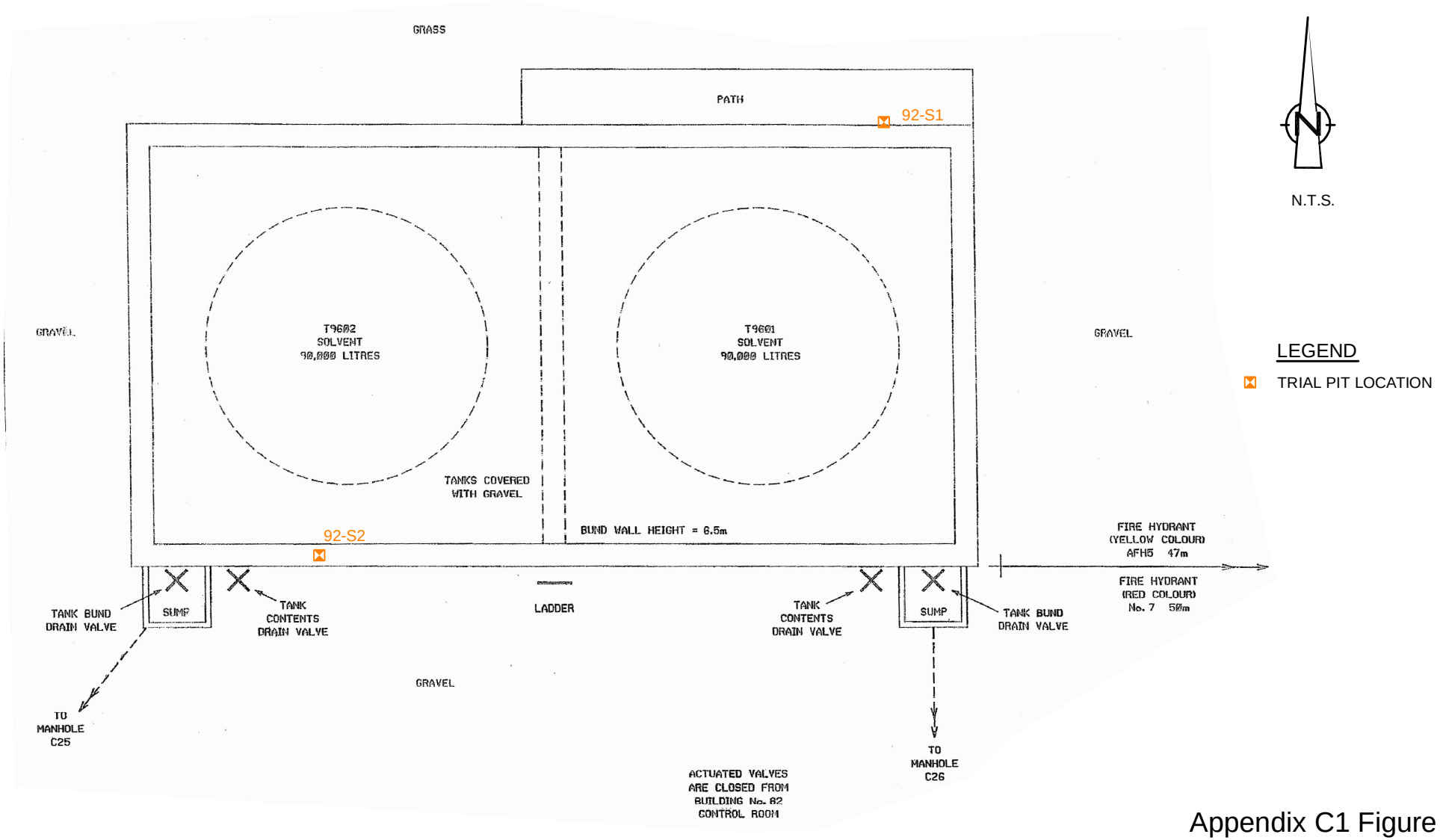
LEGEND

TRIAL PIT LOCATION

Appendix C1 Figure 3

ZONE C1 - AREA A91 (LIQUID BULK STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



Appendix C1 Figure 4

ZONE C1 - AREA A92 (SOLVENT BULK STORAGE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX C2

ZONE C2
(No Samples Collected)

APPENDIX D

ZONE D
SAMPLE LOCATIONS

BUILDING 41

GROUND FLOOR

SAMPLE ID: D-B41-INT-00-001NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING	
SURFACE TREATMENT: PAINTED GREY	**CONDITION:** GOOD
QUANTITY : 72m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled store is next to the office at the northeastern end of the building. An asbestos sticker was applied.

SAMPLE ID: D-B41-INT-00-002NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING IN CORRIDOR NEAR ELECTRICIAN'S WORKSHOP	
SURFACE TREATMENT: PAINTED GREY	**CONDITION:** GOOD
QUANTITY : 72m^2 **ASBESTOS TYPE SUSPECTED:** CEMENT BOARD	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled store is in a corridor on the eastern side of the electricians' workshop.

SAMPLE ID: D-B41-INT-00-003NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE WALL BOARD IN DOORWAY OF TACKLE SHOP	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : 70m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled store is in the southeastern end of the building between the tackle shop and a locked store.

SAMPLE ID: D-B41-INT-00-004NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE SUSPENDED CEILING BOARD IN INFO STORE	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : $9m^2$	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

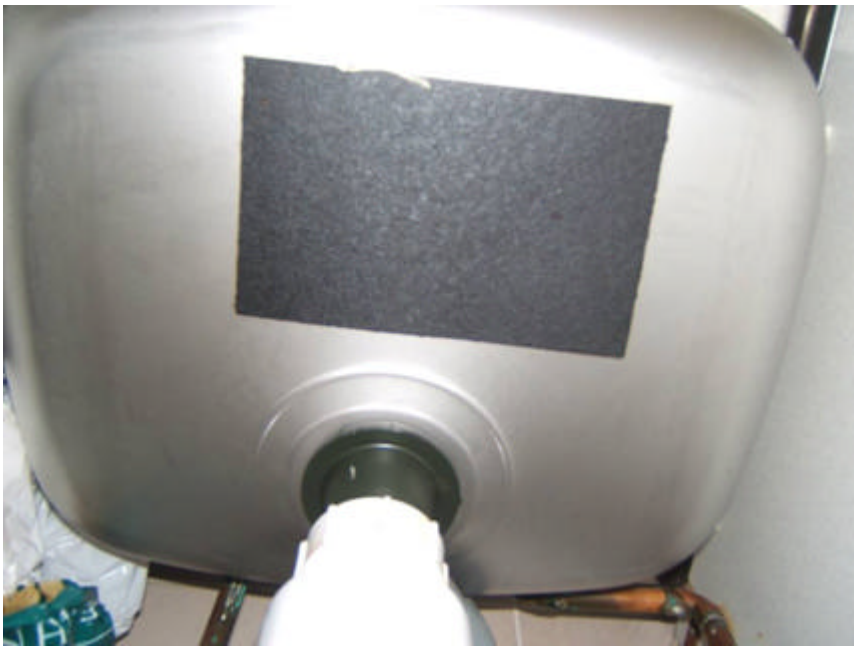
COMMENTS : The sampled store is in the southeastern end of the building east of the tackle shop.

SAMPLE ID: D-B41-INT-00-005NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE CEILING BOARD IN INSTRUMENT WORKSHOP	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : 12m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled store is in the southeastern end of the building south of the tackle shop.

SAMPLE ID: D-B41-INT-00-006NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: BLACK SOUND DAMPING PAD UNDER SINK IN CALIBRATION ROOM	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : 0.25 m^2	**ASBESTOS TYPE SUSPECTED:** DAMPING PAD



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sink is on the southern wall of the instrument workshop in the southeastern sector of building 41. There are two sinks with pads in the men's and women's toilets as well.

SAMPLE ID: D-B41-INT-00-007NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING ON WEST WALL OF FORK LIFT TRUCK BAY	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : 6400 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS :

NONE

SAMPLE ID: D-B41-INT-00-008NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE CEILING BOARD ABOVE SLIDING DOOR IN WELDING SHOP	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : 6400 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled ceiling is north of the welding shop in the western section of building 41.

SAMPLE ID: D-B41-INT-00-009NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 41 (CENTRALISED WORKSHOP)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/WEST OFFICE AREA
SAMPLE DESCRIPTION: BOARD ON SOUTH PARTITION WALL OF SECONDARY ENTRYWAY	
SURFACE TREATMENT: WALLPAPERED	**CONDITION:** GOOD
QUANTITY : 925 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sampled wall board runs throughout the offices.

BUILDING 42

SAMPLE ID: D-B42-INT-00-001NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 42 (FORMER A.T.S. & S.F.B.)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE CEILING CEMENT BOARD IN CONTRACTORS' MESS ROOM	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY : 66m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The white ceiling board runs throughout the entire building. One sink in the mess room has a damping pad that may contain asbestos.

SAMPLE ID: D-B42-EXT-001AG	**DATE SAMPLED:** 10/01/2007
BUILDING : 42 (PMSD VEHICLE CHARGING BAY)	**FLOOR/ROOM No/LOCATION:** FLAT ROOF
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : 45 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 46

SAMPLE ID: D-B46-INT-00-001NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 46(BOILER HOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /SE CORNER
SAMPLE DESCRIPTION: FLOOR TILE IN OFFICE AND LAB	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : 18m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS :

SAMPLE ID: D-B46-INT-00-002NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 46(BOILER HOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /BOILER 2
SAMPLE DESCRIPTION: WHITE PIPE COATING AND DEBRIS FROM PIPES UNDER BOILER 2	
SURFACE TREATMENT: NONE	**CONDITION:** N/A
QUANTITY : 24 LINEAR m OF 0.6m DIAMETER PIPE	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS :

BUILDING 56

EXTERIOR

SAMPLE ID: D-B56-EXT-001AG	**DATE SAMPLED:** 10/01/2007
BUILDING : 56 (CANTEEN)	**FLOOR/ROOM No/LOCATION:** ROOF / NE CORNER
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: BITUMEN COATING	**CONDITION:** POOR
QUANTITY : 200 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : PITCHED ROOF.

BUILDING 66

SAMPLE ID: D-B66-INT-00-001NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 66 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /SOUTHERN WALL
SAMPLE DESCRIPTION: LAGGING	
SURFACE TREATMENT: COVERED IN BLACK PLASTIC	**CONDITION:** GOOD
QUANTITY : 20 LINEAR M	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-B66-EXT-00-001NG	**DATE SAMPLED:** 09/01/2007
BUILDING : 66 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /E AND W WALLS
SAMPLE DESCRIPTION: CEMENT DOWNPIPES	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : 24 LINEAR METRE X 4	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : There are four pipes in total (eastern and western exterior walls). One pipe also includes an asbestos cement junction. Asbestos warning stickers have been applied to the pipes.

BUILDING 83

SAMPLE ID: D-B83-INT-00-001	**DATE SAMPLED:** 09/01/2007
BUILDING : 83 (ENGINEERS' MESS AND TOILET BLOCK)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: GREY BENCH TILE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : $10m^2$	**ASBESTOS TYPE SUSPECTED:** TILE

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : The sample was taken from the bench at the back of the central row of lockers.

SAMPLE ID: D-B83-INT-00-001	**DATE SAMPLED:** 09/01/2007
BUILDING : 83 (ENGINEERS' MESS AND TOILET BLOCK)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: WHITE WALL BOARD PARTITION WALL	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY : 64m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

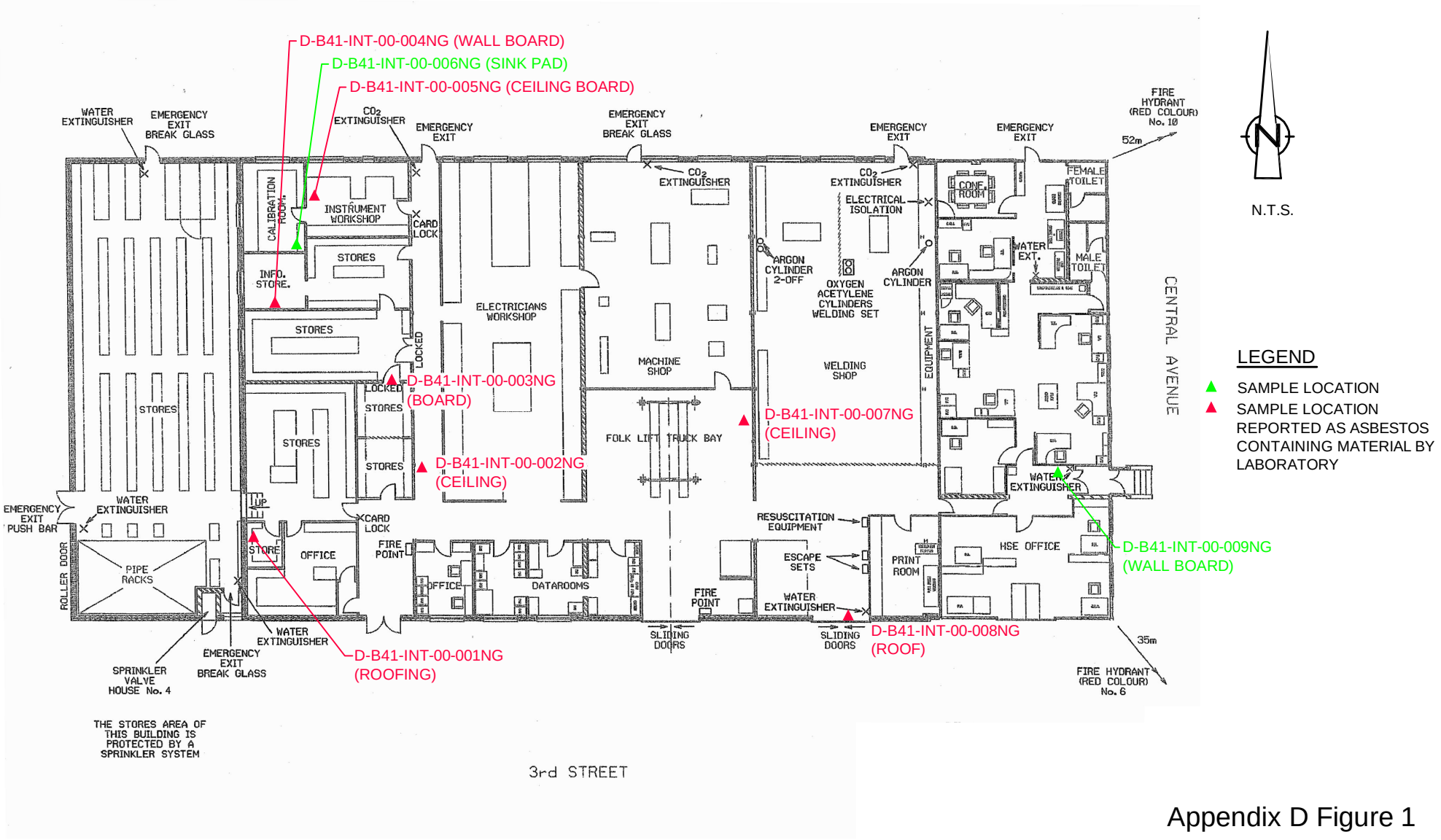
COMMENTS : The sample was taken from the northern wall of the drying room. The board could be supalux.

BUILDING 93

SAMPLE ID: D-B93-INT-00-001	**DATE SAMPLED:** 09/01/2007
BUILDING : 93 (NITROGEN GENERATION PLANT)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
PRODUCT DESCRIPTION: BLACK GASKET	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : --	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

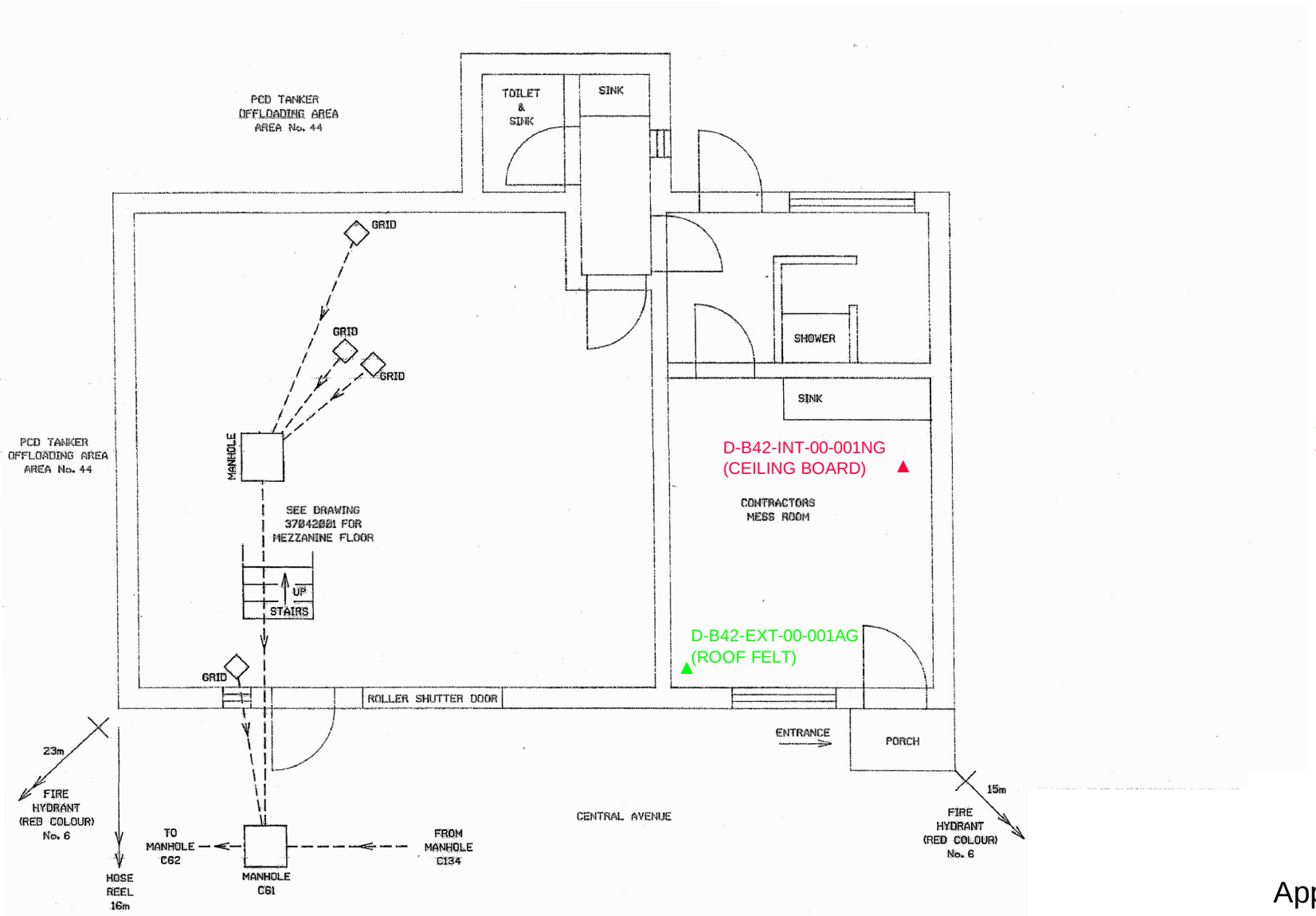
COMMENTS : Gaskets were fairly inaccessible as plant was live. This gasket was present outside of the pipe junction and was accessible. All other gaskets in the building are assumed to be possible asbestos containing materials.



Appendix D Figure 1

ZONE D - AREA B41 (CENTRALISED WORKSHOP)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

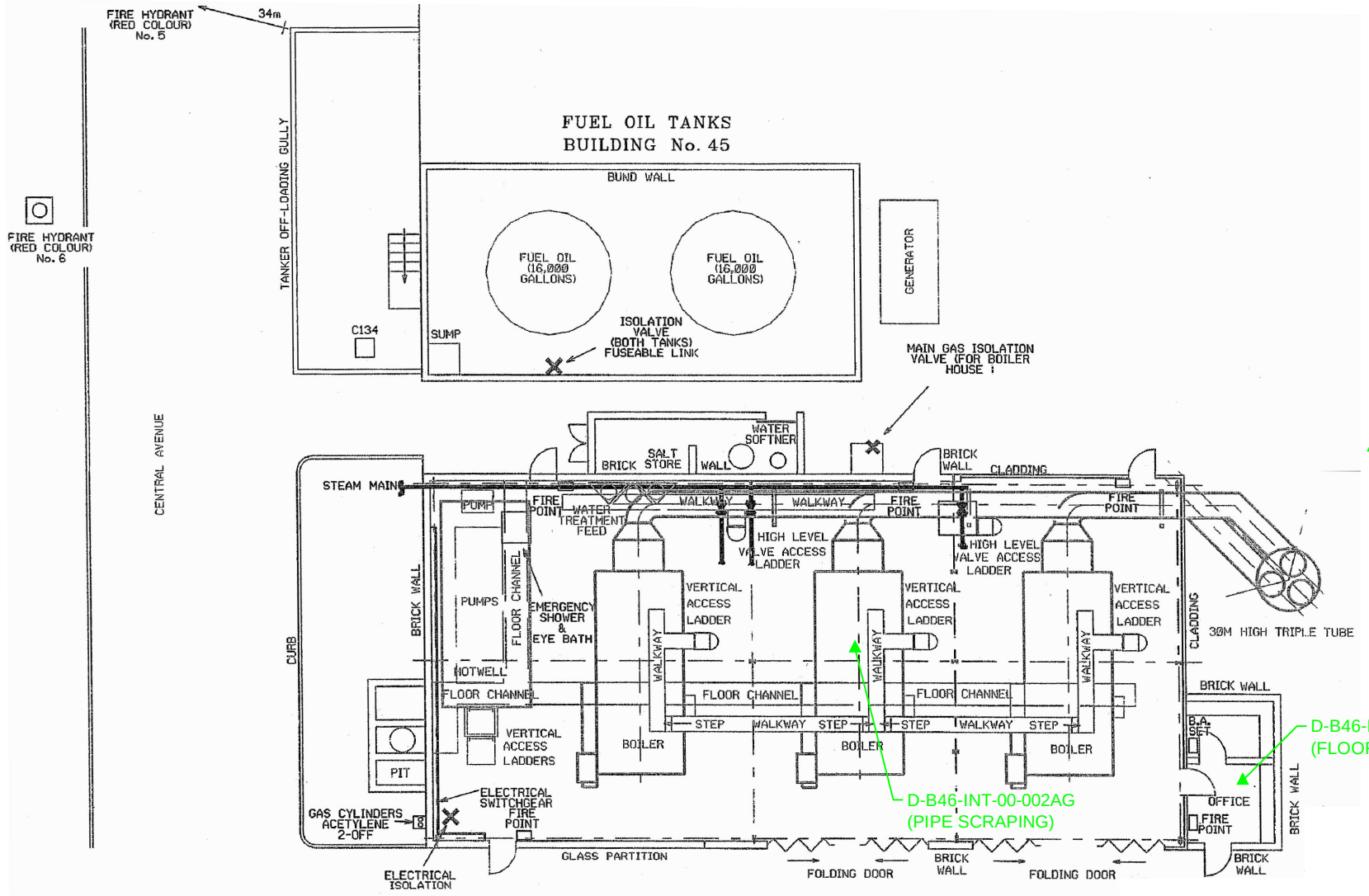
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix D Figure 2

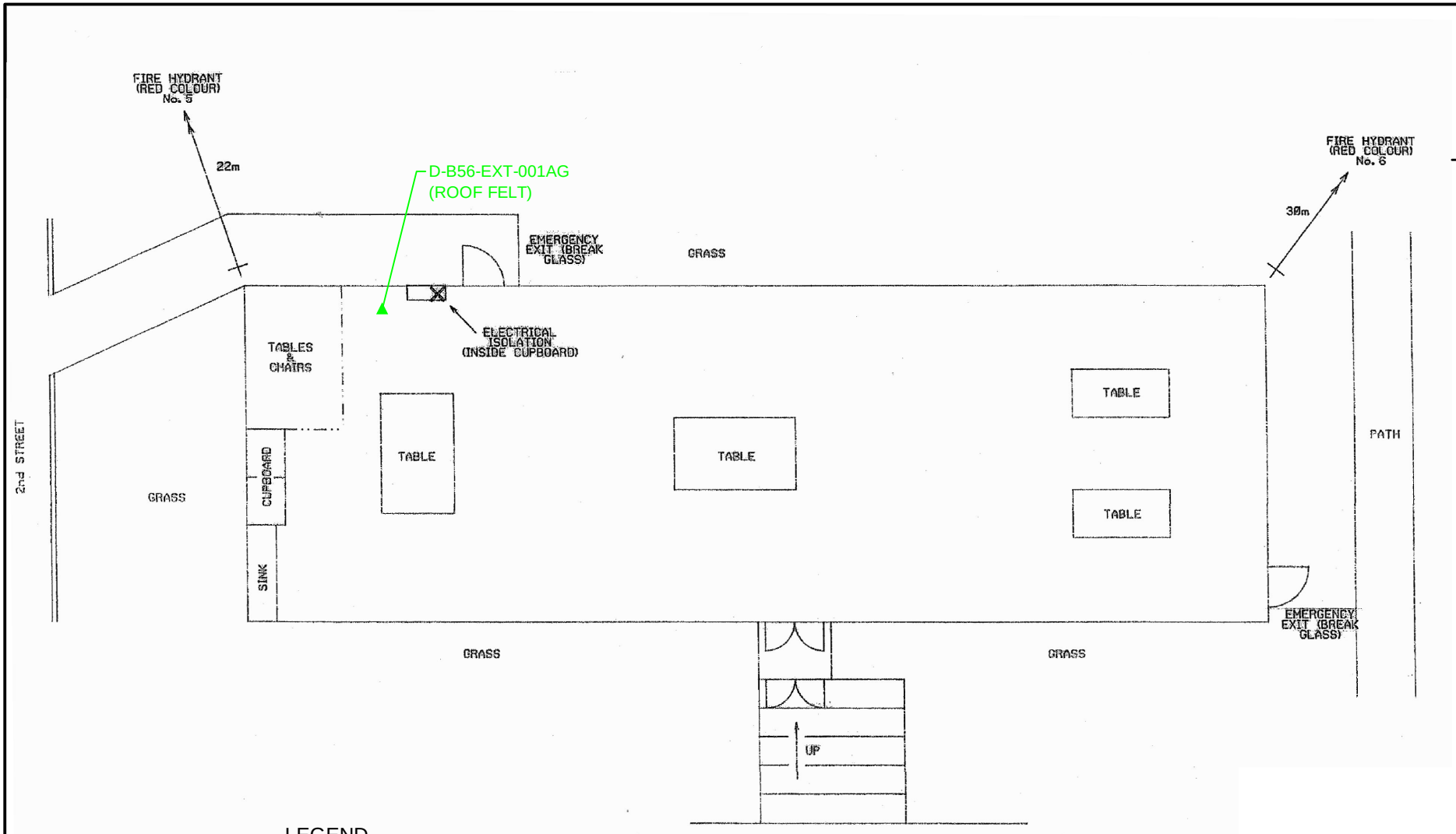
ZONE 2 - AREA B42 (A.T.S. & S.F.B.)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



Appendix D Figure 3

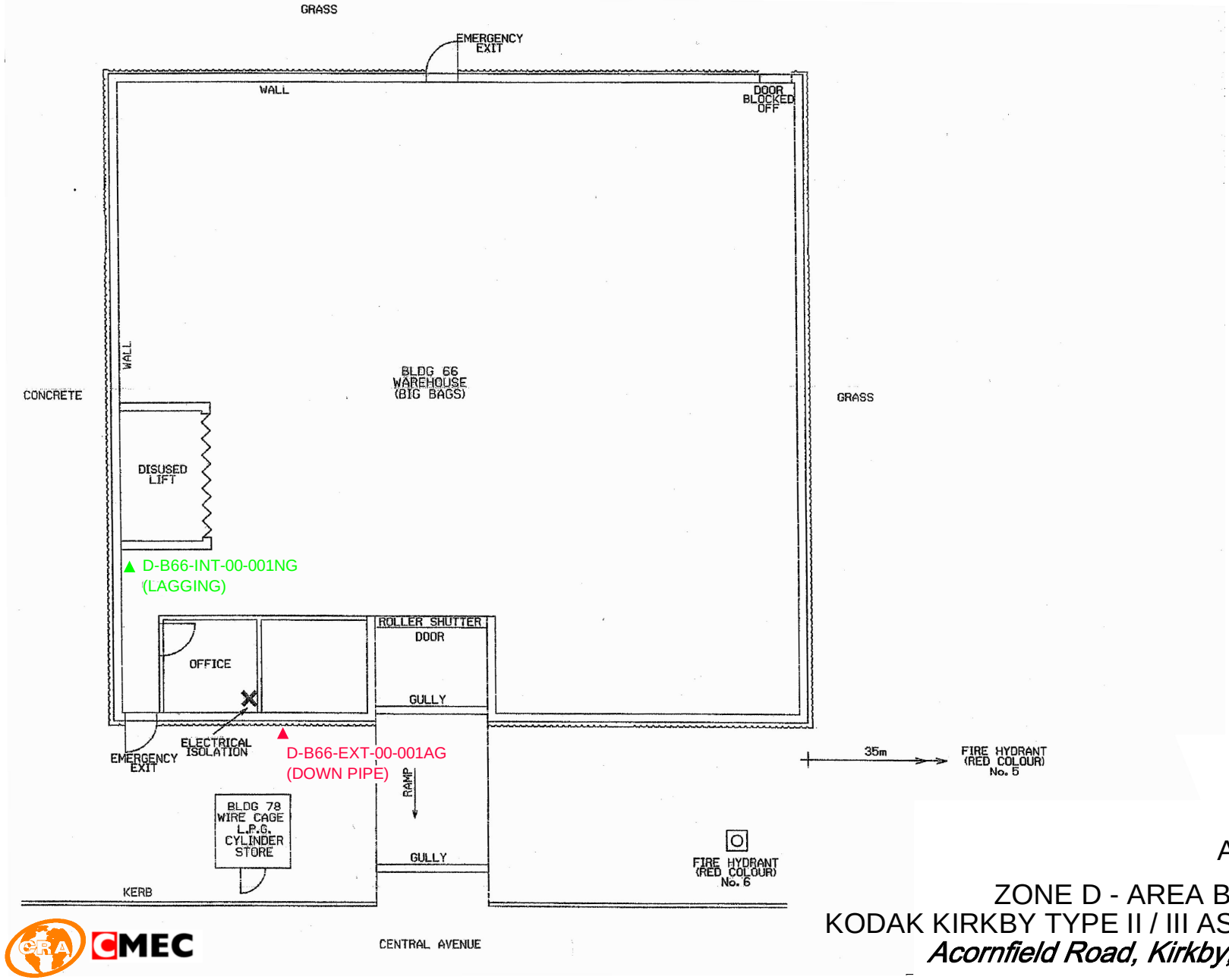
ZONE D - AREA B45/46 (FUEL OIL TANKS AND BOILER HOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



Appendix D Figure 4

ZONE D - AREA B56 (BAR/K.R.S. BUILDING)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

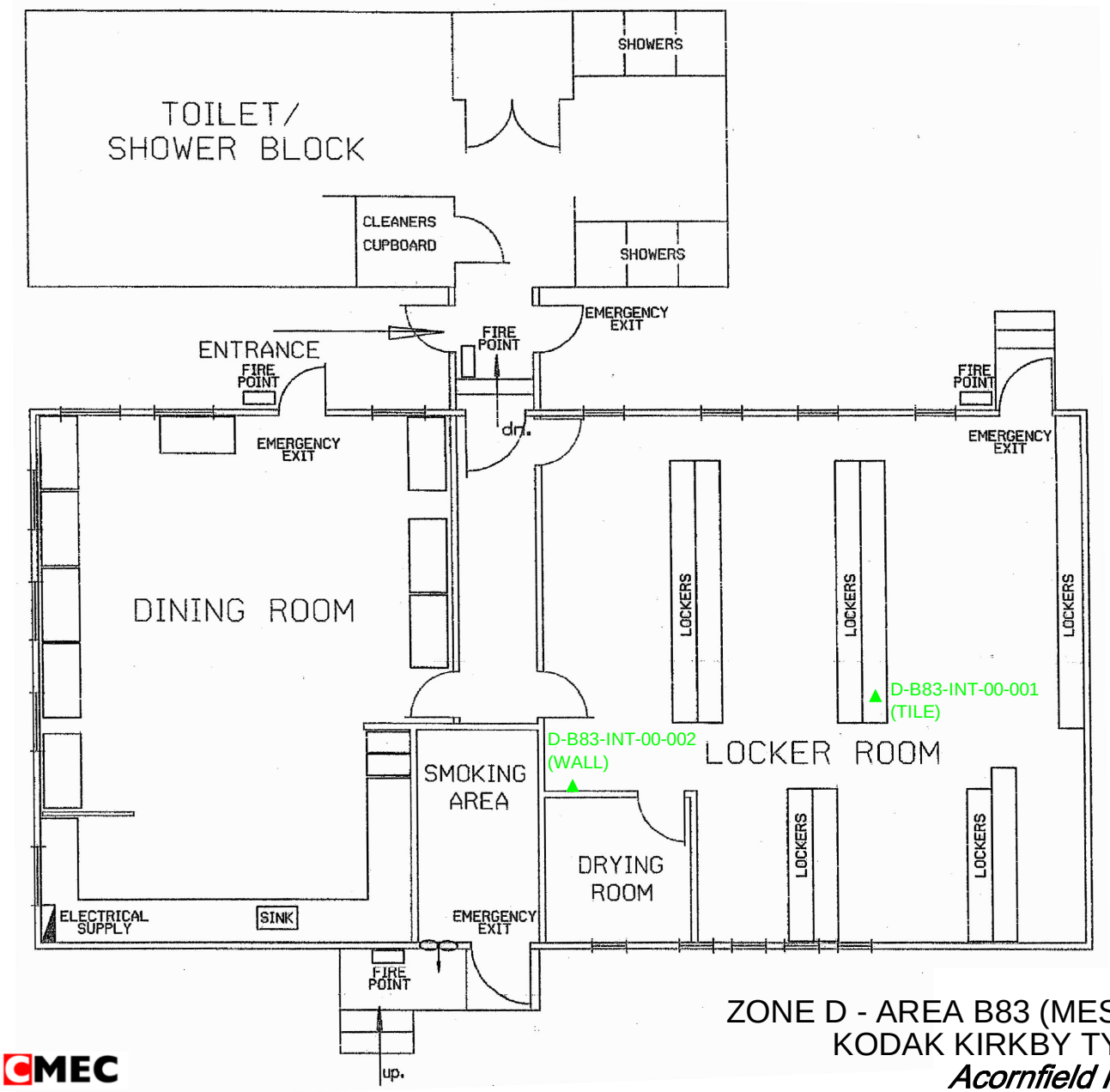
- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix D Figure 5

ZONE D - AREA B66 (WAREHOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

933389-00(001)GN-WA010 FEB 14/2007



N.T.S.

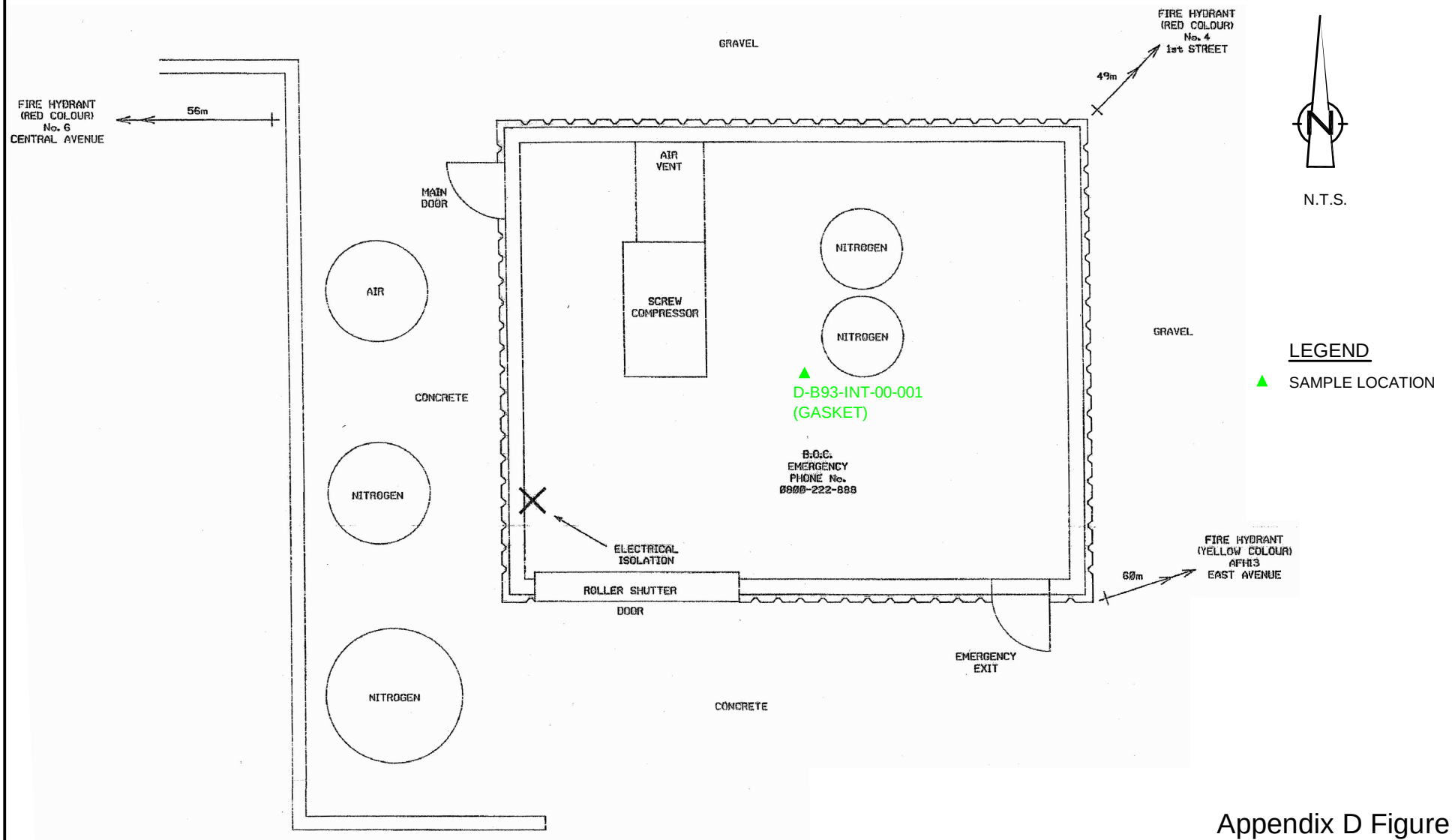
LEGEND

▲ SAMPLE LOCATION

Appendix D Figure 6

ZONE D - AREA B83 (MESSROOM AND TOILET BLOCK)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



Appendix D Figure 7

ZONE D - AREA B93 (NITROGEN GENERATION PLANT)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX E

ZONE E
SAMPLE LOCATIONS

BUILDING 43

SAMPLE ID: E-B43-INT-00-001	**DATE SAMPLED:** 12/01/2007
BUILDING: 43 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: ROPE GLAZING AROUND NORTHERN LIGHTS	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : ALL NORTHERN LIGHTS (4 SETS)	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

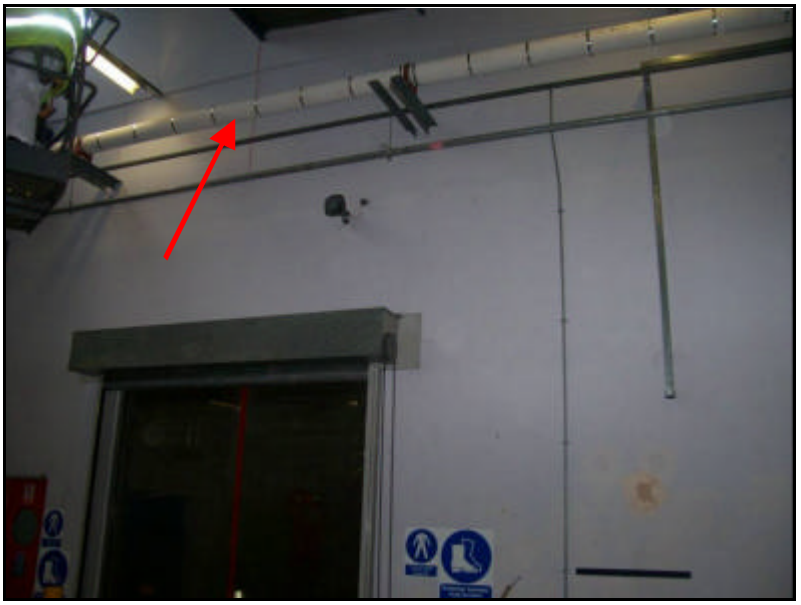
COMMENTS : Four sets of northern lights (sky lights) run across the full length of the warehouse. The rope used as glazing on windows of this age often contains asbestos. This was not picked up on the Type II asbestos survey performed on 2 Dec 2003.

SAMPLE ID: E-B43-INT-00-002 AND E-B43-INT-00-003	**DATE SAMPLED:** 12/01/2007
BUILDING: 43 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/WESTERN WALL
SAMPLE DESCRIPTION: PIPE SCRAPING FROM OLD PIPE ALONG WALL	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH METAL CASING	**CONDITION:** FAIR
QUANTITY: 80 LINEAR M (4 PIPES)	**ASBESTOS TYPE SUSPECTED:** LAGGING RESIDUE

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : A sample of suspected asbestos residue was taken to ensure that the pipes had been cleaned thoroughly before being covered with non-asbestos containing lagging. The pipe is along the western wall of the warehouse above the roller shutter door.

SAMPLE ID: E-B43-INT-00-004	**DATE SAMPLED:** 12/01/2007
BUILDING: 43 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/EASTERN WALL
SAMPLE DESCRIPTION: PIPE SCRAPING FROM PIPE ABOVE MIDDLE ROLLER DOOR	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH CLOTH CASING	**CONDITION:** FAIR
QUANTITY: 20 LINEAR M	**ASBESTOS TYPE SUSPECTED:** LAGGING RESIDUE



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : A sample of suspected asbestos residue was taken to ensure that the pipes had been cleaned thoroughly before being covered with non-asbestos containing lagging. The pipe is along the western wall of the warehouse above the roller shutter door.

SAMPLE ID: E-43-INT-00-073PT	**DATE SAMPLED:** 12/01/07
BUILDING: B43	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CLEANER CUPBOARD, DISABLED TOILET, SHOWERS, MALE CHANGING, MALE TOILETS, CORRIDOR FROM MAIN ENTRANCE TO ROLLER DOOR AREA
PRODUCT DESCRIPTION: GREEN LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 200 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-43-INT-00-074PT	**DATE SAMPLED:** 12/01/07
BUILDING: 43	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LADIES TOILETS, LADIES CHANGING
PRODUCT DESCRIPTION: RED LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 40 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-43-INT-00-075PT	**DATE SAMPLED:** 12/01/07
BUILDING: 43	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / SMOKER'S ROOM, BREAK ROOM
PRODUCT DESCRIPTION: GREY FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-43-INT-00-076PT	**DATE SAMPLED:** 12/01/07
BUILDING: 43	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / KITCHEN
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** POOR
QUANTITY: 16 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-B43-EXT-001	**DATE SAMPLED:** 23/01/2007
BUILDING: 43 (WAREHOUSE)	**FLOOR/ROOM No/LOCATION:** ROOF / SW CORNER
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 3000 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 48

SAMPLE ID: E-B48-EXT-001AG	**DATE SAMPLED:** 10/01/2007
BUILDING: 48 (SUB STATION)	**FLOOR/ROOM No/LOCATION:** ROOF
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 36 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 55

SAMPLE ID: E-B55-EXT-001	**DATE SAMPLED:** 23/01/2007
BUILDING: 55 (TONER UTILITIES PLANT)	**FLOOR/ROOM No/LOCATION:** ROOF / NW CORNER
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 44 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 74

SAMPLE ID: E-74-INT-00-148PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / DEVELOPMENT LABORATORY
PRODUCT DESCRIPTION: SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-74-INT-00-149PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / DEVELOPMENT LABATORY
PRODUCT DESCRIPTION: DRAINER PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-74-INT-00-150PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / DEVELOPMENT LABATORY
PRODUCT DESCRIPTION: BLUE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 84

SAMPLE ID: E-84-INT-00-144PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / SWITCH ROOM
PRODUCT DESCRIPTION: CEILING PANELS	
SURFACE TREATMENT: UJNSEALED	**CONDITION:** FAIR
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-84-EXT-00-145PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / SWITCH ROOM
PRODUCT DESCRIPTION: LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-84-INT-00-146PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / STORE
PRODUCT DESCRIPTION: LOOSE BOARD	
SURFACE TREATMENT: UJNSEALED	**CONDITION:** FAIR
QUANTITY: 1 m^2	

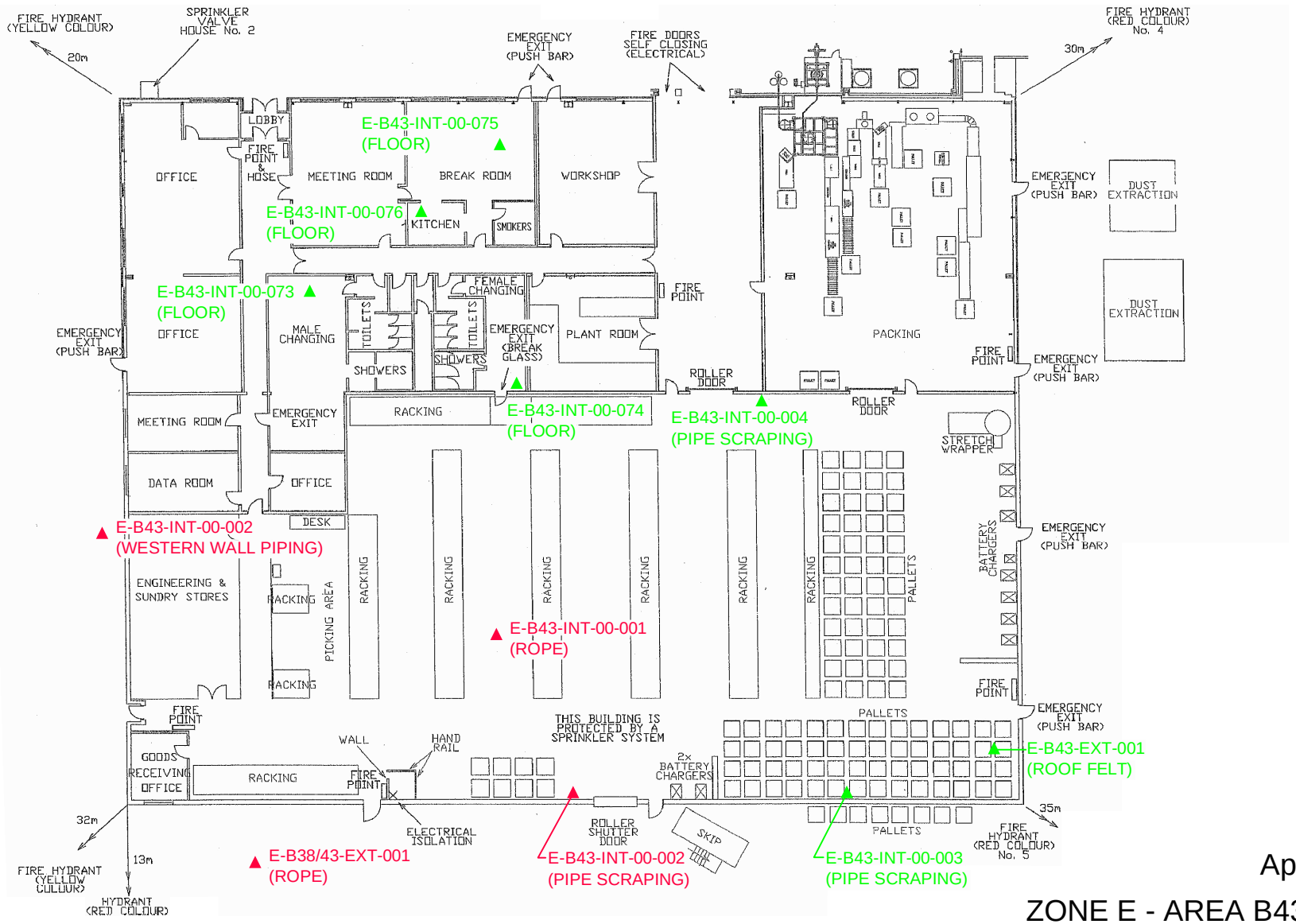
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: E-84-EXT-00-147PT	**DATE SAMPLED:** 18/01/2007
BUILDING: 84	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / STORE
PRODUCT DESCRIPTION: ROOF LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



N.T.S.

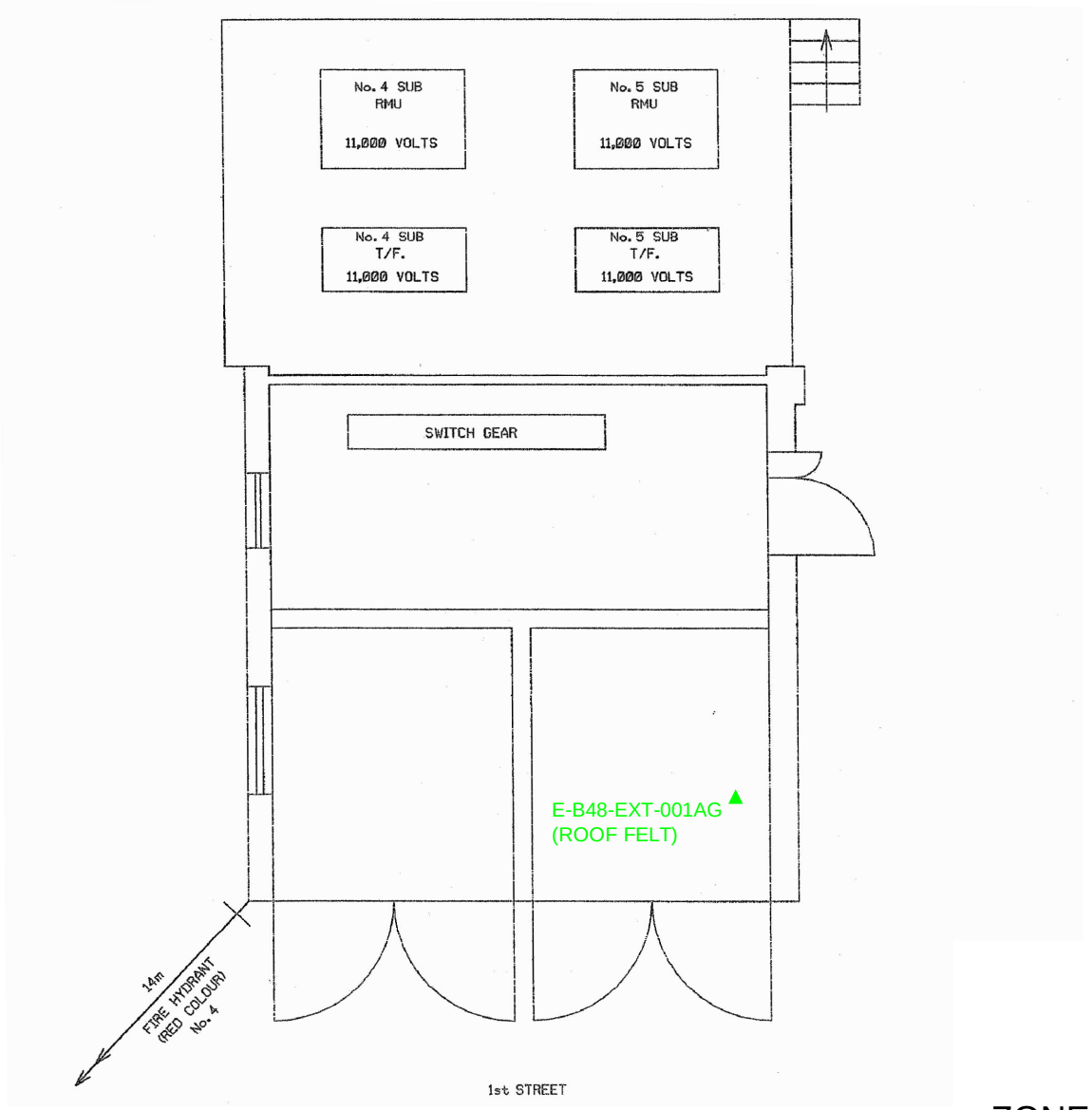
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix E Figure 1

ZONE E - AREA B43 (WAREHOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



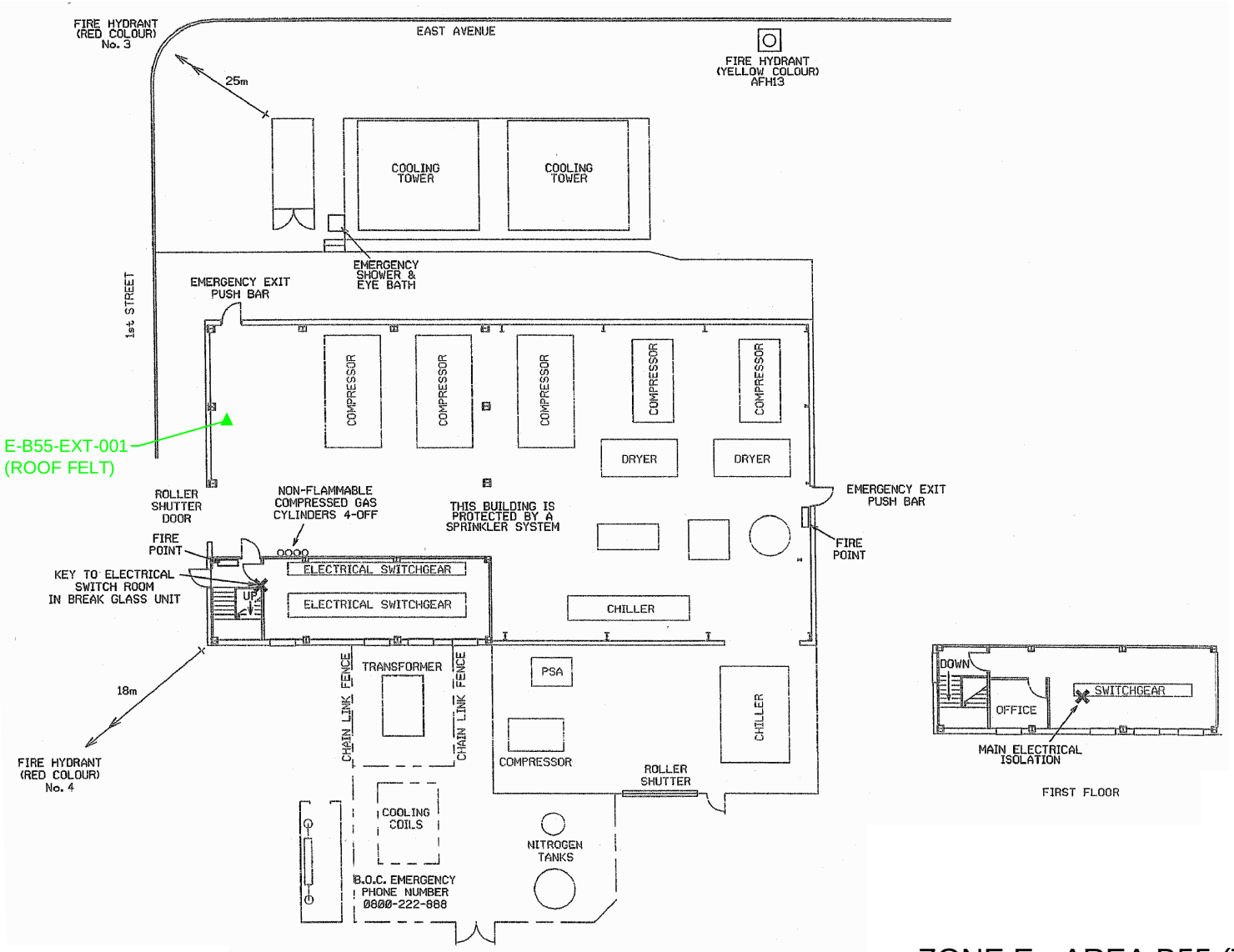
N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix E Figure 2

ZONE E - AREA B48 (PALLET STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



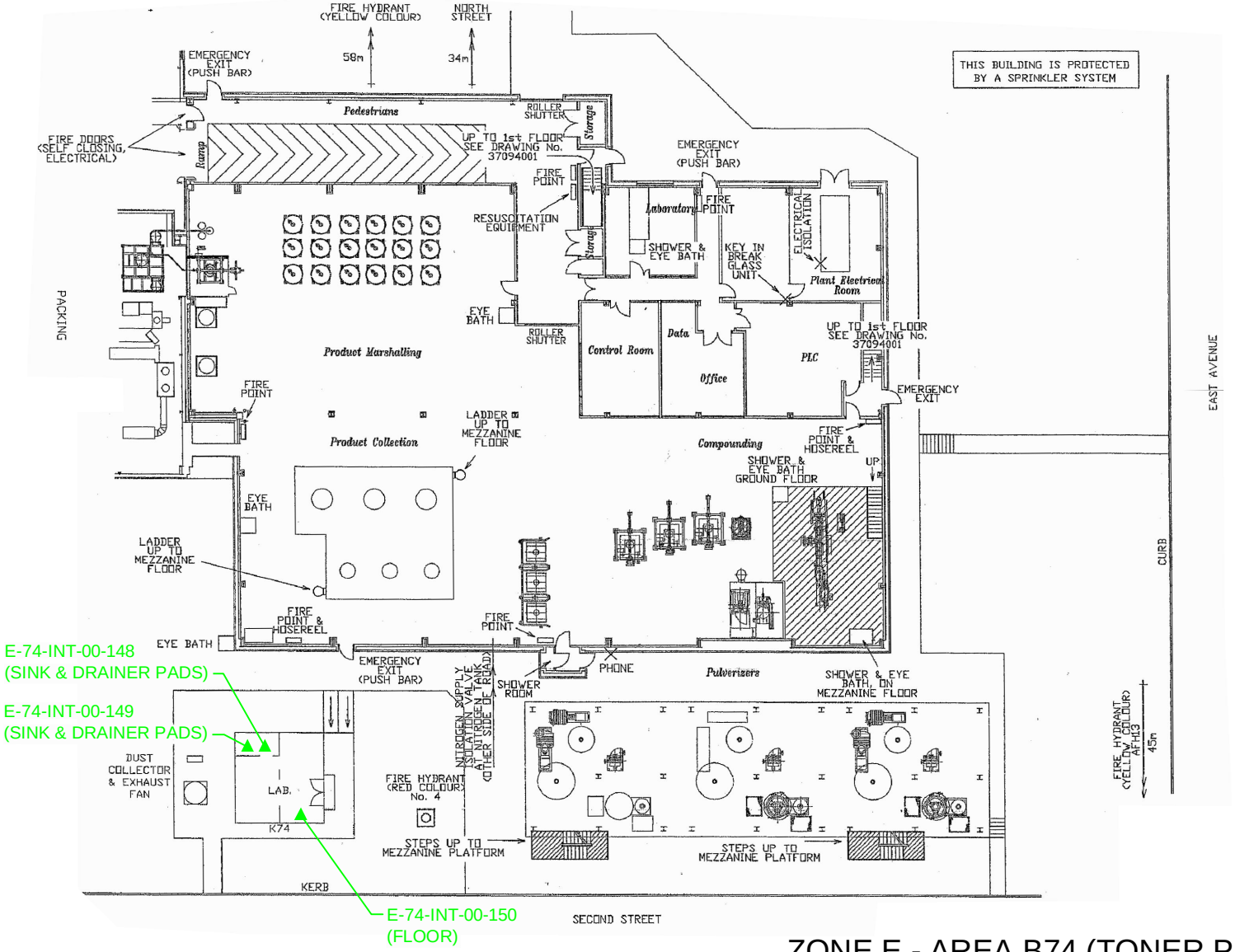
N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix E Figure 3

ZONE E - AREA B55 (TONER UTILITIES PLANT
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



N.T.S.

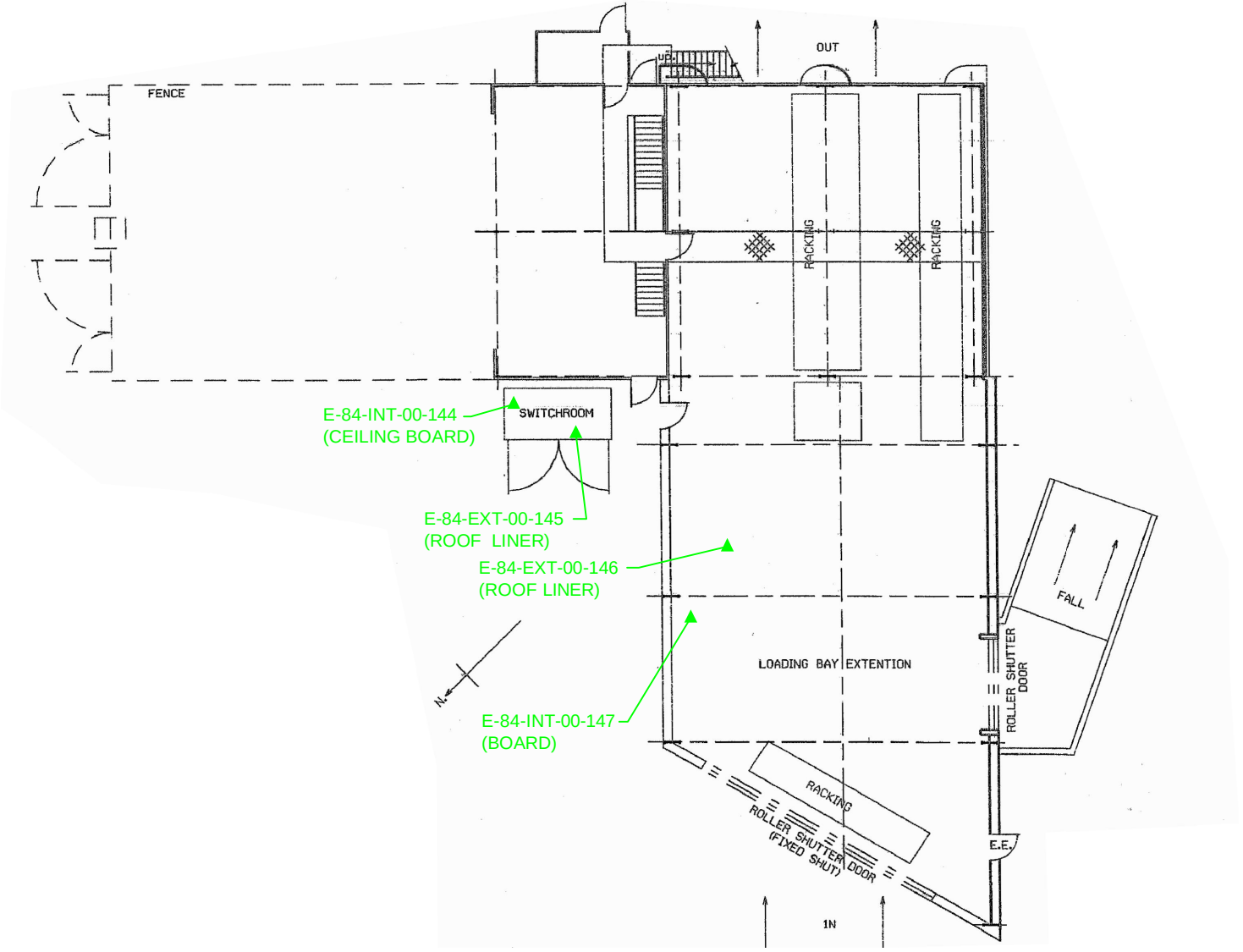
LEGEND

▲ SAMPLE LOCATION

Appendix E Figure 4

ZONE E - AREA B74 (TONER PLANT - GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



Appendix E Figure 5

ZONE E - AREA B84 (TONER STORAGE AEA - GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX F1

ZONE F1
SAMPLE LOCATIONS

BUILDING 8
GROUND FLOOR

SAMPLE ID: F1-B8-INT-00-001NG	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / EAST STAIR
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 12m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-INT-00-002NG	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /EAST STAIR
SAMPLE DESCRIPTION: WHITE WALL BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 16m^2	

ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-INT-00-003NG	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /EAST STAIR
SAMPLE DESCRIPTION: BLACK STAIR NOSINGS	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 20 NOSINGS	**ASBESTOS TYPE SUSPECTED:** FLOOR TILE

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-B8-INT-00-004NG	**DATE SAMPLED:** 16/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /PLANT ROOM
SAMPLE DESCRIPTION: RESIDUE ON PIPE	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH FOIL CASING	**CONDITION:** GOOD
QUANTITY: 12 LINEAR M	

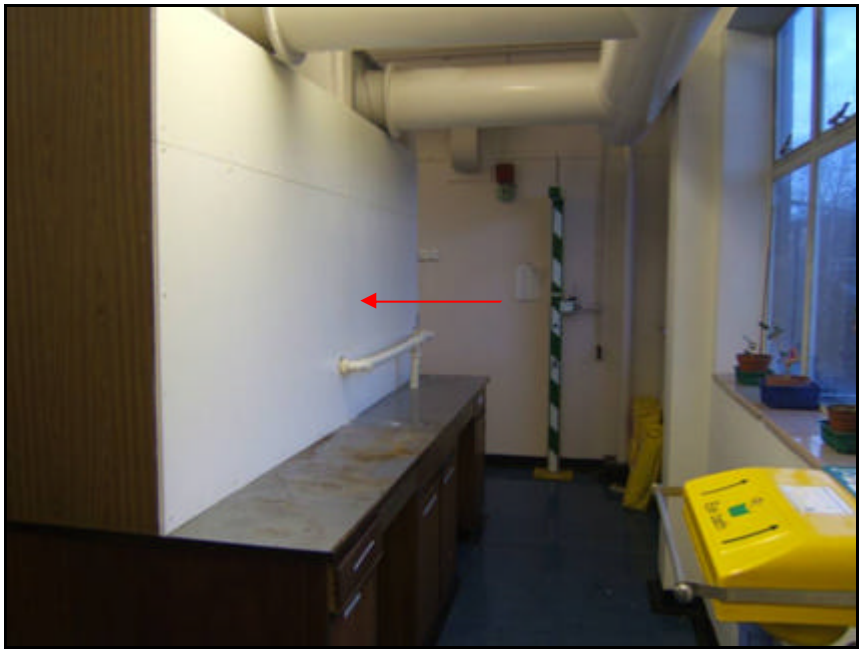
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 8

FIRST FLOOR

SAMPLE ID: F1-B8-INT-01-001	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 38 LABORATORY	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /NORTHEAST CORNER
SAMPLE DESCRIPTION: WHITE WALL BOARD ON BACK OF FUME CUPBOARDS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

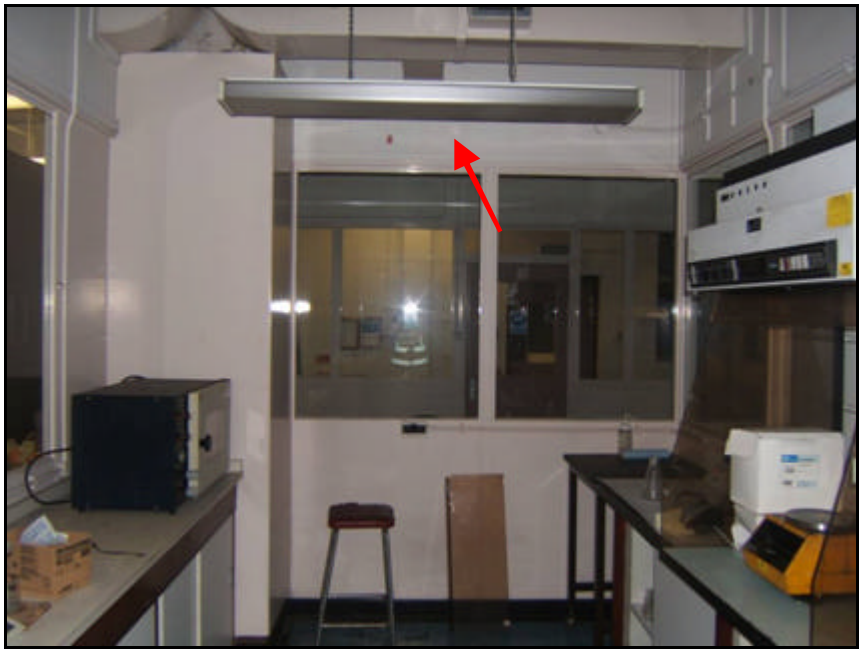
COMMENTS: NONE

SAMPLE ID: F1-B8-INT-01-002	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) / MEETING & WEIGH ROOMS
SAMPLE DESCRIPTION: OUTSIDE WHITE WALL BOARD AROUND TOP OF ROOMS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 30m^2	

ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: ASBESTOS STICKER PRESENT.

SAMPLE ID: F1-B8-INT-01-003	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /MEETING & WEIGH ROOMS
SAMPLE DESCRIPTION: INSIDE WHITE WALL BOARD AROUND TOP OF ROOMS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 48m^2	



ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

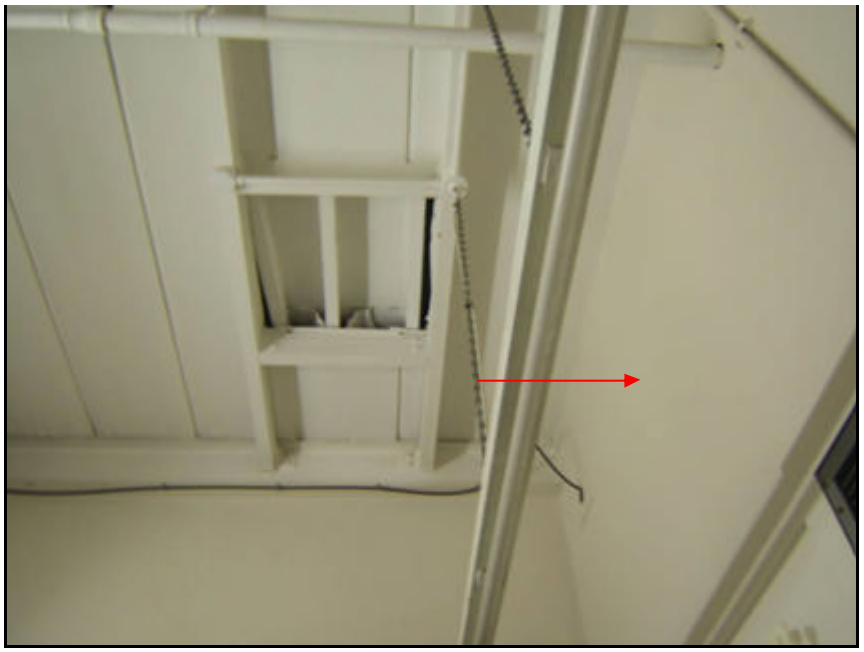
COMMENTS: NONE

SAMPLE ID: F1-B8-INT-01-004	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /CHROMATOGRAPHY LAB
SAMPLE DESCRIPTION: WHITE WALL BOARD AROUND TOP OF ROOM INTERIOR & EXTERIOR	
SURFACE TREATMENT: PAINTED PEACH	**CONDITION:** GOOD
QUANTITY: 28m^2	

ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

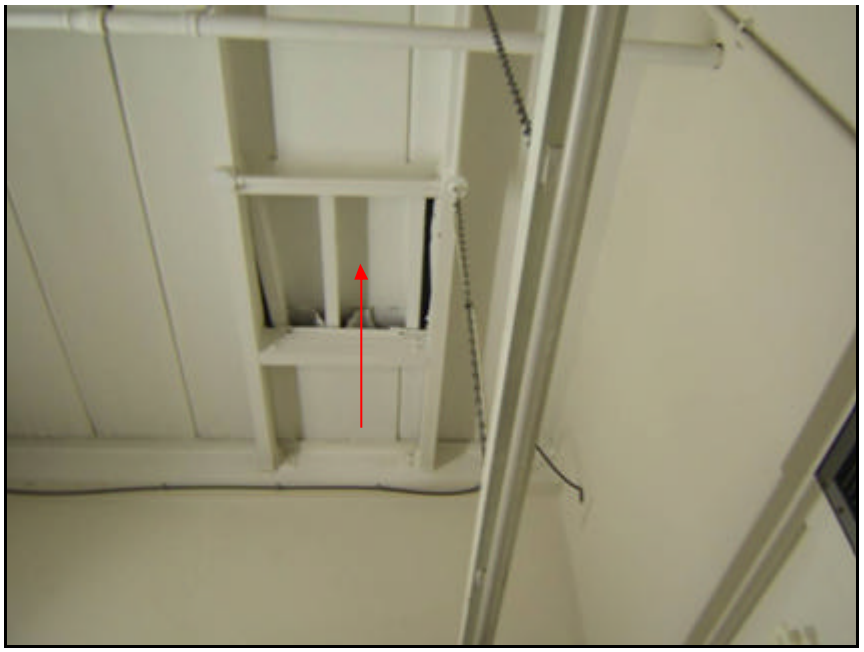
SAMPLE ID: F1-B8-INT-01-005	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /NORTHEAST STORE ROOM
SAMPLE DESCRIPTION: WHITE WALL BOARD AROUND TOP OF ROOM (INTERIOR & EXTERIOR)	
SURFACE TREATMENT: PAINTED PEACH	**CONDITION:** GOOD
QUANTITY: 28m^2	



ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-INT-01-006	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** 00 (FIRST FLOOR)
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 162m^2	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 8

ROOF

SAMPLE ID: F1-B8-INT-ROOF-001	**DATE SAMPLED:** 16/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** ROOF/ PLANT ROOM
SAMPLE DESCRIPTION: CEMENT CEILING BOARD	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-EXT-ROOF-001	**DATE SAMPLED:** 16/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** ROOF
SAMPLE DESCRIPTION: PIPE RESIDUE	
SURFACE TREATMENT: FIBREGLASS LAGGING	**CONDITION:** GOOD
QUANTITY: 24 LINEAR METRE	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-EXT-ROOF-FELT	**DATE SAMPLED:** 16/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** ROOF
SAMPLE DESCRIPTION: BLACK ROOFING FELT	
SURFACE TREATMENT: TAR AND GRAVEL	**CONDITION:** GOOD
QUANTITY: 162 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B8-EXT-001NG	**DATE SAMPLED:** 23/01/2007
BUILDING: NO. 8 LABORATORY	**FLOOR/ROOM No/LOCATION:** EXTERIOR WINDOW CAULKING
SAMPLE DESCRIPTION: WINDOW CAULKING	
SURFACE TREATMENT: NONE	**CONDITION:** FAIR
QUANTITY:	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILD ING 9

GROUND FLOOR

SAMPLE ID: F1-B9-INT-00-001	**DATE SAMPLED:** 15/01/2007
BUILDING: 9 (LAUNDRY)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)
SAMPLE DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 66m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The sample was taken from the back porch (2m^2). The ceiling in the main drying room (64m^2) is visibly of similar material and remained inaccessible because of its height.

BUILDING 9

EXTERIOR

SAMPLE ID: F1-B9-EXT-00-001	**DATE SAMPLED:** 15/01/2007
BUILDING: 9 (LAUNDRY)	**FLOOR/ROOM No/LOCATION:** EXTERIOR FLAT ROOF
SAMPLE DESCRIPTION: FELT ROOFING MATERIAL	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 120 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

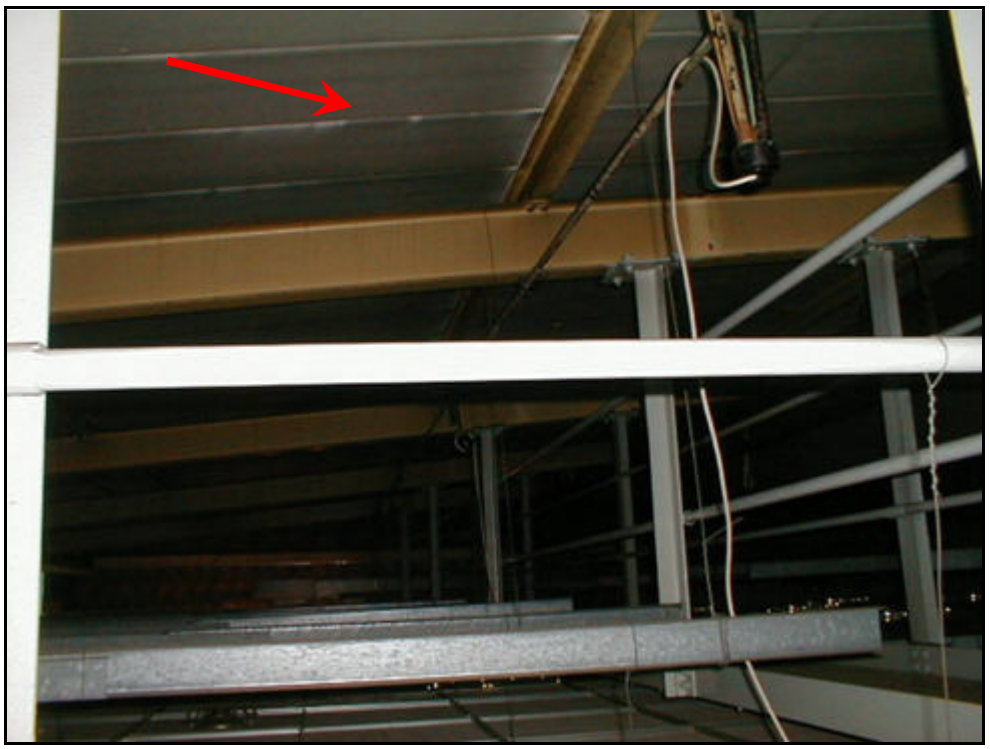
COMMENTS: NONE

SAMPLE ID: F1-B9-EXTERIOR-00-002	**DATE SAMPLED:** 15/01/2007
BUILDING: 9 (LAUNDRY)	**FLOOR/ROOM No/LOCATION:** EXTERIOR SLOPED ROOF
SAMPLE DESCRIPTION: FELT ROOFING MATERIAL	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 60 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-055PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / ALL ROOMS
PRODUCT DESCRIPTION: CEILING PANELS	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 400 m^2	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-056PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / MAIN ENTRANCE & EATING AREA
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

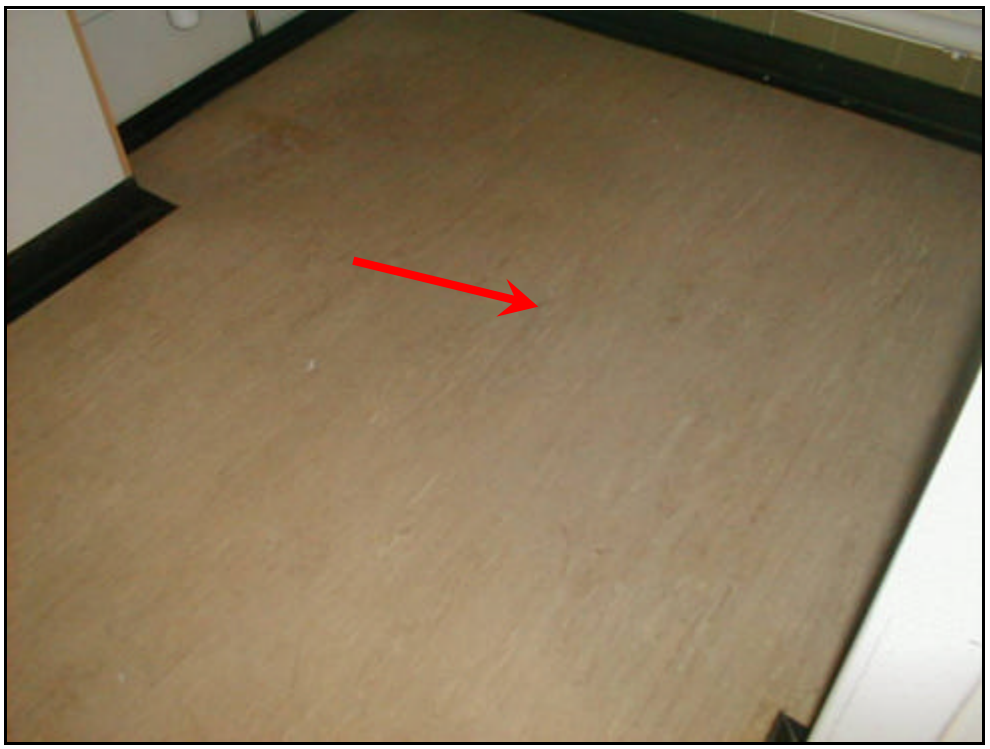
COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-057PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / GENTS 7 MAIN ENTRANCE & KITCHEN RHS ENTRANCE
PRODUCT DESCRIPTION: BLACK EDGING TO BOTTOM OF WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 100 Linear metres	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-058PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / GENTS
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-059PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / LADIES
PRODUCT DESCRIPTION: FLUE PIPE ABOVE INCINERATOR	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-060PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / LADIES
PRODUCT DESCRIPTION: LINER INSIDE INCINERATOR	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED AMOSITE & CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-061PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / STORE
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-062PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: PINK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 50 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-20-INT-00-063PT	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: BLUE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

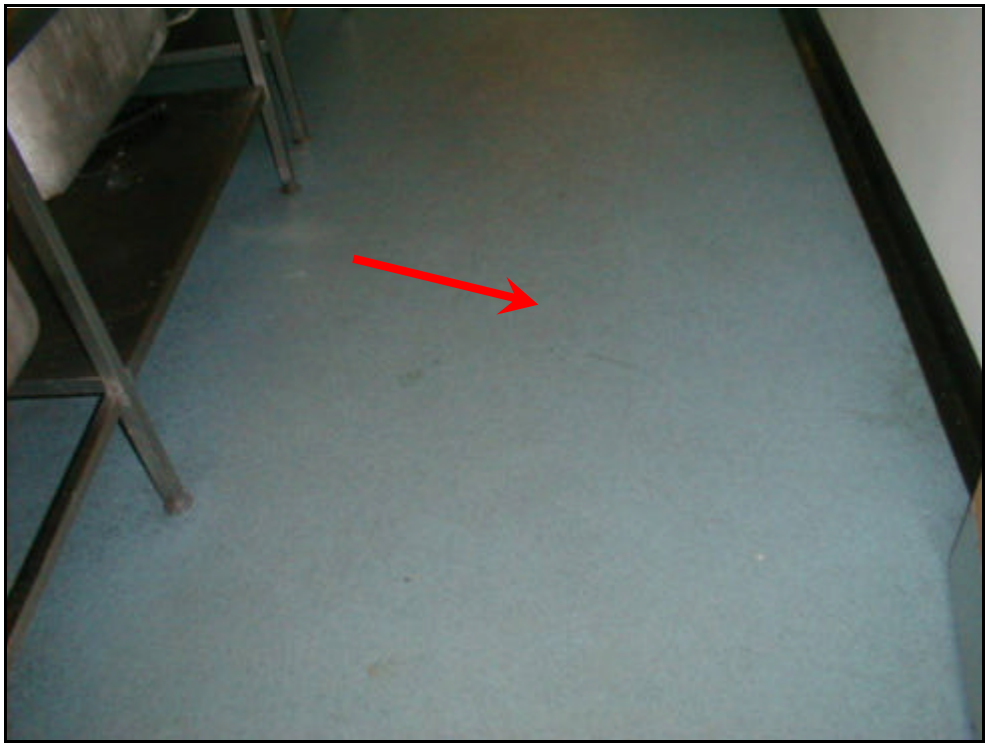
COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-064PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / EATING AREA
PRODUCT DESCRIPTION: GREEN SPARKLY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-065PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: GREEN SPARKLY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 20 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-066PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: SINK PAD	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: <1 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-067PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: WOVEN SEAL TO BLODGETT OVEN DOOR	
SURFACE TREATMENT: UNSEALED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-068PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 10 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-069PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BEIGE LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 3 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-070PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: PINK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-071PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / KITCHEN
PRODUCT DESCRIPTION: BOXING ABOVE DOORS	
SURFACE TREATMENT: PAINTED	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-20-INT-00-072PT	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 20	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / CANTEEN / BUFFET ROOM & STORE
PRODUCT DESCRIPTION: GREEN VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** GOOD
QUANTITY: 100 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 21

EXTERIOR

SAMPLE ID: F1- B21-EXT-001	**DATE SAMPLED:** 24/01/2007
BUILDING: B21 (ENGINNEERS STORE)	**FLOOR/ROOM No/LOCATION:** --
PRODUCT DESCRIPTION: WINDOW CAULKING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY:	

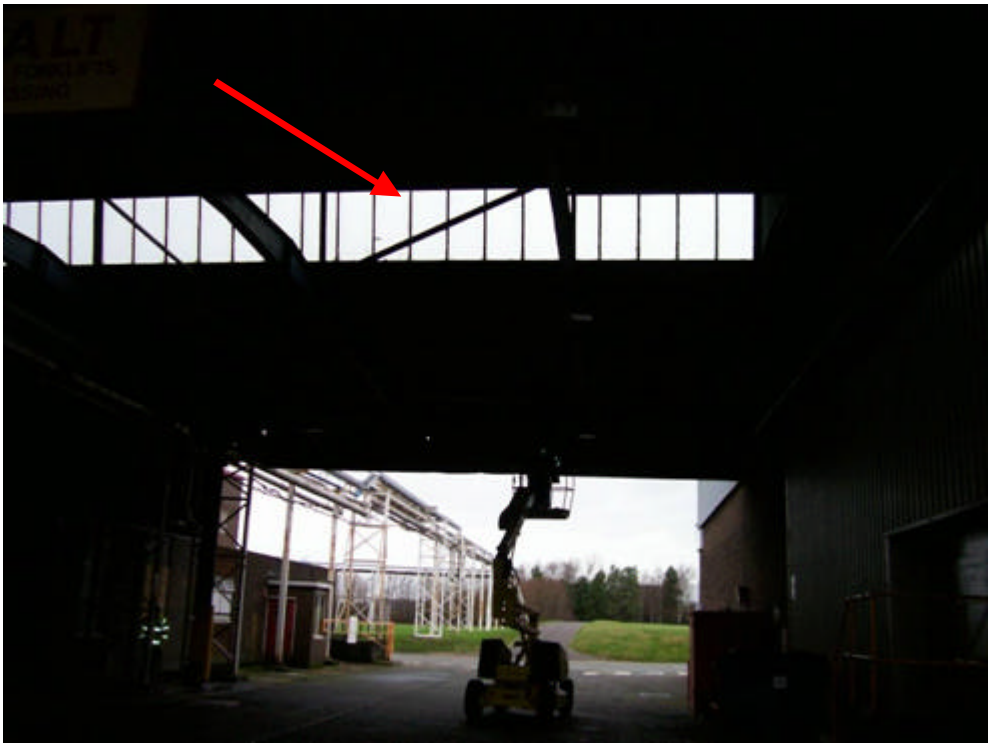
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 38/43 CANOPY

EXTERIOR

SAMPLE ID: E-B38/43-EXT-001	**DATE SAMPLED:** 12/01/2007
BUILDING: CANOPY BETWEEN B38 AND B43	**FLOOR/ROOM No/LOCATION:** --
PRODUCT DESCRIPTION: ROPE GLAZING AROUND NORTHERN LIGHTS	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: ALL NORTHERN LIGHTS (2 SETS)	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The northern lights (sky lights) run throughout. The rope used as glazing on windows of this age often contains asbestos. This was not picked up on the Type II asbestos survey performed on 2 Dec 2003.

BUILDING 38

GROUND FLOOR

SAMPLE ID: F1-B38-INT-00-001NG AND F1-B38-INT-00-007NG	**DATE SAMPLED:** 09/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /CEILING IN S WAREHOUSE
SAMPLE DESCRIP TION: SPRAY INSULATION (LIMPET)	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** FAIR
QUANTITY: 975 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The spray was present on beams and the ceiling itself. This sample is from the southern area of the warehouse in a location near sample F1-B38-INT-00-007NG.

SAMPLE ID: F1-B38-INT-00-002NG	**DATE SAMPLED:** 09/01/2007
BUILDING: NO. 38 SOUTHWEST CONFERENCE ROOM	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /SW CORNER
SAMPLE DESCRIPTION: GREY FLOOR TILE	
SURFACE TREATMENT: COVERED WITH CARPET	**CONDITION:** GOOD
QUANTITY: 72 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:

SAMPLE ID: F1-B38-INT-00-003NG	**DATE SAMPLED:** 09/01/2007
BUILDING: NO. 38 RECEPTION	**FLOOR/ROOM No/LOCATION:** GROUND FLOOR /MAINTENANCE WORKSHOP
SAMPLE DESCRIPTION: GREY FLOOR TILE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 12 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-B38-INT-00-004NG	**DATE SAMPLED:** 09/01/2007
BUILDING: NO. 38 RECEPTION	**FLOOR/ROOM No/LOCATION:** GROUND FLOOR / RECEPTION CUPBOARD
SAMPLE DES CRIPTION: GREY FLOOR TILE IN CUPBOARD UNDER STAIRS	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-005NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WOMEN'S TOILET
SAMPLE DESCRIPTION: WHITE CEILING BOARD IN CUPBOARD UNDER STAIRS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

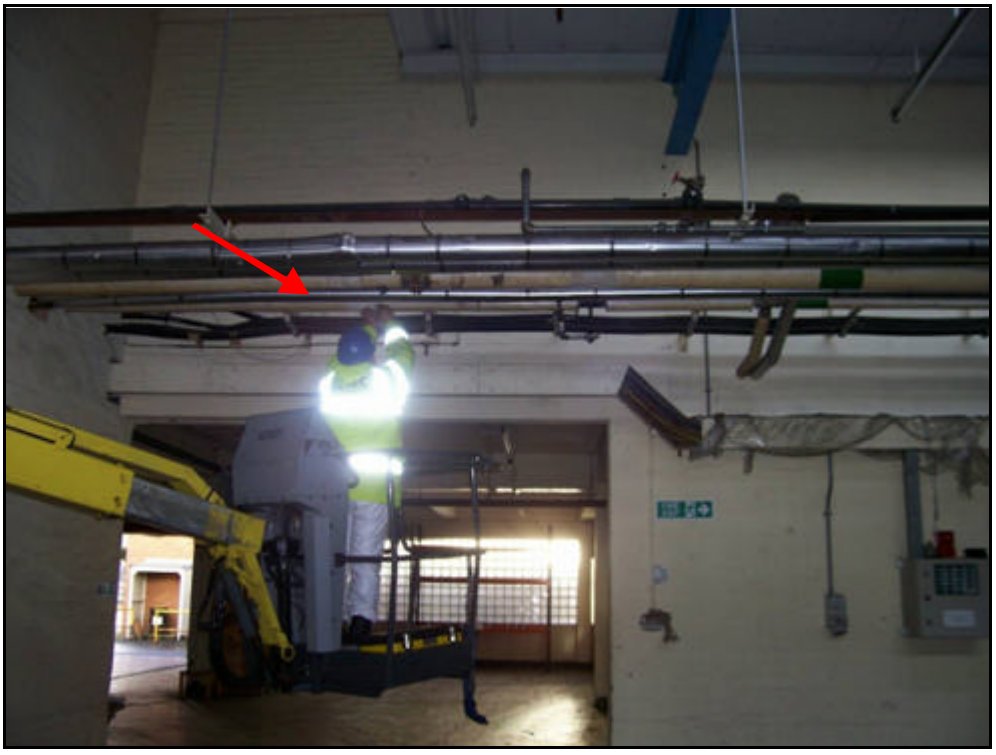
COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-006NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WOMEN'S TOILET
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 440 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-B38-INT-00-008NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** GROUND FLOOR /SOUTH END OF WAREHOUSE
SAMPLE DESCRIPTION: LAGGING	
SURFACE TREATMENT: COVERED IN WHITE PAPER **QUANTITY:** 40 linear m	**CONDITION:** GOOD



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-009NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** GROUND FLOOR /SOUTH END OF WAREHOUSE
SAMPLE DESCRIPTION: LAGGING	
SURFACE TREATMENT: COVERED IN WHITE PAPER	**CONDITION:** GOOD
QUANTITY: 40 linear m	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:

SAMPLE ID: F1-B38-INT-00-010NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /CALORIFIER ROOM
SAMPLE DESCRIPTION: RESIDUE ON PIPE ELBOW	
SURFACE TREATMENT: COVERED IN FIBREGLASS LAGGING	**CONDITION:** POOR
QUANTITY: $10m^2$	

<<No Photograph>>

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-011NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /NE SIDE OF PLANT ROOM
SAMPLE DESCRIPTION: RESIDUE ON PIPE ELBOW	
SURFACE TREATMENT: COVERED IN FIBREGLASS LAGGING	**CONDITION:** POOR
QUANTITY:	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-012NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /LABEL BENCH AREA
SAMPLE DESCRIPTION: GREEN WALL BOARD	
SURFACE TREATMENT: PAINTED GREEN	**CONDITION:** GOOD
QUANTITY: 125 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:
The sampled board was sparkling and is suspected Supalux.

SAMPLE ID: F1-B38-INT-00-013NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /NORTHERN LIGHTS
SAMPLE DESCRIPTION: WAXY YELLOWISH ROPE USED FOR WINDOW GLAZING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: ALL NORTHERN LIGHTS	

<< No photograph>>

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The northern lights (sky lights) run throughout the warehouse. The rope used as glazing on windows of this age often contains asbestos. This was not picked up on the Type II asbestos survey performed on 17 June 2003.

SAMPLE ID: F1-B38-INT-00-014NG	**DATE SAMPLED:** 12/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WAREHOUSE CEILING
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4065 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The white board ceiling runs throughout the warehouse area with exception of the large concrete ceiling area on the southern side of building 38 and the metal ceiling on the northwestern receiving area.

SAMPLE ID: F1-B38-INT-00-015NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /OUTSIDE CANTEEN
SAMPLE DESCRIPTION: WHITE WALL BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 24 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The white board wall runs along the exterior of the canteen wall on the first floor of the warehouse area. Fascia boards running along the bottom of this wall and an alcove ceiling beneath this area have been sampled (F1-B38-INT-00-0016NG (fascia) and F1-B38-INT-00-0017NG (alcove ceiling)).

SAMPLE ID: F1-B38-INT-00-016NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /OUTSIDE CANTEEN
SAMPLE DESCRIPTION: WHITE FASCIA BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 3 m^2	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

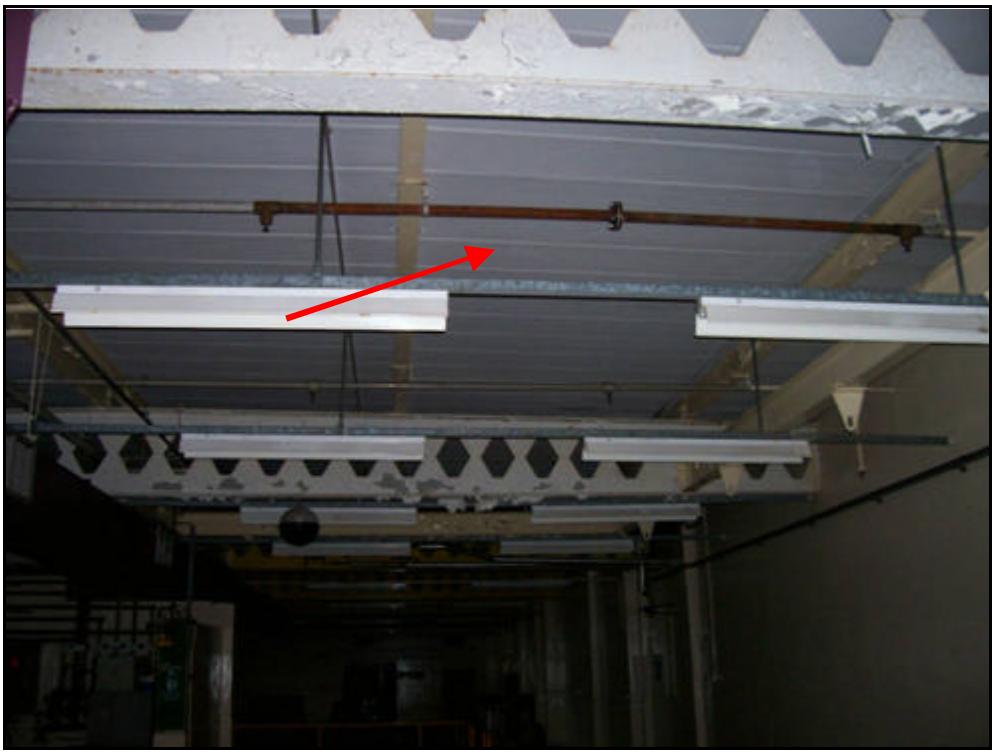
COMMENTS: The white fascia board runs along the exterior of the canteen wall on the first floor of the warehouse area. Wall boards running along this wall and an alcove ceiling beneath this area have been sampled (F1-B38-INT-00-0016NG (wall) and F1-B38-INT-00-0017NG (alcove ceiling).

SAMPLE ID: F1-B38-INT-00-017NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /ALCOVE UNDER CANTEEN
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:
The white ceiling board is in an alcove under the first floor canteen. Wall boards running along this wall and fascia board have been sampled (F1-B38-INT-00-0015NG (fascia) and F1-B38-INT-00-0016NG (wall)).

SAMPLE ID: F1-B38-INT-00-018NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WAREHOUSE CEILING
SAMPLE DESCRIPTION: WHITE CEILING BOARDS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 243.75 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:

1) 2.5m X length of building
2) 2.5m X half length of building

SAMPLE ID: F1-B38-INT-00-019NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WAREHOUSE CEILING
SAMPLE DESCRIPTION: WHITE CEMENT BOARD PANELLING	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4065 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-020NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WAREHOUSE CEILING
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4065 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-021NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /WAREHOUSE CEILING
SAMPLE DESCRIPTION: WHITE CEMENT BOARD PANELLING	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 4065 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-00-022NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /SERVICE DUCT
SAMPLE DESCRIPTION: PIPE RESIDUE AND LAGGING	
SURFACE TREATMENT: COVERED IN PAPER	**CONDITION:** GOOD
QUANTITY:	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:
Pipes were accessed from the ground floor; the pipes were sampled between the first and second floors.The sampled pipes bore ‘asbestos present’ stickers from a previous survey, but were not recorded in the survey from 17 June 2003.

SAMPLE ID: F1-B38-INT-00-023NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /SERVICE DUCT
SAMPLE DESCRIPTION: PIPE RESIDUE AND LAGGING	
SURFACE TREATMENT: COVERED IN PAPER	**CONDITION:** GOOD
QUANTITY:	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS:
Pipes were accessed from the ground floor; the pipes were sampled between the first and second floors. The sampled pipes bore ‘asbestos present’ stickers from a previous survey, but were not recorded in the survey from 17 June 2003.

BUILDING 38

FIRST FLOOR

SAMPLE ID: F1-B38-INT-01-001NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /WEST STORE
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 1218 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Sample was taken beneath the stairs in the store room. The white ceiling board is present throughout the first floor.

SAMPLE ID: F1-B38-INT-01-002NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /CONFERENCE ROOM
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** POOR WITH WATER DAMAGE
QUANTITY: 243 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Sample was taken beneath the stairs in the store room. The white ceiling board is present throughout the first floor.

SAMPLE ID: F1-B38-INT-01-003NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /EAST STAIR
SAMPLE DESCRIPTION: SPRAY INSULATION RESIDUE ON SUPPORT BEAMS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** POOR
QUANTITY: 198 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The sampled beam is adjacent to the stairwell. Four beams are visible in the making room that extends from the ground floor to the second floor.

BUILDING 38

SECOND FLOOR

SAMPLE ID: F1-B38-INT-02-001NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /SE STAIR
SAMPLE DESCRIPTION: WHITE CEILING BOARD IN STAIRWELL CRAWL SPACE	
SURFACE TREATMENT: PAINTED WHITE; GYPSUM BOARD COVER	**CONDITION:** POOR WITH SEVERE WATER DAMAGE
QUANTITY: 4.5 m^2	

<< No Photograph >>

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-02-002NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: GLAZING MATERIAL ON WINDOWS IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: NONE	**CONDITION:** POOR WITH SEVERE WATER DAMAGE
QUANTITY:	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: The windows are located on the northern wall of the corridor to the north of the raw material store on the second floor of building 38. All windows (7 sets of paned windows with panels about 3m high and 2m wide) had glazing that appeared the same as that sampled

SAMPLE ID: F1-B38-INT-02-003NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: PEACH WALL BOARD IN CORRIDOR NEAR SOLUTION MIXING ROOM	
SURFACE TREATMENT: PAINTED PEACH	**CONDITION:** GOOD
QUANTITY: 198 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-INT-02-004NG	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: PIPE RESIDUE IN CORRIDOR NEAR SOLUTION MIXING ROOM	
SURFACE TREATMENT: COVERED WITH FIBREGLASS LAGGING	**CONDITION:** POOR
QUANTITY: 50+ LINEAR M	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

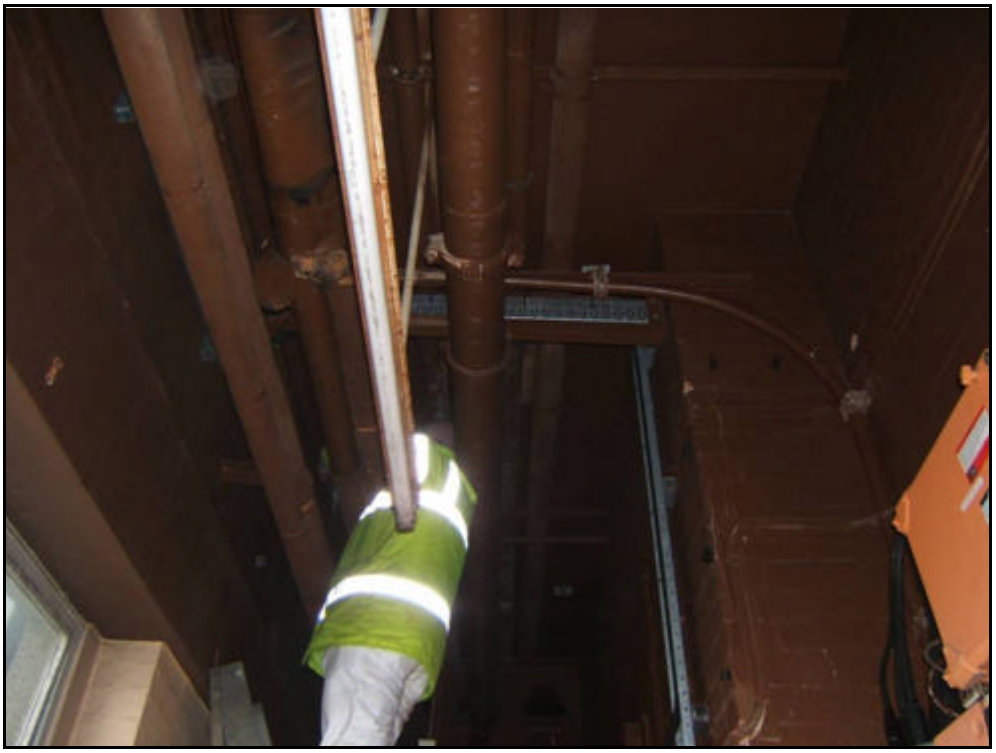
COMMENTS: This is a pipe scraping.

SAMPLE ID: F1-B38-INT-02-005NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: PIPE RESIDUE IN CORRIDOR NEAR SOLUTION MIXING ROOM	
SURFACE TREATMENT: COVERED WITH FIBREGLASS LAGGING	**CONDITION:** FAIR
QUANTITY: 50+ LINEAR M	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: This is a pipe scraping.

SAMPLE ID: F1-B38-INT-02-006NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: PIPE RESIDUE IN CORRIDOR NEAR SERVICE DUCT	
SURFACE TREATMENT: COVERED WITH FIBREGLASS LAGGING	**CONDITION:** FAIR
QUANTITY: 50+ LINEAR M	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

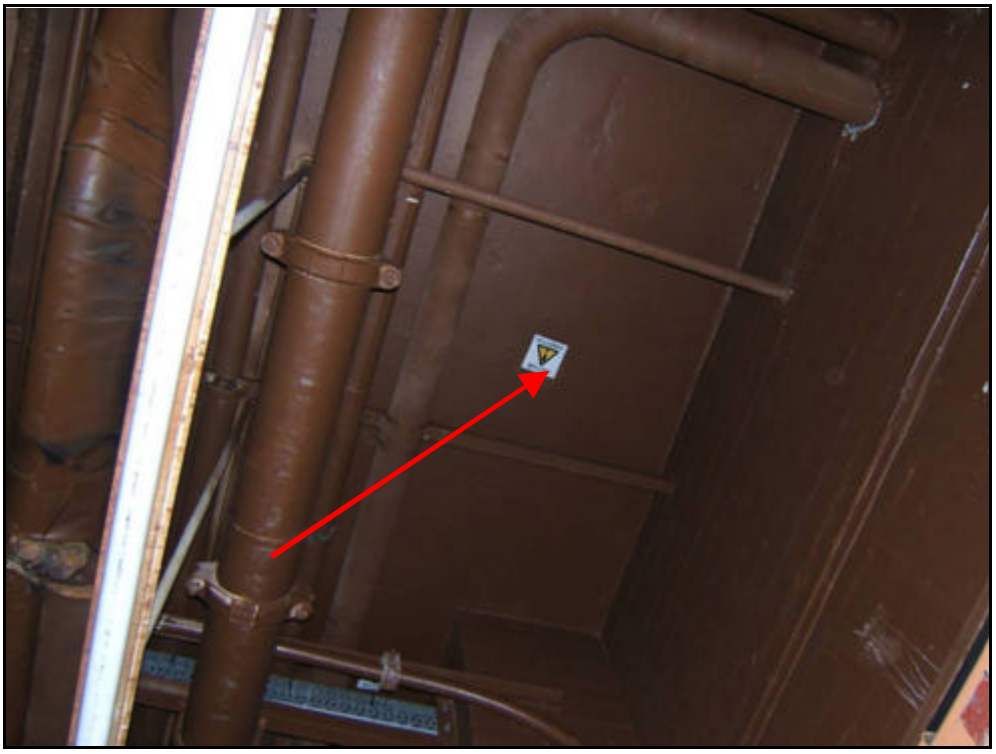
COMMENTS: This is a pipe scraping.

SAMPLE ID: F1-B38-INT-02-007NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: SPRAY INSULATION ON CEILING IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: PAINTED BROWN	**CONDITION:** FAIR
QUANTITY: 12m^2	

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: These areas were marked with asbestos stickers.

SAMPLE ID: F1-B38-INT-02-008NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: SPRAY INSULATION ON CEILING IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: PAINTED BROWN	**CONDITION:** FAIR
QUANTITY: 12m^2	



ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: These areas were marked with asbestos stickers.

SAMPLE ID: F1-B38-INT-02-009NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /NORTH CORRIDOR
SAMPLE DESCRIPTION: SPRAY INSULATION ON CEILING IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: PAINTED BROWN	**CONDITION:** FAIR
QUANTITY: 12m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: These areas were marked with asbestos stickers.

SAMPLE ID: F1-B38-INT-02-010NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/RO OM No/LOCATION:** 02 (SECOND FLOOR) /LABORATORY
SAMPLE DESCRIPTION: LIMPET SPRAY INSULATION ON CEILING IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** FAIR
QUANTITY: 495 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Approximately 1-1.5" of spray asbestos has been removed from the ceiling then encapsulated with white paint. Remaining residues were suspected in gaps between steel girders and the ceiling and between ceiling boards.

SAMPLE ID: F1-B38-INT-02-011NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /LABORATORY
SAMPLE DESCRIPTION: LIMPET SPRAY INSULATION ON CEILING IN CORRIDOR NEAR RAW MATERIAL STORE	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** FAIR
QUANTITY: 495 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Approximately 1-1.5" of spray asbestos has been removed from the ceiling then encapsulated with white paint. Remaining residues were suspected in gaps between steel girders and the ceiling and between ceiling boards.

SAMPLE ID: F1-B38-INT-02-012NG	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** 02 (SECOND FLOOR) /MISC. SECTION PLATFORM
SAMPLE DESCRIPTION: RESIDUAL LIMPET SPRAY INSULATION BETWEEN CEILING BOARDS	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** FAIR
QUANTITY: 495 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED AMOSITE/CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Approximately 1-1.5" of spray asbestos has been removed from the ceiling then encapsulated with white paint. Remaining residues were suspected in gaps between steel girders and the ceiling and between ceiling boards.

BUILDING 38

ROOF

SAMPLE ID: F1-B38-INT-ROOF-001	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** ROOF/ LIFT ROOM
SAMPLE DESCRIPTION: WHITE CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 20 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 38

ROOF EXTERIOR

SAMPLE ID: F1-B38-EXT-ROOF-NL1 AND F1-B38-EXT-ROOF-NL2	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** ROOF/ NORTHERN LIGHT PANELS
PRODUCT DESCRIPTION: WHITE BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** FAIR
QUANTITY: 112 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: Collected two samples from different northern light panels. These boards were identified in the Type II Asbestos Survey from 17 June 2003. There are 28 panels present (2 panels on each of 14 rows) on the roof.

SAMPLE ID: F1-B38-EXT-ROOF-FELT	**DATE SAMPLED:** 10/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** ROOFTOP
PRODUCT DESCRIPTION: BLACK ROOFING FELT UNDER TAR LAYER	
SURFACE TREATMENT: BLACK TAR AND FINE GRAVEL COVER	**CONDITION:** FAIR
QUANTITY: 5040 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-EXT-001AG	**DATE SAMPLED:** 23/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** ROOFTOP
PRODUCT DESCRIPTION: BLACK ROOFING FELT UNDER TAR LAYER	
SURFACE TREATMENT: BLACK TAR AND FINE GRAVEL COVER	**CONDITION:** FAIR
QUANTITY: 4900 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B38-EXT-002AG	**DATE SAMPLED:** 23/01/2007
BUILDING: NO. 38 WAREHOUSE	**FLOOR/ROOM No/LOCATION:** ROOFTOP
PRODUCT DESCRIPTION: PANELS BENEATH WINDOWS	
SURFACE TREATMENT: NONE	**CONDITION:** POOR
QUANTITY: 24 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 39

GROUND FLOOR

SAMPLE ID: F1-B39-INT-00-001SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /LOBBY
PRODUCT DESCRIPTION: GREY FLOOR TILE	
SURFACE TREATMENT: COVERED WITH CARPET	**CONDITION:** GOOD
QUANTITY: 530 m^2	

ASBESTOS CONFIRMED **ASBESTOS** CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-INT-00-002SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /CORRIDOR
PRODUCT DESCRIPTION: GREY FLOOR TILE IN CLEANER'S CUPBOARD	
SURFACE TREATMENT: COVERED WITH CARPET	**CONDITION:** GOOD
QUANTITY: 530 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-INT-00-003SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /CORRIDOR
PRODUCT DESCRIPTION: GREY FLOOR TILE IN WEST OFFICE	
SURFACE TREATMENT: COVERED WITH CARPET	**CONDITION:** GOOD
QUANTITY: 530 m^2	

<<No Photograph>>

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F1-B39-INT-00-004SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /NORTH STAIR
PRODUCT DESCRIPTION: BLACK STAIR NOSINGS ON THE STEP FRONTS	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: ALL STAIRS	

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-INT-00-005SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /NORTH STAIR
PRODUCT DESCRIPTION: WHITE CORRUGATED BOARD ALONG ENTIRE CEILING	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 530 m^2	**ASBESTOS TYPE SUSPECTED:** CEMENT BOARD

<<No Photograph>>

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-INT-00-006SZ	**DATE SAMPLED:** 15/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) /MALE TOILETS
PRODUCT DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: FIBREGLASS LAGGING WITH PAINTED CLOTH	**CONDITION:** GOOD
QUANTITY: 18 LINEAR m	**ASBESTOS TYPE SUSPECTED:** LAGGING

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 39

FIRST FLOOR

SAMPLE ID: F1-B39-INT-01-001SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /FROST EAST WING
PRODUCT DESCRIPTION: GREY FLOOR TILE IN ADJACENT CONFERENCE ROOM	
SURFACE TREATMENT: COVERED WITH CARPET	**CONDITION:** GOOD
QUANTITY: 530 m^2	**ASBESTOS TYPE SUSPECTED:** FLOOR TILE

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-INT-01-002SZ	**DATE SAMPLED:** 11/01/2007
BUILDING: NO. 39 ADMINISTRATION OFFICES	**FLOOR/ROOM No/LOCATION:** 01 (FIRST FLOOR) /FROST EAST WING
PRODUCT DESCRIPTION: WHITE TEXTURED COATING ON CEILING OF ADJACENT CONFERENCE ROOM	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 15 m^2	**ASBESTOS TYPE SUSPECTED:** TEXTURED COATING

<<No Photograph>>

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

BUILDING 39

ROOF EXTERIOR

SAMPLE ID: F1-B39-EXT-002NG	**DATE SAMPLED:** 23/01/2007
BUILDING: 39 (ADMINISTRATION)	**FLOOR/ROOM No/LOCATION:** ROOF / W SIDE NEAR CARPARK
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 530 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE

SAMPLE ID: F1-B39-EXT-003SZ	**DATE SAMPLED:** 23/01/2007
BUILDING: 39 (ADMINISTRATION)	**FLOOR/ROOM No/LOCATION:** ROOF / W SIDE NEAR CARPARK
SAMPLE DESCRIPTION: ROOFING FELT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 530 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

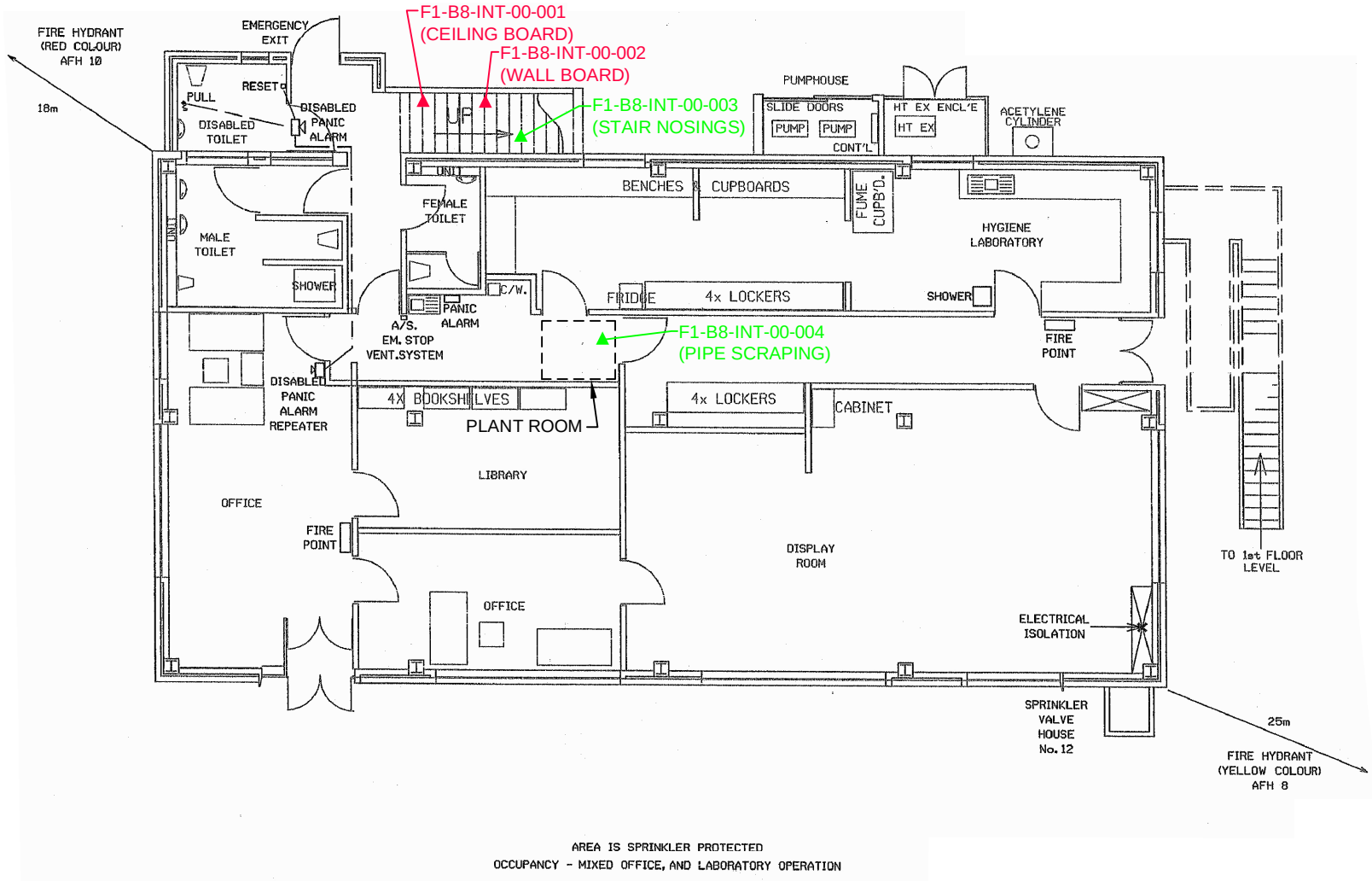
COMMENTS: NONE

BUILDING 80

SAMPLE ID: F1-B80-INT-001	**DATE SAMPLED:** 19/01/2007
BUILDING: 93 (GATEHOUSE)	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/FLOOR
PRODUCT DESCRIPTION: GREY FLOOR TILE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 8M X 5M	**ASBESTOS TYPE SUSPECTED:**

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS: NONE



N.T.S.

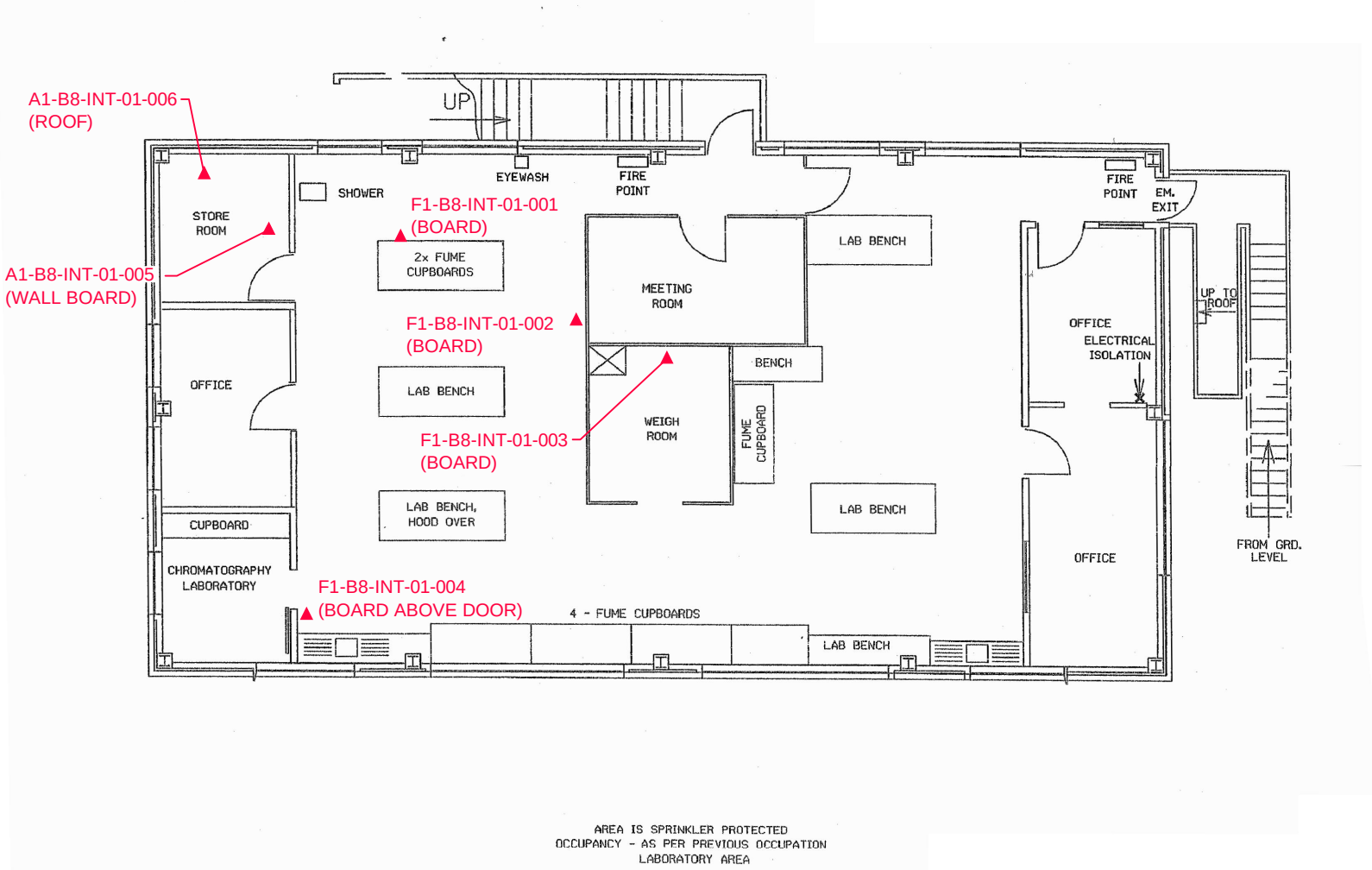
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 1

ZONE F1 - AREA B8 (LABORATORY-GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

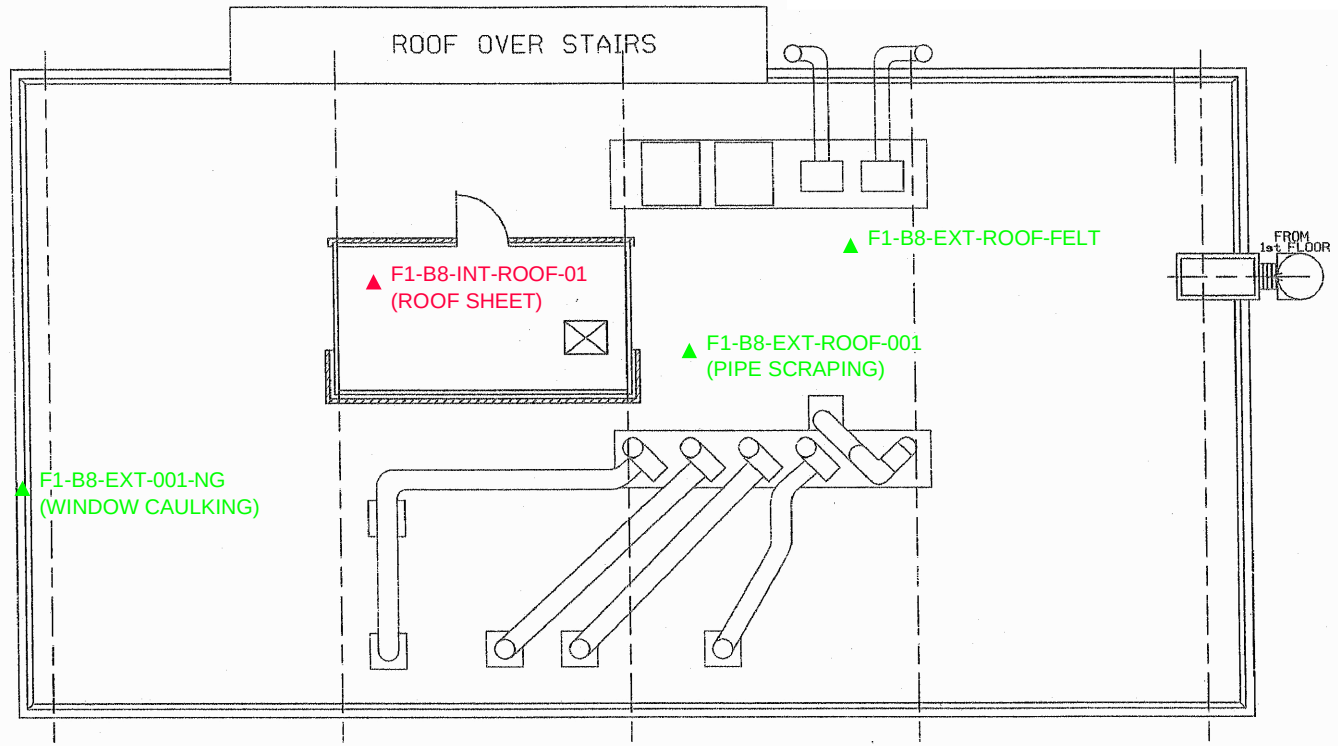
LEGEND

▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 2

ZONE F1 - AREA B8 (LABORATORY-FIRST FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

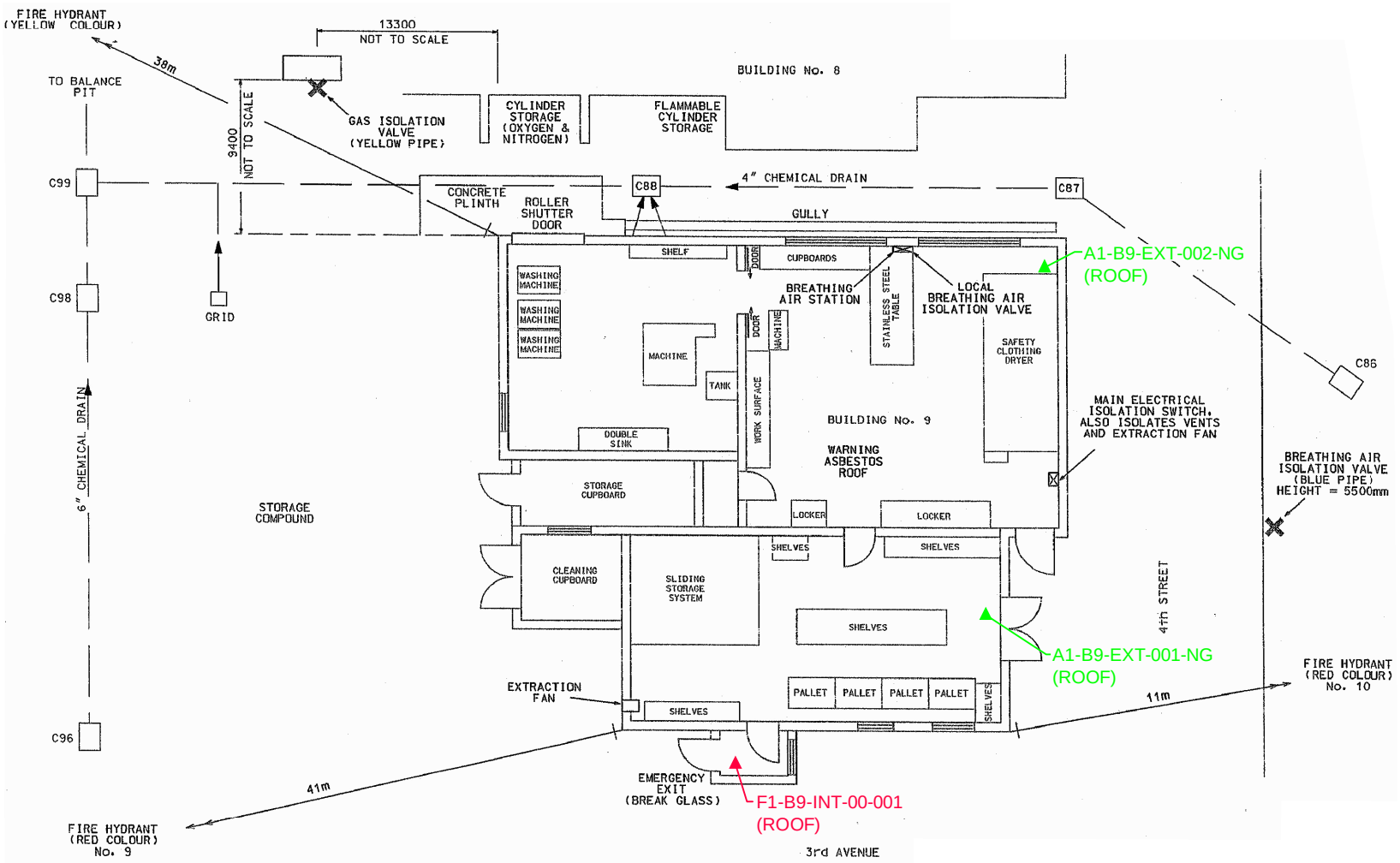
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 3

ZONE F1 - AREA B8 (LABORATORY-ROOF)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

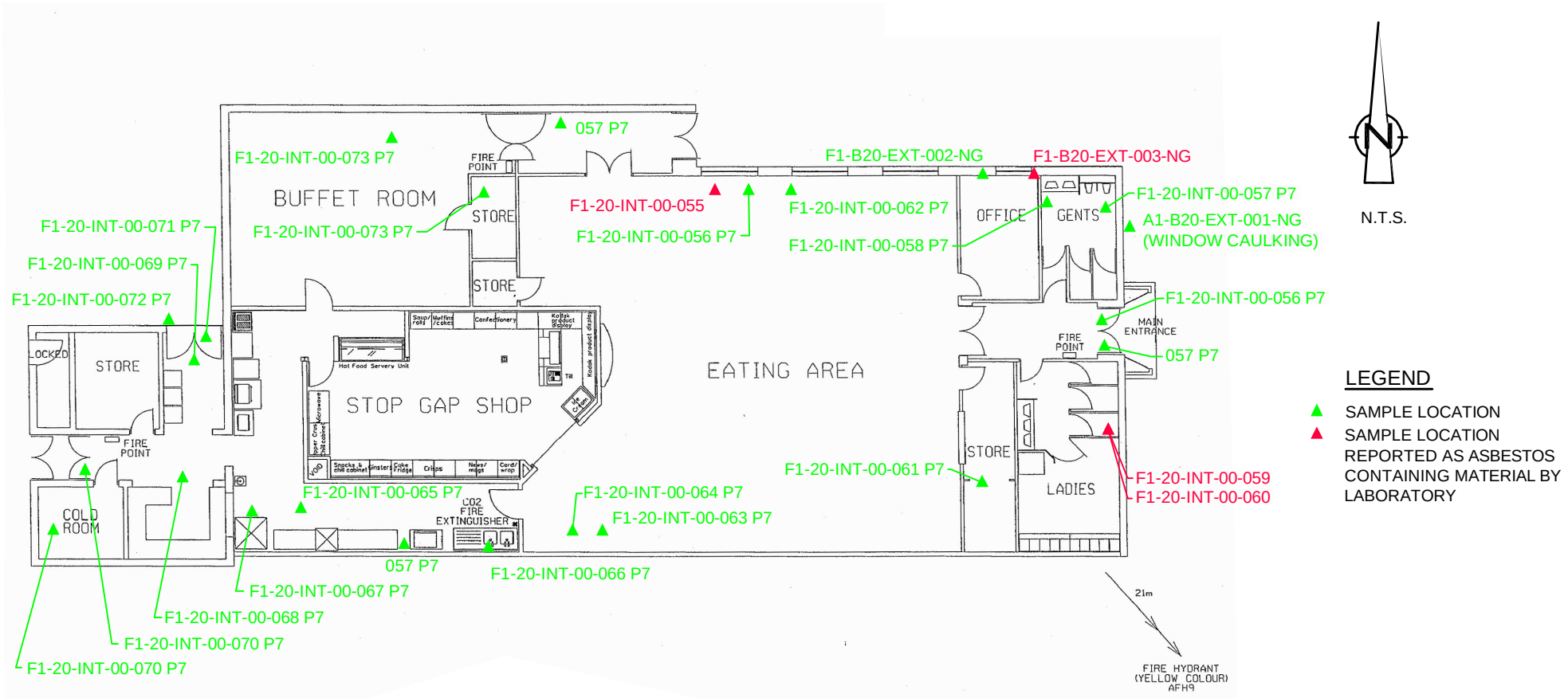
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 4

ZONE F1 - AREA B9 (LAUNDRY)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

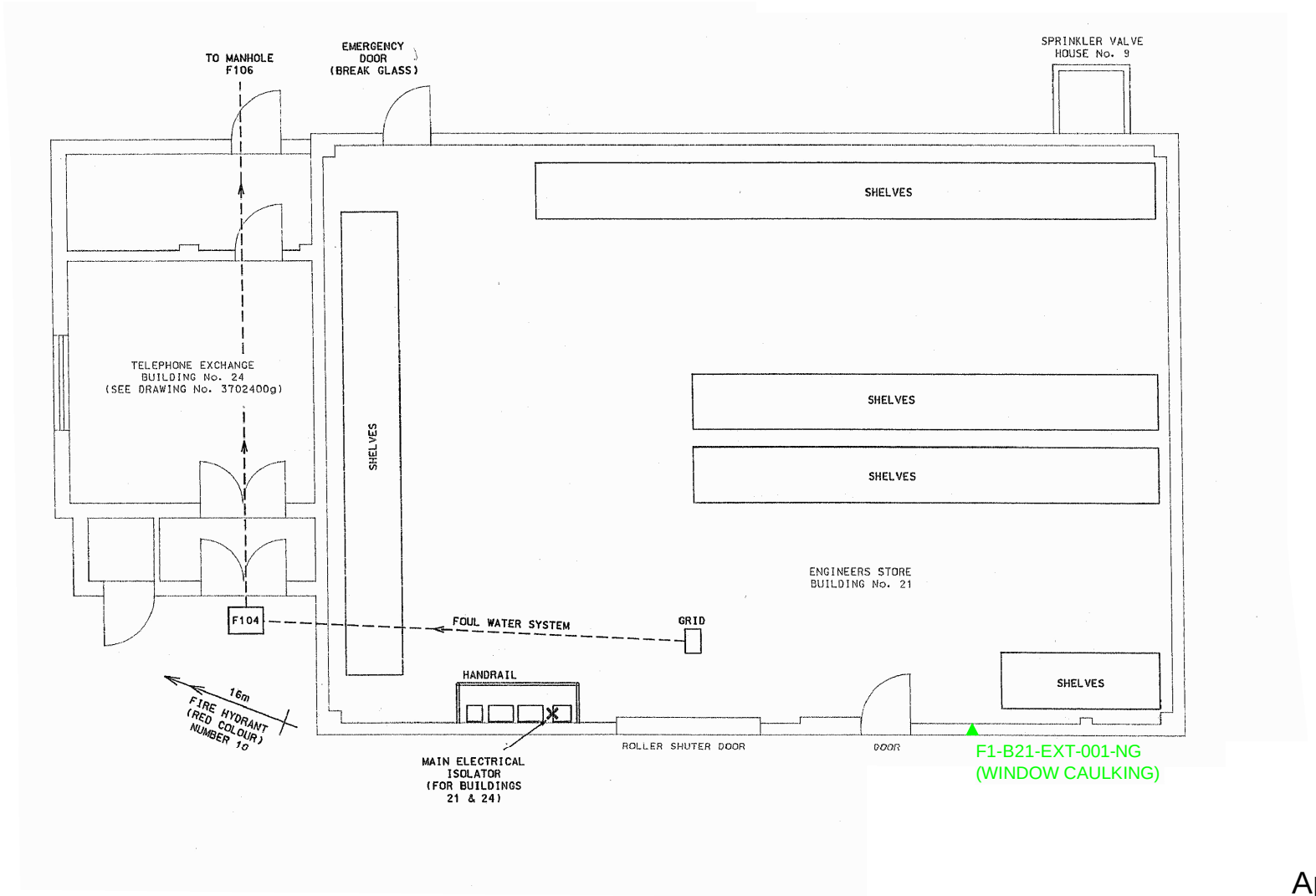


Appendix F1 Figure 5

ZONE F1 - AREA B20 (CANTEEN)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

933389-00(001)GN-WA020 FEB 14/2007



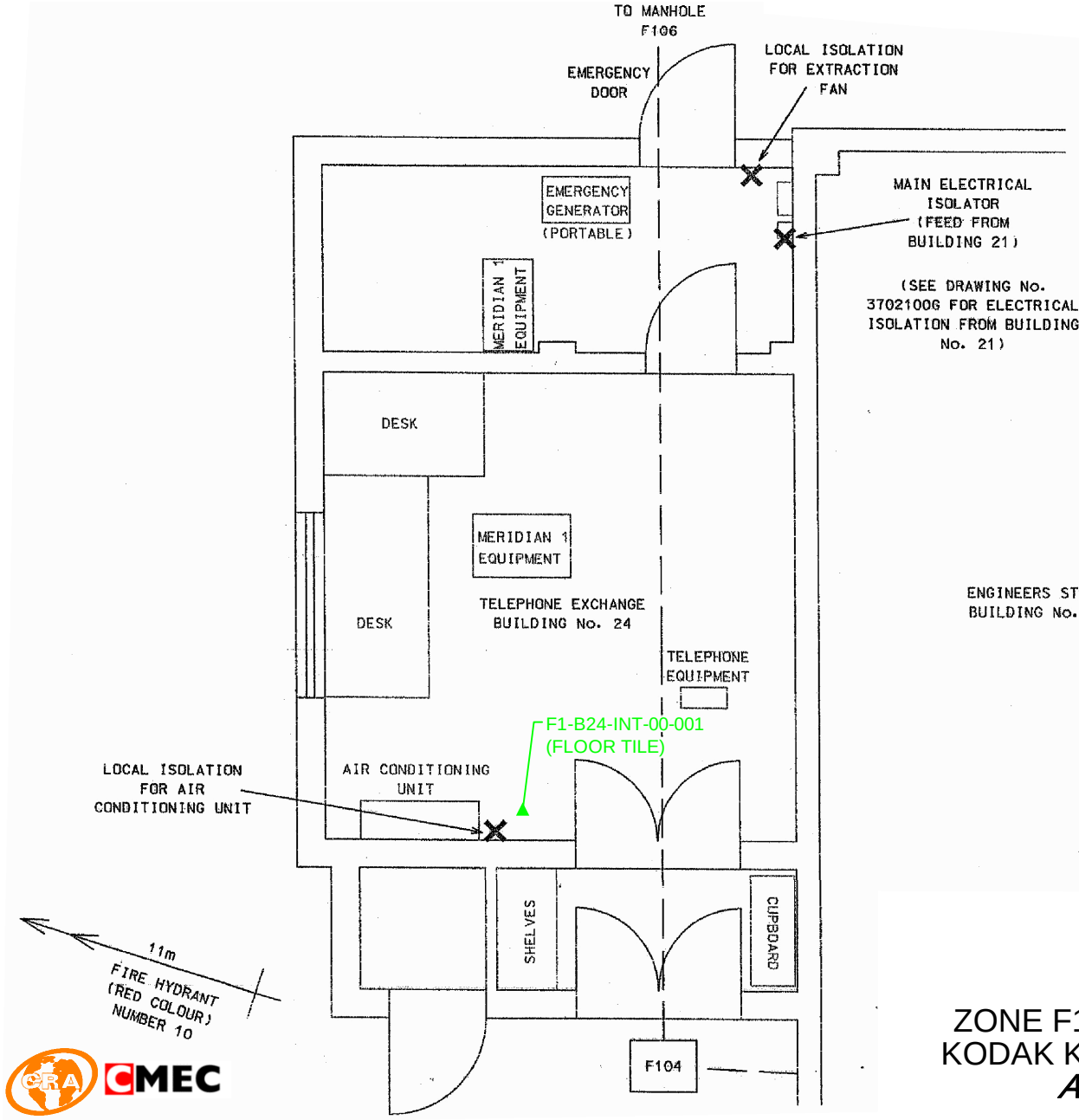
N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix F1 Figure 6

ZONE F1 - AREA B21 (ENGINEERS STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



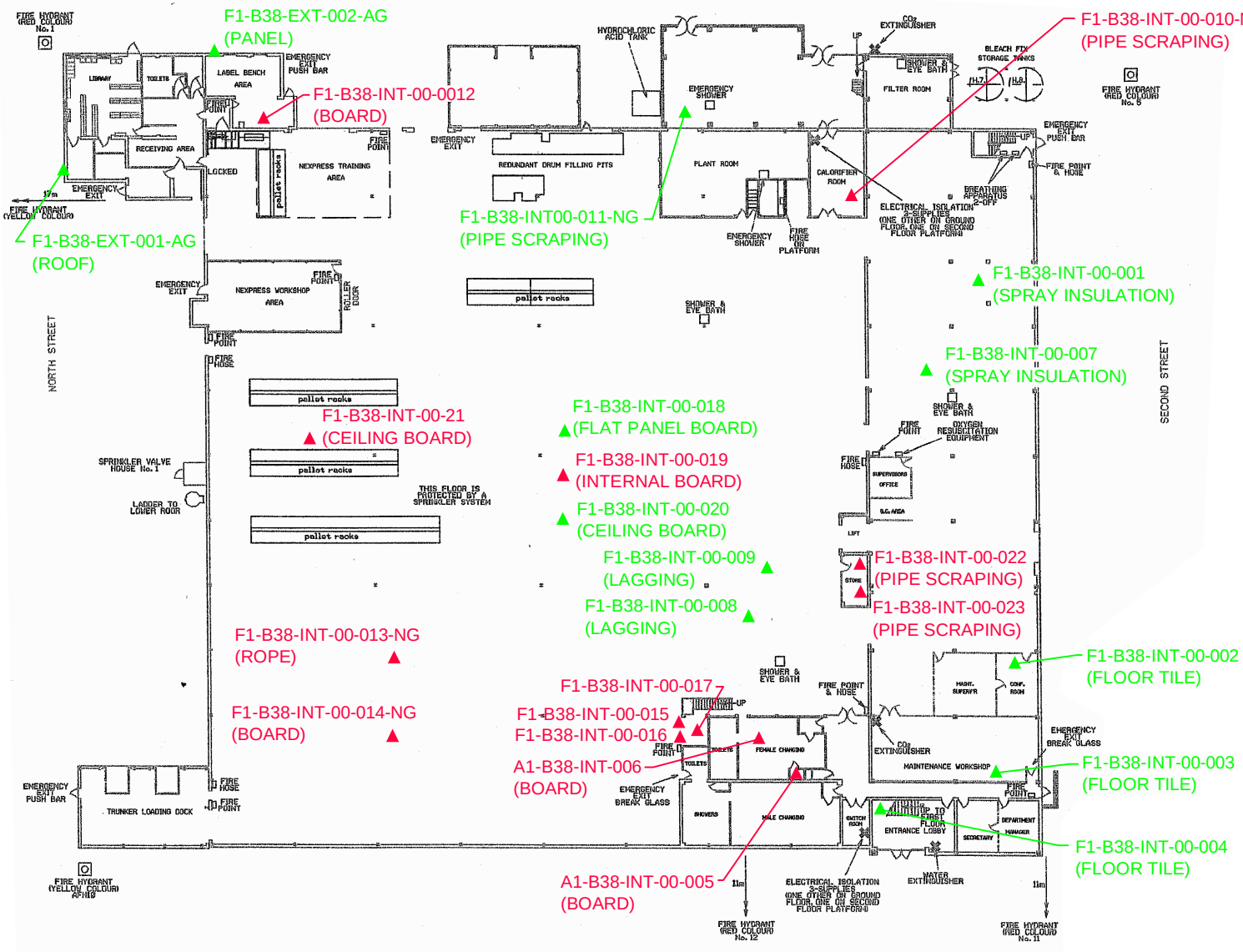
N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix F1 Figure 7

ZONE F1 - AREA B24(TELEPHONE EXCHANGE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England



N.T.S.

LEGEND

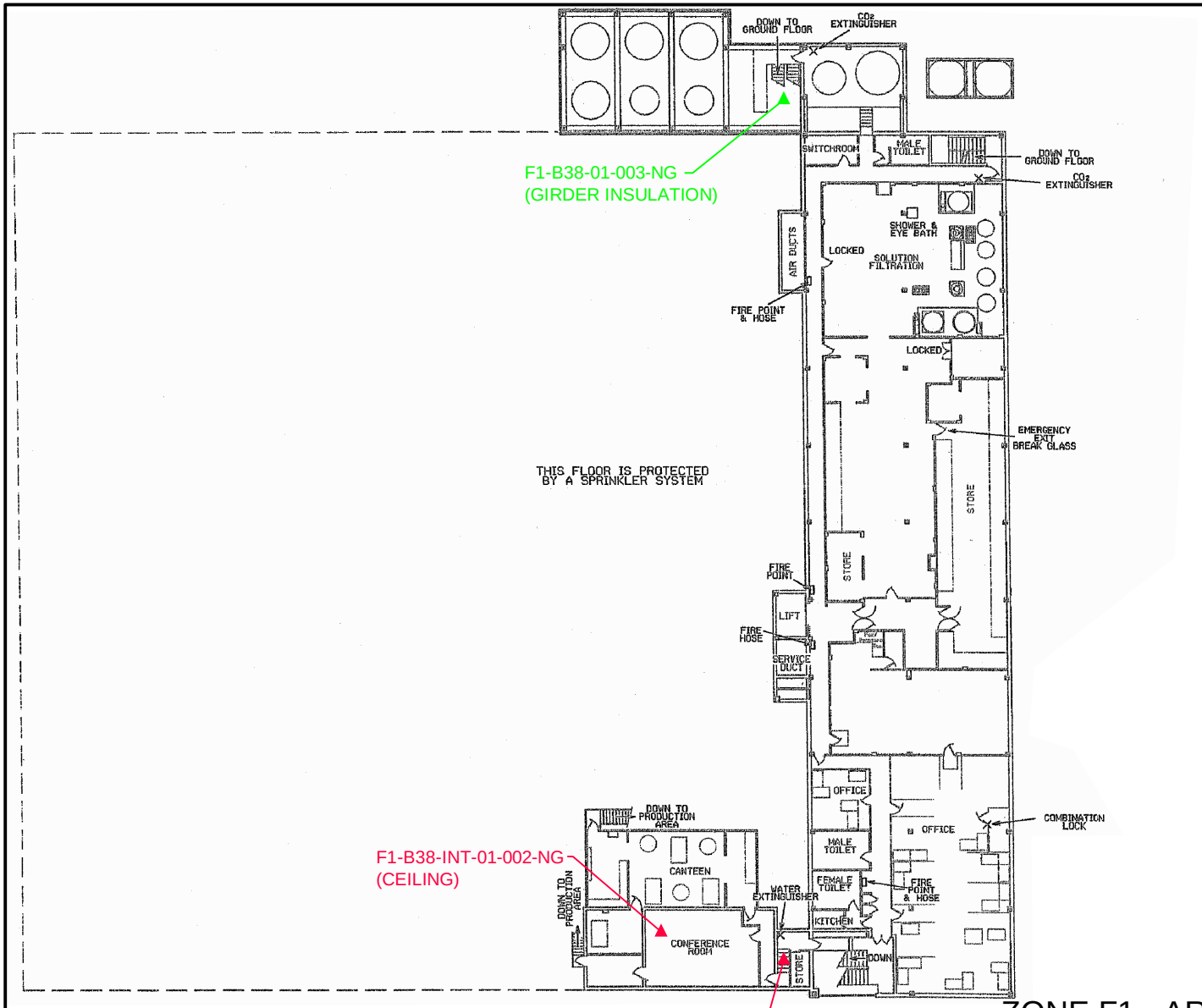
- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 8

ZONE F1 - AREA B38 (X-RAY-GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY

Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

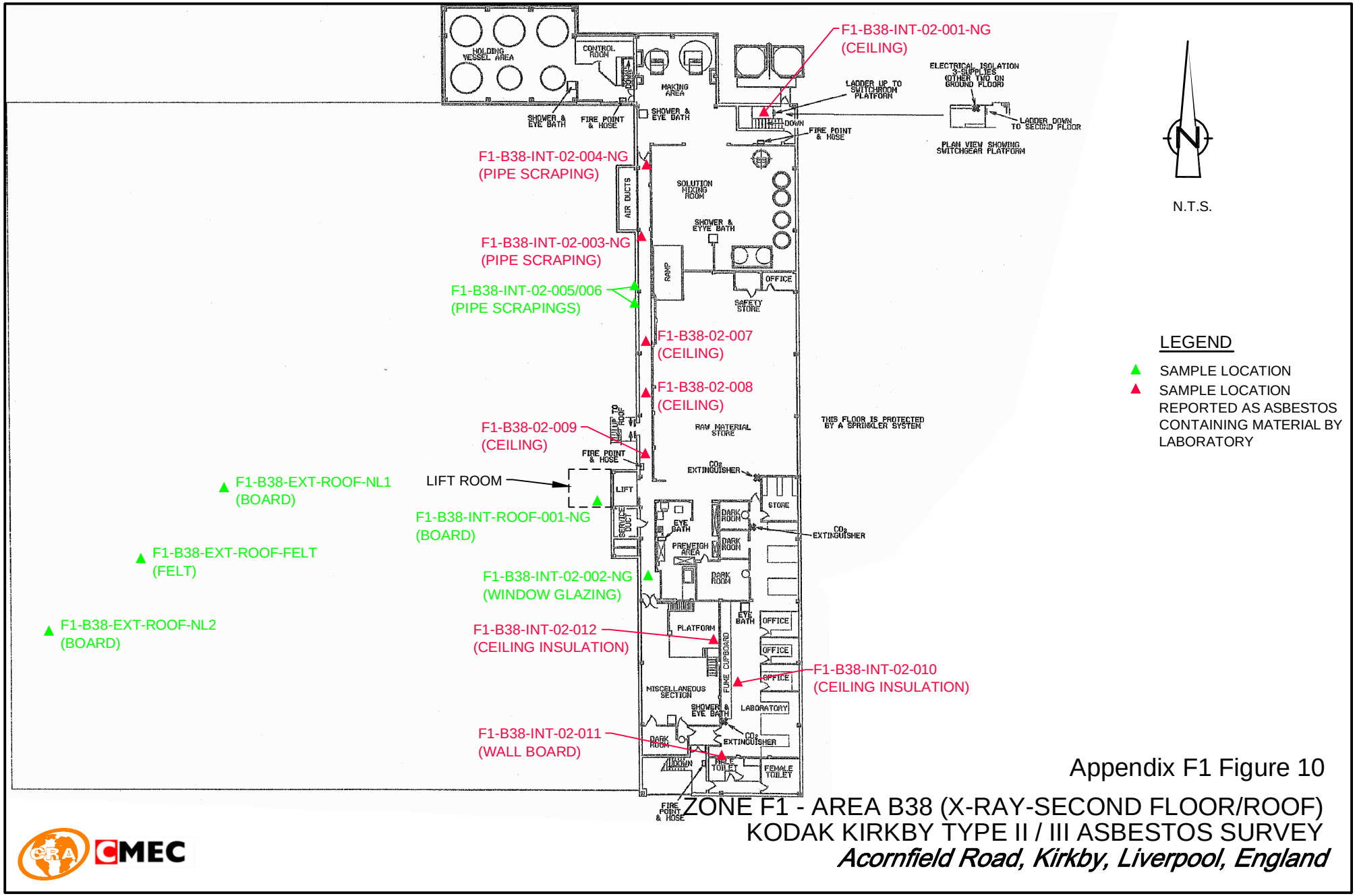
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 9

ZONE F1 - AREA B38 (X-RAY-FIRST FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



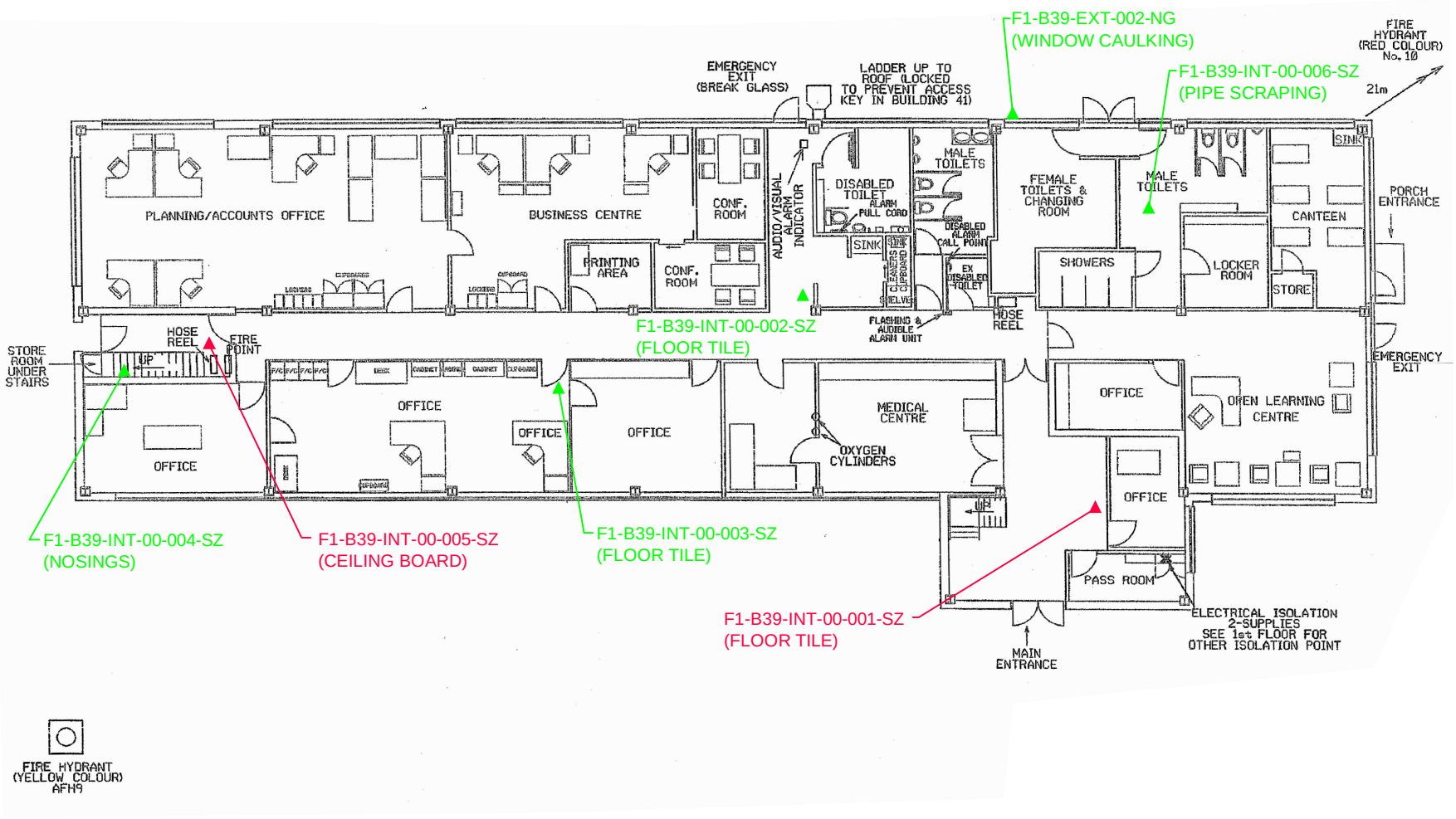
Appendix F1 Figure 10

ZONE F1 - AREA B38 (X-RAY-SECOND FLOOR/ROOF)

KODAK KIRKBY TYPE II / III ASBESTOS SURVEY

Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

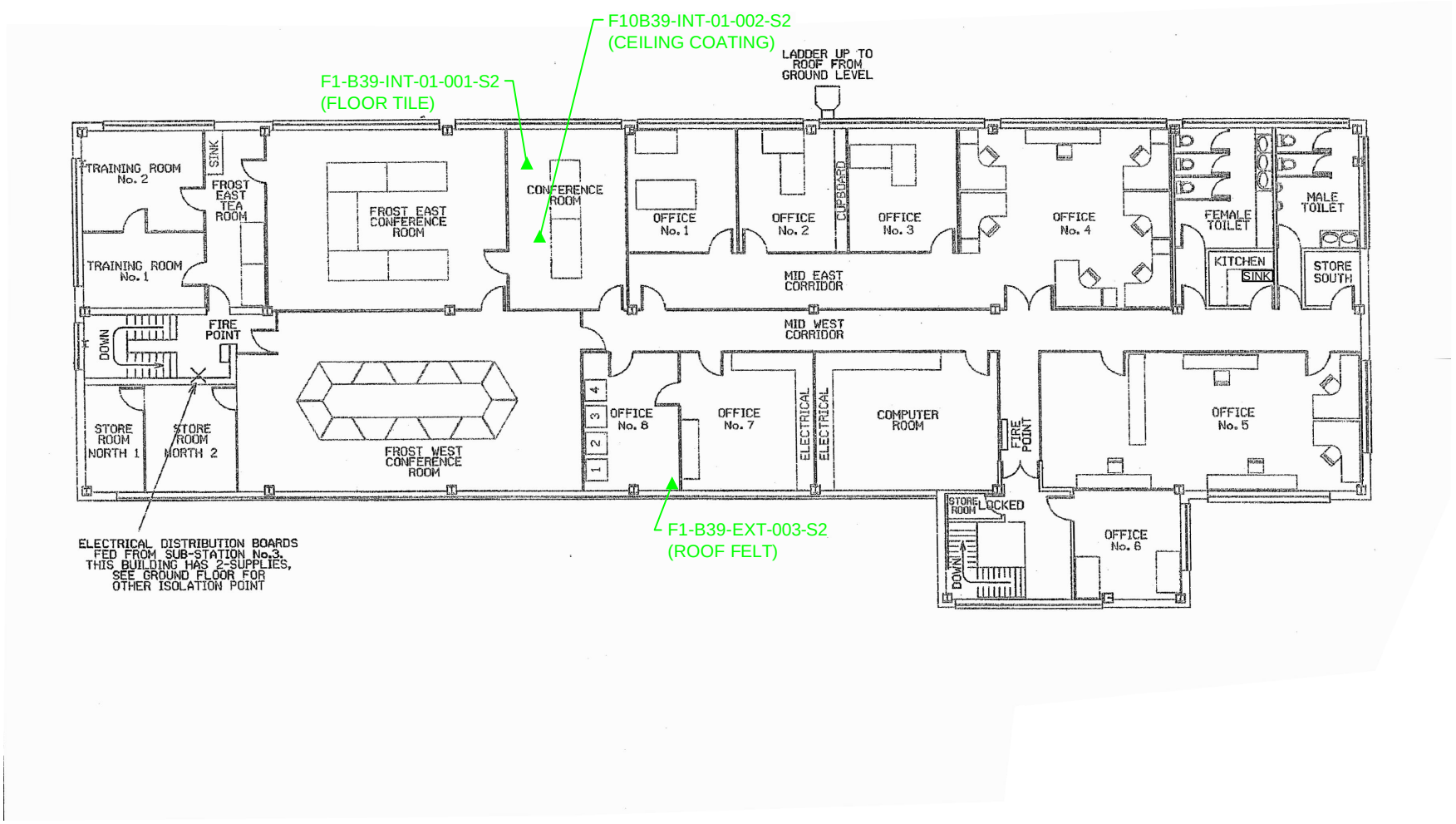
- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F1 Figure 11

ZONE F1 - AREA B39 (ADMINISTRATION OFFICE-GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY

Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

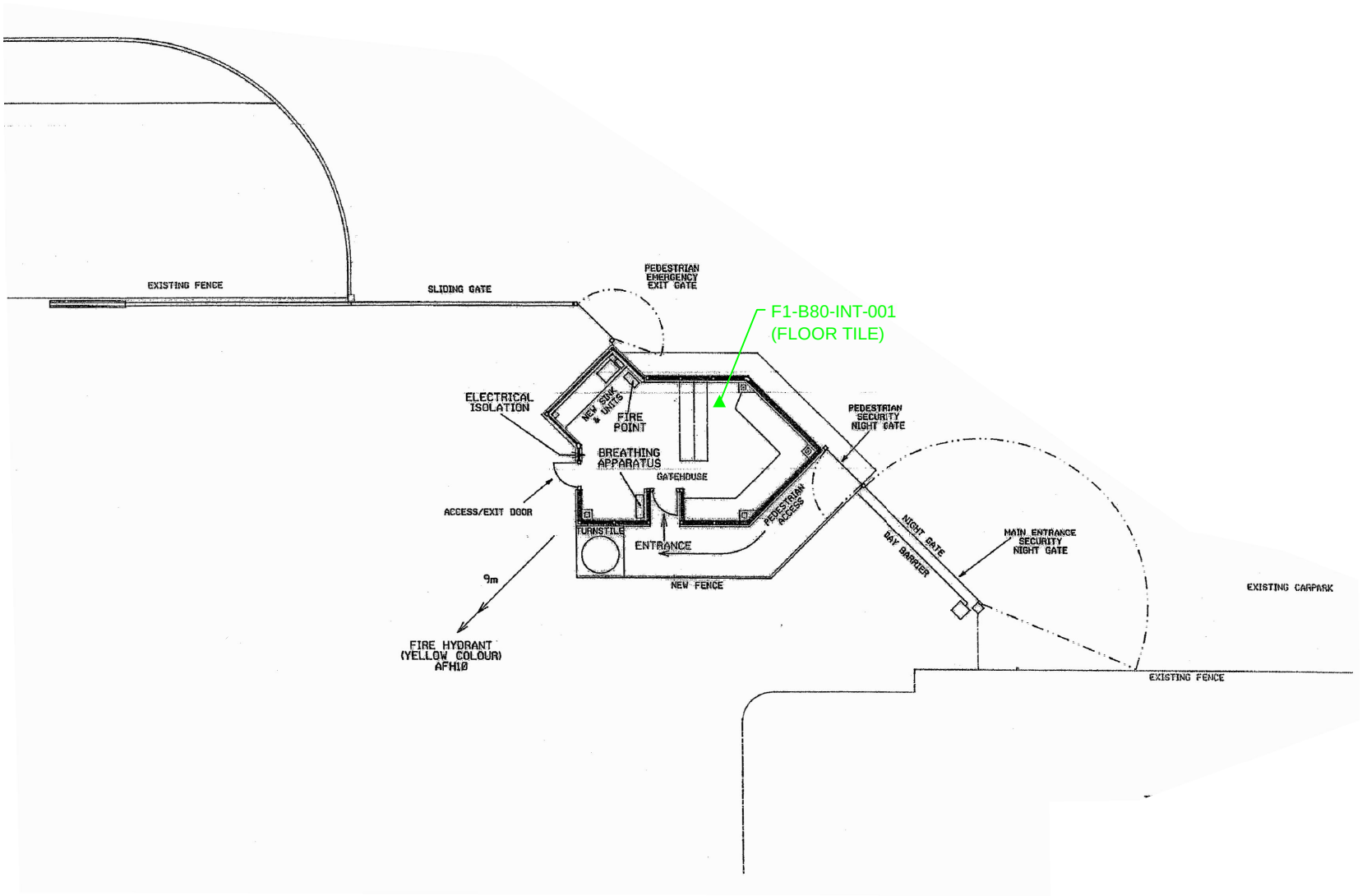
LEGEND

▲ SAMPLE LOCATION

Appendix F1 Figure 12

ZONE F1 - AREA B39 (ADMINISTRATION OFFICE-FIRST FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix F1 Figure 13

ZONE F1 - AREA B80 (GUARDHOUSE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX F2

ZONE F2
SAMPLE LOCATIONS

BUILDING 49

SAMPLE ID: F2-B49-EXT-001	**DATE SAMPLED:** 23/01/2007
BUILDING: 49 (STORE)	**FLOOR/ROOM No/LOCATION:** ROOF /W SIDE OF BUILDING
SAMPLE DESCRIPTION: SOFFIT BOARDS	
SURFACE TREATMENT: NONE	**CONDITION:** POOR
QUANTITY: 50 LINEAR m	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

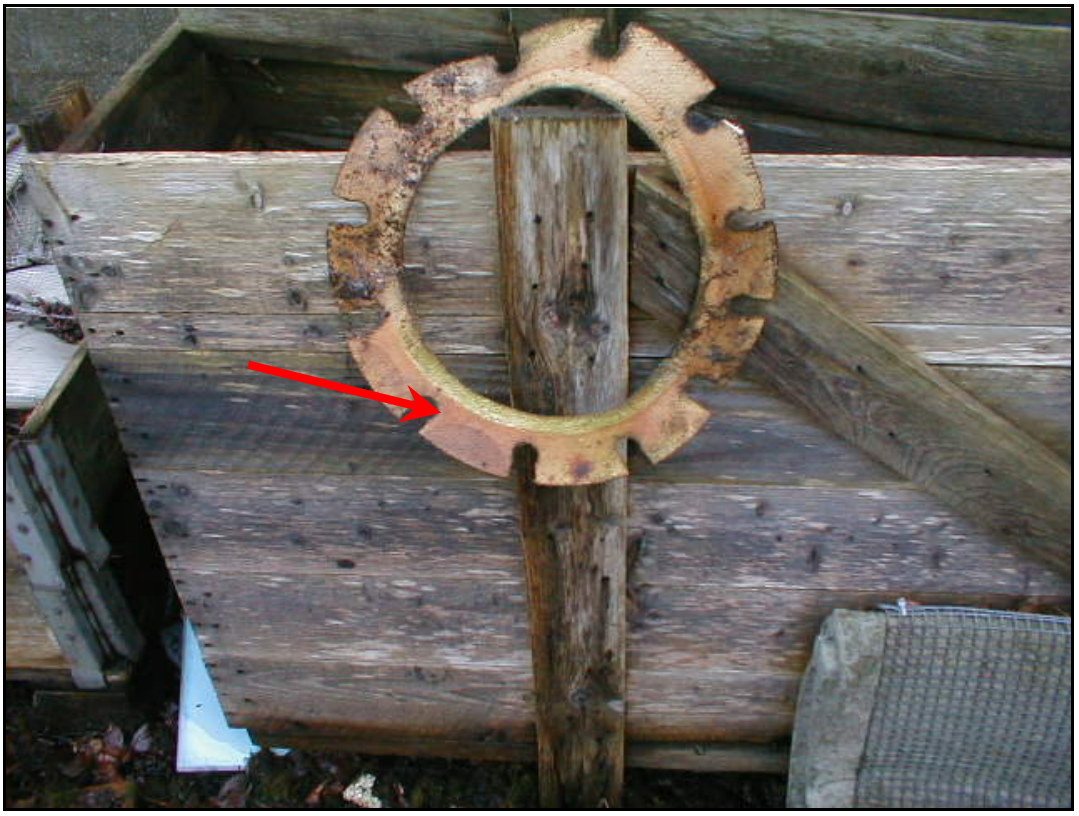
SAMPLE ID: F2-B49-EXT-002	**DATE SAMPLED:** 23/01/2007
BUILDING: 49 (STORE)	**FLOOR/ROOM No/LOCATION:** ROOF /W SIDE OF BUILDING
SAMPLE DESCRIPTION: CORRUGATED CEMENT BOARD ROOFING	
SURFACE TREATMENT: NONE	**CONDITION:** FAIR
QUANTITY: 1540 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 61

SAMPLE ID: F2-61-EXT-00-143PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 61	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / EXTERNAL
PRODUCT DESCRIPTION: LOOSE GASKETS X 2 TO REAR OF BUILDING 73 BY WALL	
SURFACE TREATMENT: UNSEALED	**CONDITION:** FAIR
QUANTITY: 1 m^2	



ASBES TOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 64

SAMPLE ID: F2-64-INT-00-136PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / DECON UNIT
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

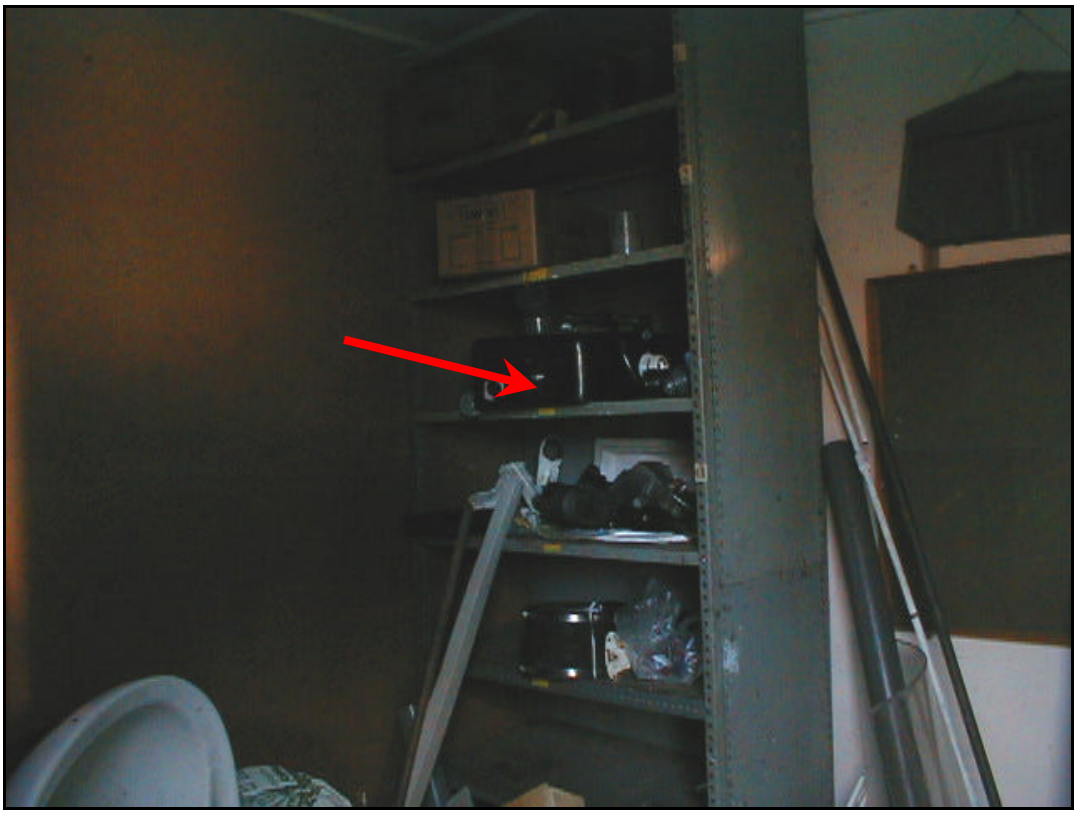
COMMENTS : NONE

SAMPLE ID: F2-64-INT-00-137PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / OFFICE-STORE
PRODUCT DESCRIPTION: BLACK LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 8 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-64-INT-00-138PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / RHS OFFICE
PRODUCT DESCRIPTION: TOILET CISTERN ON BENCH	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 1 m^2	



ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-64-INT-00-139PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LHS OFFICE
PRODUCT DESCRIPTION: GREY LINOLEUM	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 5 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-64-EXT-00-140PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / PAINT STORE
PRODUCT DESCRIPTION: LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 16 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-64-INT-00-141PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 64	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / LHS STORE
PRODUCT DESCRIPTION: WHITE VINYL FLOOR TILES	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** MED
QUANTITY: 2 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 73

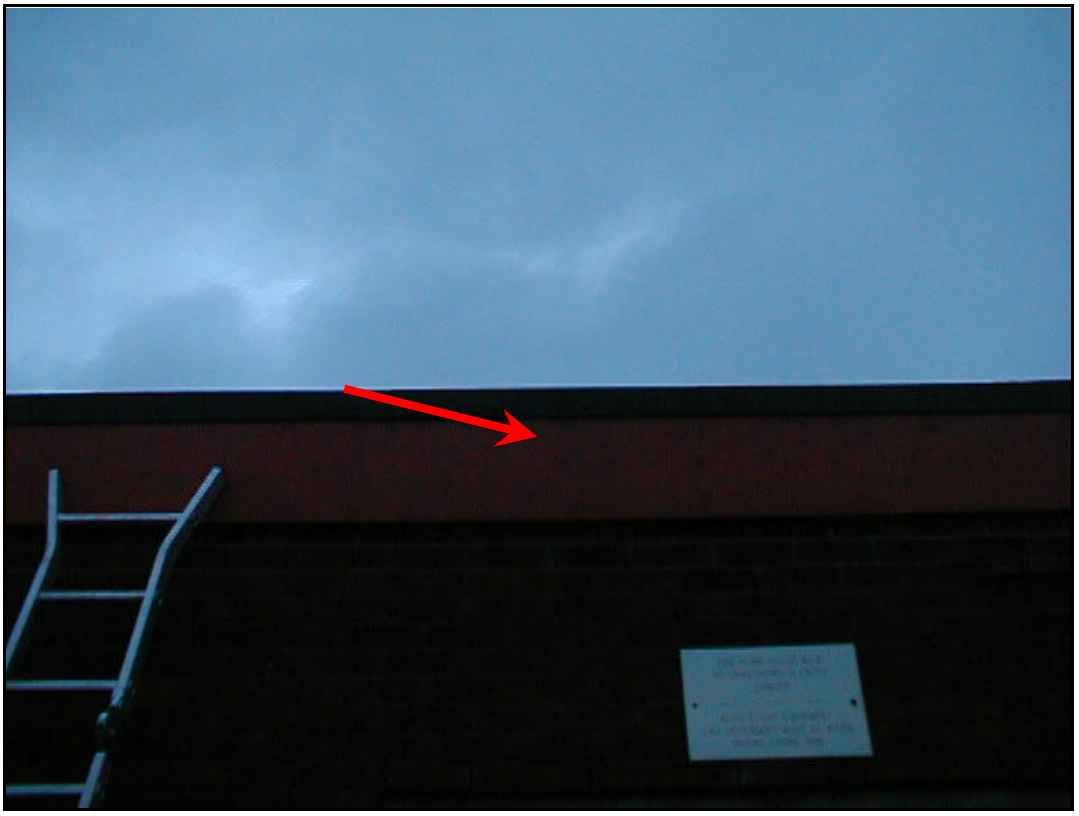
SAMPLE ID: F2-73-INT-00-142PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 73	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / STORE
PRODUCT DESCRIPTION: RED WALL PANELS TO LHS WALL	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 4 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 76

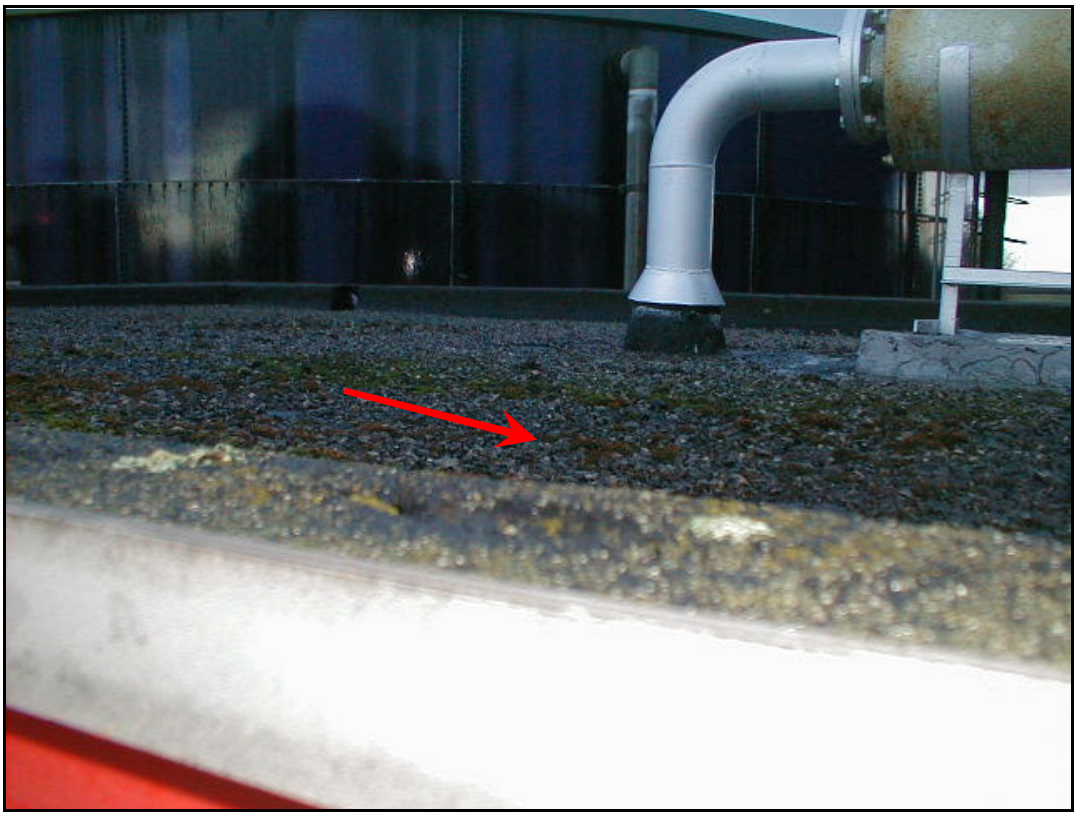
SAMPLE ID: F2-76-EXT-00-132PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 76	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / FIRE PUMP HOUSE NO. 3
PRODUCT DESCRIPTION: ROOF LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 30 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-76-EXT-00-133PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 76	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / FIRE PUMP HOUSE NO. 2
PRODUCT DESCRIPTION: ROOF LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 30 m^2	



ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-76-EXT-00-134PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 76	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / FIRE PUMP HOUSE NO. 1
PRODUCT DESCRIPTION: ROOF LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 30 m^2	

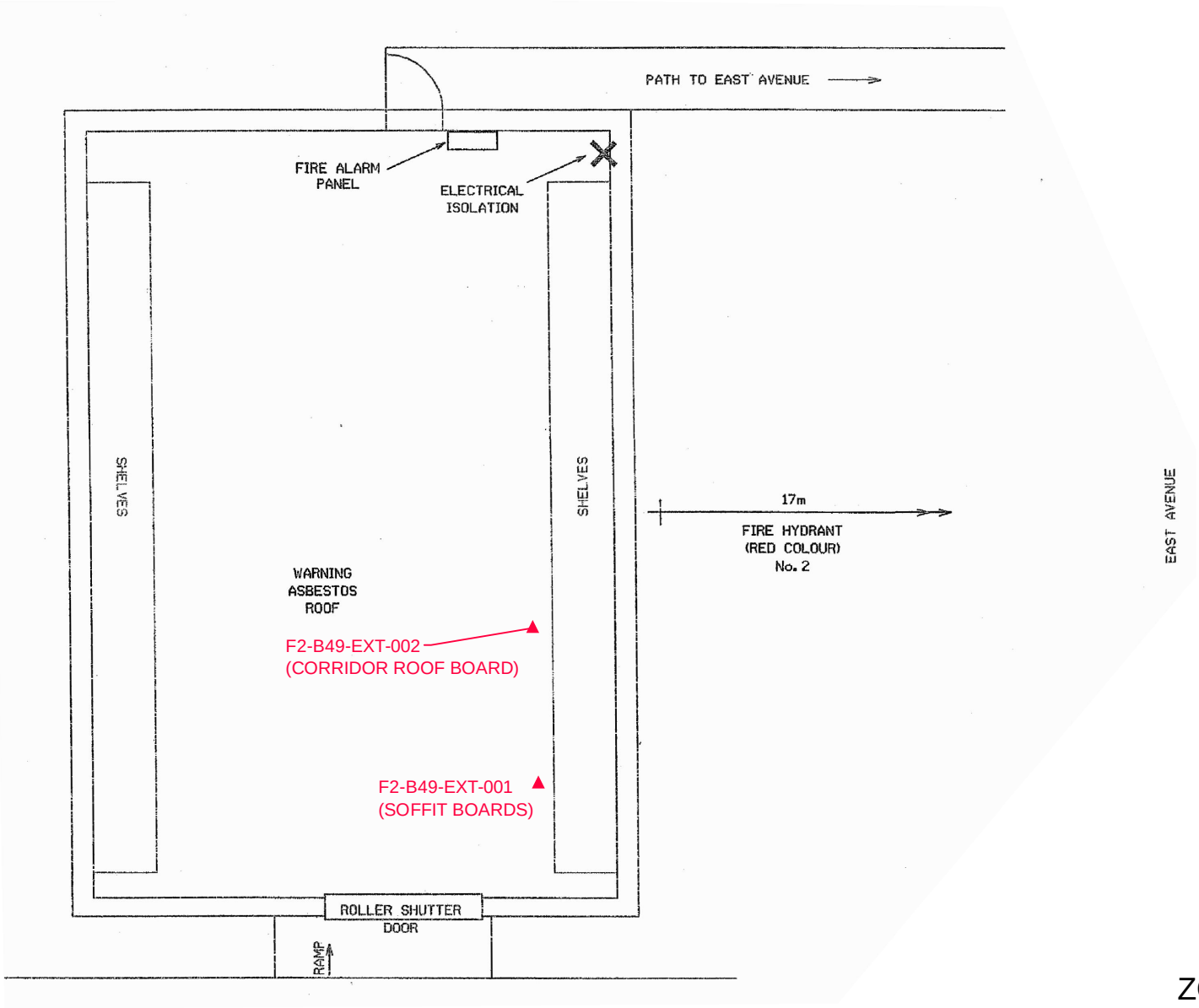
ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: F2-76-EXT-00-135PT	**DATE SAMPLED:** 17/01/2007
BUILDING: 76	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR) / FIRE PUMP HOUSE NO. 4
PRODUCT DESCRIPTION: ROOF LINER	
SURFACE TREATMENT: COMPOSITE	**CONDITION:** FAIR
QUANTITY: 30 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



N.T.S.

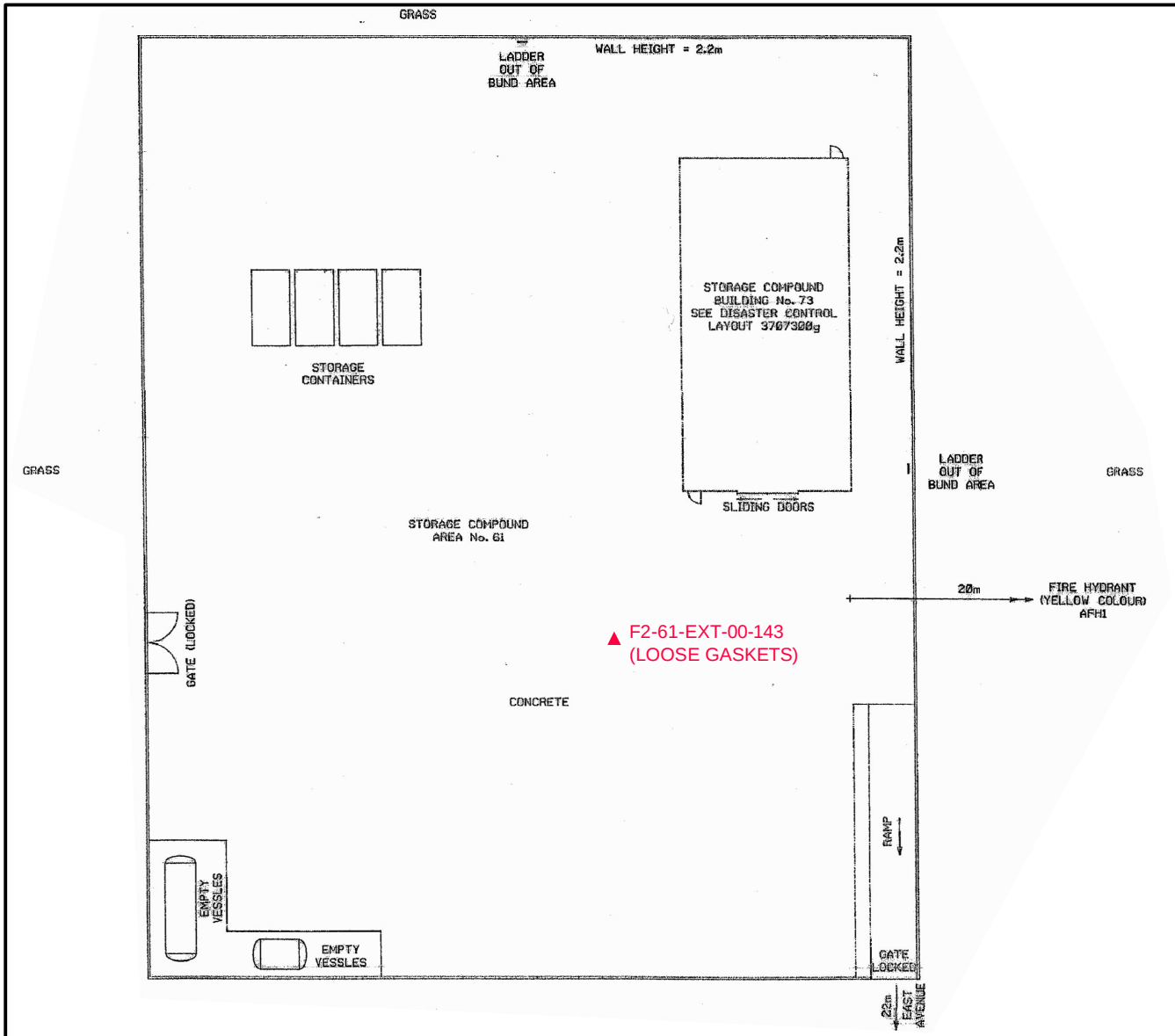
LEGEND

▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F2 Figure 1

ZONE F1 - AREA B49 (STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

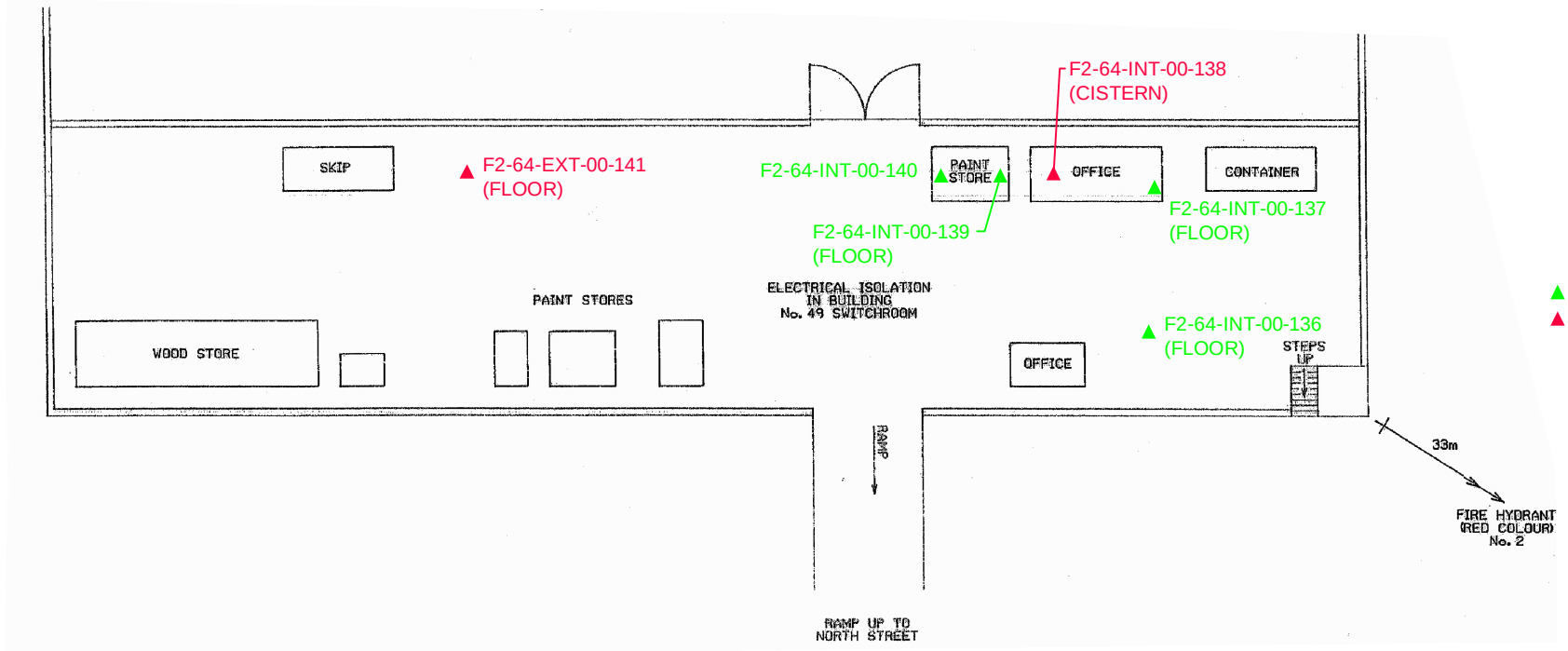
LEGEND

▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F2 Figure 2

ZONE F1 - AREA B61 [STORAGE AREA (OLD RESERVOIR)]
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

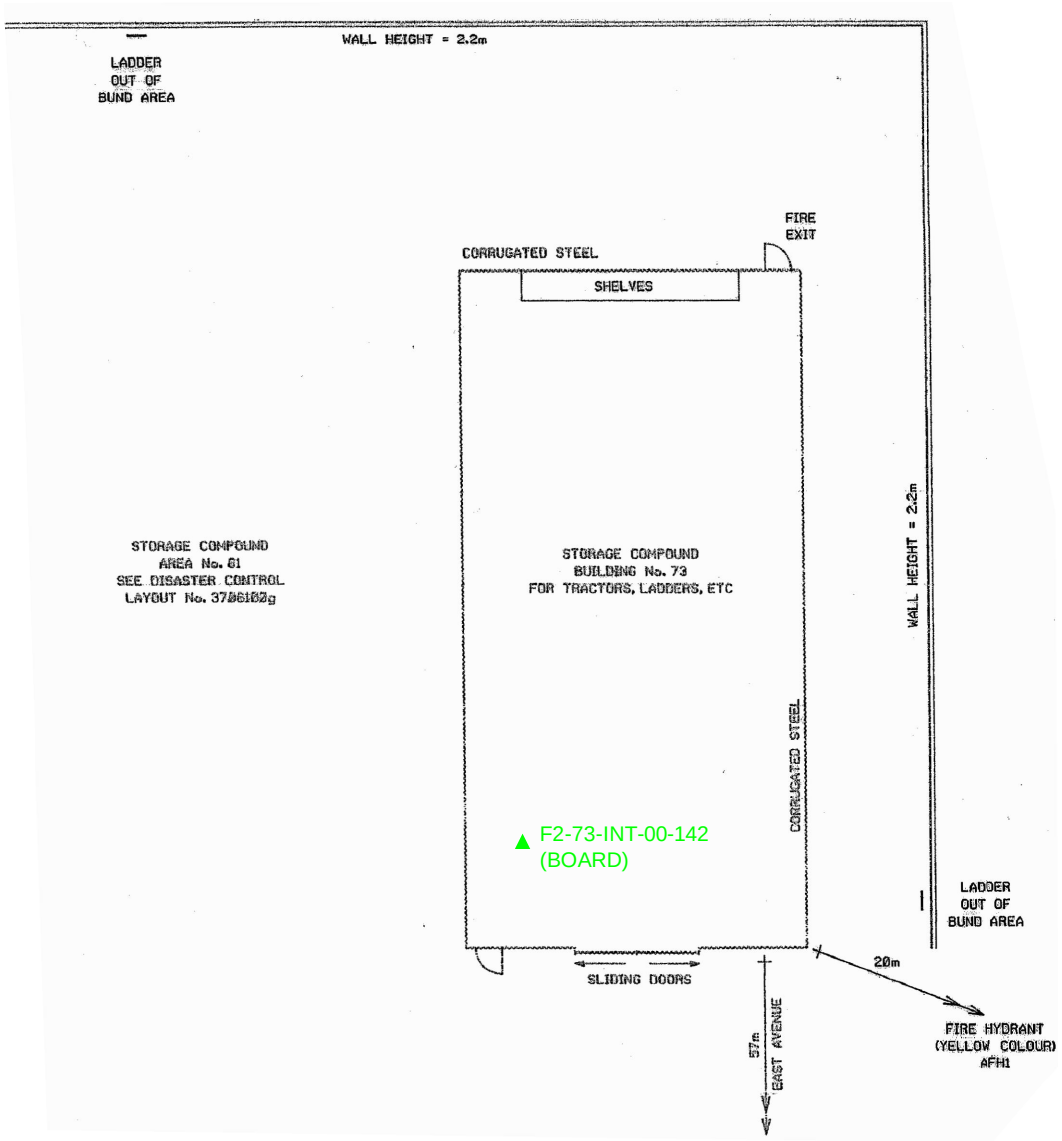
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix F2 Figure 3

ZONE F2 - AREA B64 (CONTRACTORS COMPOUND)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

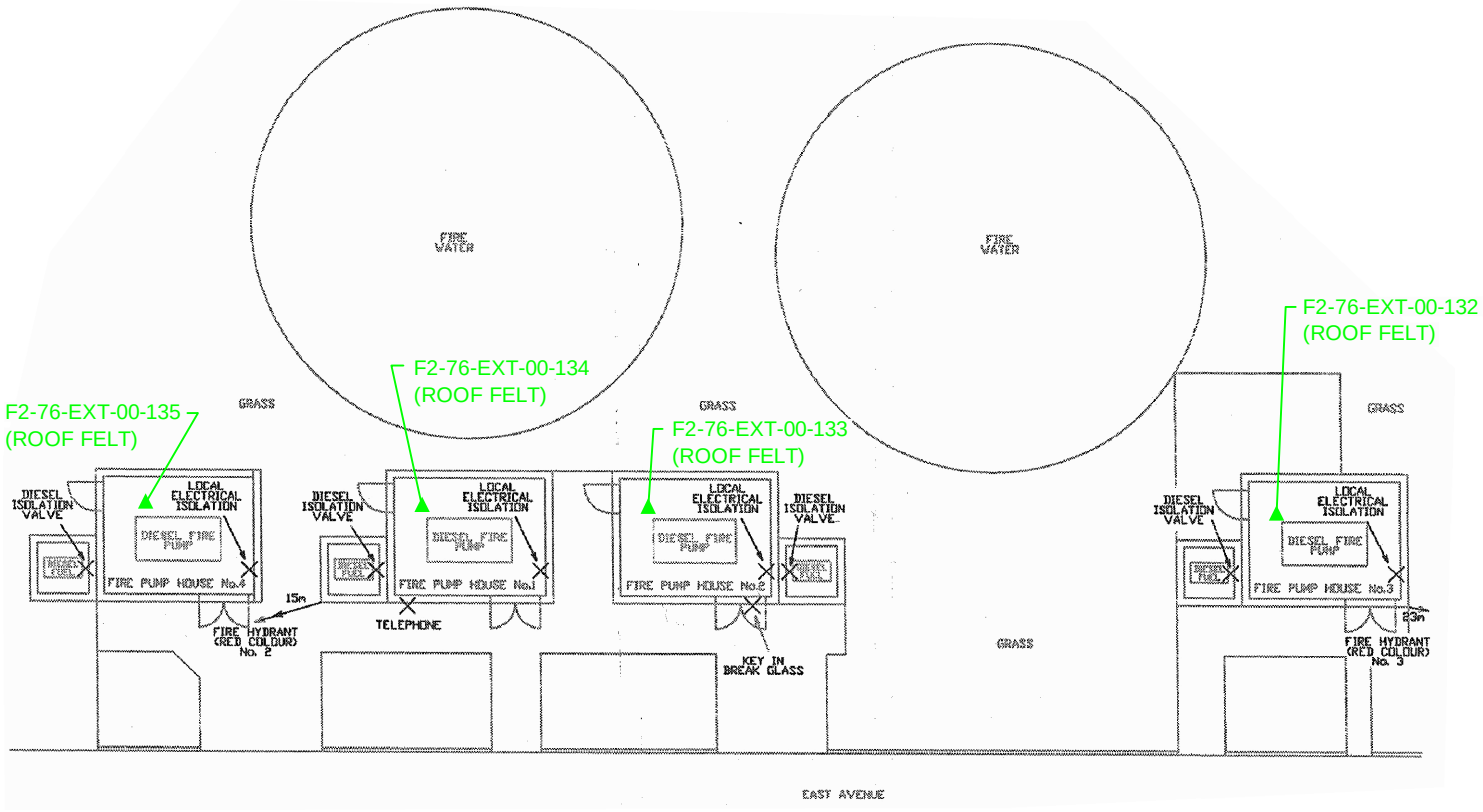
LEGEND

▲ SAMPLE LOCATION

Appendix F2 Figure 4

ZONE F2 - AREA B73 (STORE)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

LEGEND

▲ SAMPLE LOCATION

Appendix F2 Figure 5

ZONE F2 - AREA B76 (FIRE MAIN PUMPS & WATER STORAGE TANKS)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX G

EASTMAN CHEMICALS

BUILDING 33

GROUND FLOOR

SAMPLE ID: B33-INT-02-001	**DATE SAMPLED:** 18/01/2007
BUILDING: NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/P.E.T.LAB/SOUTHERN WORKSHOP/WALLBOARD UNDERNEATH BENCH
SAMPLE DESCRIPTION: WALLBOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 6 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B33-INT-00-002	**DATE SAMPLED:** 18/01/2007
BUILDING: NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/P.E.T.LAB/PPL1 AREA
SAMPLE DESCRIPTION: PANELLED CEILING BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY: 140 m^2	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS :
Labelled with asbestos warning.

SAMPLE ID: B33-INT-00-003	**DATE SAMPLED:** 18/01/2007
BUILDING: NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/P.E.T.LAB/WALL DIVIDING PPL1 AND PPL2
SAMPLE DESCRIPTION: TEXTURED WHITE PAINT	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY: 72 m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

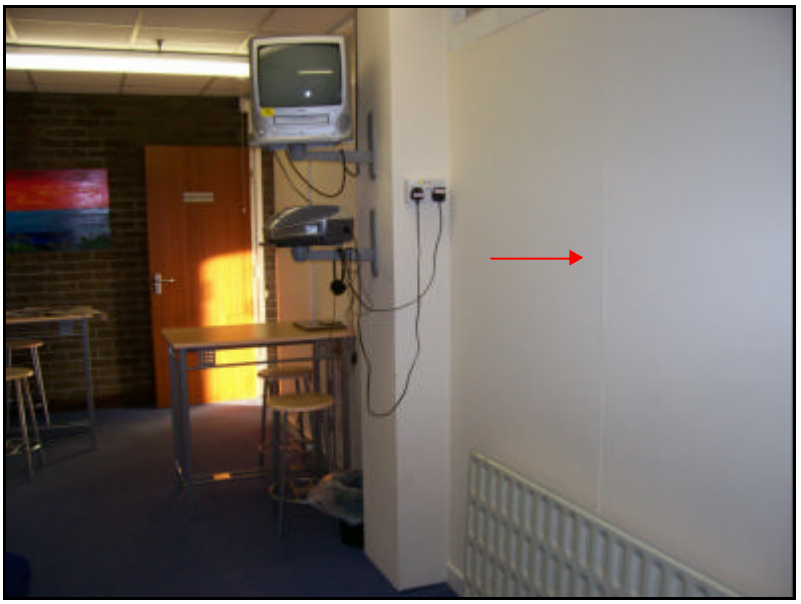
COMMENTS : NONE

SAMPLE ID: B33-INT-00-004	**DATE SAMPLED:** 18/01/2007
BUILDING: NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/STAIRS (NORTH END OF BUILDING)
SAMPLE DESCRIPTION: STAIR NOSING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY:	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B33-INT-00-005	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/BREAK ROOM/INTERIOR WALL
SAMPLE DESCRIPTION: WALL BOARD	
SURFACE TREATMENT: PAINTED WHITE	**CONDITION:** GOOD
QUANTITY : 12m^2	



ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

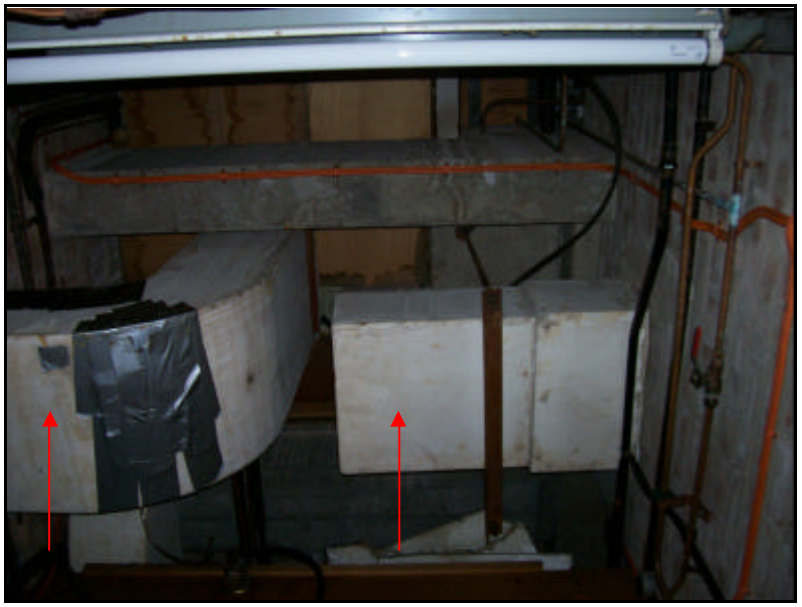
COMMENTS : NONE

SAMPLE ID: B33-INT-00-006	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/CORRIDOR
SAMPLE DESCRIPTION: BLUE FLOOR TILE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY :	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

SAMPLE ID: B33-INT-00-007 AND B33-INT-00-008	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/NMR TRANSFORMER ROOM
SAMPLE DESCRIPTION: DUCT INSULATION	
SURFACE TREATMENT: NONE	**CONDITION:** POOR
QUANTITY :	



ASBESTOS CONFIRMED AMOSITE	**ASBESTOS TYPE**
AIR ASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : SAME DUCT INSULATION NOT SEEM OUTSIDE THIS TRANSFORMER ROOM.

SAMPLE ID: B33-INT-00-009	**DATE SAMPLED:** 18/01/2007
BUILDING: NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/SOUTH LABORATORY/FUME CUPBOARD (INTERIOR)
SAMPLE DESCRIPTION: BOARDING	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY:	

ASBESTOS CONFIRMED	CHRYSOTILE	**ASBESTOS TYPE**	
ASBESTOS CONFIRMED	NONE DETECTED	**HSE NOTIFIABLE**	

COMMENTS : The other two fume cupboard located on the ground floor were not observed to contain suspect asbestos material.

SAMPLE ID: B33-INT-00-010 AND B33-INT-00-011	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/CORRIDOR/OVERHEAD PIPES
SAMPLE DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: FIBERGLASS LAGGING	**CONDITION:** GOOD
QUANTITY :	

ASBESTOS CONFIRMED	**ASBESTOS TYPE**
ASBESTOS CONFIRMED NONE DETECTED	**HSE NOTIFIABLE**

COMMENTS :NONE

SAMPLE ID: B33-INT-00-012	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 00 (GROUND FLOOR)/CORRIDOR/ELECTRICAL CUPBOARD
SAMPLE DESCRIPTION: TAPE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY :	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 33

FIRST FLOOR

SAMPLE ID: B33-INT-01-001	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 1ST FLOOR/CORRIDOR
SAMPLE DESCRIPTION: BLUE FLOOR TILE	
SURFACE TREATMENT: NONE	**CONDITION:** GOOD
QUANTITY : $60m^2$	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

BUILDING 33

SECOND FLOOR

SAMPLE ID: B33-INT-02-001 & B33-INT-02-002	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 2ND FLOOR/DIVIDING WALL BETWEEN VISITOR OFFICE NO. 3 AND LABORATORY FUMEHOOD
SAMPLE DESCRIPTION: WALL BOARD	
SURFACE TREATMENT: PARTIALLY ENCAPSULATED WITH WALL PANELS AND WHITE PAINT	**CONDITION:** GOOD
QUANTITY : $10m^2$	

ASBESTOS CONFIRMED CHRYSOTILE	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Wall board exposed above recessed ceiling and underneath fume hood in laboratory.

SAMPLE ID: B33-INT-02-003	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** 2ND FLOOR/CORNER OFFICE ADJACENT LIFT
SAMPLE DESCRIPTION: FLOOR TILE	
SURFACE TREATMENT: COVERED OVER WITH CARPET	**CONDITION:** GOOD
QUANTITY : 6m^2	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE

ROOF

SAMPLE ID: B33-INT-ROOF-001	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** ROOF/SERVICE SHAFT (RUNS TROUGHOUT BUILDING LEVELS)
SAMPLE DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: FIBERGLASS LAGGING WITH CLOTH COVERING	**CONDITION:** POOR TO GOOD
QUANTITY :	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Lagging condition of pipe in service shaft were observed as poor in the room located on the roof; however, the condition of the same pipe lagging was observed as good elsewhere.

SAMPLE ID: B33-INT-ROOF-002	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** ROOF/SERVICE SHAFT (RUNS TROUGHOUT BUILDING LEVELS)
SAMPLE DESCRIPTION: PIPE SCRAPING	
SURFACE TREATMENT: FIBERGLASS LA GGING WITH FOIL COVERING	**CONDITION:** FAIR
QUANTITY :	

ASBESTOS CONFIRMED NONE DETECTED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : Lagging condition of pipe in service shaft were observed as poor in the room located on the roof; however, the condition of the same pipe lagging was observed as good elsewhere.

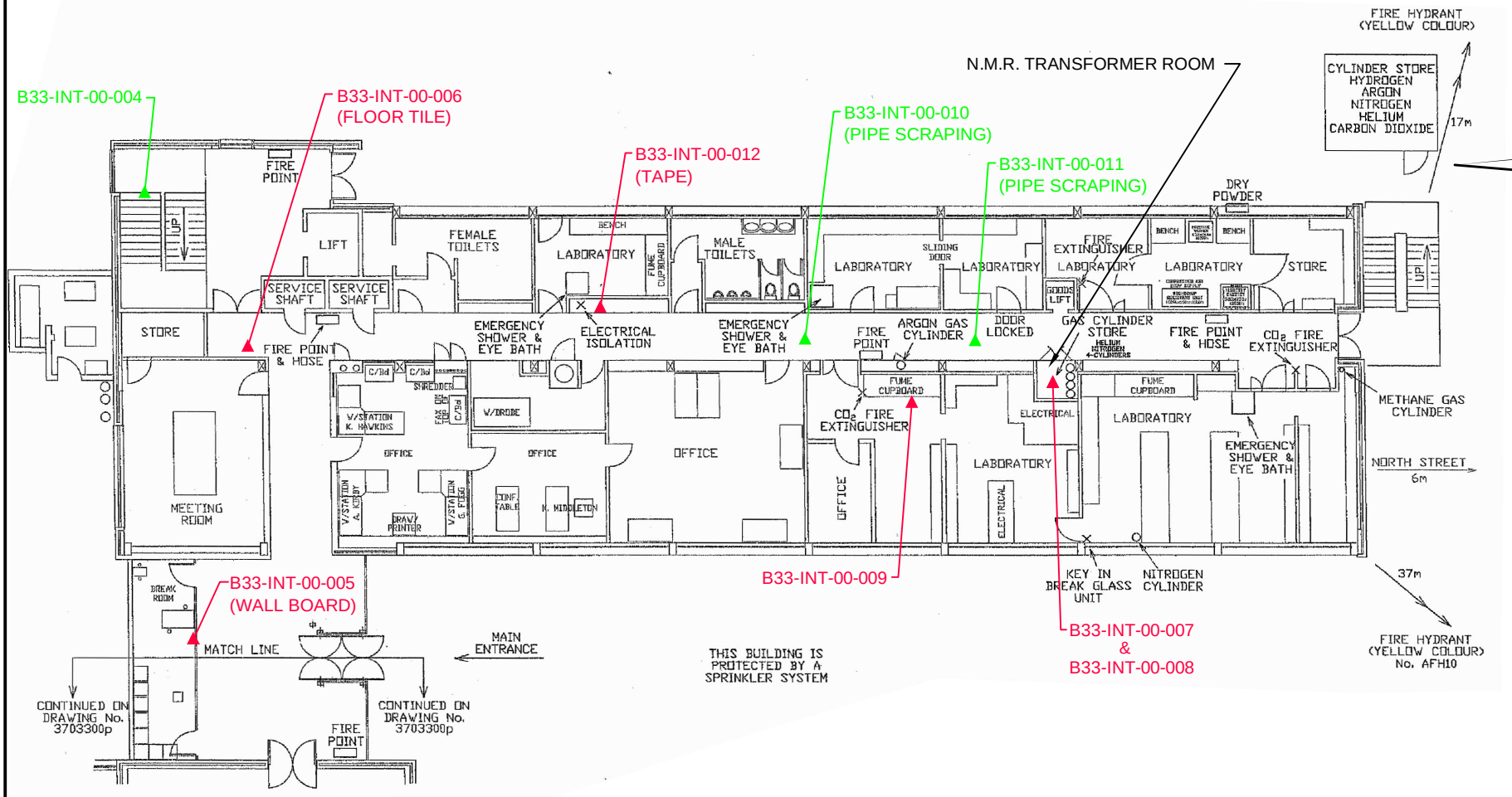
EXTERIOR

SAMPLE ID: B33-INT-EXT-001 AND B33-INT-EXT-001	**DATE SAMPLED:** 18/01/2007
BUILDING : NO. 33 EASTMAN BUILDING	**FLOOR/ROOM No/LOCATION:** EXTERIOR/PANELS BENEATH WINDOWS
SAMPLE DESCRIPTION: PANELS UNDERNEATH WINDOWS	
SURFACE TREATMENT: PAINTED RED	**CONDITION:** GOOD
QUANTITY :	

<< No Photograph >>

ASBESTOS CONFIRMED	**ASBESTOS TYPE**
AIR REASSURANCE REQUIRED	**HSE NOTIFIABLE**

COMMENTS : NONE



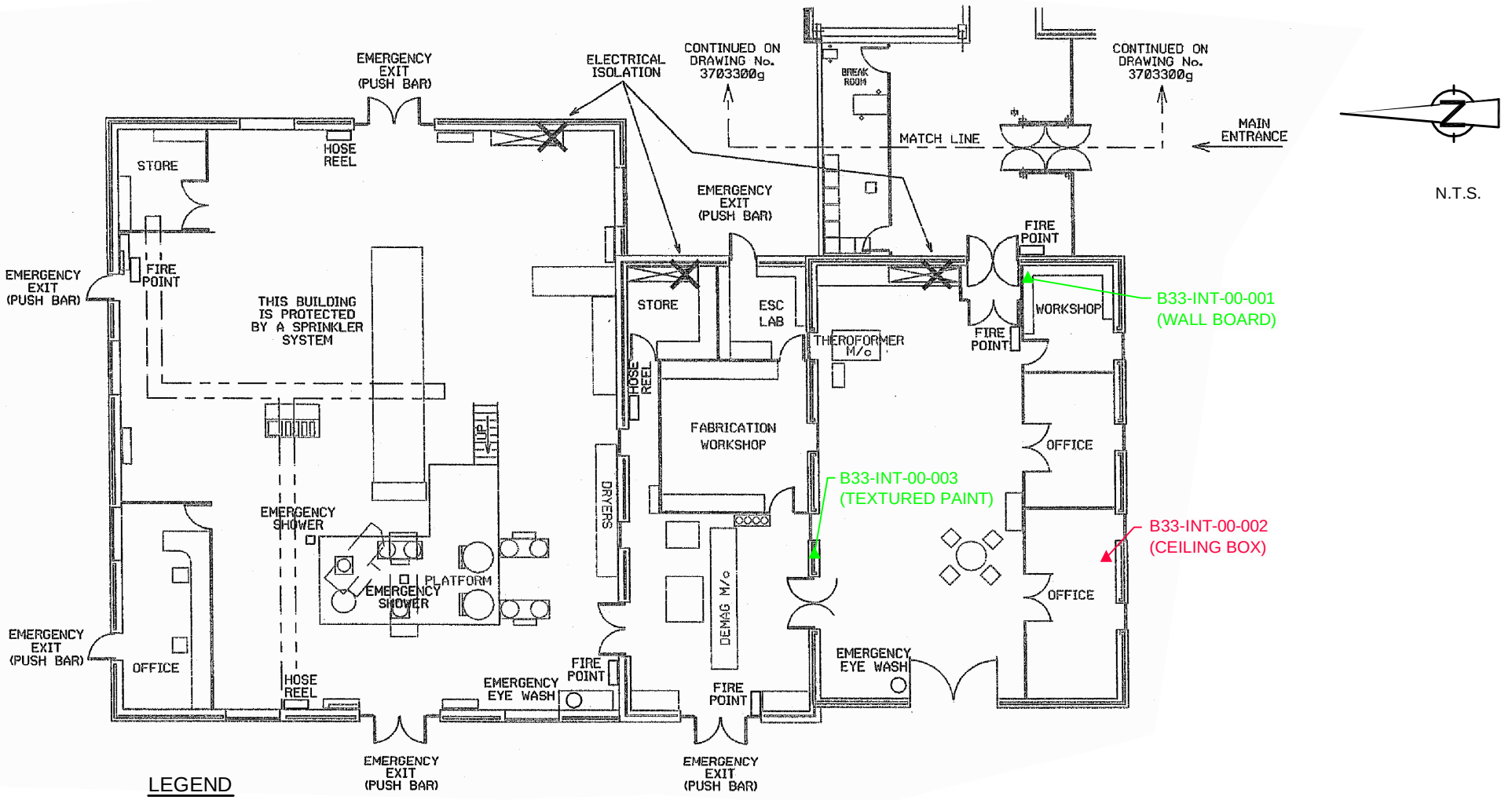
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix G Figure 1

AREA B33 (EASTMAN - NORTH PART OF GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

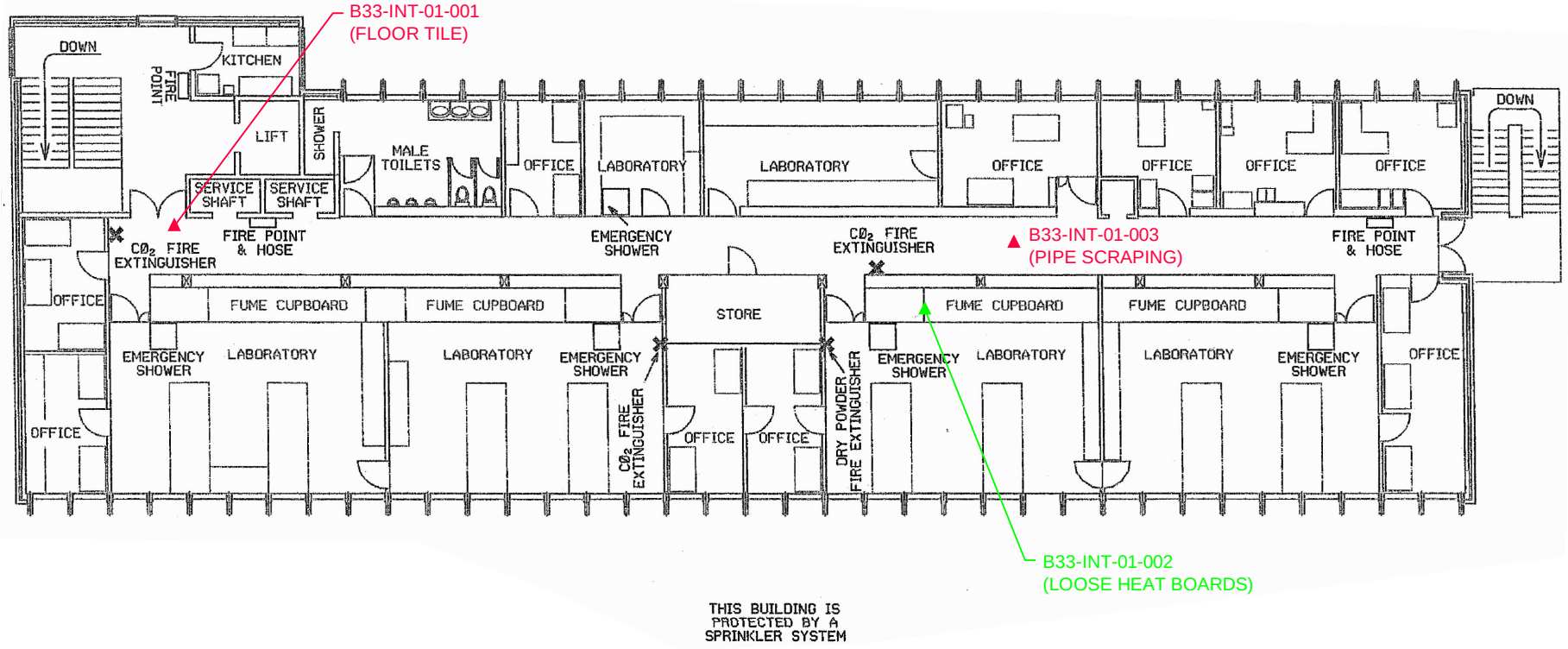
CRA CMEC



Appendix G Figure 2

AREA B33 (EASTMAN - SOUTH PART OF GROUND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

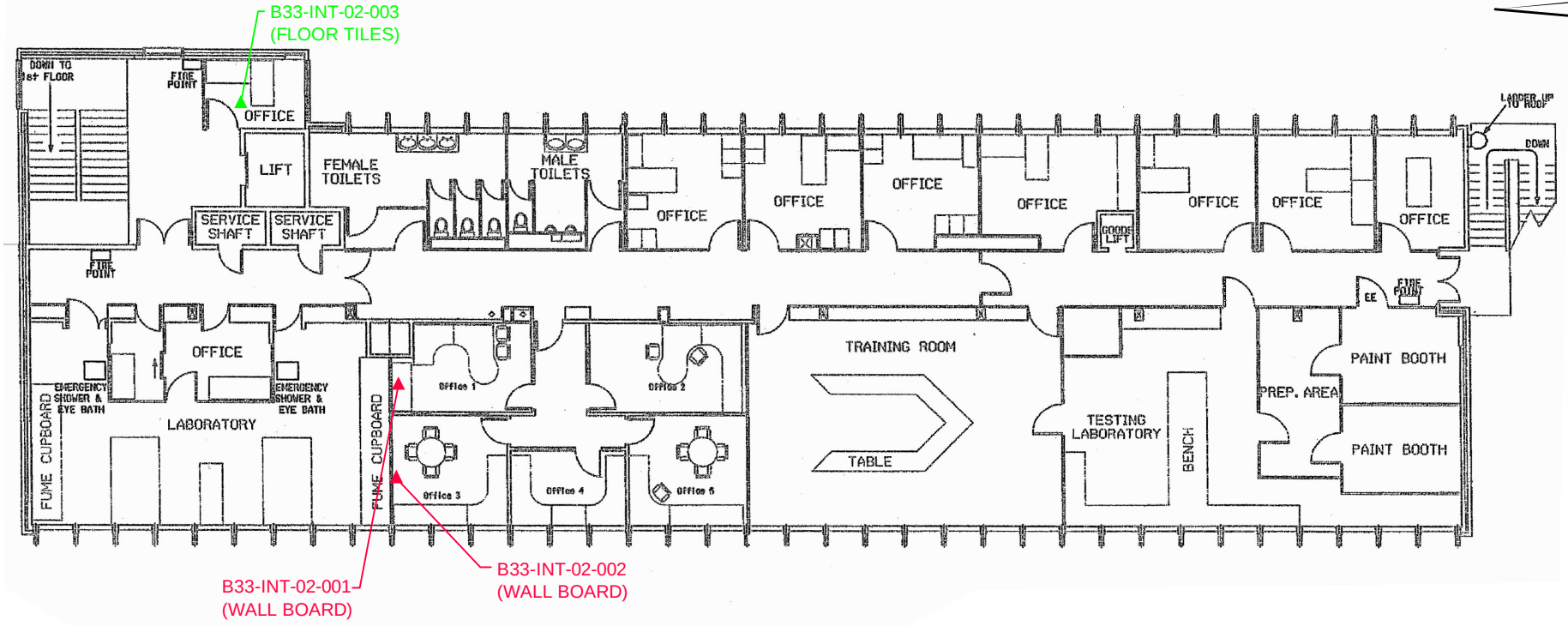
LEGEND

- ▲ SAMPLE LOCATION
- ▲ SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix G Figure 3

AREA B33 (EASTMAN - FIRST FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



N.T.S.

THIS BUILDING IS PROTECTED BY SPRINKLERS

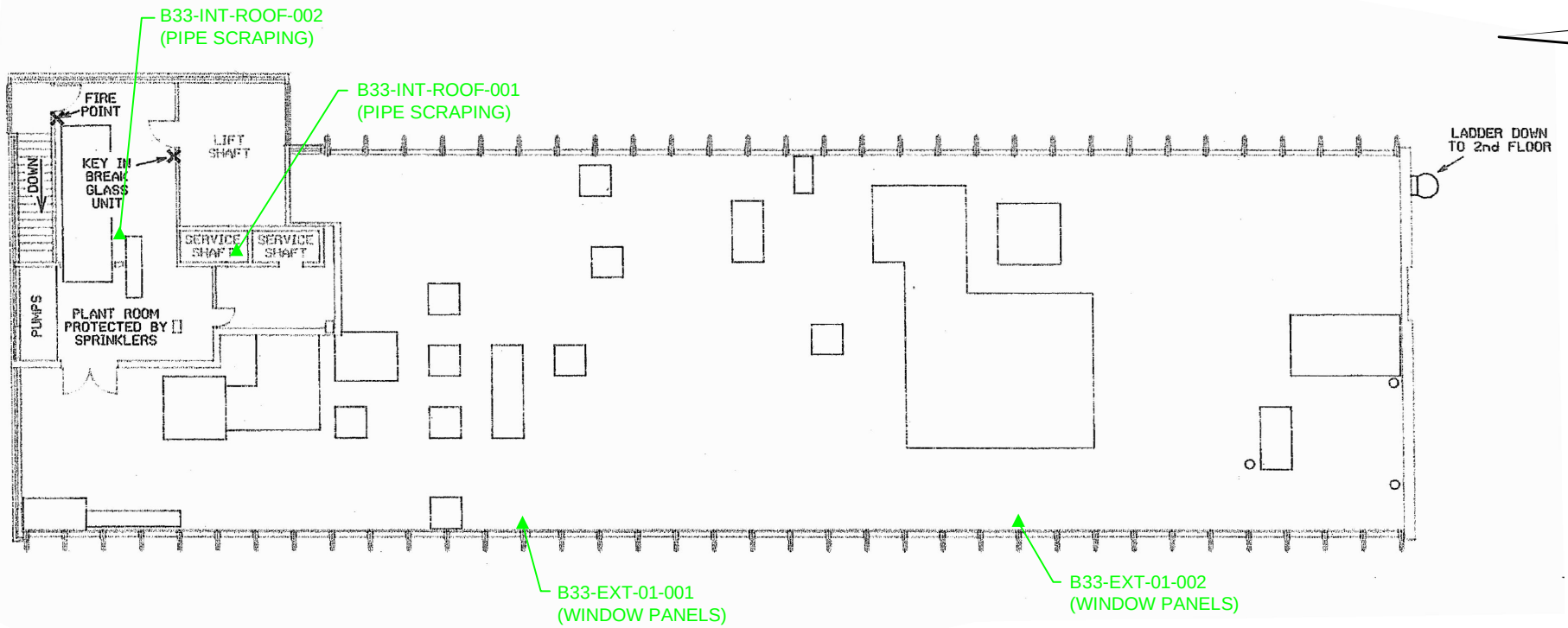
LEGEND

- SAMPLE LOCATION
- SAMPLE LOCATION REPORTED AS ASBESTOS CONTAINING MATERIAL BY LABORATORY

Appendix G Figure 4

AREA B33 (EASTMAN - SECOND FLOOR)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC



LEGEND

▲ SAMPLE LOCATION

Appendix G Figure 5

AREA B33 (EASTMAN - ROOF)
KODAK KIRKBY TYPE II / III ASBESTOS SURVEY
Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

APPENDIX H

PIPEWORK

Appendix H Figure 1

PIPEWORK

KODAK KIRKBY TYPE II / III ASBESTOS SURVEY

Acornfield Road, Kirkby, Liverpool, England

CRA CMEC

933389-00(001)GN-WA035 FEB 14/2007

APPENDIX I

LABORATORY CERTIFICATES

APPENDIX J

LIMITATIONS

LIMITATIONS

Our review and assessment was conducted in accordance with HSE guidance (MDHS 100) Surveying, Sampling and Assessment of Asbestos-Containing Materials (July 2001) and is based on the results acquired using the methodology set out in this report. The opinions in this report are given using generally accepted scientific judgement, principles, and practices; however, because of the inherent uncertainty in this process no guarantee of conclusion is intended or can be given.

This assessment was undertaken exclusively for the purpose outlined herein at Kodak Ltd Chemical Manufacturing, Acornfield Road, Kirkby, Liverpool, UK. It should be recognized that this ACM survey was conducted in accordance with the agreed upon scope of work. CRA cannot be held responsible for any ACM at the Site associated with concealed / non-accessible areas. While every effort was made to access all areas of the Site, certain areas could not be fully accessed without causing irreparable damage to the building fabric. This report is based on a non-destructive survey of the Site. It is known that ACM are frequently concealed within the fabric of buildings voids so that it is not possible to regard the findings of the survey as being definitive. It remains a possibility that further ACM may be found during renovation / demolition activities. In addition, where ACM has been confirmed, it is possible that past degradation of the material may have contaminated localized areas. The presence or extent of such contamination cannot be visually identified or assessed without the use of airborne fibre monitoring and / or swab sampling techniques, unless debris was visible during the survey. This exercise would require a separate visit and would be subject to further cost implications.

This report was prepared by CRA for Frank Penketh of Kodak Ltd Chemical Manufacturing. The scope of the services performed may not be appropriate to satisfy the needs of other parties. Any use that another party makes of this report, or any reliance or decisions made based on it, are the sole responsibility of the other party. CRA accepts no responsibility for damages, if any, suffered by any other party as a result of decisions made or actions based on this report.

APPENDIX K

ASBESTOS SURVEYING, SAMPLING AND ASSESSMENT

ASBESTOS SURVEYING, SAMPLING AND ASSESSMENT

There are three types of ACM survey:

- Level 1 Survey: Location and Assessment Survey (presumptive survey)

  Visual inspection and assessment of materials to locate suspected asbestos containing materials within a building, based on the presumption that suspect materials contain asbestos.

- Level 2 Survey: Identification, Assessment and Sampling Survey

  Same as the level 1 Survey, except that samples of suspect materials are taken and analysed for asbestos.

- Level 3 Survey: Full Access Sampling and Identification Survey (pre-demolition / major refurbishment surveys)

  Full intrusive survey to locate and assess all materials within the building that contain asbestos. It may involve the destruction of the fabric of the building to gain access to other areas. The survey is designed to be used as a basis for tendering for the removal of asbestos containing materials prior to major refurbishment works or demolition.

Asbestos can be defined as the term used for the fibrous forms of several naturally occurring minerals. There are three main types of asbestos that were commercially used: white, brown and blue. Common forms of these main asbestos types found in buildings are:

Chrysotile	-	White Asbestos
Amosite	-	Brown Asbestos
Crocidolite	-	Blue Asbestos
Amphibole	-	Brown or blue or a mixture of the two

All can be dangerous, but blue and brown asbestos are known to be more dangerous than white. The different types cannot usually be identified by their colour alone. Where asbestos is affected by heat or chemicals, or combined with other substances, the colour and appearance can change.

Ground Contamination Review & Remediation Action Plan
Former Kodak Chemicals Ltd Site, Kirkby, UK
International Process Plants

April 2007

DRAFT
SUBJECT TO PLC APPROVAL

WSP

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft	Revision post investigation	Draft Revision post investigation	Finalised document incorporating comments
Date	January 2007	March 2007	April 2007	April 2007
Prepared by	Richard Lawless	Richard Lawless	Richard Lawless	Richard Lawless
Signature				
Checked by	Steve McPartlin	Steve McPartlin	S McPartlin/J Black	S McPartlin/J Black
Signature				
Authorised by	Paul Connell	Paul Connell	R Clayton	R Clayton
Signature				
Project number	12121392/001	12121392/001	12121392/001	12121392/001
File reference	7885 (1)	7885(2)	7885(3)	7885(4)

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Contents

List of Acronyms / Technical terms i

Confidentiality Statement ii

Executive Summary iii

1 Introduction 1

2 Background 3

3 2007 Site Investigation 12

4 Conceptual Site Model 15

5 Remediation Strategy 30

FIGURES

Figure 1 Historical and Current Land Uses
Figure 2 Exploratory Hole Location Plan
Figure 3 Monitoring Well Locations
Figure 4 Glacial Till Thickness
Figure 5 Depth to Sherwood Sandstone
Figure 6 Shallow Groundwater Contours
Figure 7 Deep Groundwater Contours
Figure 8 Contamination Observations
Figure 9 Soil Contamination Summary
Figure 10 Perched Groundwater Contamination Summary
Figure 11 Deep Groundwater Contamination Summary
Figure 12 Drainage Layout
Figure 13 Remediation Works Summary
Figure 14 Indicative Remediation Programme Schedule

APPENDICES

Appendix A Document List
Appendix B Environment Agency Letter
Appendix C CRA Factual Report

List of Acronyms / Technical terms

ASTs – above ground storage tanks

bgl – below ground level

BTEX - benzene, toluene, ethylbenzene and xylene

CRA - Conestoga Rovers & Associates (Europe) Ltd

DRO – diesel range organics

DQRA - detailed quantitative risk assessment

EPH – extractable petroleum hydrocarbons

GRO – gasoline range hydrocarbons

IBC – intermediate bulk container

Kodak - Kodak Chemicals Ltd

MNA - Monitored Natural Attenuation

PCP - pentachlorophenol

PCBs - Polychlorinated Biphenyls

QRAs - Quantitative Risk Assessments

SPL - significant pollutant linkage

TPH – total petroleum hydrocarbons

Trial Pitting – Test Pit

USTs - underground storage tanks

Window Samples – Geoprobe Samples

WSPE - WSP Environmental Limited

Confidentiality Statement

This Environmental Site Assessment Report is addressed to and may be relied upon by the following parties:-

International Process Plants

Elgey Estates
C/o Neswick Farms
Neswick
Driffield
East Yorkshire
YO25 9EG
UK

17A Marlen Drive
Hamilton, NJ
08691
USA

ACE USA

436 Walnut Street – WA 07A
Philadelphia,
Pennsylvania 19106
USA

This assessment has been prepared for the sole use and reliance of the above named parties. This report shall not be relied upon or transferred to any other parties without the expressly written authorisation of WSP Environmental Limited (WSPE). No responsibility will be accepted by WSPE where this Report is used, either in its entirety or in part, by any other party.

With prior agreement from WSPE and in accordance with our standard terms and conditions this report can be reassigned to a future leaser, their funder and tenants, if applicable.

Executive Summary

WSP Environmental Ltd (WSPE) has been commissioned to undertake an environmental assessment and derive an appropriate remediation strategy for the closed Kodak Chemicals Ltd (Kodak) facility located in Kirkby, Liverpool. Continued commercial / industrial use is contemplated and no consideration of potential future redevelopment for residential or other more sensitive uses has been made during the development of the remediation strategy.

The subject site comprises a 13.5Ha chemical manufacturing facility that ceased production in late 2006. Two limited areas of the site have been leased and are continuing in operation; Ames Goldsmith has leased and is running the silver nitrate plant close to the southern boundary, and Eastman Chemicals Ltd is occupying offices and laboratories in the north-western corner of the site.

Kodak has made its files at the Site and in Rochester, New York available for review. Environmental investigations have been instigated by Kodak since the early 1990s. WSPE had input into the scope of the most recent investigation during January – March 2007, which was instructed by Kodak and managed by their consultants, Conestoga Rovers & Associates (Europe) Ltd (CRA). WSPE was also allowed to be present for the field work and made independent observations alongside CRA.

Ground conditions beneath the site comprise Made Ground of generally between 1 – 3m depth (maximum 7m in an area of historical landfilling), underlain by the Shirdley Hill Sand (a thin impersistent sand horizon up to 1m thick), and in turn by Glacial Till (a restricted-permeability clay horizon) and the Sherwood Sandstone at depths of between 2.5m and 14m. The Sherwood Sandstone is classified as a major aquifer by the Environment Agency and is considered to be the principal environmental receptor when considering whether remediation is required. Two separate groundwater bodies have been identified, a perched water table (above the glacial till) within the Made Ground & Shirdley Hill Sand and the deeper water within the Sherwood Sandstone.

As a legacy of the chemical manufacturing processes, the shallow soils and perched groundwater beneath parts of the site have been contaminated. The contamination identified includes various solvents (primarily petroleum based) used by Kodak, as well as traces of chlorinated hydrocarbons. The main area of impact is the original chemical manufacturing plant, which was demolished and replaced in the early 1980s together with the current solvent storage infrastructure. In addition, a localised area in the north-eastern corner of the site was found to be contaminated with a mixture of fuel hydrocarbons and poly-chlorinated biphenyls (PCBs).

Historical investigations have determined that the site poses a low risk to human health, and WSP would concur based on the ongoing commercial / industrial use. However, contamination has been identified within soil, shallow groundwater and the Sherwood Sandstone aquifer all that appears to have been derived from, or exacerbated by activities at, the Kodak site. WSPE has identified several migration pathways from shallow groundwater to the Sherwood Sandstone within the site boundary. These contaminant migration pathways are an unresolved issue in respect of recent correspondence from the Environment Agency (the UK regulatory body responsible for environmental protection).

The goals of the program are to get a concurrence letter from the Environment Agency that the linkages from the site to the Sherwood Sandstone have been mitigated. Mitigation of these linkages will include reduction in the mass of mobile compounds of concern in soils, reduction of the mass of compounds of concern in shallow groundwater, and the removal / management of the migration pathways to the Sherwood Sandstone. The programme of combined source remediation and pathway closure forms the basis of the proposed remediation strategy.

Remediation Strategy

The remediation strategy has been developed to address two pollutant linkages considered to be capable of presenting a significant risk.

The most immediate risk is associated with the linkage between contaminant (List 1 Substances) affected shallow soils, leaching to shallow groundwater and subsequent vertical leakage into the deeper Sherwood Sandstone water bearing zone. This linkage appears to be currently active principally around the Fire Water Pit and former Synchem area, and to a lesser degree in the bulk solvents area of the Site. Based upon the available data WSPE considers the likely Remedial Strategy to be as follows:-

- Restricting future site use to industrial or commercial purposes
- Reduction of the mass of constituents of concern in the shallow soils
- Reduction of the mass of constituents of concern in the shallow groundwater zone
- Restriction of identified pathways (aka “linkages”) into the underlying Sherwood Sandstone,
- Limited removal and in-situ containment of potentially mobile hydrocarbons and Polychlorinated Biphenyls (PCBs)
- Interruption of any potential pathways (aka “linkages”) for contact between constituents of concern and site occupants.
- Long term monitoring of perched and deep groundwater quality to provide evidence, post-remediation, of the absence of a significant pollutant linkage.

Implementation of that strategy will include the following specific actions:

- Removal of impacted soils within specific parts of the site, with limited demolition of existing buildings required where necessary to facilitate access.
- Remediation of impacted soils within specific parts of the site using in-situ technologies, where demolition of existing buildings required to facilitate access is not possible.
- Onsite treatment of soils containing organic compounds. The soils will be treated onsite and used as fill in the excavations.
- Containment and capping of PCB affected soils, with limited removal of mobile phase hydrocarbon liquids.
- Collection, pre-treatment, and discharge of the shallow groundwater in the vicinity of excavations. Discharged waters will be under permit to the sanitary sewer system.
- Installation of perched groundwater management to divert impacted shallow groundwater into above ground treatment infrastructure..
- Excavation and placement of high permeability fill around sumps that penetrate the Glacial Till. Shallow and deep groundwater shall be extracted for 12- to 18-months. Following extraction the fill will be sealed.
- Installation of specific perched water interception systems around deep penetrating structures (which cannot be removed for operational reasons) to discount preferential contaminant migration pathways (these to include the USTs and the fire water pit). Specifically, around the fire water pit, interception trenches will be installed to divert perched groundwater. Upon completion, any gaps behind the walls of the fire water pit will be grouted.
- Implementation of Monitored Natural Attenuation (MNA) programme within the shallow and deep aquifer with a target of a negotiated end point within 12 years

Prior to implementation of the above works, further assessment / detailed design will be required and the detailed strategy shall be agreed with the Environment Agency.

In addition to the works described herein, sources in soil, shallow groundwater, and linkages within the Effluent Plant area will be removed by Kodak.

1 Introduction

1.1 AUTHORISATION

On the instruction of International Process Plants (IPPE), WSP Environmental Limited (WSPE) has undertaken an assessment of historical and recent environmental data to derive an appropriate remedial action plan relating to soil and groundwater contamination. The assessment considers the available information relating to the Kodak Chemicals Limited (Kodak) installation located off Acornfield Road, Knowlsey Industrial Park, North Kirkby, Merseyside, L33 7UF, U.K. The available information includes:

1. Historical records made available by Kodak at the facility,
2. Historical records made available by Kodak at their NPEC, Inc. offices in Rochester, New York,
3. Observations made by WSPE during more than 10 days on site;
4. Observations made during the 2007 investigations conducted by Conestoga Rovers & Associates (Europe) Ltd (CRA), and
5. Data provided by CRA from their 2007 investigations.

A bibliography of all available documentation is documented in the attached list.

1.2 AIMS AND OBJECTIVES

It is understood that IPPE is looking to purchase the buildings and equipment and secure a long-term leasehold interest to the property. Following the purchase it is our understanding that IPPE will undertake a programme of refurbishment, plant sales, letting of buildings and possible limited redevelopment. It is understood that the principal site infrastructure such as roads, services and the majority of buildings will remain. WSPE is unaware of any specific redevelopment plans, and for the purposes of this report, a continued industrial use has been assumed.

WSPE has been requested by IPPE to undertake a review of all relevant environmental data / reports held by Kodak and assess the likelihood of significant environmental liabilities associated with the long-term leasehold ownership of the site. The assignment does not include the buildings or equipment being purchased, only the ground and groundwater from the slabs and foundations downward. From the information and observations, WSPE is to derive an appropriate remediation strategy to manage any potential environmental liabilities identified.

1.3 SCOPE OF WORKS

WSPE was initially commissioned in January 2007 to review existing environmental information pertaining to the site, develop the outline conceptual site model and undertake a gap analysis of the data (summarised in Section 2 to 5 inclusive). From this initial review, a further phase of site investigation was performed by CRA under contract to Kodak, with the aim of reducing the uncertainty associated with the identified data gaps.

CRA had been commissioned by Kodak to investigate readily accessible areas of the site by means of trial pitting on a regular grid. WSPE requested additions to this scope of works by way of further exploratory positions, additional types of sampling (window and soil boring samples), additional monitoring well installations, and laboratory analysis. The site investigation was subsequently undertaken by CRA during January to March 2007, with WSPE present in an observing role.

Upon completion of the site investigation, WSPE has interpreted the findings to produce a refined conceptual site model (Section 4), and derived a remediation strategy (Section 5).

1.4 INFORMATION SOURCES

Representatives from WSPE attended Site meetings and conducted a document review during December 2006 and January 2007 and were assisted by Francis Penketh of Kodak. A second document review was conducted in Rochester, New York assisted by Joseph Gabriel and Julia Ispentchian. Various sources of information were provided, including site plans and aerial photographs. The documents reviewed as part of this commission are listed in Appendix A.

1.5 LIMITATIONS

A portion of the information presented in this document is based solely on third party data. However, WSPE has had opportunity to verify the accuracy of recent third party data during the performance of the 2007 supplemental investigation.

2 Background

2.1 SITE DETAILS

Site Address:	Acornfield Road, Knowlsey Industrial Park, North Kirkby, Merseyside, L33 7UF	
National Grid Reference:	SJ438987	
Size:	13.5 Hectares (37 acres)	
Description of Site:	The Site is currently occupied by Kodak and, until recently, was used for the manufacture of photochemicals. Production ceased during 2006 and the plant is in the process of being shut down, with the exception of the silver nitrate plant (recently leased to Ames Goldsmith) and Eastman Chemicals Limited in the north-western corner of the site (research facility). The property comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. All roadways and loading areas are surfaced with concrete hardstanding. The north-eastern corner of the site was until recently utilised as a sports pitch (grassed).	
Surrounding Area:	north	Industrial / commercial premises
	east	Perimiter Road, beyond which lies open farmland. To the southeast an area of recent landfilling / landraising is apparent.
	south	Undeveloped woodland.
	west	Industrial / commercial premises and derelict land.

2.2 SITE HISTORY

The site history has been obtained from referral to Ordnance Survey maps, historical site photographs and anecdotal / archive information contained within the CRA desk study report (Report 22 – Appendix A).

Until WWII the study area was situated within a rural, agricultural setting. The site itself was undeveloped until the end of the 19th Century, with Boundary Lane forming the site's boundary to the north and Kirkby Rank Lane the boundary to the south. By 1894 a small residential dwelling had been built in the north-eastern corner and a marl pit had been excavated in a field just to the south of Boundary Lane. However, the remainder of the site was still utilised as agricultural land.

In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). The site was used as a filling factory, whereby explosives were loaded into various types of ammunition cases. The Munitions Factory covered 743 acres, with the majority located off-site, to the west of Acornfield Road and only covered a small part of the Kodak site (mainly the south-western corner). Within the subject site a number of small buildings were constructed within the south-western corner, together with a rectangular feature close to the eastern boundary, anecdotal information suggesting this was a fresh water reservoir. The buildings on site were reportedly used as explosive test bays. The presence of earth bunds around some of the buildings suggests that explosives may have been stored on site.

The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. It appears that initially operations were small-scale with 9 employees occupying the former MoD buildings, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's additional facility in Harrow, London. In 1962 the

Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

In 1969 production on site diversified to produce chemicals not specifically for the photochemicals industry. Initially this involved the production of hydroquinone and tecmangam (manganese ammonium sulphate) with production of benzoquinone added in 1971. These ancillary activities were located in areas 48 and 49 and ceased in 1974.

The synthetic chemicals manufacturing buildings were demolished and replaced (by Building 82) in the late 1970s. The Powders & Solutions Department was closed in 2001 and the installation ceased production at the end of 2006.

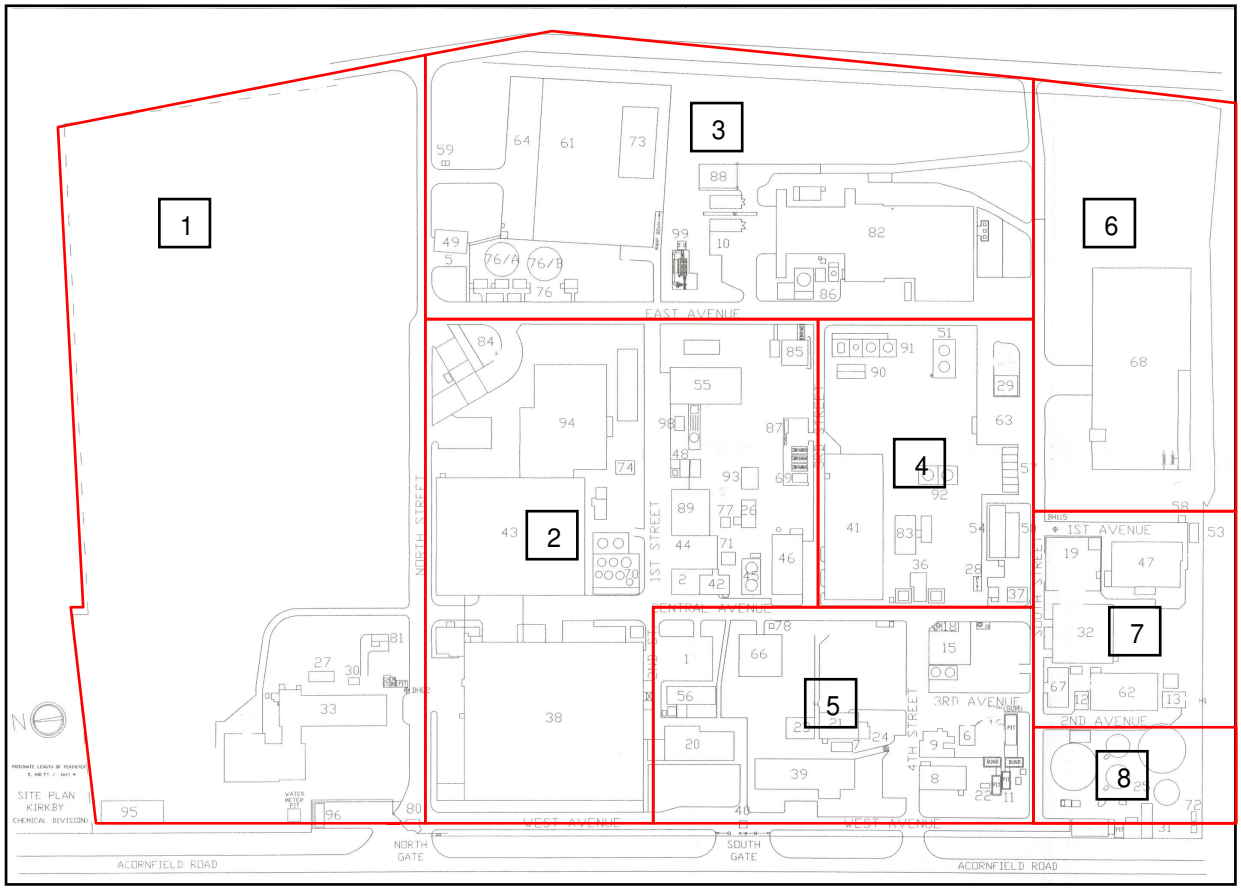
2.3 CURRENT LAYOUT / LAND USE

An aerial photograph of the current layout is presented below and the current Site layout can be determined from the plan overleaf and in detail on Figure 1.

Recent Aerial Photograph

For ease of reference, the site has been split into eight separate zones, based on the current or most recent usage, as follows:

1. Playing field & Eastman Chemicals
2. Photochemicals Division
3. Reservoir and Synchem Plant
4. Bulk solvents area
5. Former Synchem Plant
6. Drum storage compound and 'mound'
7. Ames Goldsmith area (silver nitrate)
8. Effluent plant



Site Zones as Defined by WSPE

WSP Zone 1 – Eastman Chemicals and Former Playing Fields

Eastman Chemicals Ltd occupies the north-western corner of the site (Buildings 33, 27, 30 and 81 – Figure 1). This area comprises offices and small-scale testing laboratories utilised for research purposes. Only small quantities of chemicals are stored / used within this part of the site.

The former playing fields are located to the east of the Eastman Chemicals buildings and occupy the majority of Area 1. The area occupied by the playing fields was formerly used as a waste disposal / burning location during the 1950s – 1970s.

WSP Zone 2 – Former Photochemicals Division, Former Nexpress, and Utilities

The photochemicals process commenced in 1961 and was closed in 2001, occupying Buildings 38 and 43. Liquid chemicals were stored in bulk in an above ground tank farm to the south of Building 43. The chemicals used included a 20% ammonia solution, sodium hydroxide, acetic acid, potassium sulphate, ferric nitrate and ammonium thiosulphate. Various production / holding tanks were located within Building 38, with Building 43 used for storage / distribution. A small laboratory within this area produced limited quantities of quinone.

This area was also the location of the historical hydroquinone / benzoquinone and tecmangam production during the late 1960s to early 1970s.

The Utilities area of the site included the engineering department / stores (Building 41). The main boiler house (Area 46) is also present within this area and is gas supplied. The boiler house was provided with gas-oil back up which is stored in two 76,000l ASTs (Building 45).

WSP Zone 3 – Reservoir and Synthetic Chemicals Manufacture (Synchem)

Synthetic chemical manufacture has been undertaken since the commencement of Kodak's operations in 1949 starting in Area 5, described below. The most recent Synchem buildings and plant are understood to date from 1980. Synthetic chemicals manufacture is undertaken within Building 82 (Figure 1).

The products were mainly photographic couplers and stabilisers. Large volumes of petroleum based-solvents are used in the processes, including methanol, heptane, methyl ethyl ketone (MEK) ethyl acetate, toluene and acetone. Bulk chemical storage was located elsewhere on site and is discussed below. Smaller volume chemicals were stored in 205l (55 gal.) drums. Most were located in purpose built concrete storage areas although a few were reported to be stored adjacent to open ground to the east. Process wastes were directed into the chemical drainage system and generally contained acid, caustic soda, diluted methanol and triethylamine.

This area also contains the "reservoir". The "reservoir" was originally constructed by the Ministry of Defence, and it is assumed (given the location and presence of other similar features around the former munitions factory) that the reservoir was used as a store for fire-fighting water. Kodak did not use the reservoir for storage of open liquids. Kodak used the reservoir area for the storage of drums of their most flammable chemicals during the 1950s to 1970s. This location was well away from the occupied parts of the site at that time.

Immediately to the west of the reservoir are two large sprinkler water tanks for fire-fighting purposes. The pumps are powered by diesel motors, with diesel stored in small ASTs within the immediate vicinity.

WSP Zone 4 – Bulk Solvent Storage and Reclaim

This comprises a series of bulk storage tanks comprising both ASTs and two underground storage tanks (USTs) and is located in Areas 29, 37, 50, 54, 57 and 63 (Figure 1). The bulk storage tanks for raw solvents were located in this area, with road bulk liquid tankers being unloaded in Area 63. This facility was used to accumulate waste solvent streams from across the site. Toluene and heptane were recovered in an on-site process. All remaining waste solvents were sent off site for recovery or incineration. Solvent recovery was undertaken in a distillation unit in Area 37.

Solvents were delivered to the relevant process areas (and returned) by a series of overhead pipelines. Areas beneath the overhead pipelines were generally noted by CRA to be unsealed and evidence of localised staining from leaks was apparent. However, site staff stated that no significant leaks were known to have occurred within the pipe network.

Anecdotal evidence indicates that routine testing highlighted weld failures on one of the USTs. This was reportedly fixed, although it is not known how long this problem endured.

WSP Zone 5 – Former Synchem

The original synthetic chemicals manufacture took place in Area5 (Buildings 15 and 23). All associated buildings were demolished in the early 1980s, although only to ground level. The ground floor slabs are still in place, together presumably with any below ground infrastructure. The original boiler house is still present as Building 23, although it is now used as a store. The associated gas oil tanks were removed during the early 1980s, although the concrete plinth is still evident immediately to the south of Building 23. The former silver recovery plant was built over the top of Area 15.

The silver recovery plant was historically licensed and monitored by the Environment Agency. The process involved the adjustment of pH and addition of iron powder to silver bearing liquor. Five ASTs were required for the process in Building 15, comprising two 90,000l waste tanks, two 1,000l sulphuric acid tanks and a 16,000l day tank. The process commenced on site in 1995.

WSP Zone 6 – Drum Storage Compound and 'Mound' Area

The drum storage compound was constructed in the late 1970s for the temporary storage of all small-scale chemicals and finished products. To the east of this feature is an area of grassed open space, which rises into a mound on the eastern edge. Kodak staff have identified the mound feature as the

location that soils from foundation and pit excavations were placed. The exact foundations or pits are not known, although it is thought that this whole area (including beneath the drum store) was used for the management or disposal of site-derived wastes. As shown on the figures, there has been a significant amount of investigation throughout this area.

WSP Zone 7 – Ames Goldsmith

Ames Goldsmith have undertaken a leasehold interest in this part of the site since cessation of production by Kodak at the end of 2006. It is understood that silver nitrate production is continuing in the same manner as previously conducted by Kodak.

This process is undertaken in Building 47 (Figure 1). Silver nitrate has been produced on site since 1967 and the process has not moved during this time. Silver nitrate production involves the reaction of silver bullion with nitric acid. Nitric acid is stored adjacent to Building 47 in a 17,000l above ground storage tank (AST) which was provided with secondary containment. The drainage system directs all drainage (via a settlement pit) to the effluent treatment plant in the south-western corner of the site (Area 25). Prior to closure of the effluent treatment plant in April 2007, the drainage will be redirected to the sanitary sewer system under permit to the local authority.

Adjacent to the Silver Nitrate plant is a licensed groundwater abstraction well. This abstracts water from the Sherwood Sandstone aquifer at a depth of approximately 106 m for use within the Silver Nitrate process. The water has been regularly tested by Kodak (CRA) no site related influences have been detected to date.

WSP Zone 8 – Effluent Treatment

Wastewater treatment was undertaken on site, comprising separator pits, neutralisation and biological treatment. The majority of this apparatus is located in the south-western corner of the site in Area 25 (Effluent Plant) and is due to be demolished by Kodak in April and May 2007, prior to handing this area over to Ames Goldsmith. It is understood that the main tanks in this area are constructed on vibro-stone columns to a depth of approximately 3m. Kodak is going to conduct a program of soil and shallow groundwater remediation between the time the demolition is completed and the property is turned over to Ames Goldsmith. One component of the soils/shallow groundwater remedial action shall be the elimination of the potential for vertical migration along the stone columns.

Ancillary Activities

Three separate drainage systems have been developed at the site, one for surface drainage, another for foul water, and a third for chemical drainage. The drainage systems comprise a mixture of former Ministry of Defence (MoD) drains from WWII and more recent additions by Kodak. The chemical drainage system is understood to be constructed from glazed ceramics.

A visual inspection of the chemical drains and pits is conducted annually to check condition and a thorough CCTV survey was last completed in 2003 with no significant concerns identified. No integrity / leak testing of the drains are undertaken. Kodak staff have reported that several sections of drains have been replaced in the past due to chemical attack and subsequent collapse, including a failure at the northwest corner of building 82 and along South Street near Building 6, although the affected areas are generally not documented.

2.4 POTENTIAL AREAS OF ENVIRONMENTAL CONCERN

The review of available historical documents relating to the site has identified a number of potential sources of ground contamination. These are presented as Figure 1 and include historical and current bulk fuel storage and process areas.

2.5 ENVIRONMENTAL SETTING

Site Setting

The subject site is located on the eastern boundary of the Kirkby Industrial Park. The Park was developed on top of the former Ministry of Defence munitions factory after WWII. The wider area was rural prior to the construction of the munitions factory and the land to the east is still used for agricultural purposes.

Immediately adjacent land uses to the west and north are industrial / commercial, whilst mature woodland bounds the site to the south (Charley Wood). To the southeast of the site is a raised field, currently utilised for grazing. This area was formerly a landfill during the 1950s to 1970s, and the waste types deposited are unknown, although it was reportedly operated by the local authority in the 1970s for domestic refuse disposal.

Kirkby Industrial Park has been occupied by several large chemical manufacturing companies since WWII and the Environment Agency has provided anecdotal information that groundwater beneath the Park has been impacted by the presence of tributyltin (TBT). The source of this contamination is understood to be off-site, some distance to the west, although two unreplicated detections of TBT have been reported at the site.

Geology

The 1:50,000-scale solid and drift geological map for the area indicates the study area is directly underlain by superficial deposits of peat. These deposits are further underlain in the north, west and east of the Kodak facility by the Shirdley Hill Sand. The bedrock strata beneath the Site are indicated as the Permo-Triassic Sherwood Sandstone.

Hydrogeology

The Shirdley Hill Sand is classified as a minor aquifer, whilst the Sherwood Sandstone is classified as a major aquifer by the Environment Agency. Groundwater from the Sherwood Sandstone is abstracted in the region for commercial and drinking water purposes. Kodak held (reportedly Ames Goldsmith now holds) a license for groundwater abstraction for industrial use. The borehole is understood to be 106m deep and drilled in 1986 to supply the silver nitrate plant close to the southern boundary. The license is for 90,000m^3 per year, although the amount actually used by Kodak and now by Ames Goldsmith varies.

Data from the Environment Agency indicates that the closest abstraction for drinking water is the Knowsley Pumping Station approximately 1.5km to the south. This well is not downgradient of the site, although this abstraction well is currently not operational.

A second drinking water abstraction (Randle's Bridge pumping station) is located approximately 3.5km southwest of the Site. This well is also not downgradient of the site. The Former Kodak facility is not currently located within a Source Protection Zone for a potable abstraction (as defined by the Environment Agency).

Given the highly sensitive nature of the groundwater beneath the study area, the Environment Agency manages a network of groundwater monitoring wells within the wider area. The closest well to the subject site is located approximately 50m to the south of the Kodak boundary within Charley Wood.

Hydrology

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 10m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area.

2.6 GROUND CONDITIONS FROM PREVIOUS SITE INVESTIGATIONS

Geology

Based on the previous reports listed in Section 1.4, the geology beneath the site broadly comprises Made Ground underlain by Shirdley Hill Sand (with peat present locally), then Glacial Till, which in turn is underlain by the Sherwood Sandstone Group.

The Made Ground is generally described as a reworked sand / clay with varying amounts of roadstone, glass, brick, metal, ash, wood etc. Made Ground has been recorded across the entire site with a maximum depth of 3.2m, although it is usually approximately 1m thick.

Beneath the Made Ground a thin, impersistent sand was encountered. This has been interpreted as the Shirdley Hill Sand and is described as a fine to medium sand with varying silt and gravel content and a maximum thickness of 0.7m. Peat has also been recorded locally immediately beneath the Made Ground.

Beneath the Shirdley Hill Sand / Peat, Glacial Till has been encountered across the whole site, although the thickness varies widely, with a range between 0.8m and 12.2m proved in previous investigations (Glacial Till was noted to be absent in a single exploratory hole, BH12 located close to the southern boundary). This stratum appears to generally thin towards the southwest of the site.

The Sherwood Sandstone has been proved immediately beneath the Glacial Till to a maximum depth of 100m below ground level (bgl); although we have the abstraction well record that suggests it may be 106m deep. The depth at which this major aquifer is encountered varies between 4.4m bgl to 14m bgl, and is closest to the surface in the south-western corner of the site (close to the effluent treatment plant).

Groundwater

Two distinct groundwater bodies have been established by Aspinwall and CRA previously. The upper (perched) water body is present within the base of the Made Ground and the Shirdley Hill Sand, resting on the Glacial Till.

CRA has previously monitored shallow groundwater levels on 7 separate occasions and consistently identified a flow direction to the west / southwest.

Groundwater levels within the Sherwood Sandstone have also been recorded by CRA on 7 occasions and indicate that the major aquifer is fully saturated (confined) beneath part of the site, with a flow direction generally recorded to the northwest. The recorded levels indicate a hydraulic head separation between the two groundwater bodies of approximately 4 to 5m, supporting the position that the till isolates the shallow and deep units from each other.

2.7 PREVIOUS INVESTIGATIONS

Numerous site investigations have been conducted at the site, although many were limited and for geotechnical purposes. Two main phases of environmental investigations have been undertaken during the 1990s (Aspinwall) and during the 2000s by CRA.

As part of the conceptual model of the site presented as Section 4, WSPE has incorporated the data from these previous investigations. Relevant data is also included on Figures 2 to 11 inclusive. A brief summary of the previous work is provided below.

Aspinwall Investigations

It is understood that Aspinwall was instructed to undertake an environmental assessment at the Kirkby site in response to an unrelated contamination incident that arose at another Kodak property in the United States of America. The work progressed in three main stages; an initial site-wide investigation in 1993, limited further intrusive works in 1994 and subsequent groundwater monitoring visits and assessments until 2000.

During the 1993 / 1994 investigations, Aspinwall encountered soil and perched groundwater contamination in several discrete parts of the site. This principally related to solvent contamination around the bulk solvent area (WSP Zone 4) and fuel hydrocarbon contamination (petroleum range)

around BH11R in WSP Zone 2. Localised ammonium impact was also noted within the perched groundwater.

Aspinwall did not undertake any sampling of groundwater within the underlying Sherwood Sandstone, although the potential risk to this receptor was identified by the company, due to the thinning of the Glacial Till in the south-western corner of the site. Monitoring episodes post 1994 generally noted a reduction in contaminant concentrations within the perched groundwater.

CRA Investigations

CRA was commissioned in early 2003 to undertake an environmental assessment of the Kirkby site. This was part of 'Project Discovery', a programme by Kodak to identify environmental liabilities associated with all their properties.

CRA initially produced a desk study report, which includes a detailed historical record of the site. Subsequently, a series of investigations has been undertaken including a general site wide survey, followed by investigations of specific areas and ongoing groundwater monitoring.

As part of the work completed by CRA, detailed quantitative risk assessments (QRA) have been undertaken on risks to controlled waters. The relevant reports have been submitted to the Environment Agency for their comment.

The initial investigation by CRA in 2003 was a general site-wide investigation, although it appears to have been limited to roadways and landscaping areas. The investigation also avoided sensitive operational areas such as the bulk solvent storage and synchem buildings, for health and safety reasons. The 2003 investigation comprised a soil vapour survey, 33 window sample holes and six cable percussive boreholes with shallow and deep installations targeting the Shirdley Hill Sand and Sherwood Sandstone respectively.

In November 2003 CRA drilled two further groundwater monitoring wells into the Sherwood Sandstone to depths of 80m and 100m bgl. Subsequently, a total of six groundwater monitoring rounds have been completed covering both CRA wells and older Aspinwall wells that have survived.

Since 2004 CRA has undertaken ground investigations of specific areas. These included the following:

- Two separate investigations of the playing field area in WSP Zone 1, subjected to historical landfilling and/or raising.
- A site investigation of part of WSP Zone 6, 'the Mound' also subjected historically to landfilling.
- A site investigation of the silver nitrate plant.
- An investigation of the Eastman Chemicals site, within WSP Zone 1.

The CRA investigations have generally recorded limited soil contamination, when concentrations are compared to a commercial / industrial end use. Notwithstanding this, some localised elevated concentrations have been identified and include slight hydrocarbon contamination within the mound (WSP Zone 6) and playing field (WSP Zone 1), as well as slight silver impact within one exploratory hole within WSP Zone 7.

Perched groundwater contamination, where identified is generally localised and varied, including slight metal contamination, TPH and BTEX (benzene, toluene, ethylbenzene and xylene).

BH11R (an Aspinwall well) has consistently recorded slightly elevated concentrations of BTEX up to several mg/l. Slightly elevated concentrations of BTEX have also been recorded intermittently in BH2A, BH12R and BH1. Slightly elevated EPH concentrations have been recorded within BH1 (1.7mg/l) and BH2A (2.1mg/l). Study of the chromatograph indicated that the EPH within BH2A was due to the presence of various 'naphthas'.

Slightly elevated concentrations of pentachlorophenol (PCP) have been detected intermittently in BH1 and BH2A, both located close to the southern boundary of the site, in the area of historical landfilling. There is no record of PCP having been used by Kodak on the subject site.

Groundwater testing of samples obtained from the Sherwood Sandstone has identified slightly elevated concentrations of several metal species; TPH and benzene have also been recorded locally.

Trace concentrations of several chlorinated hydrocarbons (including pentachlorophenol, trichloroethene and vinyl chloride) have been detected within several of the deep wells. Tributyltin (TBT) has also been detected in two deep boreholes (BH4A and BH5A) on a single occasion in 2005. Anecdotal information suggests that TBT contamination of the Sherwood Sandstone is a wider issue relating to the Kirkby Industrial Estate.

CRA Risk Assessments / Regulatory Liaison

CRA has undertaken detailed Quantitaive Risk Assessments (QRAs) on the chemical data obtained for the site. CRA identified three main potential pollutant linkages with respect to controlled waters, as follows:

1. Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2. Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water channel 30m to the south of the site boundary.
3. Deep groundwater contaminants, via lateral migration to a theoretical 250m distant compliance point down-gradient of the site.

CRA has utilised a commercially available risk assessment package, Consim V2, published by Golder Associates / Environment Agency to model predicted concentrations of contaminants down-gradient of an assumed source.

With respect to the above linkages, CRA concluded the following:

1. Long term risks exist to deep groundwater quality 250m from the site boundary relating to benzene, xylene and TPH, particularly with respect to BH11R.
2. This pollutant linkage is not considered by CRA to be valid, as the watercourse in question is up-hydraulic gradient from groundwater beneath the Kodak site.
3. No long term risks identified with respect to groundwater quality 250m from the site, from pre-existing contamination beneath the study area.

CRA undertook a limited human health risk assessment that was restricted to a comparison of contaminant concentrations against published generic screening values for a commercial / industrial end use. CRA identified localised exceedances with respect to lead, polycyclic aromatic hydrocarbons (PAHs) and TPH, although no further assessment was undertaken.

The Environment Agency has reviewed the risk assessment produced by CRA and provided their formal response in a letter dated 21 December 2006 (included as Appendix B). This letter generally approves the findings of the QRA and concludes that Pollutant Linkages 2 and 3 *'do not appear to be viable pollutant linkages'.* However, the Agency reserves concern in relation to Linkage 1, *'because the contaminants which are reaching the major aquifer are List 1 Substances'* and has requested more detailed modelling and the derivation of site-specific remedial targets to determine the need for any remediation works (this has not been undertaken to date). Responding to the EA 21 December 2006 letter will be one of the first actions required under the program proposed in Section 5.

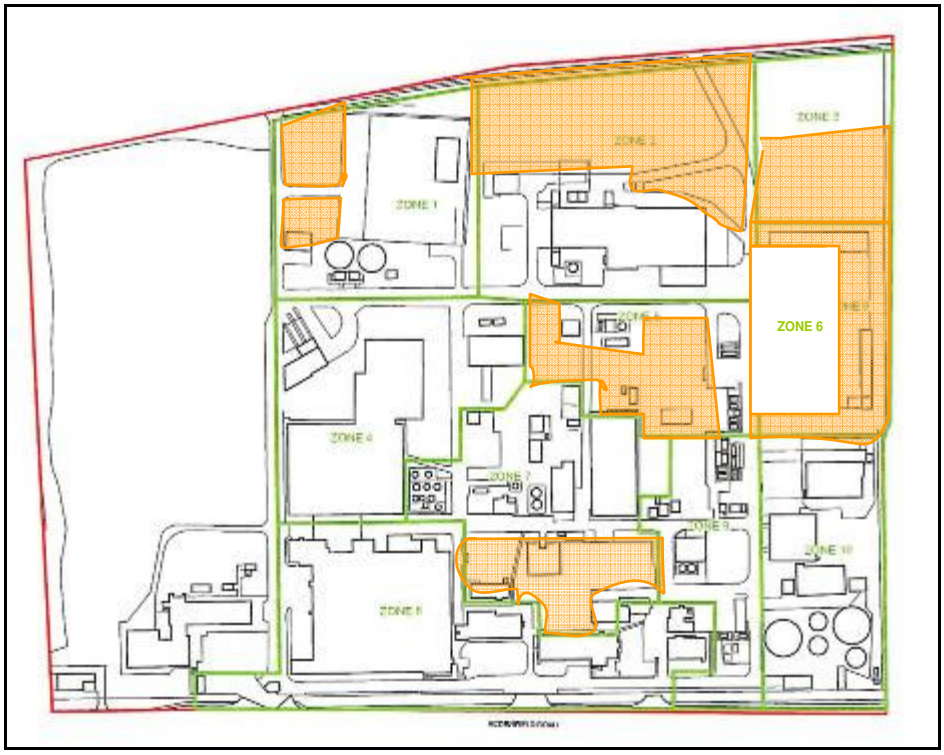
3 2007 Site Investigation

3.1 INTRODUCTION

CRA was commissioned in early 2007 to undertake a site investigation of the Kirkby site. The rationale was to investigate newly accessible areas, given that production at the facility had ceased at the end of 2006. The investigation was restricted to areas of soft landscaping and, rather than targeting any particular issues of concern, the strategy was generally to undertake trial pitting on a regular grid. This was prior to IPPE's interest in purchasing the facility and procuring a leasehold on the property.

3.2 INVESTIGATION RATIONALE

Notwithstanding the changed circumstances brought about by IPPE's interest in the facility and property, the CRA element of the investigation proceeded unaltered. CRA split the site into a number of zones (not to be confused with WSPE's zoning) as shown on the plan below:



The areas highlighted in orange approximate the soft landscaping areas subjected to trial pitting by CRA on a regular grid.

CRA undertook the following investigation:

CRA Zone 1 – 11 trial pits (TPZ1-1 to TPZ1-11 inclusive) – North end of WSP Zone 3

CRAZone 2 – 20 trial pits on a 20m grid (TPZ2-1 to TPZ2-20 inclusive) – South end of WSP Zone 3

CRA Zone 3 – 13 trial pits (TPZ3-1 to TPZ3-12 inclusive) – East end of WSP Zone 6

CRA Zone 5 – 19 trial pits (TPZ5-1 to TPZ5-19 inclusive) – West end of WSP Zone 6

CRA Zone 6 – 17 trial pits (TPZ6-1 to TPZ6-17 inclusive) – WSP Zone 4

Zone 7 – 20 trial pits on a 10m grid (TPZ7-1 to TPZ7-20 inclusive) – Portion of WSPE Zones 2 and 5

WSPE undertook a review of the existing site data in January 2007 and identified a number of gaps in the existing data. These included potential contamination sources that had not been subjected to investigation, areas of identified contamination in need of further delineation, and also parts of the site not previously subjected to any investigation.

The rationale for the WSPE element of the investigation is summarised in the table below:

Issue	WSP Zone	Exploratory Hole References
Additional investigation within reservoir area	2	WSPT1,2,3,4,5,6,7 WSPX6,7
Diesel tanks associated with sprinkler tanks	2	WSPX5,51
Investigate beneath Building 82 (not previously investigated)	2	WSPX55,56,57,58
Collapsed / failed drain (AF on Figure 1)	2	WSPX8
Area of suspected historical waste disposal (D on Figure 1)	2	WSPX9,59,58 WSPT9
Area of historical informal drum storage	2	WSPX41
Delineation of contamination identified within BH11R	3	WSPX50 WSPT11
Former hydroquinone / benzoquinone / tecmangam production area	3	WSPX4 WSPT12,13
Buildings 43 / 94 not previously investigated	3	WSPX4,65,66
Building 38 bulk storage tank farm	3	WSPX37,48
Former hydroquinone production area (V on Figure 1)	3	WSPX33,34 WSPT16,17
Former liquid waste incinerator (W on Figure 1)	3	WSPX35 WSPT18
Oil drum store	3	WSPX36
Building 38 area not previously investigated	3	WSPX1,2,3,45,46,47 WSPT15
Targeting bulk solvent tanks – not previously investigated Also targeting historical issues in this area, including C,E,I,R,S on Figure 1.	4	WSPX10,11,12,14,15,16,17, 18,19,20,21,22,23,54 WSPT19,20,21,23,28
Former Synchem area (Areas L / AA on Figure 1)	5	WSPX30,31,25,24,30A,53 WSPT32
Former gas-oil tanks (Z on Figure 1)	5	WSPX29
Former compressor house and laboratory (AB on Figure 1)	5	WSPX28 WSPT34
Calamity pit	5	WSPX26,52
Prove depth of Made Ground within mound area	6	WSPX60,61 WSPC1
Further investigation of drum store and reported historical landfilling beneath	6	WSPX40,42,43,44
Investigation of former solvent drum store	7	WSPX62
Investigation of effluent treatment plant (not previously investigated) Also includes investigation of historical features in this area (J,AC,AD on Figure 1)	8	WSPX63,64 WSPT37,38

T = Trial pit X = window sample hole C = cable percussive hole

In addition to the trial pits and window sample holes which were designed to investigate shallow soils and perched groundwater, four deeper boreholes were drilled (WSPB1 to WSPB4 inclusive (to 20m below ground level) to intercept and sample groundwater within the Sherwood Sandstone aquifer.

The site works were managed by CRA in the field, with WSPE present in an observational role and the intrusive works were undertaken between January and March 2007. The exploratory hole location plan is presented as Figure 2. A number of the window sample holes and all deeper boreholes were provided with groundwater monitoring wells. The complete network of these new wells, together with pre-existing installations is presented as Figure 3.

A programme of laboratory chemical testing of soil samples was undertaken to complement the fieldwork. Samples were chosen on a visual basis, where evidence of contamination was identified, but also to provide sufficient spatial coverage. The chemical testing suite was agreed between WSPE and CRA and varied depending on the nature of contamination anticipated in any given part of the subject site.

Groundwater sampling and laboratory testing was undertaken as a two-staged process. In January 2007 (prior to commencement of the site works) all existing shallow and deep monitoring wells were sampled and analysed for a standard suite of contaminants, as determined by CRA. WSPE requested that ammonium be added to this suite, as this contaminant had not been tested for since 2000.

Upon completion of the site works, an initial monitoring exercise was conducted by CRA to determine which of the new installations to sample and submit for laboratory testing. The headspace of each well was monitored using a PID (photo-ionisation detector), as was an initial grab sample of groundwater. CRA utilised this data to design the groundwater sampling and testing regime. As with the soils, the testing suite was varied based on the anticipated contamination.

3.3 INVESTIGATION FINDINGS

The site investigation works were supervised full time by CRA engineers and CRA has produced the factual report of the investigation. This is presented in full as Appendix C, which contains all exploratory hole logs, and laboratory results.

Within the factual report, CRA has undertaken a basic ‘tier l’ assessment of the chemical testing results, utilising published generic guideline values from a range of sources. Details of this can be found in Appendix C.

WSPE has undertaken its own assessment of the 2007 investigation. This has been incorporated, together with the historical data to derive the conceptual model presented in the following section.

4 Conceptual Site Model

4.1 INTRODUCTION

In determining what constitutes a requirement for remediation under UK legislation the data attained from historical and recent site investigations has been assessed to establish the presence of contamination, and to understand the potential risks associated with its presence. In order to do this it is necessary to understand the relationship between identified contamination and those individuals, property, waterbodies, ecosystems etc (receptors). This relationship, or conceptual site model, is used to establish the presence of pollutant linkages and their significance. Should statutory definitions relating to contaminated land or water resources be met there is likely to be a requirement to perform some form of remediation.

Statutory drivers for remediation activity are considered to be restricted to:

- Part 2A of the 1990 Environmental Protection Act,
- the Water Resources act or
- Dangerous Substances Directive.

Extracts from the DEFRA Circular 01/2006, providing statutory definitions are presented below.

Part 2A

Within the context of UK legislation Part 2A of the Environmental Protection Act 1990 – which was inserted into that Act by section 57 of the Environment Act 1995 – provides a regulatory regime for the identification and remediation of contaminated land

Section 78A(2) defines contaminated land for the purposes of Part 2A as:

> "any land which appears to the contaminated land in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that –
>
> "(a) SIGNIFICANT HARM is being caused or there is a significant possibility of such harm being caused, or
>
> "(b) POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused".

Before the local authority can make the judgement that any land appears to be contaminated land, the authority must satisfy itself that a pollutant linkage exists in relation to the land. A pollutant linkage requires each of the following to be identified:

> (a) a CONTAMINANT;
>
> (b) a RECEPTOR; and
>
> (c) a PATHWAY capable of exposing a receptor to the contaminant.

The next step is for the local authority to satisfy itself that the pollutant linkage is a significant pollutant linkage. To do this, the local authority must consider the degree of possibility or likelihood of one or more of the following, referring to the definition of contaminated land in paragraphs 2.1 and 2.1A above:

> (a) SIGNIFICANT HARM,
>
> (b) POLLUTION OF CONTROLLED WATERS, or
>
> (c) HARM (where attributable to radioactivity).

Where any land has been identified as being contaminated land, the enforcing authority has a duty to require appropriate remediation.

Water resources Act 1991

Sections 161 to 161D of the Water Resources Act 1991 give the Environment Agency powers to take action to prevent or remedy the pollution of controlled waters. The normal enforcement mechanism under these powers is a "works notice" served under section 161A, which specifies what actions have to be taken and in what time periods. This is served on any person who has "caused or knowingly permitted" the potential pollutant to be in the place from which it is likely to enter controlled waters, or to have caused or knowingly permitted a pollutant to enter controlled waters. Where it is not appropriate to serve such a notice, because of the need for urgent action or where no liable person can be found, the Agency has the power to carry out the works itself. The Water Resources Act powers may be particularly useful in cases where there is historical pollution of groundwater, but where the Part 2A regime does not apply. This may occur, for example, where the pollutants are entirely contained within the relevant body of groundwater or where the "source" site cannot be identified.

To date no works notice has been served on Kodak, Ames Goldsmith, Eastman Chemicals, or IPPE with reference to this site.

Dangerous Substances Directive

Directive 2006/11/EC of the European Parliament (which the UK has signed up to) lays down rules for protection against, and prevention of, pollution resulting from the discharge of certain substances into the aquatic environment.

To combat the pollution of these waters, two lists have been compiled of dangerous substances that need to be controlled:

- pollution caused by the discharge of substances in list I must be eliminated;
- pollution from the products in list II must be reduced.

List 1 Substances comprise the following:

1. Organohalogen compounds and substances that may form such compounds in the aquatic environment
2. Organophosphorus compounds
3. Organotin compounds
4. Substances which possess carcinogenic, mutagenic or teratogenic properties in or via the aquatic environment
5. Mercury and its compounds
6. Cadmium and its compounds
7. Persistent Mineral oils and hydrocarbons
8. Cyanides

Given the objective for the discharge of List 1 Substances to be eliminated, The Environment Agency pays particular attention to the presence of any of the above chemicals and can use the powers of the Directive to insist that discharge to controlled waters be prevented. The List 1 substances identified on site to date include PCBs, dichloroethane, trichloroethene, chloroethane, pentachlorophenol, benzene, toluene, xylenes and tetrachloroethane.

4.2 CONTAMINATION SOURCES

WSPE has reviewed the 2007 chemical testing data in conjunction with the historical testing results and a summary of elevated results is provided as Figures 9 to 11 inclusive. The table overleaf provides a summary of identified contamination within the individual zones.

WSPE Zone	Visual Evidence of Contamination (Figure 8)	Soil Contamination (Figure 9)	Perched Groundwater Contamination (Figure 10)	Sherwood Sandstone Aquifer Contamination (Figure 11)
WSP Zone 1	Numerous thin horizons exhibiting evidence of burning	Three incidences of elevated TPH were identified in samples collected within the Made Ground, ranging from 1,100mg/kg to 14,357mg/kg.	A single elevated TPH concentration recorded in 2004, although no contamination noted during the remaining 6 monitoring visits.	A single occurrence of pentachlorophenol (12ug/l) in 2003, not recorded during remaining 6 monitoring visits.
WSP Zone 2	WSPT11 – oily land drain encountered. Strong fuel hydrocarbon odour throughout hole. Slight odour noted in sample from nearby WSPX50. Chemical odours noted down-gradient of Building 38 bulk storage area.	Elevated fuel hydrocarbons within sample from WSPT11 also including 210mg/kg PCBs. Elevated metals and TPH beneath south-eastern corner of Building 58.	Fuel hydrocarbon impact noted within samples from BH11R (also trace concentrations of several chlorinated hydrocarbons) and to a lesser extent in sample from WSPX50. Elevated ammonium down-gradient of Building 58 bulk storage area (28mg/l)	No deep wells within this zone, although BH3AS is located approximately 30m downgradient and has not recorded contamination during 7 visits.
WSP Zone 3	Solvent odours noted within the two exploratory holes within Building 82 (Synchem).	No elevated contaminants noted within this area.	Elevated chloroethane (74ug/l), dichloroethane (25ug/l) and xylene (250ug/l) in sample from WSPX56, a well located within Building 82.	No contamination identified in samples collected within the single well in this area.
WSP Zone 4	Several contamination observations of a varied nature, including fuel hydrocarbons and solvents.	Elevated xylene (81mg/kg) and ethylbenzene (11mg/kg) in a sample from WSPX20.	Localised TPH and BTEX impact (1.4 to 6.8mg/l), several incidences of chlorinated hydrocarbons between 10ug/l and 100ug/l. Elevated ammonium (maximum 25mg/l).	

WSPE Zone	Visual Evidence of Contamination (Figure 8)	Soil Contamination (Figure 9)	Perched Groundwater Contamination (Figure 10)	Sherwood Sandstone Aquifer Contamination (Figure 11)
WSP Zone 5	Numerous observations of chemical / Solvent odours throughout the Made Ground and underlying Shirdley Hill Sand within the former Synchem area. In one location (BHB2) field screening evidence of contamination was noted throughout the Glacial Till to a depth of 7.0m.	Elevated TPH (maximum 5,537mg/kg and BTEX (maximum xylene concentration 450mg/kg) in samples from the former Synchem area. Highest concentrations recorded in a sample from TPZ7-15, whilst testing of sample from BHB2 recorded slightly elevated chlorinated hydrocarbons (<10mg/kg).	Testing of sample from WSPX30 recorded elevated TPH, BTEX and chloroaniline (7.8mg/l, 2.3mg/l and 0.4mg/l respectively). Testing of sample from WSPX24 recorded 55mg/l xylene as well as lower concentrations of the remaining BTEX compounds and 0.3mg/l trichloroethene.	Samples from the three deep wells in this area contain slightly elevated concentrations of chlorinated hydrocarbons (maximum concentration 22ug/l trichloroethene recorded to date).
WSP Zone 6	Evidence of large quantities of waste disposal towards the eastern boundary. Isolated strong amine odour in TPZ6-3 which also encountered a crushed IBC.	TPH impact in BH2A and TPZ6-15. Copper concentration of 30,000mg/kg in sample from WSPX40.	Samples from two wells in this area (BH2AS and BH2) exhibit elevated TPH concentrations. Testing of sample from BH2AS also recorded xylene 1mg/l and ammonium at 27mg/l. Testing of samples from two other wells in this area did not record contamination.	Evidence of TPH impact in WSPB1 and WSPB2. Chlorinated hydrocarbon impact noted in all 4 deep wells in this area, with the highest concentration in sample from WSPB1 adjacent to the calamity pit (tetrachloroethane 1.3mg/l).
WSP Zone 7	Several sulphur odours within this area. Two locations recorded evidence of chemical / solvent contamination (BH1 / BH1R).	TPH contamination (maximum 1,200mg/kg). Slight silver impact recorded in sample from WS31 (147mg/kg). Traces of dibenzofuran, carbazole and trichlorophenol recorded in several locations (<0.2mg/kg).	TPH, toluene and xylene contamination detected in sample from BH1.	Single well in this area (BH2AD) has not recorded elevated contaminant concentrations.

WSPE Zone	Visual Evidence of Contamination (Figure 8)	Soil Contamination (Figure 9)	Perched Groundwater Contamination (Figure 10)	Sherwood Sandstone Aquifer Contamination (Figure 11)
WSP Zone 8	Strong ammonia / sewage odour noted in one location. Slight chemical / solvent odours noted in two further exploratory holes.	Elevated contamination not recorded within this area.	No significantly elevated results recorded.	No deep wells within this area.

Summary of Contamination Sources

Based on the findings of the 2007 and previous site investigations, WSPE has made an assessment of the potentially significant contaminant sources that have been identified:

WSP Zone 1

a) Extensive testing was conducted throughout WSP Zone 1 because of historical burning conducted in this area.

b) TPH contamination identified in the Made Ground in WS5. An EPH concentration of 14,357mg/kg was recorded at 1.1m to 1.3m depth.

c) The exploratory hole log identified tar fragments at this horizon, although the lateral and vertical extent appears to be limited.

d) No current potential risk to human health identified in this area.

e) A linkage to shallow groundwater may exist.

f) No linkage to deep groundwater identified.

g) Any future development of this area will require proper management of excavated soils and encountered shallow groundwater.

WSP Zone 2

a) WSP Zone 2 is a relatively large area. The western most extent of the area is occupied by two large buildings; photochemicals and Nexpress. Neither area is significantly impacted. The south eastern portion of WSP Zone 2 was occupied by the utilities area of the site and has some limited TPH impact. The northeastern portion of WSP Zone 2 is one of the more impacted areas of the site.

b) Contamination has been identified around BH11R and extending to include WSPT11 and WSPX50. The contamination in this locality is present from close to ground level to a depth of at least 4.4m within the Shirdley Hill Sand and has been recorded both within soils and perched groundwater. The contamination comprises predominantly petroleum hydrocarbons, although PCBs have also been detected. The concentrations are generally less than 1 mg/kg although a single concentrations of 210mg/kg was measured in a sample from WSPT11.

c) Strong chemical odours (of indeterminate origin) have been recorded immediately downgradient of the Building 70 bulk storage area (the PCD tank farm area). Soil contamination has not been identified associated with the odours, although elevated ammonium concentrations have been detected in perched groundwater. It has been assumed that this contamination is likely to extend beneath the tank farm area.

d) No current potential risk to human health identified in this area.

e) No linkage to deep groundwater identified.

f) Any future development of this area will be restricted from any penetration of soils in the area of the PCB containing soils.

WSP Zone 3

a) WSP Zone 3 is a relatively large area along the eastern boundary of the processing areas. The northern portion is occupied by the war era “reservoir” area and the southern portion by the synchem building.

b) Solvent odours were recorded in both WSPX55 and WSPX56. Elevated concentrations of chloroethane, trichlorethane and xylene have been identified within the perched groundwater in WSPX56. Given the limited access that has been possible in this area, it

has been assumed that a localised area of impacted soils may be present beneath the northern part of Building 82.

c) No current potential risk to human health identified in this area.

d) Potential linkage to shallow groundwater is known

e) No direct linkage to deep groundwater has been identified.

f) Any future development of this area will require proper management of excavated soils and encountered shallow groundwater

WSP Zone 4

a) WSP Zone 4 includes the former solvent storage, waste solvent accumulation, and solvent recovery processes.

b) The solvents used at the site were predominately petroleum based solvents.

c) Within the bulk solvent storage area, numerous chemical / solvent odours have been recorded and these are accompanied by predominantly BTEX and chlorinated hydrocarbon impact within soils and perched groundwater.

d) Potential linkage to shallow groundwater is known

e) Potential linkage to deep groundwater has been identified, possibly if the UST excavations have penetrated the Glacial Till, and/or via lateral migration towards the fire water pit.

f) Any future development of this area will require proper management of excavated soils and encountered shallow groundwater

WSP Zone 5

a) The former synchem area is the area with the highest percentage of samples with impact.

b) Numerous strong solvent, chemical and fuel hydrocarbon odours have been identified within the former Synchem area. Elevated concentrations of TPH, BTEX and chlorinated hydrocarbons have been identified within the Made Ground and underlying Shirdley Hill Sand.

c) There is evidence of limited downward migration directly through the Glacial Till in WSPB2 to a depth of at least 7.0m.

d) The construction of the Fire Water Pit likely provides a migration pathway between the shallow and deep groundwater through the backfill around its perimeter.

e) Potential linkage to shallow groundwater is known.

f) Potential linkage to deep groundwater has been identified.

g) Any future development of this area will require proper management of excavated soils and encountered shallow groundwater.

WSP Zone 6

a) Although the area was used for management of soils excavated from other potions of the site, no data has been collected that would trigger action.

b) No linkage to shallow groundwater is known.

c) No linkage to deep groundwater has been identified.

d) Any future development of this area will require proper management of excavated soils and encountered shallow groundwater

WSP Zone 7

a) The Ames Goldsmith lease area is subject to the terms of their lease with Kodak. Under the Kodak interpretation of the lease, after five years all responsibility for soil and shallow groundwater revert to Ames Goldsmith.

b) TPH and chlorinated hydrocarbon contamination has been recorded in the Made Ground and perched groundwater of the south central portion of the silver nitrate plant.

WSP Zone 8

a) Significant contamination has not been recorded to date within the effluent plant.

b) Odours were noted in three of the four exploratory holes in this area and the access was severely restricted due to the existing structures.

c) Kodak is retaining responsibility for soil and shallow groundwater in the effluent plant area.

d) Kodak will demolish all plant and equipment in April/May 2007.

e) Kodak will remediate soil and shallow groundwater following plant demolition.

4.3 RECEPTORS

Based on the ongoing commercial / industrial use of the site, the following receptors are considered relevant to the subject site:

1. the underlying Sherwood Sandstone;
2. the drainage ditch close to the southern boundary of the site;
3. ecological receptors;
4. 3rd party property (including drainage);
5. current / future end users and maintenance workers; and,
6. buildings and building services including water pipelines.

Within the context of the subject site, the most significant receptor is considered to be the Sherwood Sandstone major aquifer. This groundwater body is regionally important for providing potable drinking water and is closely regulated by the Environment Agency.

No formally designated ecological receptors (such as Sites of Special Scientific Interest or Sites of Biological Interest) have been identified within the immediate vicinity of the subject property, thereby no receptors are considered to be evident as defined by Part 2A of the 1990 Environmental Protection Act.

4.4 PATHWAYS

To enable a detailed consideration of contamination pathways, particularly with respect to controlled waters, a good understanding of the study area's ground conditions is required. The following sections provide summaries of the geological and hydrogeological regimes beneath the site.

4.5 GEOLOGY

Made Ground

The Made Ground depth is variable, although generally between 1m and 3m across the majority of the site. The maximum depth was recorded in WSPC1 which was positioned on top of the mound in WSP Zone 6 and recorded a depth of 7.0m.

The Made Ground is generally granular in nature, with the exception of parts of WSP Zones 1,2 and 6 where natural soils have been deposited from elsewhere on site, probably during construction activities. A significant proportion of waste materials are evident close to the eastern boundary of the site, within WSP Zone 6. The waste generally comprises timber, metal, concrete and brick with occasional evidence of chemical wastes including isolated drums. The location of the waste materials is highlighted on Figure 8.

Made Ground in the other main area of reported landfilling (the playing field area, WSP Zone 1), is generally described as a sandy clay with occasional brick and concrete. Numerous thin black horizons were noted in this area, as possible evidence of burning which conforms with Kodak's knowledge of the history of this area.

Shirdley Hill Sand

Immediately beneath the Made Ground, a thin sandy horizon was encountered across much of the study area. The Shirdley Hill Sand is a post glacial wind-blown deposit (uniform and fine to medium grained) that occurs across parts of the northwest of England, with a maximum thickness of approximately 1m. The sand encountered beneath the Made Ground fits this description.

Shirdley Hill Sand is present across the majority of the site although is absent from some areas including beneath parts of the former playing fields (WSP Zone 1) and the former Synchem Area (WSP Zone 5). It has also been removed from the reservoir area within WSP Zone 2. This area is several metres below the surrounding ground levels as the Ministry of Defence appears to have excavated the surface to create a depression, with the Shirdley Hill Sand removed as a consequence.

Glacial Till

Glacial Till was found to be present beneath the entire study area, with the exception of BH12, adjacent to the drum store in WSP Zone 6. The recorded thickness of this stratum is presented as Figure 4. As can be seen the unit is thickest in the north and northwest of the site (in excess of 8m) and thins to the south, so that by the southern boundary, it is generally less than 1m thick. The Glacial Till is generally described as a sandy, occasionally gravelly clay. A few discrete sandy horizons have also been recorded within the Till, although these are laterally discontinuous.

Sherwood Sandstone

The depth to the top of the Sherwood Sandstone is highly variable and closely corresponds with the Glacial Till thickness. The contours to the top of this stratum are presented as Figure 5 and highlight the depth to vary from in excess of 14m in the northwest to less than 2m in the extreme south of the site.

The Sherwood Sandstone has a distinct weathered horizon at the top, described as a sand with gravel of completely weathered sandstone. Within 1 to 2m this grades into less weathered bedrock. No cores of the bedrock have been obtained during any previous investigations, preventing detailed descriptions, although this unit has been proved to a maximum depth of 100m (Note: abstraction well is 106 m deep).

4.6 HYDROGEOLOGY

Two distinct groundwater bodies are present beneath the subject property. These comprise a perched groundwater within the Made Ground / Shirdley Hill Sand, resting on the Glacial Till and the main groundwater body within the underlying Sherwood Sandstone.

The perched groundwater is nearly continuous across the study area, and is only locally absent beneath some of the larger existent structures (the drum store in WSP Zone 6 and Building 38 in WSP Zone 3). The contour data for the perched groundwater is presented as Figure 6 and indicates a flow direction to the west / southwest.

Figure 7 presents the contour data for the Sherwood Sandstone and indicates a flow direction to the northwest. Where the Glacial Till deepens in the north and northwest of the site the Sherwood Sandstone is fully saturated, with sub-artesian conditions within the various monitoring wells in this area.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone, with the result that the separation between the two bodies is nearly 6m on the eastern boundary and approximately 4m on the western boundary.

Given the groundwater flow directions, the two bodies appear to be operating independently. However, WSPE considers it likely that there are several locations where recharge to the Sherwood Sandstone is occurring from the shallower body. These areas are highlighted on Figure 5 and are as follows:

- The fire water pit in WSP Zone 5, which is at least 4.7m deep, with adjacent Glacial Till thickness 4.9m. It is considered likely that this feature was excavated to the top of rockhead and whilst this feature is currently watertight, migration downwards may be possible within the surrounding fill materials immediately adjacent.
- BH12 in WSP Zone 6 where boring logs suggest Glacial Till is locally absent. All surrounding boring logs suggest a consistent presence of till. BH12 lies within an area where the data suggest no action is required.
- The effluent treatment plant (WSP Zone 8). The Sherwood Sandstone is present from 1.9m below ground level (bgl) in this area and the effluent treatment plant was constructed on vibro-stone columns reported to be 3m deep. These piles are likely to provide a vertical pathway for the perched groundwater to recharge the main groundwater body.
- It is possible that the two USTs within WSP Zone 4 were installed close to the top of the Sherwood Sandstone. The top of the Sherwood Sandstone is 3.1m in this area. The construction details of the USTs are unknown, although could extend to approximately 3m bgl, thus providing a pathway through the Glacial Till to allow recharge.

Possible evidence of this interaction can be seen on Figure 6, with the perched groundwater apparently migrating towards the calamity pit and effluent treatment plant.

The contamination distribution within BHB2 (where chlorinated hydrocarbons have been identified within the Made Ground and throughout the underlying Glacial Till to a depth of 7.0m) provides evidence of a secondary means of connectivity between the perched groundwater and main groundwater body within the Sherwood Sandstone. It appears that limited downward migration through the Glacial Till may be possible, possibly due to its relatively high sand / gravel content.

4.7 POTENTIAL EXPOSURE PATHWAYS

The following pathways have been considered:

1. mobilisation of contaminants in soils on-site to shallow perched groundwater in the Shirdley Hill Sand;
2. migration of impacted perched groundwater across and off-site beneath 3rd party property to the west;
3. migration of perched groundwater to the drainage ditch to the south of site;
4. migration of perched groundwater via drainage systems both on-site and off-site into 3rd party drainage network;
5. interconnection between perched groundwater and the deeper major aquifer, particularly in the south-western part of the study area where the Glacial Till may have been 'punctured' by foundations / tanks;
6. dermal contact, ingestion and inhalation of contaminants;
7. migration and inhalation of volatile vapours; and,
8. direct contact with buildings and building services.

4.8 ASSESSMENT OF POLLUTANT LINKAGES

The potential exposure pathways outlined above are considered in greater detail, in turn below.

Mobilisation of contaminants in soils on site to shallow (perched) groundwater in the Made ground/Glacial Till/Shirdley Hill Sand

As highlighted in the table within Section 4.2, evidence of migration of contaminants from soil into the perched groundwater has been detected within WSP Zones 3, 4, 5 and 7. The lines of evidence include shallow groundwater data; conditions wherein the shallow depth of the perched groundwater could allow frequent direct contact with contaminated soils; the mobility of much of the identified contamination; and the granular / sandy nature of the majority of shallow soils which may have limited attenuation capabilities.

There is a suspicion of potential linkages in WSP Zones 1 and 6. The lines of evidence are much weaker, but in WSP Zone 6 we have a single detection of TPH at 14,000 mg/kg in soil and in WSP Zone 6 we have visual evidence of impacted soils management. As such these pollutant linkages are not considered significant under Part 2A.

Migration of perched groundwater across and off-site

A relatively continuous perched groundwater body has been identified across the study area. While there are limited areas where perched water was absent, generally beneath large buildings or areas of hardstanding, the perched water is suspected of being able to migrate from the site. Monitoring on the numerous occasions since the early 1990s has determined a flow direction to the west or southwest, in the general direction of the south-western corner of the site. This appears to broadly follow the topography of the area, although the flow direction may also be evidence of an area of recharge to the underlying Sherwood Sandstone (discussed below). The potential also exists for migration of contamination off-site beneath Acornfield Road to the west, although the two shallow wells within the off-site car park in this direction have not recorded significant evidence of site related compounds to date.

A second means of migration of impacted perched water may be via the site's drainage systems, where these are damaged. Based on the shallow depth to perched groundwater in many areas of the site, there is potential for leakage into the sewer system. The most recent survey of the chemical drains in 2003 did not identify any significant issues. This survey is focused on the chemical drain system and does not include the storm or foul water systems at the site. The chemical, storm and foul water systems are not a component of the program proposed herein. The evaluation and management of soil and groundwater conditions that could affect them is addressed in Section 5.

Migration of perched groundwater to the off-site drainage ditch

Collation of survey data by CRA as part of the risk assessment undertaken in 2006 appeared to confirm that the level of water within the drainage ditch is above that of the perched groundwater, thus indicating that a pathway between the two is absent. The Environment Agency has accepted this conclusion. The westerly flow direction of the perched groundwater is further evidence that migration towards this surface drain is unlikely.

Migration of shallow perched groundwater via drainage network

During the site's operation and management by Kodak, the drainage network was split into 3 separate categories; surface water; foul drainage and chemical drainage. These were managed to ensure that no unauthorised chemicals were directed either into the surface or foul water drains. This system must be appropriately maintained to minimize the risks posed by these potential pathways.

The storm water drainage system provides a potential means for the local migration of contaminants within the site. An example has been noted within WSP Zone 2 in the BH11R / WSPT11 area, where liquid appears to have collected in an old land drain (not part of the current formal drainage network).

Failed / leaking drains within the site's drainage system provide a possible migration pathway for contaminated effluents to leak into the surrounding ground. Whilst there is anecdotal evidence of several

such drainage failures, no significant areas of impact have been identified associated with drainage failures. However, given the localised nature of such incidences, this possibility has not been ruled out.

Interconnection of shallow perched groundwater and deeper groundwater

As discussed in Section 4.6, it appears that there are 4 areas (possibly 5) where the Glacial Till is either absent or has been removed by human activities. The two most significant features are considered to be the fire water pit and effluent treatment plant foundations in WSP Zones 5 and 8, the south-western corner of the site. The main areas of contamination (particularly the former Synchem area WSP Zone 5) are a short distance up-gradient of these two features. Chemical testing of groundwater from the Sherwood Sandstone confirms the validity of this pathway, particularly BHB1 which is located immediately adjacent to the fire water pit and contains contaminants also present within soils and perched groundwater in the former Synchem area (WSP Zone 5).

Further, more unexpected evidence of interconnectivity between the two groundwater bodies was noted in BHB2 where chlorinated hydrocarbons (albeit at low concentrations) were observed to have migrated vertically downwards through to the base of the Glacial Till. It has been previously assumed that, where the Glacial Till is present at a reasonable thickness, this will act to prevent downwards migration. However, descriptions of this stratum generally highlight a sand / gravel fraction. The 5.2m of Glacial Till within BHB2 has not prevented downward migration of contamination into the underlying Sherwood Sandstone.

The fourth possible connection is suspected in WSP Zone 6 at the northeast corner of building 68. A 1990's era boring log did not identify the till in the descriptions provided. As there are seven borings and test pits surrounding this location that have till, and the groundwater elevation differences between the shallow and deep groundwater are interpreted to be nearly 4 m, the interconnection is suspect.

The fifth potential connection is the two USTs within Zone 4. The depth of these tanks is unknown, although could be close to the top of the Sherwood Sandstone.

Dermal contact, ingestion and inhalation of contaminants

For an assumed continued commercial / industrial use, the contamination identified is considered unlikely to pose a significant risk to human health, assuming maintenance of the majority of the hard landscaping / buildings will prevent direct contact with the Made Ground across those areas of impact of the site. A development management plan will be prepared to assist IPPE with understanding their requirements for notification of site contractors, utility workers, and others who will excavate the surface of the site.

Migration and inhalation of volatile vapours

Potentially volatile contaminants such as BTEX and chlorinated hydrocarbons have been identified during the various phases of investigation. However, the main areas of impact are away from buildings and subsequently not considered to pose a significant risk to human health. However, this issue would require further consideration by IPPE should development be proposed over areas of known impact, especially in WSP Zones 4 and 5.

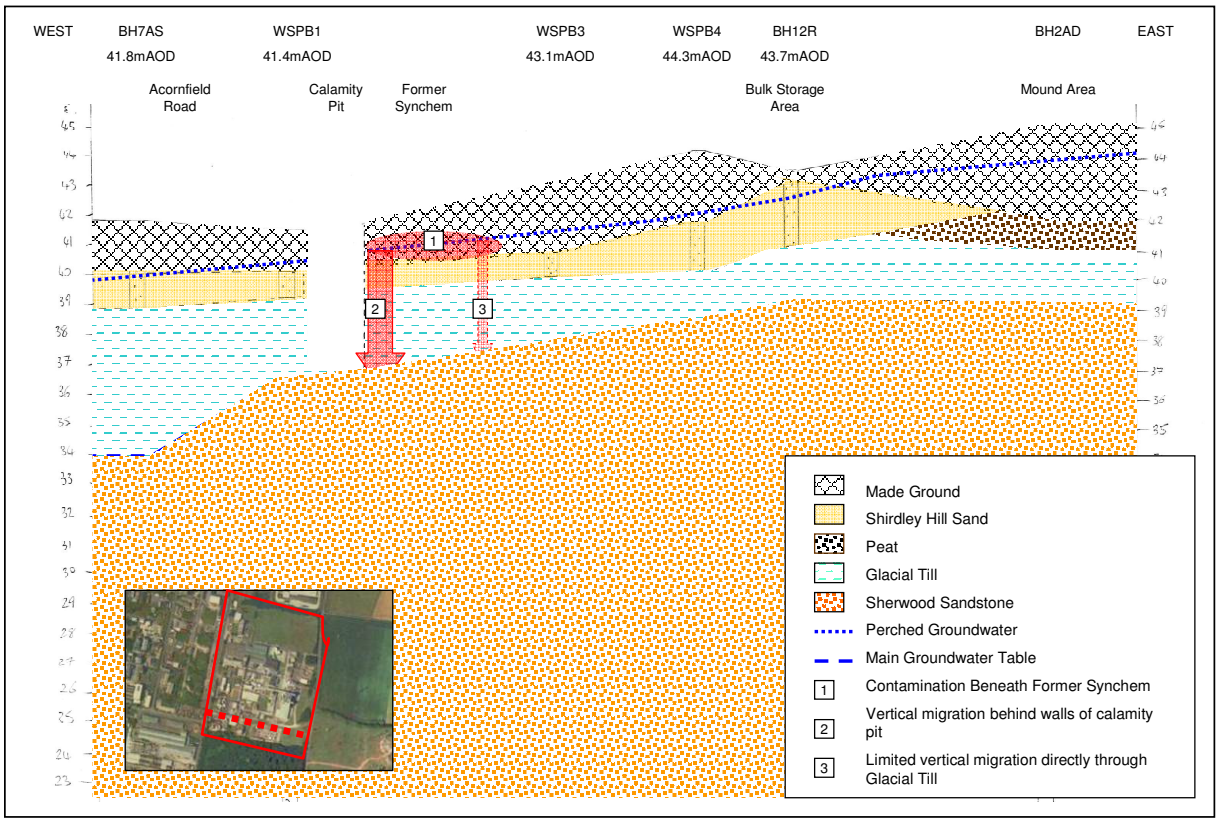
Direct contact with buildings and building services

The previous investigations have concentrated on specific areas of the site and have been generally focussed on risks to controlled waters. Therefore, the risk to future buildings and associated services may require further consideration should redevelopment be proposed. These risks would include potential chemical attack (sulphates) on buried concrete and permeation of organic chemicals into drinking water supply lines, for example.

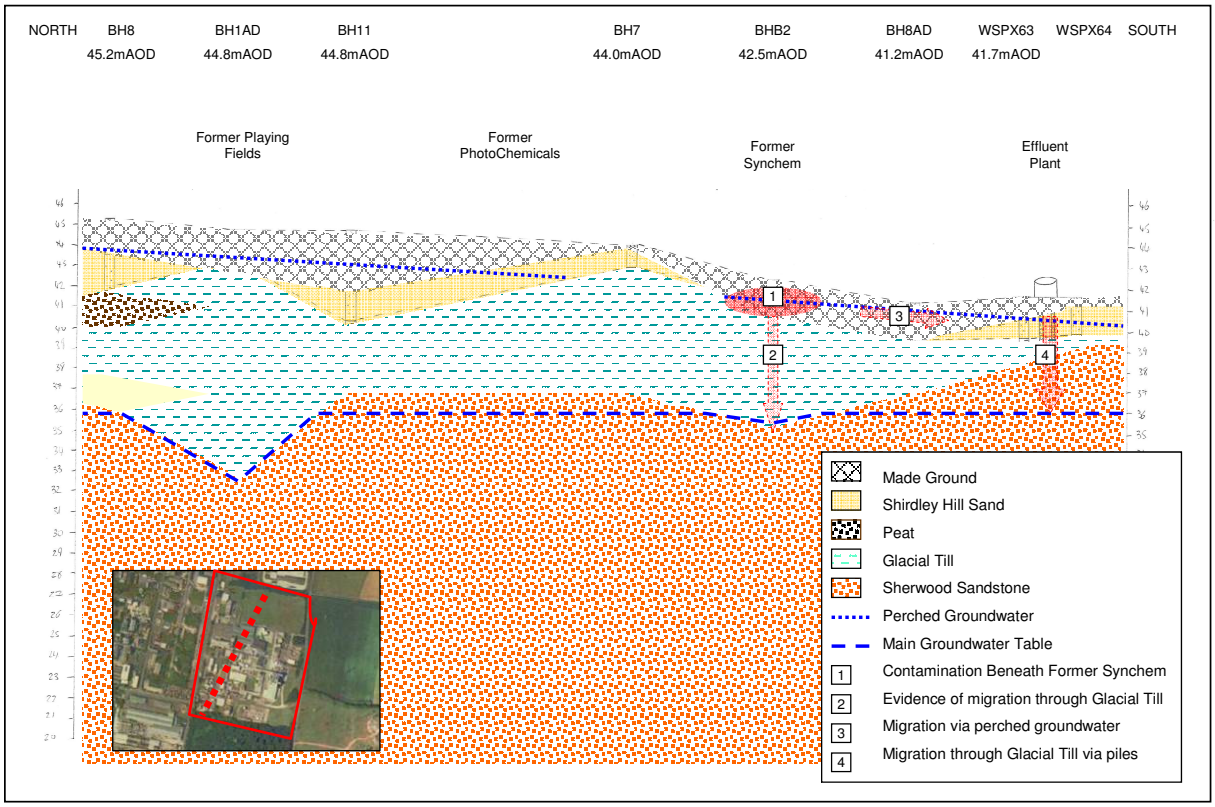
4.9 SUMMARY OF RISK ASSESSMENT

The receptor to be most at risk from the site is considered to be the Sherwood Sandstone, with evidence of site-derived contamination having entered this major aquifer in the south-western corner. This is considered likely to be the main driver for any remediation of the site. The two cross sections below

present summaries of the conceptual model and the two main pathways into the Sherwood Sandstone, namely the fire water pit and the effluent treatment plant.



Cross section east – west across the southern part of the site



Cross section north – south across the site

Significant Pollutant Linkages

The pollutant linkages of concern with respect to the subject site are considered to be related to the presence of List I substances in shallow soils, perched waters and deeper groundwater. The presence of source concentrations (both in the shallow soils and perched waters) are deemed sufficiently elevated to represent a Statutory concern. No authoritative benchmarks, or screening criteria, other than the presence of these substances is available. However as a guide to understanding where significant sources are located within the site a comparison against water quality standards has been made.

The table below highlights the available water standards for the identified List I substances across the site.

List 1 Substance	Water quality guide (mg/l)
PCBs	No UK Guideline
Dichloroethane	0.003 – UK Drinking Water Standard
Trichloroethene	0.01 - UK Drinking Water Standard
Chloroethane	No UK Guideline
Tetrachloroethene	0.01 – UK Drinking Water Standard
PCP	0.002 – UK Environmental Quality Standard
Benzene	0.001 – UK Drinking Water Standard
Toluene	0.05 – UK Environmental Quality Standard
Xylenes	0.03 – UK Environmental Quality Standard
Petroleum Hydrocarbons	0.05 – UK Surface Water Abstraction Standard

Concentrations of contaminants in excess of these concentrations are considered to be indicative of source areas relating to the significant pollutant linkages. For soils no benchmarking criteria are available due to site specific partitioning relationships driving the release of sorbed contaminants into perched waters. However, areas identified as part of the significant pollutant linkages illustrate the co-presence of these substances in soil and in groundwater, confirming the presence of the pollutant linkage.

- **Pollutant Linkage 1** - Shallow soil leaching of organic contaminants, into perched groundwater with subsequent vertical migration and/or leakage through or around the glacial till into the Sherwood Sandstone aquifer. This pollutant linkage is currently considered to be significant in respect of current environmental law.
- **Pollutant Linkage 2** - A second pollutant linkage which provides a driver for remediation is the potential migration of contamination from BH11R via relict drainage and / or perched groundwater. Whilst not technically nor currently considered 'significant' in terms of Part 2A, given the nature of the contamination (PCBs) and associated remediation costs, early remediation is proposed to prevent further spread and associated potentially exacerbated future remediation costs in the former Toner Storage Area (WSP Zone 2).

5 Remediation Strategy

5.1 INTRODUCTION

The objective for the remediation programme is to eliminate identified significant pollutant linkages in consideration of the continued industrial usage of the site, and as such, avoid any statutory enforced remediation requirements. The Environment Agency shall be fully involved to maintain a dialog and to obtain a letter of acknowledgement that we have identified and addressed suspected linkages from the site. The proposed outline remedial actions are depicted in summary form within Figure 13. The program is defined in relation to each of the significant pollutant linkages defined in Section 4.

The prescribed remediation represents a combination of reduction in site contaminant load, contaminant containment and management, not a complete removal of contamination. The contaminant load will be reduced through a combination of chemical extraction, stabilization of potential sources, onsite treatment, and reduction in the hydraulic gradients potentially enabling the migration of compounds of concern. The post remediation condition will be one where significant pollutant linkages are not present or likely to be present. Total contaminant removal will entail excessive cost and is not considered viable.

Disturbance of residual contamination through development activity, construction works or below ground maintenance works may introduce a 'receptor' to contamination or create a 'pathway' between receptors and contamination and therefore potentially re-establish a significant pollutant linkage (SPL).

To avoid the future creation of pollutant linkages a combination of active site environmental management, the imposition of land use restrictions within various areas of the site and contaminant load reduction is prescribed

5.2 WORKS TO ADDRESS POLLUTANT LINKAGE 1

Pollutant Linkage 1. - *Shallow soil leaching of organic contaminants, into perched groundwater with subsequent vertical migration and/or leakage through or around the glacial till into the Sherwood Sandstone aquifer.*

WSP Zone 1

No significant linkage has been confirmed in WSP Zone 1, therefore no actions are required.

WSP Zone 2

WSP Zone 2 is a relatively large area. The western most extent of the area is occupied by two large buildings; photochemicals and Nexpress. Neither area is significantly impacted. The south eastern portion of WSP Zone 2 was occupied by the utilities area of the site and has some limited TPH impact. The northeastern portion of WSP Zone 2 is one of the more impacted areas of the site.

Contamination has been identified within the northeastern area of WSP Zone 2 (principally gasoline range hydrocarbons and PCBs). No action specifically to address this pollutant linkage is proposed for this identified source. However, works are proposed for other reasons as described under Pollutant linkage 2.

Strong chemical odours (of indeterminate origin) have been recorded immediately downgradient of the Building 70 bulk storage area (tank farm area). Soil contamination has not been identified associated with the odours, although elevated ammonium concentrations have been detected in perched groundwater. In the absence of a recognisable SPL in this area no remediation works are proposed.

WSP Zone 3

WSP Zone 3 is a relatively large area along the eastern boundary of the processing areas. The northern portion is occupied by the war era "reservoir" area and the southern portion by the synchem building (Building 82). No works are proposed for the reservoir area of the WSP Zone 3.

Solvent odours were recorded in both WSPX55 and WSPX56. Elevated concentrations of chloroethane, trichlorethane and xylene have been identified within the perched groundwater in WSPX56, situated beneath the current Synchem building

To remove the potential linkage to shallow groundwater and potential further vertical migration the area beneath the northern end of Building 82 will be delineated, shallow groundwater will be extracted through a series of wells advanced through the floor of the building, and soil vapour will be extracted through a series of points advanced though the building slab. This system will utilise dual phase vacuum extraction technology and will be installed integral to the building, thus avoiding significant constraints on future building usage. The system will actively collect perched waters from the area, treat within and discharge to sewer under consent. In addition soil vapours will be extracted reducing contaminant mass in the unsaturated soils. The operation of the in-situ system is expected to durate for between 18 and 36 months.

WSP Zone 4

WSP Zone 4 includes the former solvent storage, waste solvent accumulation, and solvent recovery processes. The solvents used at the site were predominately petroleum based solvents. Within the bulk solvent storage area, numerous chemical / solvent odours have been recorded and these are accompanied by predominantly BTEX and chlorinated hydrocarbon impact within soils and perched groundwater.

The potential linkage to shallow groundwater is known and will be addressed with both short-term and long-term shallow groundwater extraction and soils removal.

Accessible soils will be excavated from the vicinity of the tank farms and process areas as generally shown on Figure 13. Excavtions will focus on relict drainage structures and existing land drainage and known hotspots. Excavated soils will be transported to Building 68, the drum storage area, which will be prepared for management of these materials. The soils will be treated ex-situ to remove the mobile constituents.

Voids excavated during the soils removal activity will be backfilled with granular material and the clay surface profiled to allow targeted collection of perched waters from the Zone. The network of voids will extend to and designed to include the interception of waters around known deep penetrating structures (such as the USTs to be retained) and will serve to break the pathway between perched waters and deeper groundwater.

Where access to impacts is restricted by structures required to be retained the perched water collection systems will be locally adapted to a less intrusive (treatment well based) dual phase vacuum extraction technology to allow collection of waters and reduction of contaminant mass in the unsaturated zone.

Groundwater collection and trench drains (and the DPVE if necessary) will be installed in WSP Zone 4 for long-term shallow groundwater management. The trenches will serve two functions, in the short term they will remove groundwater with residual concentrations of site related compounds, in the long-term they will reduce the depth of shallow groundwater thereby reducing the driving hydraulic head on the top of the till. Initially pre-treatment facilities will be in place to ensure the effluent quality meets the permit conditions.

Shallow groundwater shall be extracted for pre-treatment and discharge from the areas proposed for soil excavation. This extraction will allow the excavations to proceed to the required depths and remove a significant portion of the mobilized mass of site related compounds. Removal and treatment of this groundwater will protect deep groundwater. Treatment operation is expected to last between 18 and 36 months depending upon performance.

There are two empty USTs in WSP Zone 4. Under IPPE operations, USTs will not be utilized. The two USTs will be infilled in place as removal would affect the piping and other utilities in the area.

Deep groundwater monitoring as part of the MNA program will be performed in this area over a period of approximately 5-7 years. The programme will be used to demonstrate the effective reduction of contaminant inputs into the major aquifer.

WSP Zone 5

The former Synchem area is the area with the highest percentage of samples with impact. Numerous strong solvent, chemical and fuel hydrocarbon odours have been identified within the former Synchem area. Elevated concentrations of TPH, BTEX and chlorinated hydrocarbons have been identified within the Made Ground and underlying Shirdley Hill Sand.

There is evidence of limited downward migration directly through the Glacial Till in WSPB2 to a depth of at least 7.0m.

The construction of the Fire Water Pit provides a likely migration pathway between the shallow and deep groundwater through the backfill around its perimeter.

The pollutant linkage to shallow and deep groundwater is demonstrated in this Zone and will be addressed with both short-term and long-term shallow groundwater extraction, soils removal, and the interception (to prevent vertical migration) of perched waters from around the fire water pit area.

Several buildings in this area will be demolished by IPPE. Soils will be excavated from the vicinity of the former process areas as shown on Figure 13, notably focussing on the building 15 area and the expected relict drainage structures beneath the Zone. Excavated soils will be transported to Building 68, the drum storage area, which will be prepared for management of these materials. The soils will be treated ex-situ to remove the mobile constituents.

Shallow groundwater shall be extracted for pre-treatment and discharged from the areas proposed for soil excavation. This extraction will allow the excavations to proceed to the required depths and remove a significant portion of the mobilized mass of site related compounds. Removal and treatment of this groundwater eliminates the potential that it will migrate to deep groundwater.

An extensive network of groundwater collection drainage will be installed in WSP Zone 5 for long-term shallow groundwater management. This collection system will serve two functions; in the short term it will remove groundwater with residual concentrations of site related compounds; in the long-term it will reduce the depth of shallow groundwater thereby reducing the driving hydraulic head on the top of the till and eliminate the migration of shallow groundwater toward the site boundary and vertically through the glacial till. Initially pre-treatment facilities will be in place to ensure the effluent quality meets the permit conditions.

There is high confidence in the interpretation of a linkage to deep groundwater along the sides of the fire water pit. Soils surrounding the pit will be excavated to construct a groundwater interception system around the pit, thereby restricting any perched water vertical migration.

Soils beneath facilities that cannot be removed will be treated as needed (utilising DPVE techniques) to reduce the constituent loading to shallow groundwater.

Treatment and interception of perched waters within the Zone is expected to operate for between 18 and 36 months.

Deep groundwater monitoring as part of the MNA program will be performed in this area over a period of approximately 5-7 years. The programme will be used to demonstrate the effective reduction of contaminant inputs into the major aquifer.

WSP Zone 6

Although the area was used for management of soils excavated from other portions of the site, no data has been collected that would trigger action in respect of the pollutant linkage identified.

WSP Zone 7

The Ames Goldsmith lease area is subject to the terms of their lease with Kodak. Under the Kodak interpretation of the lease, after five years all responsibility for soil and shallow groundwater revert to Ames Goldsmith.

TPH and chlorinated hydrocarbon contamination has been recorded in the Made Ground and perched groundwater to the rear of the silver nitrate plant. The impact is considered localised and does not presently appear to be actively part of the pollutant linkage to the deeper aquifer. However, given the limited thickness of glacial till in this area it is proposed to continue shallow groundwater monitoring in this area, pending more detailed assessments. Should the assessments indicate a requirement to perform some localised intervention a programme of either soils excavation within the open area of the Ames Goldsmith zone will be performed together with associated perched water collection and treatment, or in-situ treatment as per other Zones where access restrictions are possible.

Should soil be required to be removed these will be treated ex-situ or disposed of off-site.

WSP Zone 8

Kodak are understood to be in the process of tendering the demolition works of all plant and equipment in April May 2007.

Kodak are expected to remediate soil and shallow groundwater following plant demolition, to include for the sealing of the expected vertical migration pathway through clay or grout replacement the stone column foundations.

Deep groundwater monitoring as part of the MNA program will be performed in this area by WSP and as such access to deeper wells will be required.

5.3 WORKS TO ADDRESS POLLUTANT LINKAGE 2

Pollutant Linkage 2. - ***The potential lateral spread of identified hydrocarbon contamination through drainage features and service conduits within the north-eastern area of WSP Zone 2.***

Whilst not significant in terms of Part 2A, given the nature of the contamination (gasoline range hydrocarbons and PCBs) and associated remediation costs, early remediation is proposed to prevent further spread and associated potential future remediation costs in the former Toner Storage Area. Contamination has been identified around BH11R and extending to include WSPT11 and WSPX50. The contamination in this locality is present from close to ground level to a depth of at least 4.4m within the Shirdley Hill Sand and has been recorded both within soils and perched groundwater. The contamination comprises predominantly petroleum hydrocarbons, although PCBs have also been detected. The PCB concentrations are generally less than 1 mg/kg although a concentration of 210mg/kg was measured in a sample from WSPT11. Relevant PCB concentrations within the UK regulatory context include the 1mg/kg threshold for Hazardous Waste and the 50mg/kg threshold, above which landfills cannot accept the material and incineration is the only means of off-site disposal.

Risks associated with soils within this area will be managed rather than removed. Given the exceptional cost of PCB impacted soils disposal, a containment strategy with limited removal, is proposed to prevent any potential spread of impact.

Following the demolition of the Building located over the affected area, a trench will be excavated around the perimeter of the affected area to allow the installation of a low permeability barrier wall. With the sealing or diversion of service routes that pass through the area, inclusive of land drainage, lateral migration of identified impact will be prevented. Prior to the installation of the barrier, the area will be

dewatered as far as is possible without entailing excessive soils excavation. This dewatering exercise will remove readily mobile impacts (such as product within land drains).

Following the installation of the barrier wall a hardcover, impermeable cap will be completed to prevent infiltration into the area. These actions will effectively contain the known impacts, until a change in landuse for the area is considered. Any consideration of development in this area will need to reconsider the remediation of PCB impacted materials.

5.4 PRELIMINARY ACTIVITY AND DETAILED DESIGN

Prior to performing any decontamination works at the site various actions will need to be performed. These actions, listed below, include a combination of additional delineations, detailed design works for active remediation, and also actions to prevent further contamination or exacerbation of contamination related risks by way of ongoing site activities.

1. The development of a site wide environmental management plan to ensure future activities on the site do not compromise the performance of prescribed remediation activities, or allow the creation of significant pollutant linkages. This will need to include an environmental audit of tenanted activities, and suggested enhancement of their environmental procedures if necessary.

2. The imposition of land use restrictions in areas where contamination exists but a significant pollutant linkage (SPL) does not, will be required to ensure that a SPL will not be created by site activity.

3. Monitoring of shallow perched water quality for a period of approximately 5 years (10 rounds) in areas of known shallow groundwater quality impacts will be performed following the soils remedial actions to provide continual assurance in the absence of an SPL.

4. Baseline ground condition reports (compiled from existing data where available) will be prepared and issued to future tenanted activities to benchmark the contamination status at the change of liability ownership.

5. Development of a fully measured conceptual model for the preparation of a detailed quantitative risk assessment (DQRA). This document will present the standards of remediation, or end points, for various areas of the site. These will be calculated utilising Environment Agency endorsed methods and guidance. Tools such as ConSim (a probabilistic numerical groundwater modelling tool) will be used to predict leachate concentrations and migration and attenuation rates through the glacial till into the sandstone aquifer. Current and expected post-remediation site conditions (prior to any remediation works taking place) will be modelled using detailed site specific data. The 'acceptable' condition, once defined, will be presented to the Environment Agency, and replicated through active remediation activity.

6. Submission of the DQRA for consultation with the Environment Agency to present, negotiate and agree remediation design principals on a voluntary remediation scheme basis.

7. Preparation of a fully comprehensive Remediation Implementation Plan, presenting the specifications, roles and responsibilities, contractual procedures and information provision.

8. Preparation of a materials management plan to ensure compliance with waste licensing regulations during proposed earthworks and contaminated soils processing and replacement.

9. Development of detailed remediation design documents for the various media to be treated, and submission to the Local Authority and Environment Agency.

5.5 PROPOSED REMEDIAL ACTIONS

Following the supplemental investigations, detailed design, and regulatory meetings the remedial actions will be initiated. The Remedial Action Schedule is built on a Reasonable Best Case scenario as this is the goal of the program. Kodak will be addressing soil and shallow groundwater in WSP Zone 8, the former Effluent Treatment Plant area. Activities associated with the rest of the site will be concentrated within the former Toner Storage Area (WSP Zone 2), Original Synchem area (WSP Zone 5) and the bulk

solvents storage and reclaim area (WSP Zone 4). Supplemental activity will also be required in WSP Zone 3 under the synchem building and possibly in WSP Zone 7 within the Silver Nitrate Plant leased by Ames Goldsmith.

Site establishment

In order to manage the various aspects of the remediation action plan, provision for safe and secure accommodation for site engineers will be required. Office space of approximately 30m^2 with additional, regular access to meeting room facilities will be required, with heating, electric, and welfare facilities. It is assumed that such facilities can be made available for Kirkby AT LLC and its contractors at no cost from the existing buildings within the Kodak site.

Additionally, health and safety provisions such as personnel decontamination units, emergency showers, eyewash stations etc will be imported by WSP to the site.

Also assumed is the continuation of site security practices to ensure the safe storage of plant and equipment.

Demolitions (Above ground)

In order to gain access to impacted soils the buildings / structures in the vicinity of soils remediation areas highlighted in Figure 13 are to be demolished by IPPE where possible. Asbestos surveys and removals are assumed to be the responsibility of others, as is the making safe of chemical plant and distribution lines.

WSP intend to provide the specification and the supervision of demolition, however, performance of the above ground demolition contract (above slab level) is expected to be performed by others at no expense to WSP.

Demolition wastes will be segregated with brick and rubble processed by crusher for reuse as backfill aggregate. This material will be chemically tested to ensure suitability prior to replacement. All other demolition arisings will be disposed of or recycled off-site.

Demolitions (below ground)

The removal of below ground structures will be performed where such structures hinder access to soils or groundwater to be addressed by the program. Features such as the underground storage tanks, effluent pits (inclusive of the fire water pit) and the land drain in WSP Zone 2 are expected to be left in place. The slabs and foundations of Building 15 are expected to be removed.

Below ground demolitions will be performed by WSP. Demolition arisings will be processed through a crusher and resultant aggregate used as backfill material should chemical analysis demonstrate suitability.

In areas of deep penetration into the naturally present clay, backfilling with low permeability materials (such as site won clays) will be performed to replace as practicably as possible the reduced permeability layer. Such practices are expected, but not restricted to the effluent pit areas. Kodak will remove or seal the vibro-stone columns within the effluent treatment area (WSP Zone 8).

Soil treatment area establishment

Prior to the excavation of soils for treatment (or disposal) a soils treatment area will be established. The treatment area will comprise an impermeable surface with integral drainage capacity to accommodate rainfall run-off and leachate generated through the temporary storage of soils. Drainage of the area will be separated from site drainage with collected water pre-treated prior to discharge to sewer.

The treatment area is proposed to be established atop the entire area of the current drum storage compound (Building 68). The area will be divided into cells so rainwater collected in unused areas can be discharged without treatment.

To the extent possible soils will be returned to the excavations at the site. There may be scheduling issues associated with leaving some excavations open, so some stockpiling may be required. Stockpiling areas for treated soils will be required in close proximity, hence an extension of the area through the placement of an impermeable membrane, an earth bund and a crushed stone running layer may be required together with integral drainage.

The treatment area is expected to be required for approximately 35-50 weeks, assuming free access to designated remediation areas.

Once established soils can be deposited within the area for processing and bio-remedial treatment. All excavated soils brought to the area will be screened to remove any debris. The debris will be segregated and where appropriate crushed, tested and used for fill. Any debris that is inappropriate for use as fill will be properly disposed offsite.

The screened soils will be managed and tested before being extracted for reuse on the site. The soil treatment will consist primarily of bioremediation although some vapour extraction cells may be required.

Soils excavation & processing

Soil will be excavated in areas as depicted within Figure 13. Excavations will generally be restricted to the removal of impacted Made Ground, albeit locally to facilitate access to deep structures and to chase out deeper impacts, clay and sand materials will also be excavated. It is not the intention to excavate the entire area presented rather to concentrate efforts within. Excavation will focus on the removal of relict drainage structures, known hotspots and will radiate/extend into soils with demonstrable impact.

During excavation works various drain runs (active and redundant) are anticipated to be encountered and removed. Reinstatement of active drainage features or temporary diversions is assumed to be performed by others, at no cost to WSP.

Contaminated perched water will be encountered during the excavation works. Waters will be pumped out, treated and discharged to sewer under consent. The treatment plant for dewatering is likely to comprise silt-traps, product separating tanks, air stripping towers and GAC filters. The treatment plant will be constructed in a mobile unit so that it can be moved to each excavation area.

Excavated soils will be segregated into various categories. All soils will be tested to determine if they exceed the calculated target criteria (defined by the to-be-completed DQRA). Soils that are excavated, and that exceed the criteria, but that are considered unsuitable for treatment (such as impacted clays) will be disposed of off-site. Soils excavated that do not exceed the criteria and are considered suitable for replacement, such as unimpacted overburdens, arisings from installed perched water drainage infrastructure or segregated materials will be reused for backfill and replaced to a basic engineered specification. Granular materials impacted with non PCB compounds will be screened of oversize materials and deposited within the treatment bed area.

PCB impacted soils above 50mg/kg will be carefully defined by the supplemental investigation program. To date only one verifiable and two tentatively identified samples exceed 50 mg/kg. These soils will be designated to eliminate disturbance.

Excavation voids will be backfilled with materials considered suitable for reuse on the site such as imported aggregate, crushed demolition arisings, or successfully treated soils. In areas of intended perched water treatment the voids will be purposefully filled with permeable materials and the clay surface profiled to direct drainage to a central collection sump (or sumps).

The remediated areas will be graded to a level surface and covered with a 100mm layer of crushed stone/rubble.

Provided free access to designated remediation areas is provided the complete excavation (inclusive of below ground demolitions) and site profiling process is expected to be completed within approximately 35 weeks.

In-situ Treatment of Soils

Soils below Building 82 and a number of the tank Bunds in WSP Zone 4 have concentrations of site related chemicals that are capable of impacting shallow groundwater.

Under Building 82 and the Tank Bunds perched water collections systems will be modified to include a dual phase vacuum extraction technology. The goals of these actions are to remove the fraction of site related compounds that has already partitioned into groundwater and to extract the volatile fraction of these compounds in soil vapour, entrained groundwater and from the soil particles. These systems will allow treatment without constraining site operations, and will be employed where impacts in WSP Zone 4 and 5 are observed to extend beneath roadways or required structures.

The combined in-situ program will operate until an asymptotic level of recovery is achieved, expected to be between 18 and 36 months.

Shallow perched water removal and treatment

In parallel with the soils excavation programme perched water collection systems will be installed for post reinstatement of soils collection and treatment of perched waters. The process will drain areas of perched water in unexcavated areas, and allow migration of impacted water towards collection systems.

Following reinstatement of soils, perched waters would otherwise rebound to pre-existing levels. Although chemical impacts are expected to be reduced due to the removal of perched waters (during excavation dewatering) and soil sources, residual impact from the upper surface of the clays and areas where soil excavations were not performed is anticipated. The shallow groundwater collection system will collect perched waters from the clay surface in areas of residual contamination. The collection of this water will control horizontal migration of groundwater containing site related compounds and reduce the hydraulic head on the clay, reducing vertical leakage through or lateral migration towards areas of thinning clays.

Gradual reduction of contaminant load through removal and dilution of perched waters (by rainwater recharge) is expected to achieve an insignificant contaminant profile of the perched water after approximately 18-36 months of operation. Following this period, free discharge of the collected water is expected to be permitted.

Above ground plant associated with the operation of the system will require a footprint of approximately $32m^2$ together with vehicular access to the plant, a 415V electrical power supply and a connection to the foul sewer system. The systems will be similar in character to those utilised for the excavation dewatering operations and will comprise a combination of silt traps, separators, air-stripping towers and granular activated carbon filters (GACs).

Deep groundwater

The recent investigation, which included the installation of additional monitoring wells into the aquifer, has recorded contaminant impacts, principally by way of dissolved chlorinated aliphatic hydrocarbons. The concentrations have been recorded at concentrations greater than previous monitoring events and suggest that downward migration of contaminants from the shallow groundwater is occurring in the southwest (WSP Zone 5) portions of the site. The impacts are not considered to be sufficiently elevated to present a requirement for active remediation of the deeper groundwater. In order to demonstrate the effectiveness of shallow source removal works in the protection of the major aquifer and to ensure that natural attenuation processes within the aquifer are afforded the opportunity to reduce contaminant concentrations, a programme of natural attenuation monitoring (monitored natural attenuation (MNA)) is prescribed.

The MNA programme will include for the installation of an additional 7 wells into the aquifer across the south western area of the site. Quarterly monitoring of the groundwater quality, to include for the measurement of indicators of biodegradation activity will be performed over an expected period of 5-7 years. This period is considered sufficient time to allow firm conclusions to be drawn over the closure of the principal pollutant linkage.

Following the completion of the MNA programme monitoring wells which penetrate the aquifer will be decommissioned. The over drilling and grouting of the wells, some of which extend to approximately 80m will be performed to preclude the presence of additional preferential pathways to the aquifer.

5.6 VERIFICATION OF REMEDIATION PERFORMANCE

Throughout the remediation contracting phase of works, third party verification of works will be performed to ensure appropriate contract management, collation and continual assessment of data. The verification process will be performed through the full time supervision of works during the soils excavation and treatment works and the part time supervision during the groundwater treatment process.

Completion reports will be prepared to warrant the works performed on soils, shallow groundwater and the aquifer. Specific works in relation to site Zones are as follows:

WSP Zone 1

No significant linkage to deep groundwater has been identified so no verification sampling is planned.

WSP Zone 2

No linkage to deep groundwater has been identified so no verification sampling is planned in respect of the associated vertical pollutant linkage. However, monitoring of perched water quality in the vicinity of stabilised and encapsulated soils will be required to demonstrate effective containment of the PCBs and hydrocarbons respectively.

WSP Zone 3

WSP Zone 3 is a relatively large area along the eastern boundary of the processing areas. The area represents the upgradient boundary of the site with respect to deep groundwater.

No direct linkage to deep groundwater has been identified, but it is the upgradient portion of the site. Monitoring well BH6AD will be included in the monitoring program to provide upgradient data.

Perched waters in the vicinity of the current Synchem building (Building 82) will be monitored during and following the in-situ soils treatment programme to demonstrate effective reduction in contaminant source.

WSP Zone 4

In addition to the verification of soil remediation compliance, monitoring of perched waters collected throughout the treatment phase will be performed to demonstrate betterment afforded through the soils remediation exercise. Once risks of contaminant rebound have been discounted monitoring of perched waters will cease.

In addition to shallow water monitoring, monitoring well WSPB4 will be included in the program to monitor the long-term benefits of the source control efforts on the Sherwood Sandstone aquifer.

WSP Zone 5

As part of the MNA scheme deep groundwater in WSP Zone 5 will be monitored using both existing and newly installed network of monitoring wells

WSP Zone 6

No significant linkage to deep groundwater has been identified and no sources of impact are considered sufficient to warrant perched water monitoring activity.

WSP Zone 7

No significant linkage to deep groundwater has been identified to date. However as contaminants have been detected in shallow soils in this area, as a controlling measure perched water monitoring will be required throughout the duration to provide confidence into the continuing absence of a significant linkage into the aquifer.

WSP Zone 8

The former effluent plant area is a potential downgradient/side gradient area of the site. Deep groundwater in WSP Zone 8 will be monitored using a newly installed monitoring well to ensure adequate certainty as to the closure of the pollutant pathway afforded by the stone column foundations.

WSP Environmental Limited

APPENDIX A

DOCUMENT LIST

Ref.	Title	Author	Date	Reference
1	Site Investigation Report - Proposed warehouse building	Geo-Research	Apr-74	N/A
2	Site investigation report - Liquid incinerator	Geo-Research	Apr-74	N/A
3	Site investigation Report - Storage Tanks	Geo-Research	May-74	N/A
4	Site investigation report - New SCD facilities	Geo-Research	Nov-74	N/A
5	Site investigation report - Emergency reservoir	Geo-Research	Apr-79	N/A
6	Site investigation report - Pet Poly Storage	Geo-Research	Aug-84	N/A
7	Minutes of Meeting to Discuss Groundwater Project	Kodak	26-Sep-90	N/A
8	Assessment of Groundwater Sensitivity and Potential Soil and Water Contamination at the Kodak Facility, Kirkby	Aspinwall & Company	Dec-90	K(0102A)
9	Groundwater Study Team Report	Kodak	Jan-92	N/A
10	Report on Ground Investigation at Acornfield Road, Kirkby	Northern Foundations	May-92	N/A
11	Proposed new tanks at Kodak Ltd	Sub Soil Surveys Ltd	Nov-92	92/231
12	Phase II Site Investigation - Summary of Investigation in Northern Area	Aspinwall & Company	Feb-94	K0102F/R3
13	Phase II Site Investigation at the Kodak facility, Kirkby	Aspinwall & Company	Mar-94	KO0102F
14	Supplementary Site Investigation	Aspinwall & Company	Sep-94	SRJRv294
15	Groundwater Monitoring – September 1995	Aspinwall & Company	Nov-95	KO0102J
16	Groundwater Monitoring and Additional Borehole Installation	Aspinwall & Company	Jan-98	KO0102K
17	Groundwater Monitoring November 1997 - Factual Report	Aspinwall & Company	16-Jan-98	KO0102K
18	Proposed RTO Project	Worms Eye Geotechnical	19-Aug-98	WE/GGC/VG/R
19	Tank Bunds, Kodak Ltd	Worms Eye Geotechnical	11-Sep-00	GGC/DA.rept00
20	Building Extension – Nexpress Solutions Limited	Worms Eye Geotechnical	12-Sep-00	GGC/DA.rept00
21	Proposed New Tank bund : Building 82 – West Side	Worms Eye Geotechnical	13-Aug-02	GGC/DA
22	Phase 1 Environmental Site Assessment	Conestoga Rovers & Associates (UK) Ltd	Jun-03	32236(2)
23	Phase II Environmental Site Assessment	Conestoga Rovers & Associates (Europe) Ltd	Sep-03	32236(2)
24	Additional Groundwater Assessment	Conestoga Rovers & Associates (Europe) Ltd	Dec-03	32236(3)
25	Groundwater Quality Monitoring Round Three	Conestoga Rovers & Associates (Europe) Ltd	Jan-05	32236(10)
26	Groundwater Quality Monitoring Round Four	Conestoga Rovers & Associates (Europe) Ltd	Jun-05	33154(7)
27	Phase II Environmental Site Investigation - The Mound	Conestoga Rovers & Associates (Europe) Ltd	Jul-05	33154.06
28	Appendix 17 - Application Site Report, Kodak Ltd	Conestoga Rovers & Associates (Europe) Ltd	Jul-05	933221(1)
29	Kodak Ltd Chemical Manufacturing IPPC Application & Supporting Information	Kodak	Aug-05	BU5607/M
30	Groundwater Quality Monitoring Round Five	Conestoga Rovers & Associates (Europe) Ltd	Apr-06	33154.13
31	Groundwater Quality Monitoring Round Six	Conestoga Rovers & Associates (Europe) Ltd	Oct-06	933154.16
32	Environmental Risk Assessment	Conestoga Rovers & Associates (Europe) Ltd	Oct-06	33154.17
33	Phase II Environmental Assessment – Playing Field Area	Conestoga Rovers & Associates (Europe) Ltd	Nov-06	33154.14
34	Letter from Environment Agency to Conestoga Rovers	Environment Agency	21-Dec-06	033154.17/02
35	Geotechnical Investigation – Building K33 (Eastman Chemicals)	Conestoga Rovers & Associates (Europe) Ltd	02-Jan-07	933274

APPENDIX B

ENVIRONMENT AGENCY LETTER

Our ref: CL6/KN/1051/sfc
Your ref: 033154.17/02
Date: 21st December 2006

Neil Foster
Conestoga-Rovers Associates
6 Clarendon Street
Nottingham
NG1 5HQ

Dear Neil

Kodak, Knowsley Industrial Park, Groundwater Risk Assessment,

Thankyou for sending a copy of the Environmental Risk Assessment, Final Report, Kodak Ltd, Acornfield Road, Kirkby, October 2006.

The report identified the following pollutant linkages relating to controlled waters at the site:

1) Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2) Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water drainage ditch/closed culvert.
3) Deep groundwater contaminants, via lateral migration to 250m compliance point.

Review of Risk Assessment

Pollutant Linkage 1 (Sherwood Sandstone receptor) - the shallow soil & groundwater model runs have used a declining source term and most of the contaminants have been entered as single values. Oils/hydrocarbons comprise a whole site source - the concentration has been input as a range. In most cases the source term has been entered as leachate concentration rather than soil.

The mixing zone depth was changed to 10m in a number of the model runs but it didn't make an appreciable difference to the outcome - the contaminants posing a long term risk to the major aquifer were the same as those highlighted by CRA (organic contaminants).

Pollutant Linkage 2 (Surface water receptor) - level 3a RA modelling Contamination in the perched groundwater. As far as the surface water receptor location is concerned, as groundwater has been shown to flow away from the identified ditch it's probably not realistic to have such a tight compliance point of only 30m from the site boundary.

The Environment Agency
Lutra House Dodd Way
Off Seedlee Road
Walton Summit Bamber Bridge
Preston Lancs PR5 8BX Tel: 08708 506 506 Fax: 01772 627730

Pollutant Linkage 3 (contaminants already in Sherwood Sandstone)
The site derived northwesterly flow direction in the Sherwood Sandstone is consistent with flow being influenced by the Petrolite abstraction to the west and the abstractions further north at Simonswood. These include Eagersignal Ltd (spray irrigation), City Centre Commercials (dust supression), SJ Doyle & CO (dust suppression) and R Draper (general agriculture). There is a single measurement of groundwater level in the Kodak abstraction of 6.65m - can this be referenced to mAOD and incorporated into the relevant groundwater contour plot? (Estimated level of borehole top is 45mAOD putting this at 38.35mAOD)

Section 2.4.2 identifies the Pilkington Brothers Ltd abstraction just to the north of the site as being active - in fact it's not been used since the late 1980's even though the licence has continued to be live.

The main contaminants of concern are the chlorinated solvents (TCE, cis-DCE and VC) but in the absence of these substances in shallow soils and groundwater and the lack of evidence that they have been used on site I would tend to agree with CRA's view that they originate off-site. This is a plausible explanation given that these contaminants are present in the SW corner of the site. Although up-gradient of here there is only Charley Wood and agricultural fields, when the UU abstractions were in operation, groundwater flow would have been to the east and this area of the site would then have been down-gradient of much of the Industrial Estate including Petrolite and the properties to the west.

Although probably not attributable to Kodak, level 3a QRAs for the major aquifer have been carried out for the various contaminants present in the groundwater. The entire site forms the source term. This is very conservative given that e.g. the chlorinated solvents were only encountered in the SW corner of the site. No degradation has been included despite the fact that, for the chlorinated solvents at least, the presence of breakdown products of the chlorinated solvents indicates that some degradation is taking place.

The use of a 100m thick mixing zone seems inappropriately high. CRA refer to the presence of mudstone layers within the sandstone aquifer which would limit the mixing zone thickness so we changed it to 10m. Despite this, none of the site wide contaminants exceed the WQS at the 250m compliance point, when retardation is included. So I wouldn't envisage that any action would be needed with respect to the contamination already present in the major aquifer.

Conclusion

Pollutant linkages 2 and 3 do not appear to be viable pollutant linkages. For pollutant linkage 2 the direction of flow of shallow groundwater is away from the nearest surface water receptor and for pollutant linkage 3 the source of contamination appears to be from off site and is therefore not a liability for Kodak.

Pollutant linkage 1 with respect to the organic contamination remains to be a concern because the contaminants which are reaching the major aquifer are List 1 substances. Site specific target levels for remediation should be derived for the shallow groundwater and soils. The model should also be run with a suitably conservative biodegradation

rate and the results presented for with and without degradation.

If you have any queries on this please do not hesitate to contact me.

Yours Sincerely

Sarah Corbishley
Contaminated Land Technical Officer

Tel: 01772 71 4017

cc.

Dave Logan
Knowsley MBC
Municipal Building
Cherryfield Drive
Kirkby
L32 1TX

APPENDIX C

CRA FACTUAL REPORT

FIGURE 1

HISTORICAL & CURRENT LAND USES

FIGURE 2

EXPLORATORY HOLE LOCATION PLAN

FIGURE 3

MONITORING WELL LOCATIONS

FIGURE 4

GLACIAL TILL THICKNESS

FIGURE 5

DEPTH TO SHERWOOD SANDSTONE

FIGURE 6

PERCHED GROUNDWATER CONTOURS

FIGURE 7

DEEP GROUNDWATER CONTOURS

FIGURE 8

CONTAMINATION OBSERVATIONS

FIGURE 9

SOIL CONTAMINATION SUMMARY

FIGURE 10

PERCHED GROUNDWATER CONTAMINATION SUMMARY

FIGURE 11

DEEP GROUNDWATER CONTAMINATION SUMMARY

FIGURE 12

DRAINAGE LAYOUT

FIGURE 13

REMEDIATION WORKS SUMMARY

FIGURE 14

INDICATIVE REMEDIATION PROGRAMME

Former Kodak Chemicals Ltd Site
Voluntary Remediation Strategy

Acorn Properties (Kirkby) Ltd

December 2007

WSP

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft for comment			
Date	November 2007			
Prepared by	R Lawless			
Signature				
Checked by	D Reid			
Signature				
Authorised by	R Clayton			
Signature				
Project number	12121392/003			
File reference	8434(1)			

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Contents

1 Introduction 1

2 The Site 3

3 The Way Forward 11

4 Summary & Conclusions 14

Appendix A Document List 15

1 Introduction

1.1 BACKGROUND TO THE SITE

This report relates to the industrial site formerly operated by Kodak, located off Acornfield Road within the Kirkby Industrial Park, Kirkby, Merseyside. Acorn Properties (Kirkby) Limited (Acorn) has recently purchased the buildings and equipment and secured a long-term leasehold interest to the property from Kodak Chemicals UK Limited (Kodak).

Following the purchase, it is our understanding that Acorn will undertake a programme of refurbishment, plant sales, letting of buildings and possible limited redevelopment. It is understood that the principal site infrastructure such as roads, services and the majority of buildings will remain.

WSP Ltd (WSP) has been retained by Acorn to undertake voluntary remediation works that were identified during the due diligence process in order to manage / mitigate environmental liabilities relating to soil and groundwater contamination.

1.2 PROJECT OBJECTIVES

To facilitate Acorn's purchase of the site, WSP undertook a detailed review of all existing environmental data and assisted the design of supplementary investigation. This process has resulted in the establishment of the 'known contamination' at the site as of October 2007, the date of the transaction.

The review undertaken by WSP did not identify any current statutory environmental liability relating to contamination, specifically with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations.

Acorn takes its environmental responsibilities very seriously and, notwithstanding the absence of an identified statutory liability, is keen to enhance the condition of the property in the current window of opportunity that the partially vacant site presents.

Consequently, WSP has been instructed to undertake voluntary remediation works at the site. The objectives are as follows:

- To remediate known contamination at the site to levels to be determined in a forthcoming quantitative risk assessment document.
- To obtain regulatory support (specifically the Environment Agency and Knowsley MBC) for the proposed remediation activities and ultimately their confirmation that the works have been completed and validated accordingly.
- Upon completion of the remediation works, to obtain written confirmation from the regulators that, with respect to the known contamination, the site is in a satisfactory state with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations.

1.3 REPORT OBJECTIVES

The objectives of this report are as follows:

- To communicate our current understanding of the site and outline our proposed remediation activities to the regulators.
- To provide a general background to the site and summarise the existing investigation / documentation.
- To summarise the regulatory consultations held concerning the site to date.
- To present the outline remediation strategy for the site.
- To provide an outline programme of works going forward.

1.4 CURRENT LEVEL OF INFORMATION

The current understanding of the site is based on a series of historical investigations undertaken on behalf of Kodak and a complete list of available reports is included as Appendix A. Section 2, which provides a summary of our current understanding of the site is derived from the documents listed within that appendix.

2 The Site

2.1 SITE DESCRIPTION

The Site occupies approximately 15.0Ha on the eastern edge of Knowsley Industrial Park. Until recently, the site was occupied by Kodak and utilised as a photochemicals production facility. Production ceased at the end of 2006 and the majority of the facility has been decommissioned. Two companies currently reside and utilise a small proportion of the property; Ames Goldsmith Ltd operates a silver nitrate production facility in the south, and Eastman Chemicals Ltd occupies a building in the northwest of the site for research purposes.

The current layout comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. All roadways and loading areas are surfaced with concrete hardstanding. The north-eastern corner of the site was until recently utilised as a sports pitch (grassed).

The Site is bounded to the west by Acornfield Road, beyond which are a number of industrial premises. An industrial site also bounds the north. Perimeter Road forms the eastern boundary, beyond which lies agricultural land. This includes a former municipal landfill (now restored and used for grazing) to the southeast. The southern boundary is adjacent to woodland.

2.2 HISTORICAL OPERATIONS

2.2.1 Kirkby Munitions Factory

Until WWll the study area was situated within a rural, agricultural setting. In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). Portions of the site were used as a filling factory, whereby explosives were loaded into various types of ammunition cases. The Munitions Factory covered 743 acres, with the majority located off-site, to the west of Acornfield Road and only covered a small part of the Kodak site (mainly the south-western corner). Within the subject site a number of small buildings were constructed within the south-western corner, together with a rectangular feature close to the north-eastern boundary, which was used a fresh water reservoir. The buildings on site were reportedly used as explosive test bays. The presence of earth bunds around some of the buildings suggests that explosives may have been stored on site.

2.2.2 Kodak

The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. It appears that initially operations were small-scale with 9 employees occupying the former Ministry of Defence buildings, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's additional facility in Harrow, London. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

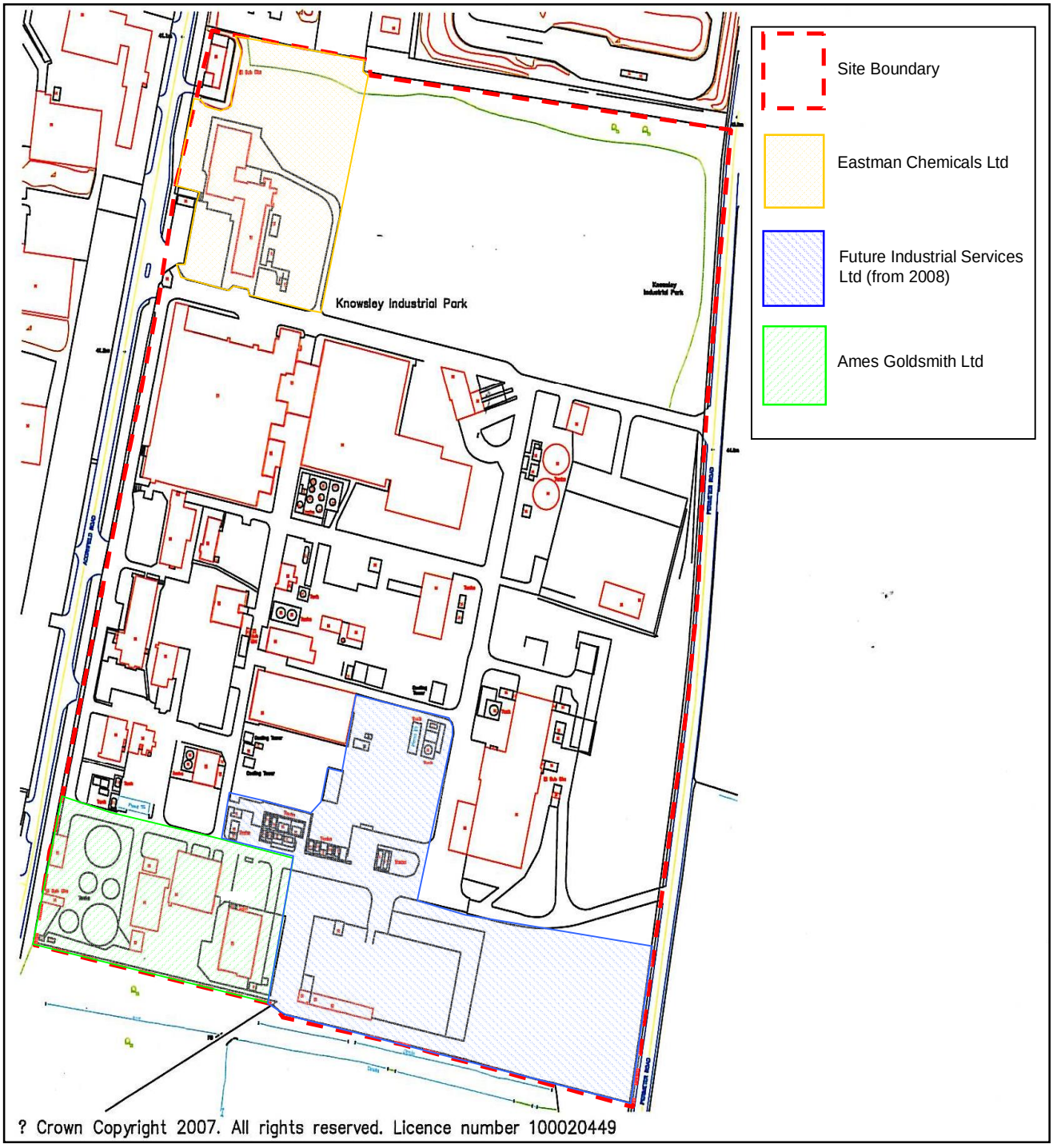
Between 1969 and 1974 production on site diversified to produce chemicals not specifically for the photochemicals industry, including production of hydroquinone, tecmangam (manganese ammonium sulphate) and benzoquinone.

The synthetic chemicals manufacturing buildings were demolished and replaced (in a different location on site) in the late 1970s. The Powders & Solutions Department was closed in 2001 and photochemical production ceased at the end of 2006.

Anecdotal information suggests that landfilling activities occurred during the 1950s / 1960s in two parts of the site; the north-eastern corner (currently a grassed area used until recently as a sports pitch) and the south-eastern corner (currently an area of soft landscaping and a drum storage compound).

2.3 CURRENT & ANTICIPATED OPERATIONS

At the time of writing approximately 60% of the site has been effectively decommissioned and mothballed. Acorn intends to transform the site into a multi-occupancy business park. This will be achieved by limited demolition of dilapidated / unsuitable structures, refurbishment for letting and development of parts of the property that are currently undeveloped.



Two companies currently lease part of the property from Acorn. In addition, Future Industrial Services Ltd will occupy a lease from 2008. The areas of the site occupied are highlighted on the plan on the previous page and the operations are summarised as follows:

2.3.1 Eastman Chemicals Ltd (Eastman)

Eastman has been located in this part of the site since the building's construction in the 1960s. The Eastman property comprises a large laboratory / office building. The ground floor contains small-scale plastics processing laboratories and offices.

The first floor contains analytical and research laboratories, formulation laboratories for paint coatings, stores and offices. The second floor contains paint formulation laboratories and spray booths. An exterior high pressure laboratory that is now disused, is located to the rear of the main building. In addition, a chemical store, a 'clean' solvent and a waste solvent building are located immediately to the east of the main building.

2.3.2 Ames Goldsmith (Ames)

Ames took over the operation of silver nitrate production in early 2007 and it is understood that the location and nature of this process has not altered since Kodak managed the plant. The process reacts silver bullion with nitric acid to form silver nitrate.

2.3.3 Future Industrial Services Ltd (Future)

Future intends to occupy two parts of the site from 2008, namely the drum storage compound close to the southern boundary and the solvent storage / recycling plant located immediately to the north.

It is understood that Future will undertake two processes within their lease; pulverised fuel ash (PFA) recycling and solvent recycling. Full details of the proposed processes are not currently available but will be subject to PPC permit applications by Future.

2.4 CONCEPTUAL SITE MODEL

2.4.1 Investigations

The current understanding of the site has been derived from site investigations undertaken by Aspinwall in the 1990s and Conestoga Rovers & Associates (CRA) from 2003 to 2007. WSP had some design input into the most recent investigation conducted in early 2007 by CRA. All relevant reports are referenced in Appendix A.

2.4.2 Geology

Published geological mapping indicates the study area to be underlain by Shirdley Hill Sand, and then subsequently by Glacial Till and Sherwood Sandstone.

Site investigations have recorded Made Ground across the whole site generally between 1 and 2m thick, although a maximum of 7m was recorded in the south-eastern corner (in an area of historical landfilling).

Shirdley Hill Sand is present as a thin horizon (generally less than 1m thick) across the majority of the site although is absent from some areas including beneath parts of the former playing fields and the original Synthetic Chemicals (Synchem) Area. It has also been removed to facilitate construction of the reservoir in the north-eastern corner.

Glacial Till was found to be present beneath the entire study area (with a single exception) and is observed to thin from the northwest to the southeast. The Glacial Till is generally described as a sandy, occasionally gravelly clay. Discrete sandy horizons have also been recorded within the Till, although these are laterally discontinuous.

The depth to the top of the Sherwood Sandstone varies from in excess of 14m in the northwest to less than 2m in the extreme south of the site and closely corresponds with the Glacial Till thickness.

2.4.3 Hydrogeology

Two distinct groundwater bodies are present beneath the site; a perched groundwater within the Made Ground / Shirdley Hill Sand, resting on the Glacial Till and the main groundwater body within the underlying Sherwood Sandstone.

The perched groundwater is nearly continuous across the study area, and is only locally absent beneath some of the larger existent structures; monitoring indicates a flow direction to the west / southwest. Data for the Sherwood Sandstone indicates a flow direction to the northwest.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone. Given the groundwater flow directions, the two bodies appear to be operating independently. However, it has been surmised that limited downward migration through the Glacial Till may be possible locally, which may be due to its relatively high sand / gravel content. Furthermore, there are several locations where recharge to the Sherwood Sandstone may be occurring from the shallower body, namely:

- The fire water pit, which is at least 4.7m deep, with adjacent Glacial Till thickness 4.9m.
- The southern part of the site (adjacent to the drum compound) where the borehole log does not clearly identify Glacial Till.
- The former effluent treatment plant in the southwest of the site, where recent works suggest a possible linkage between the perched groundwater and the underlying aquifer are the chemical drainage sumps/chambers which extend to depths ranging from 2 to 3.7m below ground.

It is possible that two underground storage tanks (USTs - the only two recorded on site) and the “graded” pit all located in the centre of the site were installed close to the top of the Sherwood Sandstone at circa 3.1m in this area. The construction details of the USTs and pit are unknown, although they could extend to approximately 3m depth, thus providing a pathway through the Glacial Till to allow recharge.

Possible evidence of this interaction is demonstrated by monitoring data with the perched groundwater apparently migrating towards the fire water pit and effluent treatment plant.

2.4.4 Hydrology

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 10m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area.

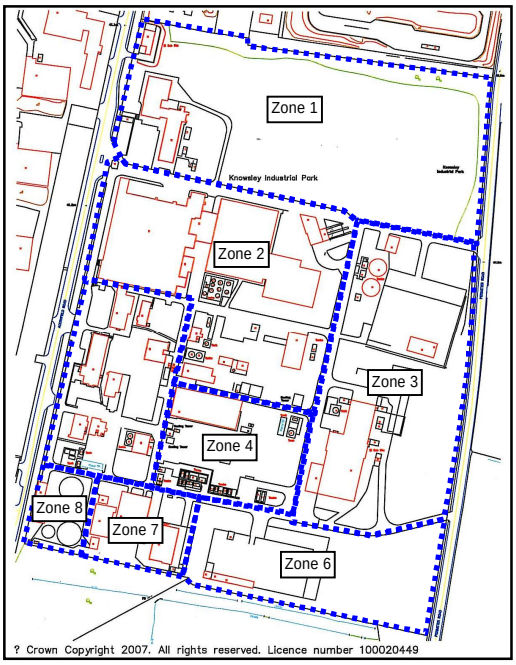
Work undertaken by CRA concluded that the water level within the nearby drainage ditch is higher than perched groundwater levels; consequently migration of groundwater to this receptor from site was considered unlikely.

2.4.5 Contamination Assessment

A significant volume of laboratory chemical testing data has been compiled for the subject site, including testing of soil samples, and regular testing of shallow and deep groundwater samples from 2003 to 2007.

For ease of discussion, the site has been split into 8 Zones as shown on the figure to the right. The zones are based on historical / current land uses.

The table below summarises the qualitative environmental risk assessment undertaken by WSP as part of the pre-purchase property due diligence. For each zone an assessment has been made as to whether risks exist to human health, perched groundwater and the main groundwater table within the Sherwood Sandstone. An indication of the likely source of any contamination is also given (if known).

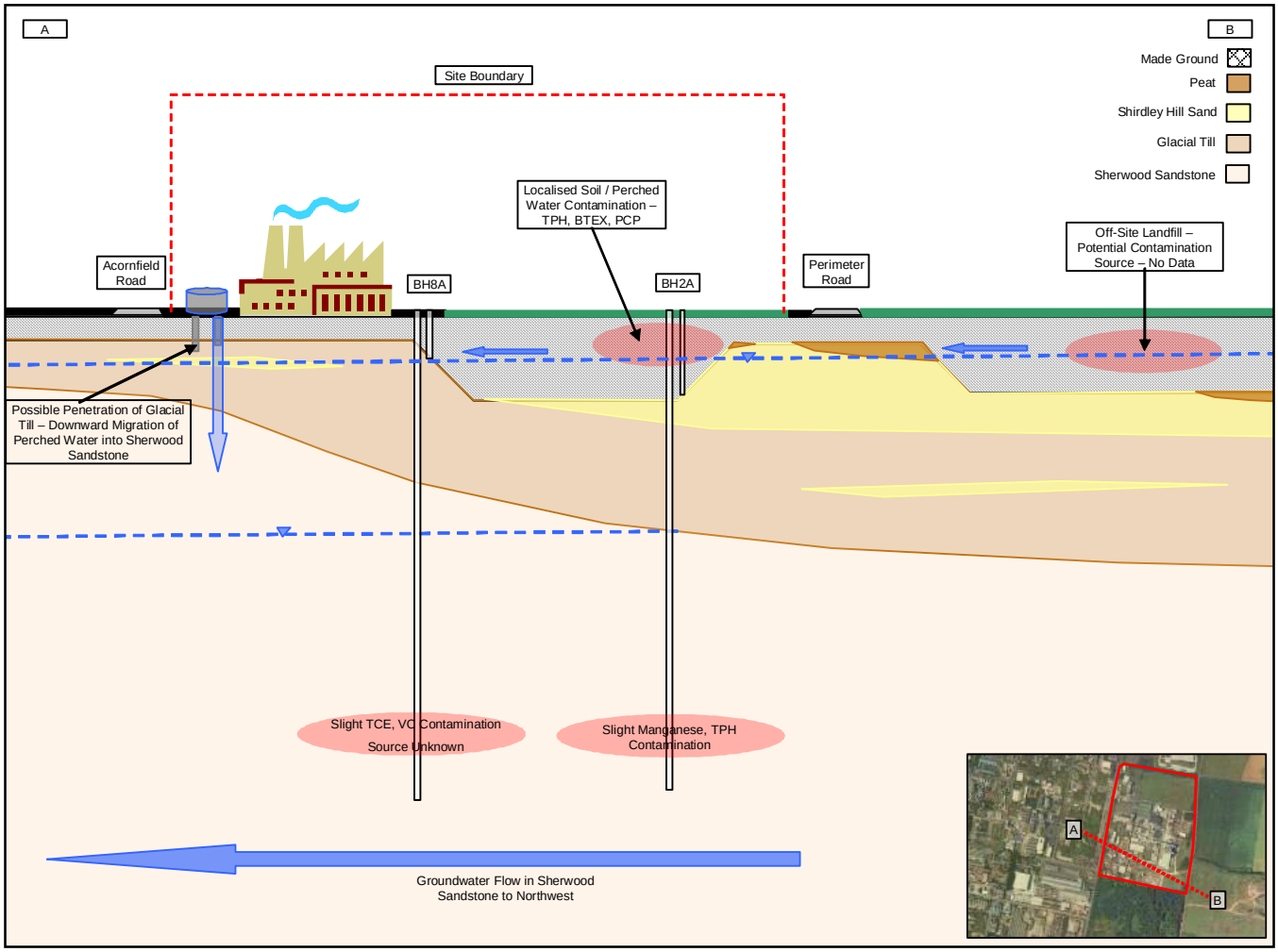


Zone	Contamination Summary	Source	Risk to Human Health	Risk to Perched Groundwater	Risk to Aquifer
Zone 1	Extensive testing was conducted throughout because of reported historical burning and waste disposal in this area. Hydrocarbon contamination was identified in the Made Ground locally associated with tar fragments in the soil matrix. However, widespread impact was not identified nor was there evidence of significant disposal or burning ground residues.	Waste materials historically placed.	No	No	No
Zone 2	Local impact was identified around the former toner storage building (Building 84) both in soils and perched groundwater. Polychlorinated biphenyls (PCBs) have also been detected in soils in this location.	Unknown	Yes	Yes	No
	Strong chemical odours (of indeterminate origin) have been recorded immediately downgradient of the PCD tank farm area. Soil contamination was not identified associated with the odours, although elevated ammonium concentrations have been detected in perched groundwater.	PCD Tank Farm	No	Yes	No
Zone 3	Local solvent odours were recorded within the northern part of the Synchem building (Building 82). Elevated concentrations of chloroethane, trichlorethane and xylene have been identified within the isolated perched groundwater.	Solvent mixing in Building 82.	No	Yes	No
Zone 4	Within the bulk solvent storage area, numerous chemical / solvent odours have been recorded and these are accompanied by predominantly BTEX (benzene, toluene, ethylbenzene and xylene) and chlorinated hydrocarbon impact within soils and perched groundwater.	Tanks and drainage.	No	Yes	Yes
Zone 5	The former Synchem area is the area with the highest impact. Numerous strong solvent, chemical and fuel hydrocarbon odours have been identified within the former Synchem area. Elevated concentrations of TPH (total petroleum hydrocarbons), BTEX and chlorinated hydrocarbons have been identified within the Made Ground and underlying Shirdley Hill Sand. There is evidence of limited downward migration directly through the Glacial Till to a depth of circa 7.0m locally. It was considered that the construction of the Fire Water Pit may provide a migration pathway between the shallow and deep groundwater through the backfill around its perimeter.	Former Synchem operations	Yes	Yes	Yes
Zone 6	None Identified.	None Identified	No	No	No

Zone	Contamination Summary	Source	Risk to Human Health	Risk to Perched Groundwater	Risk to Aquifer
Zone 7	Minor TPH and chlorinated hydrocarbon contamination has been recorded in the Made Ground and perched groundwater of the south central portion of the silver nitrate plant.	Zone 7 Silver nitrate production	No	Yes	Yes
Zone 8	Significant contamination has not been recorded in this zone during investigations and post demolition; concerns exist relating to possible linkages to the deeper aquifer.	NA	No	No	Yes

Summary of Conceptual Site Model

The receptor most at risk from the site is considered to be the Sherwood Sandstone, with evidence of site-derived contamination having entered this major aquifer in the south-western corner. This is considered likely to be the main driver for any remediation of the site. WSP has derived a graphical presentation of the conceptual model, which is presented below:



2.5 REGULATORY ENGAGEMENT TO DATE

Statutory regulatory involvement with the site in recent years has generally been limited to administration of the IPPC and COMAH permits and the groundwater abstraction license associated with the silver nitrate plant (now operated by Ames Goldsmith).

In 2006 CRA submitted their Environmental Risk Assessment Report for the site (October 2006 ref. 33154.17) to the Environment Agency and Knowsley MBC in order to obtain regulatory agreement relating to the extent (if any) of statutory environmental liabilities associated with the ownership of the property.

The CRA report submitted to the aforementioned regulators was produced prior to the investigation undertaken in early 2007. The 2007 investigation targeted many areas not previously accessible for operational reasons and also aimed to fill data gaps from previous phases of investigation. Therefore, WSP's understanding of the site's conceptual model has advanced from that presented by CRA in 2006. Nonetheless, the conceptual model presented by CRA in 2006 is still considered to be broadly accurate.

CRA identified three main potential pollutant linkages with respect to controlled waters, as follows:

1. Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2. Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water channel 30m to the south of the site boundary.
3. Deep groundwater contaminants, via lateral migration to a theoretical 250m distant compliance point down-gradient of the site.

CRA utilised a commercially available risk assessment package, Consim V2, published by Golder Associates / Environment Agency to model predicted concentrations of contaminants down-gradient of an assumed source.

With respect to the above linkages, CRA concluded the following:

1. Long term risks exist to deep groundwater quality 250m from the site boundary relating to benzene, xylene and TPH, particularly with respect to BH11R.
2. This pollutant linkage was not considered by CRA to be valid, as the watercourse in question is up-hydraulic gradient from groundwater beneath the Kodak site.
3. No long term risks identified with respect to groundwater quality 250m from the site, from pre-existing contamination beneath the study area.

CRA undertook a limited human health risk assessment that was restricted to a comparison of contaminant concentrations against published generic screening values for a commercial / industrial end use. CRA identified localised exceedances with respect to lead, polycyclic aromatic hydrocarbons (PAHs) and TPH, although no further assessment was undertaken.

The Environment Agency has reviewed the risk assessment produced by CRA and provided their formal response in a letter dated 21 December 2006 (included as Appendix B). This letter generally approves the findings of the QRA and concludes that Pollutant Linkages 2 and 3 'do not appear to be viable pollutant linkages'.

The Agency reserved concern in relation to Linkage 1, 'because the contaminants which are reaching the major aquifer are List 1 Substances' and has requested more detailed modelling and the derivation of site-specific remedial targets to determine the need for any remediation works (this has not been undertaken to date.

2.6 WSP POLLUTANT LINKAGE ASSESSMENT

During assessment of the site, the following pathways have been considered:

- Mobilisation of contaminants in soils on-site to shallow perched groundwater in the Shirdley Hill Sand.
- Migration of impacted perched groundwater across and off-site beneath 3rd party property to the west.
- Migration of perched groundwater to the drainage ditch to the south of site.
- Migration of perched groundwater via drainage systems both on-site and off-site into 3rd party drainage network.

- Interconnection between perched groundwater and the deeper major aquifer, particularly in the south-western part of the study area where the Glacial Till may have been 'punctured' by foundations / tanks.
- Dermal contact, ingestion and inhalation of contaminants.
- Migration and inhalation of volatile vapours.
- Direct contact with buildings and building services.

The pollutant linkages of concern were considered to be related to the presence of List I substances in shallow soils, perched waters and deeper groundwater. The presence of source concentrations (both in the shallow soils and perched waters) were concluded to be sufficiently elevated to require remediation and pathway management.

Two key pollutant linkages identified were:

- **Pollutant Linkage 1** - Shallow soil leaching of organic (List 1) contaminants, into perched groundwater with subsequent vertical migration and/or leakage through or around the glacial till into the Sherwood Sandstone aquifer.
- **Pollutant Linkage 2** - The potential migration of contamination from the former toner storage area (Building 84) via relict drainage and / or perched groundwater. Whilst not technically nor currently considered 'significant' in terms of statutory environmental liability, given the nature of the contamination (PCBs) and associated remediation costs, early remediation was proposed to prevent further spread and exacerbated future remediation costs.

Linkage 1 corresponds to Pollutant Linkage 1 identified by CRA and as discussed in the preceding section. The remediation activities proposed by WSP are designed primarily to address this linkage. WSP will also address Pollutant Linkage 2 relating to the TPH and PCB contamination centred on Building 84 to prevent future lateral migration.

3 The Way Forward

3.1 PROPOSED VOLUNTARY REMEDIATION WORKS

The recent change of ownership, combined with the vacation of much of the site by Kodak represents an opportunity to undertake remediation of the site, whilst minimising disruption to on-going activities. WSP has identified a programme of works considered necessary to manage the two Pollutant Linkages.

Works to Address Pollutant Linkage 1

Shallow soil leaching of organic contaminants, into perched groundwater with subsequent vertical migration and/or leakage through or around the Glacial Till into the Sherwood Sandstone aquifer.

Management of Pollutant Linkage 1 will be addressed through the following activities:

- Removal/reduction of soil sources (including chemical drain runs and associated bedding materials), where necessary.
- Removal/reduction of perched groundwater contamination through active treatment of grossly contaminated groundwater together with dewatering during soils remediation and low energy passive perched water collection sumps following soil remediation.
- Pathway management in areas where the confining Glacial Till layer has been compromised (such as the "fire water pit" and other deep underground structures).
- Demonstration of natural attenuation of the residual phase contamination through monitoring of both the perched and deeper aquifer.

Based on the extensive site investigations carried out on the site, these works are proposed in the following areas:

Zonal Area		**Proposed Pollutant Linkage 1 Works**
Zone 1	Playing field & Eastman Chemicals	No works required as the underlying depths of boulder clay prevent any significant linkage.
Zone 2	Photo-chemicals Division	No works proposed given the absence of the pollutant linkage in this area (see also Pollutant Linkage 2).
Zone 3	Reservoir and Synchem Plant	Suspected solvent contamination exists in the Synchem building and therefore delineation works and in-situ treatment of shallow solvent impact will be undertaken.
Zone 4	Bulk solvents area	Solvent contamination exists in proximity to above and below ground solvent storage tanks and infrastructure and within chemical drainage. Remediation works will be undertaken to remove impacted soils, drain runs and treat in-situ residual groundwater. Groundwater treatment will be achieved through a combination of in-situ systems (installed around future operational areas), dewatering during soils remediation, and passive remediation following soils remediation to address rebound and residual contamination. Some pathway management may be required around the deeper below ground structures in this part of the site.
Zone 5	Former Synchem Plant	This is the most heavily impacted area of the site and will be subject to substantial soils remediation works. As part of these works dewatering will be undertaken to remove contaminated groundwater and a passive collection system will be installed to treat residual contamination and rebound. Pathway management in the form of cut off walls will be used in this part of the site around the deeper structures that are known/suspected to have penetrated the confining

Zonal Area		Proposed Pollutant Linkage 1 Works
		clay layer.
Zone 6	Drum storage compound and 'mound'	No works are proposed with no evidence of contamination or a significant pollutant linkage.
Zone 7	Ames Goldsmith area (silver nitrate)	Contamination is limited in this area and therefore a monitoring only strategy is proposed for this part of the site.
Zone 8	Effluent Treatment Plant	This area has been demolished and validated as "clean" by CRA on behalf of Kodak. Some form of pathway management may be necessary due to the presence of deep structures associated with the chemical drains in this area penetrating the confining clay layer and this will form part of the site wide review and monitoring strategy.
	Whole Site	Site wide monitoring will be performed through the remediation period and for a post remediation period to be agreed with the Environment Agency. The monitoring will be undertaken to demonstrate success of the works and support natural attenuation theories for the residual contamination concentrations.

Works to Address Pollutant Linkage 2

The potential lateral spread of identified hydrocarbon contamination through drainage features and service conduits within the north-eastern area of Zone 2.

Whilst not significant in terms of Part 2A, given the nature of the contamination (gasoline range hydrocarbons and PCBs) and associated remediation costs, early remediation is proposed to prevent further spread and associated potential future remediation costs in the former Toner Storage Area.

Contamination has been identified around BH11R and extending to include WSPT11 and WSPX50. The contamination in this locality is present from close to ground level to a depth of at least 4.4m within the Shirdley Hill Sand and has been recorded both within soils and perched groundwater. The contamination comprises predominantly petroleum hydrocarbons, although PCBs have also been detected. The PCB concentrations are generally less than 1 mg/kg although a concentration of 210mg/kg was measured in a sample from WSPT11. Relevant PCB concentrations within the UK regulatory context include the 1mg/kg threshold for Hazardous Waste and the 50mg/kg threshold, above which landfills cannot accept the material and incineration is the only means of off-site disposal.

Risks associated with soils within this area can be addressed either by removal of the source, or implementing measures to prevent any future migration (i.e. encapsulation).

3.2 PRELIMINARY REMEDIATION OPTIONS APPRAISAL

In order to identify potential options that may be applicable to address the identified pollutant linkages, an Options Appraisal will be undertaken in accordance with the methodology detailed in CLR 11.

As part of the process remedial and management objectives will be established for which the remedial options are required to meet. A range of site specific characteristics and constraints that affect the feasibility of applying different remediation options will also be identified.

In the absence of the full Options Appraisal, WSP considers the following techniques may be applicable to the subject site:

Soil Remediation

Two main options for remediation of soils will be available:

- Excavation of affected soils for off-site disposal
- Excavation of affected soils, for on-site treatment and subsequent re-use of soils if suitable.

The second option is considered likely to represent both the most environmentally sustainable and economic option. The former reservoir in the northeast of the site (Zone 3) has been identified as a suitable treatment bed for soils. Small-scale remediation trials will be required in order to identify the most appropriate ex-site remediation technique.

Perched Groundwater

Remediation of perched groundwater may be required where impact is identified locally, and / or during dewatering of excavations. The most likely remediation technique will involve extraction, treatment and subsequent disposal to foul sewer under appropriate consent. The actual method of treatment will depend on the nature of contamination requiring treatment and the outcome of initial trials.

A second method of remediation that could form an alternative or be used in combination with the above is passive treatment. This would involve the installation of perched groundwater management to intercept impacted groundwater and channel this either to treatment or directly to foul sewer. Removal of identified pathways through the Glacial Till to the underlying major aquifer could also form part of the design where vertical migration of contaminated perched groundwater is considered to pose a risk.

Finally, consideration will be given to the suitability of either in-situ chemical oxidation and/or accelerated natural attenuation techniques (such as oxygen release compounds – ORC).

3.3 INITIAL ACTIONS

In order to facilitate commencement of remediation works on site, WSP propose the following initial steps:

- Limited additional site investigation for delineation / design purposes.
- Quantitative Risk Assessment (QRA) to derive appropriate remedial targets.
- Remediation Trials.
- Remediation Options Appraisal & Remedial Action Plan.

These actions will be completed during December 2007 and January 2008. It is anticipated that two documents, the QRA and Remedial Action Plan will be submitted for regulatory comment / approval in January 2008.

4 Summary & Conclusions

4.1 REMEDIATION DRIVERS / OBJECTIVES

Ownership of the subject site has recently been transferred from Kodak to Acorn. A relatively small proportion of the site is currently operational and therefore a window of opportunity exists for remediation activities.

As part of the due diligence performed by Acorn prior to purchase, a scope of voluntary remediation works was identified. The remediation works were designed primarily to manage / mitigate a pollutant linkage identified in correspondence from the Environment Agency, namely:

'Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer'.

The main objective of the proposed remediation works will be to mitigate the aforementioned pollutant linkage to the satisfaction of the Environment Agency and Knowsley MBC and obtain formal 'sign-off'.

A second objective of the remediation works will be to prevent future migration of TPH / PCB contamination in the former toner storage area; either by source removal of pathway management.

4.2 PRELIMINARY REMEDIATION STRATEGY

Within the site, localised areas of impacted soils and perched groundwater have been identified. The proposed remediation is likely to comprise a combination of reduction in site contaminant load and contaminant containment and management; not a complete removal of contamination.

A variety of remediation options have been identified and will be developed through completion of design investigations, remediation trials and options appraisals.

The objective for post remediation conditions will be where significant pollutant linkages are not present or likely to be present. Total contaminant removal will entail excessive cost and is not considered necessary.

WSP Environmental Ltd

Appendix A Document List

Ref.	Title	Author	Date	Reference
1	Site Investigation Report - Proposed warehouse building	Geo-Research	Apr-74	N/A
2	Site investigation report - Liquid incinerator	Geo-Research	Apr-74	N/A
3	Site investigation Report - Storage Tanks	Geo-Research	May-74	N/A
4	Site investigation report - New SCD facilities	Geo-Research	Nov-74	N/A
5	Site investigation report - Emergency reservoir	Geo-Research	Apr-79	N/A
6	Site investigation report - Pet Poly Storage	Geo-Research	Aug-84	N/A
7	Minutes of Meeting to Discuss Groundwater Project	Kodak	26-Sep-90	N/A
8	Assessment of Groundwater Sensitivity and Potential Soil and Water Contamination at the Kodak Facility, Kirkby	Aspinwall & Company	Dec-90	K(0102A)
9	Groundwater Study Team Report	Kodak	Jan-92	N/A
10	Report on Ground Investigation at Acornfield Road, Kirkby	Northern Foundations	May-92	N/A
11	Proposed new tanks at Kodak Ltd	Sub Soil Surveys Ltd	Nov-92	92/231
12	Phase II Site Investigation - Summary of Investigation in Northern Area	Aspinwall & Company	Feb-94	K0102F/R3
13	Phase II Site Investigation at the Kodak facility, Kirkby	Aspinwall & Company	Mar-94	KO0102F
14	Supplementary Site Investigation	Aspinwall & Company	Sep-94	SRJRv294
15	Groundwater Monitoring – September 1995	Aspinwall & Company	Nov-95	KO0102J
16	Groundwater Monitoring and Additional Borehole Installation	Aspinwall & Company	Jan-98	KO0102K
17	Groundwater Monitoring November 1997 - Factual Report	Aspinwall & Company	16-Jan-98	KO0102K
18	Proposed RTO Project	Worms Eye Geotechnical	19-Aug-98	WE/GGC/VG/R
19	Tank Bunds, Kodak Ltd	Worms Eye Geotechnical	11-Sep-00	GGC/DA.rept00
20	Building Extension – Nexpress Solutions Limited	Worms Eye Geotechnical	12-Sep-00	GGC/DA.rept00
21	Proposed New Tank bund : Building 82 – West Side	Worms Eye Geotechnical	13-Aug-02	GGC/DA
22	Phase 1 Environmental Site Assessment	Conestoga Rovers & Associates (UK) Ltd	Jun-03	32236(2)
23	Phase II Environmental Site Assessment	Conestoga Rovers & Associates (Europe) Ltd	Sep-03	32236(2)
24	Additional Groundwater Assessment	Conestoga Rovers & Associates (Europe) Ltd	Dec-03	32236(3)
25	Groundwater Quality Monitoring Round Three	Conestoga Rovers & Associates (Europe) Ltd	Jan-05	32236(10)
26	Groundwater Quality Monitoring Round Four	Conestoga Rovers & Associates (Europe) Ltd	Jun-05	33154(7)
27	Phase II Environmental Site Investigation - The Mound	Conestoga Rovers & Associates (Europe) Ltd	Jul-05	33154.06
28	Appendix 17 - Application Site Report, Kodak Ltd	Conestoga Rovers & Associates (Europe) Ltd	Jul-05	933221(1)
29	Kodak Ltd Chemical Manufacturing IPPC Application & Supporting Information	Kodak	Aug-05	BU5607/M
30	Groundwater Quality Monitoring Round Five	Conestoga Rovers & Associates (Europe) Ltd	Apr-06	33154.13
31	Groundwater Quality Monitoring Round Six	Conestoga Rovers & Associates (Europe) Ltd	Oct-06	933154.16
32	Environmental Risk Assessment	Conestoga Rovers & Associates (Europe) Ltd	Oct-06	33154.17
33	Phase II Environmental Assessment – Playing Field Area	Conestoga Rovers & Associates (Europe) Ltd	Nov-06	33154.14
34	Letter from Environment Agency to Conestoga Rovers	Environment Agency	21-Dec-06	033154.17/02
35	Geotechnical Investigation – Building K33 (Eastman Chemicals)	Conestoga Rovers & Associates (Europe) Ltd	02-Jan-07	933274
36	Additional Phase II Environmental Site Assessment	Conestoga Rovers & Associates (Europe) Ltd	02-May-07	N/A

Proposed Remedial Targets
Former Kodak Site, Kirkby

Acorn Properties (Kirkby) Ltd

March 2008

WSP

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft for comment	Regulator Issue		
Date	January 2008	March 2008		
Prepared by	R Lawless	R Lawless		
Signature				
Checked by	D Reid	D Reid		
Signature				
Authorised by	R Clayton	R Clayton		
Signature				
Project number	12121392/003	12121392/003		
File reference	8466(1)	8466(2)		

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Contents

EXECUTIVE SUMMARY

1	Introduction	2
2	Summary of Previous Works	4
3	Site Setting	6
4	Conceptual Site Model	12
5	Derivation of Soil and Shallow Groundwater Remedial Targets	21
6	Statutory Liability Assessment for Deep Groundwater Contamination	27
7	Summary and Conclusions	29

Appendix A	Document List	31
Appendix B	Environment Agency Letter 21 December 2006	33
Appendix C	Contamination Summary	35
Appendix D	ConSim Model Parameters	39

Figure 1	Site Layout	41
Figure 2	Made Ground Thickness	43
Figure 3	Peat Extent & Thickness	45
Figure 4	Shirdley Hill Sand Extent & Thickness	47
Figure 5	Glacial Till Thickness	49
Figure 6	Depth To Rockhead	51
Figure 7	Elevation of Rockhead	53
Figure 8	Depth to Perched Groundwater	55
Figure 9	Elevation of Perched Groundwater	57
Figure 10	Depth to Deep Groundwater	59
Figure 11	Elevation of Deep Groundwater	61
Figure 12	Contamination Observations	63
Figure 13	Soil Contamination	65
Figure 14	Perched Groundwater Contamination	67
Figure 15	Deep Groundwater Contamination	69
Figure 16	Tetrachloroethene Distribution in Groundwater	71
Figure 17	Trichloroethene Distribution in Groundwater	73
Figure 18	1,1 Dichloroethene Distribution in Groundwater	75
Figure 19	Cis 1,2 Dichloroethene Distribution in Groundwater	77
Figure 20	Trans 1,2 Dichloroethene Distribution in Groundwater	79
Figure 21	Vinyl Chloride Distribution in Groundwater	81
Figure 22	Tetrachloroethane Distribution in Groundwater	83
Figure 23	1,1 Dichloroethane Distribution in Groundwater	85

Executive Summary

WSP Group PLC has been commissioned by Acorn Properties (Kirkby) Limited (Acorn) to undertake voluntary remediation of a site located off Acornfield Road, Kirkby industrial Park, Kirkby, Merseyside. Acorn purchased the site from Kodak Chemicals Ltd in September 2007 and is undertaking a programme of refurbishing and re-letting the 15Ha site for a continued industrial use.

The purpose of this report is to derive suitable remediation targets for the forthcoming programme of voluntary remedial works. Previous qualitative environmental risk assessment for the site (summarised within this report) concludes that environmental receptors are not at significant risk from contamination beneath the subject site. This includes the Sherwood Sandstone major groundwater aquifer, with a hypothetical receptor some 250m off site (a point agreed by previous consultants CRA with the Environment Agency) not considered to be at risk from contamination derived from the site.

Notwithstanding the outcome of the risk assessment, it has been identified that certain contaminants of particular environmental concern (classified as List 1 Substances under the European Dangerous Substances Directive) may be entering the major aquifer from on-site shallow soils and/or perched groundwater. With the objective of ensuring that groundwater quality within the deep aquifer does not deteriorate as a result of site-derived contamination, WSP has undertaken a quantitative risk assessment (QRA) in order to determine acceptable limits of contaminants within the shallow groundmass.

The QRA has derived remedial targets for the List 1 substances of concern, comprising benzene, toluene, ethylbenzene, xylene, trichloroethene, dichloroethene, dichloroethane and vinyl chloride. To achieve the objective of no deterioration of deep groundwater quality, the compliance point chosen was either the site boundary or the base of the unsaturated zone (as opposed to 250m off-site where no risk has been demonstrated), depending on the nature of contaminants.

The QRA has considered four contaminated parts of the site, namely the Former Synchem Area, Bulk Storage Area, Current Synchem and Building 84 and derived soil and groundwater remedial targets for each individual area. Remediation is currently considered warranted for the Former Synchem and Bulk Storage Areas. The two remaining areas are under further assessment and investigation in order to determine whether intervention is required (remediation to date does not appear to be necessary). WSP has reviewed the historical chemical testing data and established remedial targets for each of the areas.

The remedial targets presented in this report should be submitted to the Environment Agency and Knowsley Metropolitan Borough Council for their approval, in conjunction with a remediation options appraisal and strategy.

WSP Group PLC

1 Introduction

1.1 BACKGROUND TO THE SITE

This report relates to the industrial site formerly operated by Kodak Chemicals UK Ltd (Kodak), located off Acornfield Road within the Kirkby Industrial Park, Kirkby, Merseyside. Acorn Properties (Kirkby) Limited (Acorn) has recently purchased the buildings and equipment and secured a long-term leasehold interest to the property from Kodak.

Following the purchase, it is our understanding that Acorn will undertake a programme of refurbishment, plant sales, letting of buildings and possible limited redevelopment. It is understood that the principal site infrastructure such as roads, services and the majority of buildings will remain.

WSP Group PLC (WSP) has been retained by Acorn to undertake voluntary remediation works that were identified during the due diligence process in order to manage / mitigate environmental liabilities relating to soil and groundwater contamination.

1.2 PROJECT OBJECTIVES

To facilitate Acorn's purchase of the site, WSP undertook a detailed review of all available environmental data and assisted the design of supplementary investigation. This process has resulted in the establishment of the 'known contamination' at the site as of October 2007, the date of the transaction.

The review undertaken by WSP did not identify any current statutory environmental liability relating to contamination, specifically with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations. This is generally supported by a letter produced by the Environment Agency dated 21 December 2001 (Appendix B), although further assessment of risk to the Sherwood Sandstone was requested.

The change of ownership and hiatus in the majority of site operations provides a suitable opportunity to investigate and if necessary undertake remediation. Consequently, WSP has been instructed to undertake supplementary investigation work, risk assessment and voluntary remediation works at the site. The objectives are as follows:

- To remediate known contamination at the site to levels to be determined by quantitative risk assessment.
- To obtain regulatory support (specifically the Environment Agency and Knowsley Metropolitan Borough Council (KMBC)) for the proposed remediation activities and ultimately their confirmation that the works have been completed and validated accordingly.
- Upon completion of the remediation works, to obtain written confirmation from the regulators that, with respect to the known contamination, the site is in a satisfactory state with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations.

1.3 REPORT OBJECTIVES

The objectives of this report are as follows:

- To summarise previous environmental risk assessments undertaken at the site and relevant regulatory consultation.
- To provide an overview of the current understanding of the conceptual site model.
- To determine contaminants of concern (CoCs) for the site.

- Undertake quantitative risk assessment (QRA) for the CoCs and derive appropriate remedial targets for subsequent regulatory approval.

2 Summary of Previous Works

2.1 EXISTING DOCUMENTS

A number of documents containing environmental information are available for the site. These can be broadly categorised as follows:

- Short investigation reports from the 1970s and 1980s mainly relating to construction activities by Kodak. These reports generally contain logs for a small number of exploratory holes and limited (if any) chemical testing.
- Aspinwall reports from the 1990s. Aspinwall was commissioned by Kodak to undertake a series of investigations in order to determine the contamination status of the site.
- Conestoga Rovers & Associates (Europe) Ltd (CRA) reports dating from between 2003 and 2007. CRA was also commissioned by Kodak to initially complete a detailed desk study, followed by a series of investigations focussing on various parts of the subject site.

A full list of all relevant documents is presented as Appendix A.

2.2 PREVIOUS ENVIRONMENTAL RISK ASSESSMENTS

Both Aspinwall and CRA have undertaken qualitative environmental risk assessments as part of their respective briefs. The most recent and detailed risk assessment work has been undertaken by CRA.

In 2004 CRA convened a site meeting with the Environment Agency and the local authority to discuss the findings of previous site investigations and agree the scope of environmental risk assessment. This resulted in the issue of a draft QRA report by CRA in August 2005. Following a further meeting in June 2006 to discuss the draft QRA, CRA issued the final Environmental Risk Assessment report in October 2006 (Appendix A - Reference 16).

The October 2006 report contains a qualitative human health risk assessment and quantitative controlled waters assessment. The human health assessment compared soil contaminant concentrations against generic acceptance criteria following the CLEA methodology for a commercial / industrial land use. The results of this assessment suggested limited / localised exceedances of lead, polycyclic aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPH).

CRA identified three main potential pollutant linkages with respect to controlled waters, as follows:

1. Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2. Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water channel 30m to the south of the site boundary.
3. Deep groundwater contaminants, via lateral migration to a theoretical 250m distant compliance point down-gradient of the site.

CRA utilised a commercially available risk assessment package, Consim V2, published by Golder Associates / Environment Agency, to model predicted concentrations of contaminants down-gradient of an assumed source.

With respect to the above linkages, CRA concluded the following:

1. Long term risks exist to deep groundwater quality 250m from the site boundary relating to benzene, xylene and TPH (particularly with respect to BH11R).
2. This pollutant linkage was not considered by CRA to be valid, as the watercourse in question is up-hydraulic gradient from groundwater beneath the Kodak site.

3. No long term risks identified with respect to groundwater quality 250m from the site, from pre-existing contamination within the Sherwood Sandstone.

2.3 PREVIOUS REGULATORY ENGAGEMENT

The Environment Agency has reviewed the risk assessment produced by CRA and provided its formal response in a letter dated 21 December 2006 (included as Appendix B). This letter generally approves the findings of the QRA and concludes that Pollutant Linkages 2 and 3 'do not appear to be viable pollutant linkages'.

The Agency reserved consideration in relation to Linkage 1, 'because the contaminants which are reaching the major aquifer are List 1 Substances' and requested more detailed modelling and the derivation of site-specific remedial targets to determine the need for any remediation works (this has not been undertaken to date).

Knowsley MBC has been issued the same reports as the Agency, but has not formally commented to date. This may be due to the primary focus of the risk assessments having been on controlled waters.

2.4 2007 INVESTIGATIONS

WSP was commissioned by Acorn at the beginning of 2007 to undertake environmental due diligence to support the proposed acquisition of the property from Kodak. WSP undertook a review of available site reports and designed a further phase of investigation upon completion of a GAP analysis.

The further phase of investigation occurred between January and March 2007 and primarily targeted parts of the site previously inaccessible for operational reasons. The investigation was undertaken and managed by CRA who issued a factual report in May 2007 (Appendix A - Reference 47). This report includes Tier I risk assessments (comparison of results against generic acceptance criteria) for both human health and controlled waters.

2.5 SCOPE OF FURTHER RISK ASSESSMENT

The purpose of the environmental risk assessments presented in the following sections is to address Pollutant Linkage 1 (predominantly with respect to List 1 Substances), incorporating data obtained during the 2007 investigation. Pollutant Linkage 3 will also be revisited, in order to assess whether groundwater 250m off site is at risk from the subject property, given the additional groundwater data now available. The structure of the remainder of the report is as follows:

- Section 3 – Summary of the site setting, history, current use and potential contamination sources.
- Section 4 – Current understanding of the Conceptual Site Model.
- Section 5 – Presentation of the Controlled Waters Quantitative Risk Assessment (QRA) and derivation of soil and shallow groundwater remedial targets (Pollutant Linkage 1 as discussed above).
- Section 6 – QRA considering risks to groundwater quality 250m from the site, from pre-existing contamination within the Sherwood Sandstone (Pollutant Linkage 3 as discussed above).
- Section 7 – Summary and conclusions.

3 Site Setting

3.1 SITE DETAILS

The Site occupies approximately 15.0Ha on the eastern edge of Knowsley Industrial Park. Until recently, the site was occupied by Kodak and utilised as a photochemicals production facility. Production ceased at the end of 2006 and the majority of the facility has been decommissioned. Three companies currently reside and utilise a proportion of the property; Ames Goldsmith Ltd operates a silver nitrate production facility in the south, Eastman Chemicals Ltd occupies a building in the northwest of the site for research purposes, and Future Industrial Services Ltd has recently taken on a lease in the south-eastern corner of the site for ash recycling.

The current layout comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. All roadways and loading areas are surfaced with concrete hardstanding. The north-eastern corner of the site was until recently utilised as a sports pitch (grassed).

The Site is bounded to the west by Acornfield Road, beyond which are a number of industrial premises. An industrial site also bounds the north. Perimeter Road forms the eastern boundary, beyond which lies agricultural land. This includes a former municipal landfill (now restored and used for grazing) to the southeast. The southern boundary is adjacent to woodland (Charley Wood).

3.2 SITE HISTORY

The site history has been obtained from referral to Ordnance Survey maps, historical site photographs and anecdotal / archive information contained within the CRA desk study report (Reference 9 – Appendix A).

Until WWII the study area was situated within a rural, agricultural setting. The site itself was undeveloped until the end of the 19th Century, with Boundary Lane forming the site's boundary to the north and Kirkby Rank Lane the boundary to the south. By 1894 a small residential dwelling had been built in the north-eastern corner and a marl pit had been excavated in a field just to the south of Boundary Lane. However, the remainder of the site was still utilised as agricultural land.

In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). The site was used as a filling factory, whereby explosives were loaded into various types of ammunition cases. The Munitions Factory covered 743 acres, with the majority located off-site, to the west of Acornfield Road and only covered a small part of the Kodak site (mainly the south-western corner). Within the subject site a number of small buildings were constructed within the south-western corner, together with a rectangular feature close to the eastern boundary, anecdotal information suggesting this was a fresh water reservoir. The buildings on site were reportedly used as explosive test bays. The presence of earth bunds around some of the buildings suggests that explosives may have been stored on site.

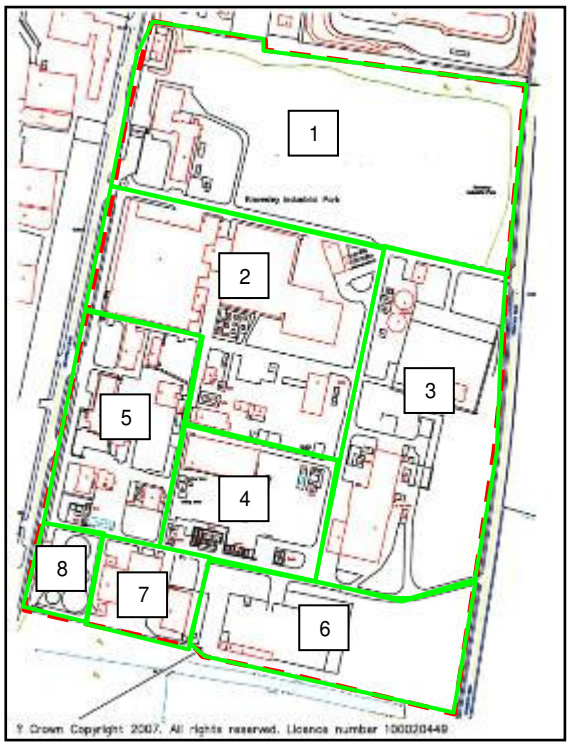
The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. It appears that initially operations were small-scale with 9 employees occupying the former MoD buildings, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's additional facility in Harrow, London. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

In 1969 production on site diversified to produce chemicals not specifically for the photochemicals industry. Initially this involved the production of hydroquinone and tecmangam (manganese ammonium sulphate) with production of benzoquinone added in 1971. These ancillary activities were located in areas 48 and 49 (Figure 1) and ceased in 1974.

The synthetic chemicals manufacturing buildings were demolished and replaced (by Building 82) in the late 1970s. The Powders & Solutions Department was closed in 2001 and the installation ceased production at the end of 2006.

3.3 CURRENT SITE LAYOUT / LAND USE

For ease of reference, the site has been split into eight separate zones, based on the current or most recent usage, as follows:



1. Playing field & Eastman Chemicals
2. Photochemicals Division
3. Reservoir and Synchem Plant
4. Bulk solvents area
5. Former Synchem Plant
6. Drum storage compound and 'mound'
7. Ames Goldsmith area (silver nitrate)
8. Effluent plant

A detailed site plan (together with building number references is provided as Figure 1).

<u>Zone 1 – Eastman Chemicals and Former Playing Fields</u>

Eastman Chemicals Ltd occupies the north-western corner of the site (Buildings 33, 27, 30 and 81). This area comprises offices and small-scale testing laboratories utilised for research purposes. Only small quantities of chemicals are stored / used within this part of the site.

The former playing fields are located to the east of the Eastman Chemicals buildings and occupy the majority of Zone 1. The area occupied by the playing fields was formerly used as a waste disposal / burning location during the 1950s – 1970s.

<u>Zone 2 – Former Photochemicals Division, Former Nexpress, and Utilities</u>

The photochemicals process commenced in 1961 and was closed in 2001, occupying Buildings 38 and 43. Liquid chemicals were stored in bulk in an above ground tank farm to the south of Building 43. The chemicals used included a 20% ammonia solution, sodium hydroxide, acetic acid, potassium sulphate, ferric nitrate and ammonium thiosulphate. Various production / holding tanks were located within Building 38, with Building 43 used for storage / distribution. A small laboratory within this area produced limited quantities of quinone.

This area was also the location of the historical hydroquinone / benzoquinone and tecmangam production during the late 1960s to early 1970s.

The Utilities area of the site included the engineering department / stores (Building 41). The main boiler house (Area 46) is also present within this area and is gas supplied. The boiler house was provided with gas-oil back up which is stored in two 76,000l ASTs (Building 45). The entire zone is currently disused, with the exception of the boiler house.

Zone 3 – Reservoir and Synthetic Chemicals Manufacture (Synchem)

Synthetic chemical manufacture has been undertaken since the commencement of Kodak's operations in 1949 starting in Area 5, described below. The most recent Synchem buildings and plant are understood to date from 1980 where Synthetic chemicals manufacture was undertaken within Building 82 through to site closure at the end of 2006 (Figure 1).

The products were mainly photographic couplers and stabilisers. Large volumes of petroleum based-solvents are used in the processes, including methanol, heptane, methyl ethyl ketone (MEK) ethyl acetate, toluene and acetone. Bulk chemical storage was located elsewhere on site and is discussed below. Smaller volume chemicals were stored in 205l (55 gal.) drums. Most were located in purpose built concrete storage areas although a few were reported to be stored adjacent to open ground to the east. Process wastes were directed into the chemical drainage system and generally contained acid, caustic soda, diluted methanol and triethylamine.

This area also contains the "reservoir". The "reservoir" was originally constructed by the Ministry of Defence, and it is assumed (given the location and presence of other similar features around the former munitions factory) that the reservoir was used as a store for fire-fighting or process water. Kodak did not use the reservoir for storage of open liquids. Kodak used the reservoir area for the storage of drums of their most flammable chemicals during the 1950s to 1970s. This location was well away from the occupied parts of the site at that time.

Immediately to the west of the reservoir are two large sprinkler water tanks for fire-fighting purposes. The pumps are powered by diesel motors, with diesel stored in small ASTs within the immediate vicinity. The whole of Zone 3 is currently disused, with the exception of the sprinkler tanks and ASTs.

Zone 4 – Bulk Solvent Storage and Reclaim

This comprises a series of bulk storage tanks comprising both ASTs and two underground storage tanks (USTs) and is located in Areas 29, 37, 50, 54, 57 and 63 (Figure 1). The bulk storage tanks for raw solvents were located in this area, with road bulk liquid tankers being unloaded in Area 63. This facility was used to accumulate waste solvent streams from across the site. Toluene and heptane were recovered in an on-site process. All remaining waste solvents were sent off site for recovery or incineration. Solvent recovery was undertaken in a distillation unit in Area 37.

Solvents were delivered to the relevant process areas (and returned) by a series of overhead pipelines. Areas beneath the overhead pipelines were generally noted by CRA to be unsealed and evidence of localised staining from leaks was apparent. However, site staff stated that no significant leaks were known to have occurred within the pipe network.

Anecdotal evidence indicates that routine testing highlighted weld failures on one of the USTs. This was reportedly fixed, although it is not known how long this problem endured. The whole of Zone 4 is currently disused, with the exception of some office space / stores within Building 41.

Zone 5 – Former Synchem

The original synthetic chemicals manufacture took place in Zone 5 (Buildings 15 and 23). All associated buildings were demolished in the early 1980s, although only to ground level. The ground floor slabs are still in place, together presumably with any below ground infrastructure. The original boiler house is still present as Building 23, although it is now used as a store. The associated gas oil tanks were removed during the early 1980s, although the concrete plinth is still evident immediately to the south of Building 23. The former silver recovery plant was built over the top of Area 15.

The silver recovery plant was historically licensed and monitored by the Environment Agency. The process involved the adjustment of pH and addition of iron powder to silver bearing liquor. Five ASTs were required for the process in Building 15, comprising two 90,000l waste tanks, two 1,000l sulphuric acid tanks and a 16,000l day tank. The process commenced on site in 1995. Zone 5 is currently disused.

Zone 6 – Drum Storage Compound and 'Mound' Area

The drum storage compound was constructed in the late 1970s for the temporary storage of all small-scale chemicals and finished products. To the east of this feature is an area of grassed open space, which rises into a mound on the eastern edge. Kodak staff have identified the mound feature as the location that soils from foundation and pit excavations were placed. The exact foundations or pits are not known, although it is thought that this whole area (including beneath the drum store) was used for the management or disposal of site-derived wastes. As shown on the figures, there has been a significant amount of investigation throughout this area. Zone 6 has been leased to Future Industrial Services Ltd who are currently refurbishing the area for their intended operations.

Zone 7 – Ames Goldsmith

Ames Goldsmith has undertaken a leasehold interest in this part of the site since cessation of production by Kodak at the end of 2006. It is understood that silver nitrate production is continuing in the same manner as previously conducted by Kodak.

This process is undertaken in Building 47 (Figure 1). Silver nitrate has been produced on site since 1967 and the process has not moved during this time. Silver nitrate production involves the reaction of silver bullion with nitric acid. Nitric acid is stored adjacent to Building 47 in a 17,000l above ground storage tank (AST) which was provided with secondary containment.

Adjacent to the Silver Nitrate plant is a licensed groundwater abstraction well. This abstracts water from the Sherwood Sandstone aquifer at a depth of approximately 106m for use within the Silver Nitrate process. The water has been regularly tested by Kodak (CRA) and no site related influences have been reported.

Zone 8 – Effluent Treatment

Wastewater treatment was undertaken on site, comprising separator pits, neutralisation and biological treatment. The majority of this apparatus is located in the south-western corner of the site in Area 25 (Effluent Plant) and was demolished by Kodak in April and May 2007, prior to handing this area over to Ames Goldsmith.

Ancillary Activities

Three separate drainage systems have been developed at the site, one for surface drainage, another for foul water, and a third for chemical drainage. The drainage systems comprise a mixture of former Ministry of Defence (MoD) drains from WWII and more recent additions by Kodak. The chemical drainage system is understood to be constructed from glazed ceramics.

A visual inspection of the chemical drains and pits was conducted annually to check condition and a thorough CCTV survey was last completed in 2003 with no significant concerns identified. No integrity / leak testing of the drains are undertaken. Kodak staff previously reported that several sections of drains have been replaced in the past due to chemical attack and subsequent collapse, including a failure at the northwest corner of building 82 and along South Street near Building 6, although the affected areas are generally not documented.

3.4 POTENTIAL AREAS OF ENVIRONMENTAL CONCERN

The review of available historical documents relating to the site identified a number of potential sources of ground contamination. These are presented as Figure 1 and include historical and current bulk fuel storage and process areas. The 2007 site investigation ensured that potential contamination sources (that had not been previously targeted) were adequately investigated.

3.5 GEOLOGY

Published geological mapping indicates the study area to be underlain by Shirdley Hill Sand, and then subsequently by Glacial Till and Sherwood Sandstone. Site investigations have generally confirmed this sequence and also encountered peat locally.

Made Ground is present across the whole site, generally between 1 and 2m thick, although a maximum of 7m was recorded in the south-eastern corner (in an area of historical landfilling). Figure 2 shows the contoured Made Ground thickness across the study area. Peat has been identified locally and reaches maximum thickness of 1.75m in the east of the site (Figure 3).

Shirdley Hill Sand is present as a thin horizon (generally less than 1m thick) across the majority of the site although it is absent from some areas including beneath parts of the former playing fields and the Former Synchem Area. It has also been removed to facilitate construction of the reservoir in the north-eastern corner. This stratum is locally associated with impersistent peat horizons, predominantly in the east within the vicinity of Building 82. The extent and thickness of the Shirdley Hill Sand is highlighted on Figure 4.

Glacial Till was found to be present beneath the entire study area (with a single possible exception) and is observed to thin from the northwest to the southeast. The Glacial Till is generally described as a sandy, occasionally gravelly clay. Discrete sandy horizons have also been recorded within the Till, although these are laterally discontinuous. The thickness of this stratum is presented in Figure 5.

The depth to the top of the Sherwood Sandstone varies from in excess of 14m in the northwest to less than 2m in the extreme south of the site and closely corresponds with the Glacial Till thickness. The variation in depth to rockhead is presented in Figure 6 with the elevation of rockhead presented as Figure 7.

3.6 HYDROGEOLOGY

Groundwater level monitoring has been undertaken and reported in detail twice by Aspinwall in the 1990s and a further seven occasions by CRA from 2003 to 2007 inclusive. This has confirmed a good deal of consistency in the groundwater regime, both in terms of levels and predicted flow directions.

Two distinct groundwater bodies are present beneath the site; a perched groundwater within the Made Ground / Shirdley Hill Sand, resting on the Glacial Till and the main groundwater body within the underlying Sherwood Sandstone.

The perched groundwater is nearly continuous across the study area, and is only locally absent beneath some of the larger existent structures; monitoring indicates a flow direction to the west / southwest (Figures 8 and 9). Data obtained for the Sherwood Sandstone between 1994 and the present indicates a flow direction to the northwest (Figures 10 and 11). Anecdotal information suggests that the flow direction within the Sherwood Sandstone may have altered over time in response to commencement / cessation of abstractions and historically flow may have been to the east. This is supported by the occasional trace of tributyltin recorded in deep groundwater between 1994 and 2007, which is reported to have been derived from a source elsewhere within Kirkby Industrial Park to the west.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone. Given the groundwater flow directions, the two bodies appear to be operating independently. However, it has been surmised that limited downward migration through the Glacial Till may be possible locally, which may be due to its relatively high sand / gravel content. Evidence of downward migration within the Glacial Till has been observed in a single exploratory hole to date, (WSPB2) located within the Former Synchem Area. Furthermore, there are several locations where recharge to the Sherwood Sandstone may be occurring from the shallower body, namely:

- The fire water pit, which is at least 4.7m deep, with adjacent Glacial Till thickness 4.9m.
- The southern part of the site (adjacent to the drum compound) where a single borehole log (BH12) does not clearly identify the presence of Glacial Till.

- The former effluent treatment plant in the southwest of the site, where recent works suggest a possible linkage between the perched groundwater and the underlying aquifer via chemical drainage sumps/chambers which extend to depths ranging from 2 to 3.7m below ground level (bgl).

It is possible that two underground storage tanks (USTs - the only two recorded on site) and the “graded” pit all located in the centre of the site were installed close to the top of the Sherwood Sandstone at circa 3.1m bgl in this area although construction details of the USTs and pit are unknown.

3.7 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 30m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area.

Work undertaken by CRA has indicated that the water level within the nearby drainage ditch is higher than perched groundwater levels; consequently migration of groundwater to this receptor from site is considered unlikely.

4 Conceptual Site Model

4.1 INTRODUCTION

This section of the report provides a summary of contamination identified during the previous site investigations. The distribution of contamination across the site is subsequently discussed, followed by a section on contaminant dynamics, which summarises evidence of migration from soils to perched groundwater and subsequently deep groundwater within the Sherwood Sandstone. Also covered in this section are identified environmental receptors, consideration of contamination pathways and finally an assessment of potential pollutant linkages.

4.2 CONTAMINATION SUMMARY

WSP has reviewed the available chemical testing data including the recent data from the 2007 investigation and a summary of elevated results is provided as Figures 12 to 15 inclusive. Appendix C provides a summary of identified contamination within the individual zones.

4.3 SUMMARY OF CONTAMINATION SOURCES

Based on the findings of the 2007 and previous site investigations, WSP has made an assessment of the potentially significant contaminant sources that have been identified:

Zone 1

- Extensive testing was conducted throughout Zone 1 given the historical burning conducted in this area.
- Generally, significant contamination was not recorded. A single elevated TPH concentration was recorded in the Made Ground associated with a very localised tarry horizon (0.1m thick).

Zone 2

- Zone 2 is a relatively large area. The westernmost extent of the area is occupied by two large buildings; photochemicals and Nexpress. Neither area is significantly impacted. The south-eastern portion of Zone 2 was occupied by the utilities area of the site and has some limited TPH impact. The northeastern portion of Zone 2 is one of the more impacted areas of the site.
- Contamination has been identified around Building 84. The contamination in this locality is present from close to ground level to a depth of at least 4.4m within the Shirdley Hill Sand and has been recorded both within soils and perched groundwater (and in an old land drain). The contamination comprises predominantly petroleum hydrocarbons, although PCBs have also been detected.
- Strong chemical odours (of indeterminate origin) have been recorded immediately downgradient of the Building 70 bulk storage area (the PCD tank farm area). Soil contamination has not been identified associated with the odours, although elevated ammonium concentrations have been detected in perched groundwater. It has been assumed that this contamination is likely to extend beneath the tank farm area.

Zone 3

- Zone 3 is a relatively large area along the eastern boundary of the processing areas. The northern portion is occupied by the war era “reservoir” area and the southern portion by the current Synchem building (Building 82).
- Solvent odours were recorded in both holes drilled within the northern part of Building 82. Elevated concentrations of chloroethane, trichlorethane and xylene have been identified within the perched

groundwater. Given the limited access that has been possible to date within Building 82, it is possible that further contamination may be encountered upon further investigation.

Zone 4

- Zone 4 includes the former solvent storage, waste solvent accumulation, and solvent recovery processes. The solvents used at the site were predominately petroleum based solvents.
- Within the Bulk Solvent Storage Area, numerous chemical / solvent odours have been recorded and these are accompanied by predominantly BTEX and chlorinated hydrocarbon impact within soils and perched groundwater.

Zone 5

- The Former Synchem area is the area with the highest percentage of samples with evidence of impact.
- Numerous moderate to strong solvent, chemical and fuel hydrocarbon odours have been identified within the former Synchem area. Elevated concentrations of TPH, BTEX and chlorinated hydrocarbons have been identified within the Made Ground and underlying Shirdley Hill Sand.
- There is evidence of downward migration directly through the Glacial Till within a single exploratory hole to a depth of at least 7.0m.

Zone 6

- Although the area was used for management of soils excavated from other potions of the site, no particular concerns with respect to contamination have been highlighted to date.

Zone 7

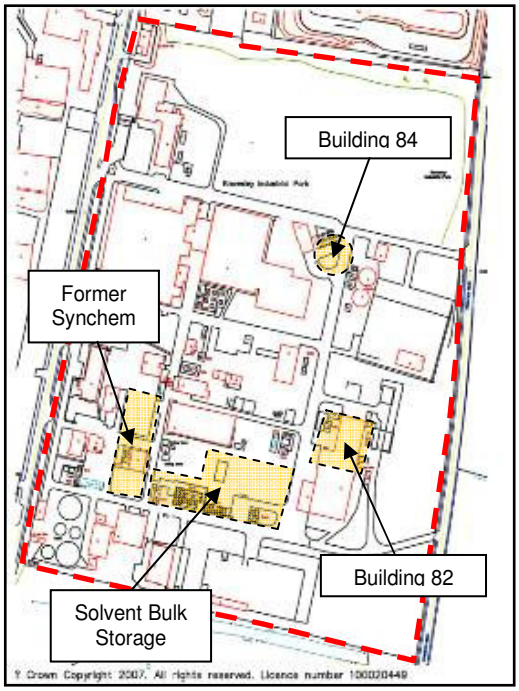
- Slight TPH and chlorinated hydrocarbon contamination has been recorded in the Made Ground and perched groundwater of the south central portion of the silver nitrate plant.

Zone 8

- Significant contamination has not been recorded to date within the effluent plant.
- Kodak arranged for the demolition and validation of the soils beneath this area during 2007. This programme was supervised by their consultants CRA (Appendix A Reference 49).

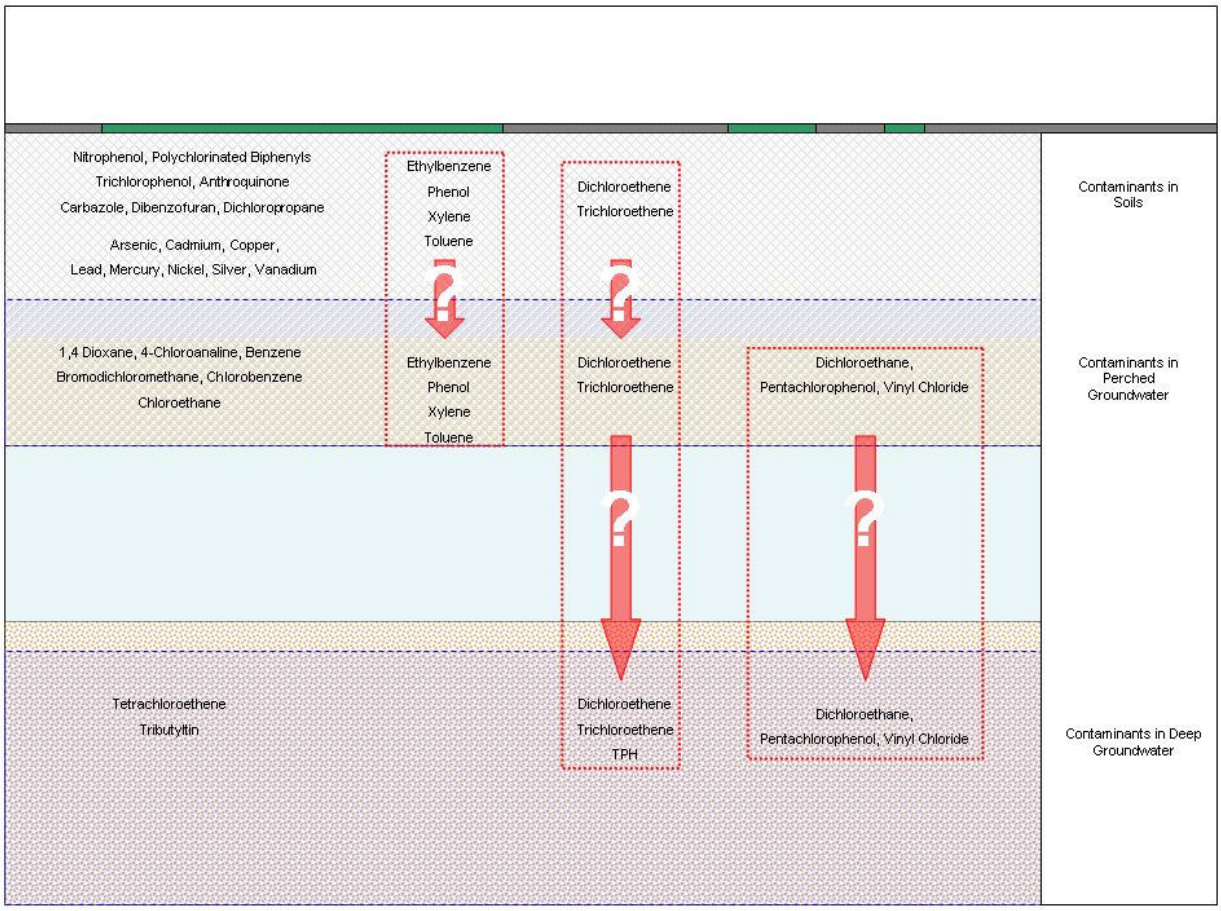
Based on the above, two principal areas of concern have been identified: the Bulk Solvent Storage Area and the Former Synchem Area. Two further areas, Building 82 and Building 84 represent potential areas of concern and further investigation is proposed.

These four areas are highlighted on the adjacent plan:



4.4 CONTAMINANT DYNAMICS

A significant volume of laboratory chemical testing data has been obtained from soil and groundwater samples beneath the site since 1993. This has included seven sampling events from a network of shallow and deep groundwater monitoring wells. WSP has reviewed this data to identify the presence of contaminants, whether in soil, perched or deep groundwater phases. The review is summarised in the figure below:



Metals

Several metal species have been identified within soils during the various phases of investigation. However, none have been recorded in elevated concentrations within perched or deep groundwater, indicating that the soil contamination is of low mobility.

Chlorinated Aliphatic Hydrocarbons (CAHs)

Trichloroethene has been detected within soils (in trace concentrations) in the Former Synchem Area and also within perched and deep groundwater over a slightly wider area, encompassing both the Former Synchem and bulk storage areas (Zones 4 and 5). There is no documented former use of trichloroethene by Kodak (or any other CAHs). However, it appears that this chemical may have been used in small quantities within the laboratories associated with the Former Synchem Area. At the time of its operation (1950s to 1970s) Zone 4 immediately to the east was reputedly used for informal waste storage / disposal from the Former Synchem process and this may explain the wider distribution.

Trichloroethene will degrade via reductive dechlorination to dichloroethene and subsequently vinyl chloride. Dichloroethene (mainly cis 1,2 dichlorethene) has been recorded in soil, perched and deep groundwater, whilst vinyl chloride has been detected in both perched and deep groundwater. The fact that CIS 1,2 dichloroethene has not been specifically marketed as a product, together with the similarities in distribution

of the two daughter compounds provides strong evidence that reductive dechlorination has occurred on site and may be ongoing.

A further CAH has been recorded within perched and deep groundwater – dichloroethane. The distribution of this contaminant is similar to dichloroethene and vinyl chloride, suggesting that this may be an additional CAH that was used on site in small quantities by Kodak historically.

Tetrachloroethene has been recorded in deep groundwater in the south-western corner of the site in three wells, WSPB2, BH4AD and BH7AS, with a maximum concentration of 1.3mg/l. This has not been detected within soils or perched groundwater anywhere on site, suggesting this contamination may have been derived from an off-site source.

BTEX

Of benzene, toluene, ethylbenzene and xylene (BTEX), only toluene is documented to have been used on site by Kodak. From the early 1980s until 1996 toluene was used within Building 82 (New Synchem), stored within bulk tanks and recovered by distillation in Zone 4.

During investigations, toluene has not been detected in areas of recent use by Kodak. However, elevated concentrations of BTEX have been recorded elsewhere on site (principally Former Synchem) within soils and perched groundwater. No elevated BTEX results have been recorded within deep groundwater (with the exception of a trace of xylene recorded in a single well), indicating these contaminants are generally being attenuated prior to reaching the deep aquifer.

Of the four chemicals, xylene has been recorded at highest concentrations; within soils in the Former Synchem Area (450mg/kg) and in perched groundwater in the vicinity of Building 84 (4.1mg/l). Ethylbenzene, toluene and benzene have generally been recorded in association with the xylene, albeit at lower concentrations.

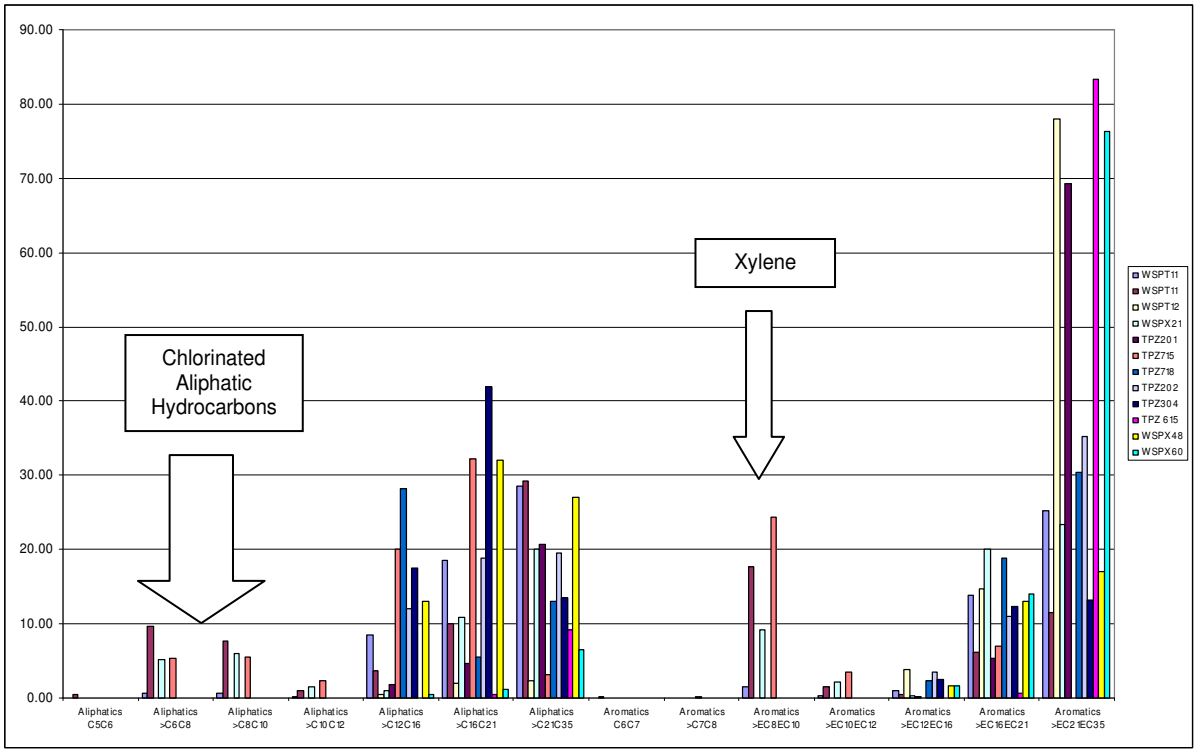
The evidence suggests that BTEX (particularly xylene) were used as process chemicals within the Former Synchem area. Furthermore, spillage / disposal comprising mainly xylene may have occurred close to Building 84 resulting in localised impact.

TPH

All TPH data for the site prior to 2007 was reported in unspeciated form, or simple breakdown into C6-C12, C12-C20 and C20 to C40 fractions. Therefore, interpretation of this data is difficult. The 2007 investigation adopted the TPH Criteria Working Group (TPHCWG) testing methodology and has enabled a more detailed assessment of results.

Elevated TPH concentrations in soil have been recorded in discrete locations across much of the study area, with a maximum concentration of 14,375mg/kg in Zone 1 (as previously discussed), although this related to a tarry substance.

The nature of TPH in soils is summarised on the graph presented overleaf:



TPHCWG Fraction Relative Proportions in Soil

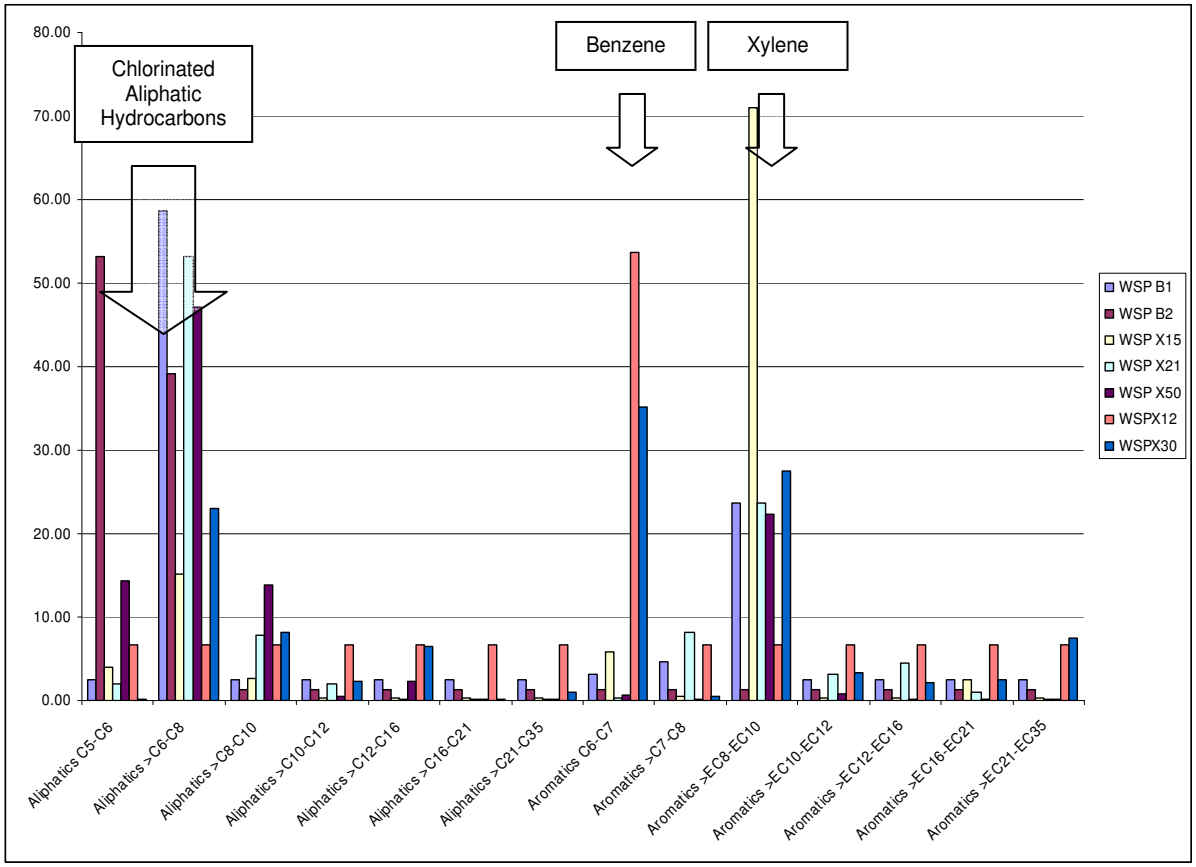
The majority of TPH is concentrated within the C12-C35 aliphatic / aromatic ranges. However, three samples (WSPT11, WSPX21 and TPZ7-15) also contain significant percentages of C6-C10 aliphatics and C8-C10 aromatics. The short chain aliphatics are considered likely to reflect the presence of CAHs within the samples, whereas the C8-C10 aromatic fraction is likely to represent xylene.

The samples containing only longer chain hydrocarbons are mainly located in Zones 1, 4, 5 and 6. These are all areas associated with either the operation of the Former Synchem building, or contemporary informal storage / disposal of wastes. The absence of shorter chain hydrocarbons indicates either a highly viscous source material such as lubricating oils or greases, or a high degree of weathering and degradation, or possibly a combination of the two. No significant sources of fuels are evident from the site history, with the exception of the former and current oil tanks associated with the boiler houses. No hydrocarbon contamination was evident in either of these areas.

WSPT11, WSPX21 and TPZ7-15 are all in different areas of the site. WSPT11 is located adjacent to Building 84 and reflects the xylene recorded in perched groundwater in this area. WSPX21 is within the Bulk Storage Area (Zone 5), and TPZ7-15 is in the centre of the Former Synchem Area (Zone 4), both providing evidence of a possible soil-source of xylene and CAHs.

The nature of TPH within perched and deep groundwater differs from the soil profile, as demonstrated on the chart overleaf. This demonstrates the absence of hydrocarbons with a carbon length in excess of C10. The chart also highlights significant differences between the deep and shallow results, with the shallow wells exhibiting the presence of short-chain aromatic hydrocarbons – specifically benzene (WSPX12 and WSPX30) and xylene (WSPX15, WSPX21 and WSPX30).

The presence of CAHs (reported as short chain aliphatics) is evident within the deep groundwater (WSPB1 and WSPB2), in addition to several samples of perched groundwater (WSPX21 and WSPX50). Also confirmed is the general absence of short-chain hydrocarbons from deep groundwater, with the exception of a trace of xylene in WSPB1.



TPHCWG Fraction Relative Proportions in Perched and Deep Groundwater

The TPH data can be summarised as follows:

- Soil samples contain longer chain hydrocarbons (indicative of either weathered fuels or lubricating oils / greases), although these are absent from perched and deep groundwater. Consequently, no potentially mobile fuel-type hydrocarbon contamination has been identified.
- The TPH data confirms the presence of xylene within soils and both xylene and benzene within perched groundwater locally. These short-chain aromatics are generally absent from deep groundwater.
- The presence of CAHs can be observed in specific samples in soil, perched groundwater and deep groundwater.

Miscellaneous

Other contaminants have been recorded at the Kodak site. However, the remainder have only been detected within a single phase (soil, perched or deep groundwater) with a limited distribution. This is with the exception of the following:

- Phenol, with elevated concentrations recorded in soil (WSPB2 17mg/kg) and perched groundwater (BH2 5.4ug/l). These positions are located 150m apart, with no evidence of a linkage between the two.
- Pentachlorophenol, with elevated concentrations recorded in perched groundwater (BH2AS / BH1 maximum concentration 27ug/l) and deep groundwater (BH1AD 12ug/l). The closest wells are 350m apart. BH1AD recorded Glacial Till to a depth of 9.8m; this together with the distribution of the contaminant suggesting the pentachlorophenol within the deep groundwater has been derived from an off-site source.

4.5 ENVIRONMENTAL RECEPTORS

Based on the ongoing commercial / industrial use of the site, the following receptors are considered relevant to the subject site:

- the underlying Sherwood Sandstone;
- the drainage ditch close to the southern boundary of the site;
- ecological receptors;
- Third party property (including drainage);
- current / future end users and maintenance workers; and,
- buildings and building services including water pipelines.

Within the context of the subject site, the most significant controlled water receptor is considered to be the Sherwood Sandstone major aquifer. This groundwater body is regionally important for providing potable drinking water and is closely regulated by the Environment Agency.

No formally designated ecological receptors (such as Sites of Special Scientific Interest or Sites of Biological Interest) have been identified within the immediate vicinity of the subject property, thereby no receptors are considered to be evident as defined by Part 2A of the 1990 Environmental Protection Act.

4.6 EXPOSURE PATHWAYS

The following pathways have been considered:

- mobilisation of contaminants in soils on-site to shallow perched groundwater in the Shirdley Hill Sand;
- migration of impacted perched groundwater across and off-site beneath 3rd party property to the west;
- migration of perched groundwater to the drainage ditch to the south of site;
- migration of perched groundwater via drainage systems both on-site and off-site into 3rd party drainage network;
- interconnection between perched groundwater and the deeper major aquifer, particularly in the south-western part of the study area where the Glacial Till may have been 'punctured' by foundations / tanks;
- dermal contact, ingestion and inhalation of contaminants;
- migration and inhalation of volatile vapours; and,
- direct contact with buildings and building services.

4.7 POLLUTANT LINKAGE ASSESSMENT

The potential exposure pathways outlined above are considered in greater detail, in turn below.

<u>Mobilisation of contaminants in soils on site to shallow (perched) groundwater in the Made Ground / Glacial Till / Shirdley Hill Sand</u>

As highlighted in Appendix C, evidence of migration of contaminants from soil into the perched groundwater has been detected within Zones 3, 4, 5 and 7. The lines of evidence include shallow groundwater data, conditions wherein the shallow depth of the perched groundwater could allow frequent direct contact with contaminated soils, and the granular / sandy nature of the majority of shallow soils which may have limited attenuation capabilities.

Contaminants with a proven linkage between soils and perched groundwater comprise ethylbenzene, xylene, dichloroethene and trichloroethene.

Migration of perched groundwater across and off-site

A relatively continuous perched groundwater body has been identified across the study area, although there are limited areas where perched water was absent, generally beneath large buildings or areas of hardstanding. During attempted purging of wells prior to groundwater sampling, recharge has generally either been very slow or not recorded, indicating that the volume of water resting on the Glacial Till is very limited. Furthermore, excavations made by CRA within the former Effluent Treatment Plant (Zone 8) were generally recorded as dry, or only with slight seepages. Consequently, it is considered that the potential for lateral migration within perched groundwater exists, although this is likely to be slow and discontinuous.

Monitoring on the numerous occasions since the early 1990s has determined a hydraulic gradient to the west or southwest, in the general direction of the south-western corner of the site. This appears to broadly follow the topography of the area, although the flow direction may also be evidence of an area of recharge to the underlying Sherwood Sandstone (discussed below). The potential also exists for migration of contamination off-site beneath Acornfield Road to the west, although the two shallow wells within the off-site car park in this direction have not recorded particular evidence of site related compounds to date.

Migration of perched groundwater to the off-site drainage ditch

Collation of survey data by CRA as part of the risk assessment undertaken in 2006 appeared to confirm that the level of water within the drainage ditch is above that of the perched groundwater, thus indicating that a pathway between the two is absent. The Environment Agency has accepted this conclusion. The westerly flow direction of the perched groundwater is further evidence that migration towards this surface drain is unlikely.

Migration of shallow perched groundwater via drainage network

During the site's operation and management by Kodak, the drainage network was split into three separate categories; surface water; foul drainage and chemical drainage. These were managed to ensure that no unauthorised chemicals were directed either into the surface or foul water drains.

However, the storm water drainage system provides a potential means for the local migration of contaminants within the site. An example has been noted within Zone 2 in the Building 84 area, where liquid appears to have collected in an old land drain (not part of the current formal drainage network).

Failed / leaking drains within the site's drainage system provide a possible migration pathway for contaminated effluents to leak into the surrounding ground. Whilst there is anecdotal evidence of several such drainage failures, no particular areas of impact have been identified associated with drainage failures. However, given the localised nature of such incidences, this possibility has not been ruled out.

Interconnection of shallow perched groundwater and deeper groundwater

Two primary mechanisms for migration from perched to deep groundwater have been identified. The first is direct vertical migration where the Glacial Till has been removed or is absent. Construction activity is likely to have removed this around the fire water pit, deep drainage features in the south-western corner of the site and possibly the two USTs within Zone 4. Furthermore, a single exploratory hole (BH12) within Zone 6 did not record the presence of Glacial Till. There are seven exploratory holes immediately surrounding this location that have proved Glacial Till, and the groundwater elevation differences between the shallow and deep groundwater are interpreted to be nearly 4m; consequently any interconnection is considered to be suspect.

The second mechanism is downward migration of contaminants through the Glacial Till. This has only been definitively proved in a single exploratory hole (WSPB2 in the Former Synchem Area, Zone 5), where CAHs were recorded in trace concentrations at the base of the Glacial Till which is 5.2m thick at this location. The exact mechanism for the migration is not established, but could relate to fissuring in the clay and/or the generally sandy nature of the clay making up the Glacial Till.

Downward migration through the clay appears to be restricted to CAHs, indicating attenuation of other contaminants at a shallow depth. This may be evidence of the relatively long travel time through the clay,

sufficient for the biodegradation of species with relatively short half-lives such as phenol, benzene, xylene and toluene.

Dermal contact, ingestion and inhalation of contaminants

For an assumed continued commercial / industrial use, the contamination identified is considered unlikely to pose a significant risk to human health, assuming maintenance of the majority of the hard landscaping / buildings will prevent direct contact with the Made Ground across those areas of impact of the site. However, appropriate health & safety assessments / management plans should be developed for any workers or contractors likely to come into direct contact with soils. Furthermore, the risk assessment will need to be revisited in the event of any future redevelopment.

Migration and inhalation of volatile vapours

Potentially volatile contaminants such as BTEX and chlorinated hydrocarbons have been identified during the various phases of investigation. However, the main areas of impact are away from buildings and subsequently not considered to pose a significant risk to human health. However, this issue would require further consideration should development be proposed over areas of known impact, especially in Zones 4 and 5.

Direct contact with buildings and building services

The previous investigations have concentrated on specific areas of the site and have been generally focussed on risks to controlled waters. Therefore, the risk to future buildings and associated services may require further consideration should redevelopment be proposed. These risks would include potential chemical attack (sulphates) on buried concrete and permeation of organic chemicals into drinking water supply lines, for example.

4.8 SUMMARY OF ENVIRONMENTAL RISK ASSESSMENT

As agreed between CRA and the Environment Agency during 2006, the sole outstanding potentially significant pollutant linkage relating to the site is the long term risk to deep groundwater within the Sherwood Sandstone from site-derived List 1 Substances. Review of chemical testing data has identified sources of the following chemicals, which also demonstrate the potential for migration, via perched and / or deep groundwater:

- Soil to perched groundwater – toluene, xylene and ethylbenzene.
- Perched groundwater to deep groundwater – dichloroethane, vinyl chloride.
- Soil to perched groundwater to deep groundwater – trichloroethene and dichloroethene.

Risks to groundwater are considered in further detail in Sections 5 and 6 to follow. Section 5 presents the calculation of remedial targets for soil and perched groundwater contaminants within the subject site. Section 6 assesses risks to groundwater quality 250m off-site from contamination already present within the deep aquifer beneath the property.

5 Derivation of Soil and Shallow Groundwater Remedial Targets

5.1 INTRODUCTION

This section presents the outcome of a quantitative risk assessment (QRA) that has been used to predict contaminant concentrations at various stages during migration from the soil phase, through to perched groundwater and subsequently to the main deep aquifer and lateral migration off-site. Based on these predicted concentrations, remediation targets are proposed to mitigate the risk to groundwater.

CRA has previously presented a QRA to the Environment Agency (Appendix A Reference 16) in 2006, although no remedial targets were presented. The Agency accepted the basis and outcome of the QRA and requested that '*more detailed modelling and the derivation of site-specific remedial targets…* be undertaken… *to determine the need for any remediation works'.* The objective of this section is to fulfil the aforementioned Agency request. To produce the QRA, CRA previously utilised ConSim, an Environment Agency approved computer package.

5.2 CONSIM SOFTWARE

The ConSim software (Version 2.0) is a probabilistic model that calculates the distribution of likely contaminant concentrations in the subsurface at various points along a migration pathway. The ConSim software is probabilistic and calculates likely a distribution of likely contaminant concentrations, as opposed to a single value. The distribution of concentrations incorporates the variation of the physical properties of the sub-surface observed on site, such as source thickness or hydraulic properties of the aquifer. The upper Ninety-fifth percentile concentration is reported at each stage, to provide a sufficient level of confidence to the Environment Agency.

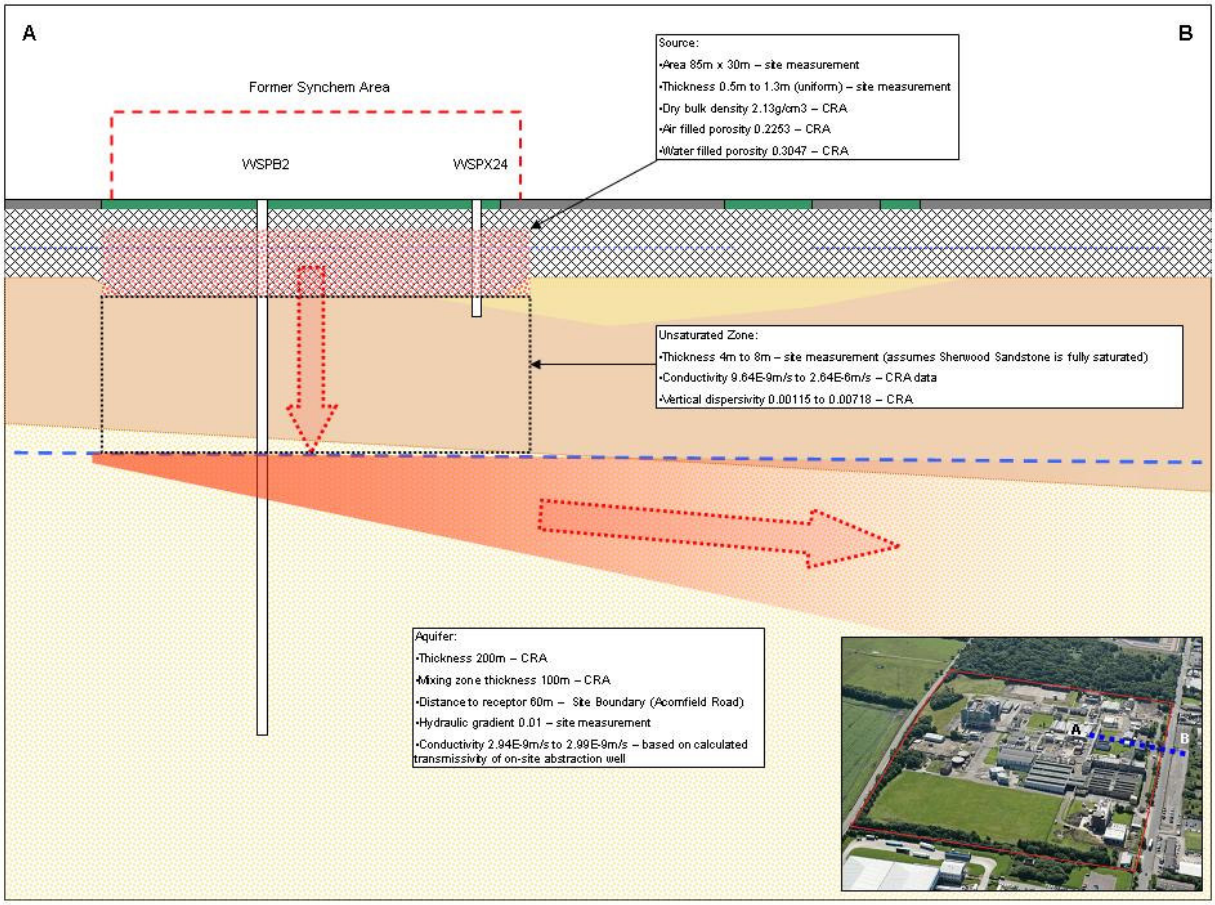
A ConSim Level 3 Assessment has been performed. This incorporates all of the following:

- Level 1 – calculates the contaminant concentration probability distribution in the soil pore water.
- Level 2 – calculates the contaminant concentration probability distribution at the base of the unsaturated zone, incorporating effects of contaminant attenuation and biodegradation (where appropriate) in the unsaturated zone. The model also calculates a probability distribution for travel time through the unsaturated zone, both unretarded and retarded (incorporating sorption and biodegradation).
- Level 3 – calculates the contaminant concentration probability distribution for dissolved contaminants in groundwater at a specified receptor, a specified time after release. As for level 2, this also incorporates the effects of attenuation and biodegradation.

5.3 CONCEPTUAL MODEL

The ConSim input parameters utilised by CRA in 2006 have previously been agreed with the Environment Agency. Therefore, WSP has reviewed the values used by CRA and only amended those where new, more appropriate data is available based on the 2007 site investigations.

The values used within the model are summarised in Appendix D. The figure overleaf summarises the conceptual model and main parameters:



Summary of the ConSim Conceptual Model and Parameters

Contamination Sources

The majority of the study area has been found to be relatively uncontaminated. Residual contamination has been identified within two specific areas, as follows:

- Former Synchem Area (Zone 5). Elevated concentrations of dichloroethene, trichloroethene, benzene, toluene, ethylbenzene and xylene recorded.
- Bulk Storage Area (Zone 4). Elevated concentrations of benzene, toluene, ethylbenzene, xylene, vinyl chloride and dichloroethane recorded.

In addition to these areas, local impact has also been identified beneath:

- Building 82 (Zone 3). Elevated concentrations of xylene and dichloroethane, although limited investigation to date and more contamination anticipated.
- Building 84. Elevated concentrations of benzene, toluene, ethylbenzene, xylene and PCBs.

Whilst only limited data is available for these areas, evidence to date suggests that impact is localised. Accordingly, remediation of these areas has not been prioritised above the Former Synchem and Bulk Storage Areas. Notwithstanding this, additional investigation of these areas is underway and pending review of the new data, remediation may prove necessary. Consequently, remediation targets have been calculated for all four source areas.

Each of the above areas has been modelled separately, to generate remedial targets specific to the individual source area. Source parameters including thickness, area and physical properties have been obtained from site measurement or values previously used by CRA where appropriate.

Unsaturated Zone

The migration pathway adopted by CRA in the model was the vertical migration of contaminants through the Glacial Till to the main groundwater table in the Sherwood Sandstone. This replicates the pathway observed in WSPB2 within the Former Synchem Area. The unsaturated zone therefore comprises the Glacial Till and the thickness will therefore vary for each contamination source area. The CRA physical parameters for the unsaturated zone, including hydraulic conductivity have been adopted.

Aquifer

The CRA physical and hydraulic properties have generally been adopted with the exception of hydraulic conductivity. CRA adopted a range of values between 0.007 and 0.024m/day, which whilst adopted from site-specific permeability testing is considered to be a significant under-estimate of the likely conductivity.

Transmissivity data for the on-site abstraction well (data presented in Appendix A Reference 16) provides a range of 2.54 to 2.58m/day, and is considered to provide a more reasonable indication of conductivity. The CRA tests are considered to be derived from the primary permeability (i.e. via the pore spaces) from boreholes that did not intercept significant fracturing or fissures, which on a larger scale form the main transport medium and a much higher conductivity. The absence of any observed drawdown from the on-site abstraction well vindicates the use of these higher conductivity values.

Previously CRA adopted a hypothetical compliance point some 250m from the site boundary and this was agreed by the Environment Agency to be a suitable measure of whether a 'significant risk' is evident. WSP has re-run this assessment of significant risk in Section 6 using the newer groundwater data available from 2007. The voluntary remediation scheme aims to go beyond this measure of significant risk and consequently the soil and perched groundwater targets have been derived from a hypothetical compliance point at the site boundary. Given the groundwater flow direction, this is effectively the distance from each contamination source to Acornfield Road.

5.4 CORRELATION OF MODEL

Prior to discussing remedial targets generated by ConSim, it is appropriate to test whether the model is providing a reasonable approximation of actual ground conditions. This can be achieved by checking predicted outcomes such as travel times and retardation factors, but also comparing predicted concentrations with on-site data.

Travel time through the unsaturated zone for the Former Synchem Area has been estimated by the ConSim model to be approximately 7 years unretarded and between 33 and 181 years for retarded travel time, depending on the contaminant properties. Travel time from the base of the unsaturated zone to the site boundary (60m), is calculated to be approximately 2 years unretarded and between 5 and 29 years retarded. The unretarded travel times are considered to be reasonable, given the nature of the geology beneath the site.

Initial runs of the model predicted breakthrough of all contaminants at the base of the unsaturated zone over time. This does not correspond with evidence on site, which suggests breakthrough of CAHs, but not the short chain aromatic hydrocarbons such as benzene and xylene. Therefore, to calibrate the model with the site data it was considered appropriate to incorporate limited biodegradation to act on the short chain aromatics within the dissolved phase only.

Re-running the ConSim model indicated only limited breakthrough with the biodegradation taken into account. This is still considered to be overly conservative in comparison to the actual situation (where no breakthrough has been observed), but does provide a reasonable basis for the generation of workable remedial targets.

5.5 CALCULATED REMEDIAL TARGETS

The ConSim model does not directly provide remedial targets, rather it calculates predicted concentrations at a chosen location down-gradient of the source. This predicted concentration can be compared to a

published acceptance criterion (UK Drinking Water Standards being the most relevant to this scenario) to determine whether the source concentrations are likely to pose an unacceptable risk. By amending the source concentrations and re-running the model, an appropriate remedial target can be established, whereby the predicted concentration no longer exceeds the chosen acceptance criterion.

The following sections present the calculated remedial targets for soil and perched groundwater, both at the base of the unsaturated zone and at the site boundary for comparison purposes. Source concentrations have been assumed as 100mg/kg for all contaminants across the entire source area – this does not reflect the actual conditions on site, but does enable remedial targets to be derived. The perched groundwater remedial targets have been obtained by inputting pore water concentrations (1mg/l source concentrations) in the source definition instead of soil concentrations.

Former Synchem Area (Zone 5)

The majority of this area has exhibited visual / olfactory evidence of contamination and consequently, the source area was assumed to constitute the entire footprint of the Former Synchem buildings. The following table summarises the calculated soil and perched groundwater remedial targets for the contaminants of concern within the Former Synchem Area:

Calculated Remedial Targets – Former Synchem Area

		Calculated Soil Remedial Target (mg/kg)		Calculated Perched Groundwater Remedial Target (mg/l)	
Contaminant	Acceptability Criterion (ug/l)	Base of Unsaturated Zone	Site Boundary	Base of Unsaturated Zone	Site Boundary
Benzene	1 – UK DWS	0.48	**17**	0.4	**11**
Toluene	700 – WHO DWS	**729**	>5,000	**466**	>5,000
Ethylbenzene	300 – WHO DWS	**261**	>5,000	**111**	>5,000
Xylene	500 – WHO DWS	**362**	>5,000	**119**	>5,000
Trichloroethene	10 – UK DWS	0.03	**3.2**	0.02	**2.1**
1,1 Dichloroethene	30 – WHO DWS	0.11	**12**	0.05	**5.7**
1,2 Dichloroethene	50 – WHO DWS	0.98	**42**	29	**50**

*** Figures in bold proposed as provisional remediation targets**

Given the conservative nature of the conceptual model used within ConSim, it is considered appropriate to utilise the remedial targets calculated for the site boundary. However, the acceptability criteria for toluene, ethylbenzene and xylene are relatively high, due to the absence of appropriate drinking water standards. Therefore, to provide suitable remediation objectives and achieve source removal, the remedial targets for the base of the unsaturated zone will be used for these three contaminants only. This approach will also assist to maintain the current condition of the aquifer.

Bulk Storage Area (Zone 4)

Zone 4 covers a wide area, although the majority is considered to be relatively uncontaminated. The exceptions are several exploratory holes adjacent to tanks (generally in the south and southwest of the zone) where impacted perched groundwater has been recorded. Therefore, to represent this area, a 30m by 30m source has been assumed, on the western boundary closest to the site boundary.

The following table summarises the calculated soil and perched groundwater remedial targets for the contaminants of concern within the Bulk Storage Area:

Calculated Remedial Targets – Bulk Storage Area

		Calculated Soil Remedial Target (mg/kg)		Calculated Perched Groundwater Remedial Target (mg/l)	
Contaminant	Acceptability Criterion (ug/l)	Base of Unsaturated Zone	Site Boundary	Base of Unsaturated Zone	Site Boundary
Benzene	1 – UK DWS	0.45	**29**	0.23	**17**
Toluene	700 – WHO DWS	**125**	>5,000	**37**	>5,000
Ethylbenzene	300 – WHO DWS	**71**	>5,000	**20**	>5,000
Xylene	500 – WHO DWS	**90**	>5,000	**20**	>5,000
Trichloroethene	10 – UK DWS	0.04	**13.5**	0.02	**7**
1,1 Dichloroethene	30 – WHO DWS	0.12	**41**	0.05	**23**
1,2 Dichloroethene	50 – WHO DWS	4.2	**500**	5.56	**528**
1, 2 Dichloroethane	3 – UK DWS	0.01	**4**	0.01	**2.1**
Vinyl chloride	0.5 – UK DWS	0.01	**0.85**	0.003	**0.55**

*** Figures in bold proposed as provisional remediation targets**

As for the Former Synchem Area, the proposed remedial targets for all contaminants are based on predicted site boundary conditions, with the exception of toluene, ethylbenzene and xylene, where remedial targets from the base of the unsaturated zone are proposed. Remedial targets for the base of the unsaturated zone are lower than the Former Synchem Area due to the thinner layer of clay present beneath the Bulk Storage Area.

Current Photochemicals Building 82 (Zone 3)

Visual / olfactory evidence of probable solvent contamination was noted during the 2007 investigation within the northern part of Building 82. Access was limited and consequently there is little in the way of chemical testing data for this area to date (although the building is the subject of ongoing investigation works). Chemicals identified to date include xylene and a trace of dichloroethane.

The source area is over 250m from Acornfield Road. Given that the Glacial Till thickness beneath Building 82 is greater than in Zone 4, the remedial targets proposed for the Bulk Storage Area presented in the table above are considered appropriate for the present should any works be deemed necessary.

Building 84 (Zone 2)

A contamination hot-spot was initially identified by Aspinwall in 1994 and subsequent investigations suggest impact over a relatively restricted area (circa 250m3). The Glacial Till is over 4m thick in this part of the site, which appears to have prevented downward migration of contamination to date. The contaminants identified comprise BTEX compounds and PCBs.

The table overleaf summarises the calculated soil and perched groundwater remedial targets for the contaminants of concern within the Building 84 Area:

Calculated Remedial Targets – Building 84

		Calculated Soil Remedial Target (mg/kg)		Calculated Perched Groundwater Remedial Target (mg/l)	
Contaminant	Acceptability Criterion (ug/l)	Base of Unsaturated Zone	Site Boundary	Base of Unsaturated Zone	Site Boundary
Benzene	1 – UK DWS	0.05	**7**	0.03	**7**
Toluene	700 – WHO DWS	**4,660**	>5,000	**38**	>5,000
Ethylbenzene	300 – WHO DWS	**39**	>5,000	**15**	>5,000
Xylene	500 – WHO DWS	**1,500**	>5,000	**17**	>5,000
PCBs	0.5 – USEPA MCL	N/A**	**N/A****	N/A**	**N/A****

*** Figures in bold proposed as provisional remediation targets**

Given that no breakthrough of any contaminants to the deep aquifer has been noted within this part of the site, any remedial targets generated on this assumption can be taken as conservative. Notwithstanding this, no breakthrough of PCBs is predicted (after 300 years), due to its strong affinity with the soil phase.

6 Statutory Liability Assessment for Deep Groundwater Contamination

6.1 INTRODUCTION

The QRA produced by CRA in 2006 determined that the pre-existing contamination within the deep groundwater beneath the site did not pose a risk to a hypothetical receptor some 250m off-site. This conclusion was accepted by the Environment Agency.

During the 2007 investigation, a further round of groundwater sampling was undertaken from a combination of existing and new wells. It is therefore appropriate to re-run the 2006 QRA with the new data to confirm that the original conclusion remains valid.

6.2 CONTAMINANTS OF CONCERN

The contaminants of concern that may have been derived from the subject site are as follows:

- Tetrachloroethene
- Trichloroethene
- Dichloroethene (all three isomers – 1,1; cis 1,2 and trans 1,2)
- Dichloroethane
- Vinyl chloride

Of the above, it is considered that tetrachloroethene may have been derived from an off-site source. Nonetheless, this has also been modelled to determine whether there is a risk associated with the identified contamination.

Distribution

The distribution of the aforementioned contaminants is highlighted in Figures 16 to 23 inclusive. Whilst the distribution for each contaminant is slightly variable, in general the highest deep groundwater concentrations are noted in the southwest of the site, either in WSPB1 or BH4AD. For simplicity, WSP has assumed a source area centred around these two boreholes for each of the contaminants.

6.3 CONSIM MODEL

The ConSim model includes a Level 3A option, which simply simulates the migration of contamination that has already reached the aquifer down-gradient to a specified receptor. WSP has re-run the model produced by CRA, with the exception of the contaminant details and hydraulic conductivity, which has been discussed previously in Section 5.3. The hypothetical receptor some 250m off-site has been retained as a reasonable measure of significant risk to groundwater quality.

Unlike the remedial target derivation exercise presented in Section 5, the actual contaminant concentrations recorded have been input into the model and the predicted concentrations compared directly to published acceptance criteria.

6.4 RESULTS

The table below presents the predicted contaminant concentrations at a hypothetical compliance point some 250m off-site:

Contaminants	Travel Time (Unretarded) Years	Travel Time (Retarded) Years	Predicted Concentrations (mg/l)	Compliance Criteria
1,1 Dichloroethene	8.7	102	1.5E-7	0.03 – WHO DWS
Dichloroethane	8.7	73	0.0025	0.003 – UK DWS
1,2 Dichloroethene	8.7	28	2.2E-7	0.05 – WHO DWS
Tetrachloroethene	8.7	178	0.0004	0.01 – UK DWS
Tetrachloroethane	8.7	63	7.1E-16	-
Trichloroethene	8.7	73	0.015	0.01 – UK DWS
Vinyl Chloride	8.7	35	0.0005	0.0005 – UK DWS

The results indicate that all contaminants are predicted to be significantly below the relevant compliance criteria concentrations 250m from site. This is with the exception of trichloroethene, with the predicted concentration of 15ug/l slightly exceeding the 10ug/l compliance criterion.

The predicted concentration for trichloroethene is based on a maximum source concentration of 660ug/l (WSPB1), recorded in 2007. This well has only been sampled on one occasion to date (a second sampling event is underway). Elsewhere on site the maximum trichloroethene concentrations have been detected in the nearby BH4AD at concentrations between 28 and 191 ug/l. The off-site predicted concentration for tirchloroethene is considered to be conservative due to the ConSim model only allowing biodegradation in dissolved phase. This limits biodegradation to 8.7 out of the 73 year predicted migration timescale and is likely to under-estimate the level of attenuation afforded by the environment.

Notwithstanding the above, trichloroethene recorded within WSPB1 has been predicted to have the potential to migrate off-site within the Sherwood Sandstone. Trace concentrations of trichloroethene have been recorded within soils and perched groundwater within Zones 4 and 5, although not approaching the concentration detected in WSPB1. This may be indicative of at least a partially off-site source of contamination, supported by the presence of tetrachloroethane within the same sample, a contaminant not recorded at shallow depth on site.

WSPB1 is to be sampled as part of the on-going quarterly groundwater monitoring exercise. The concentrations recorded to date are not considered to pose a significant risk to groundwater resources, although this conclusion (together with an assessment of the likely source) will be reviewed if more elevated concentrations are reported in the future.

7 Summary and Conclusions

7.1 SUMMARY OF ENVIRONMENTAL RISK ASSESSMENT

The environmental risk assessment for the subject site has assumed a continued industrial use and considered potential risks to human health and the wider environment. None of the identified receptors are considered to be at significant risk from contamination beneath the study area.

Notwithstanding the above, a linkage is evident from shallow soils and perched groundwater to the deep groundwater table within the underlying Sherwood Sandstone in specific areas of the site. It has been observed that several List 1 substances may have entered groundwater from the subject property, albeit at low concentrations and probably with other off-site sources contributing.

WSP has undertaken a QRA of List 1 substances within deep groundwater that may have (even partially) emanated from the site and concludes that no risk is posed to wider groundwater resources (based on a hypothetical compliance point 250m off site – a location previously agreed with the Environment Agency). Trichloroethene derived from the site is not currently considered to pose a risk to wider groundwater quality, although this will be continuously reviewed as part of the quarterly groundwater monitoring programme.

Notwithstanding the findings of the risk assessment, investigation observations are considered to warrant remedial works in two areas of the site, the Former Synchem Area (Zone 5) and the Bulk Storage Area (Zone 4), together with potential further hot-spots currently under investigation (Buildings 82 and 84).

7.2 REMEDIAL TARGETS

The objective of the voluntary remediation works is to ensure that deep groundwater quality does not deteriorate beneath the site (discounting off-site sources of contamination). Consequently, remedial targets for soils and perched groundwater have been derived by assuming a compliance point at the site boundary, or the base of the unsaturated zone depending on the nature of the contaminant.

Remedial targets produced for the voluntary remediation works are summarised in the table below:

	Former Synchem Area		Bulk Storage Area & Building 82		Building 84 BH11R Hot-Spot	
Contaminant	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)
Benzene	17	11	29	17	7	7
Toluene	729	466	125	37	4660	38
Ethylbenzene	261	111	71	20	39	15
Xylene	362	119	90	20	1500	17
Trichloroethene	3.2	2.1	13.5	7	NR	NR
Dichlorethene	12	5.7	41	23	NR	NR
Dichloroethane	NR	NR	4	2.1	NR	NR
Vinyl Chloride	NR	NR	0.85	0.55	NR	NR

* NR – Contaminant not recorded in this area

7.3 DISCUSSION OF REMEDIATION REQUIREMENTS

Based on the calculated remedial targets, the following scope of remediation works are proposed:

Former Synchem

The Former Synchem area was largely demolished to ground level in approximately 1980. All concrete floor slabs and below ground structures remain in place, together with two minor structures. The majority of exploratory locations in this area have recorded evidence of visual / olfactory impact.

It is proposed that following additional delineation works, the soils are excavated and treated ex-situ on site. Controlled excavation will be required to the top of the Glacial Till and a shallow groundwater collection system will also need to be designed to facilitate treatment of impacted perched waters and prevent migration. Ex-situ treatment of the recovered soils may be undertaken by a process of grading and screening, followed by bioremediation in soil windrows. However, the appraisal and detailed design of such a process is ongoing.

Bulk Storage Area

This part of the site is to be occupied by Future Industrial Services Ltd during 2008 and access to this area is likely to be limited, prohibiting excavation. Given this constraint, and the fact that perched groundwater from this location may migrate beneath the adjacent Former Synchem Area and ultimately to the fire water pit area, it is proposed to install a perched groundwater collection and treatment system, sufficient to enable either ex or in-situ treatment of the identified perched groundwater. Ongoing monitoring can determine the need / duration of any treatment.

Several features, namely the two USTs and the 'graded pit' may be deep enough to have penetrated the full thickness of Glacial Till in this area. It is anticipated that the USTs will be decommissioned and the graded pit may be sealed to remove these potential pathways to the underlying aquifer.

7.4 NEXT STEPS

This report should be submitted to KMBC and the Environment Agency to obtain their support for the extent of proposed remedial works and target concentrations chosen.

Further intrusive site investigation works are currently ongoing and are focussed on the four areas of the site where contamination has been identified. This will assist with the detailed remediation design and choice of suitable remediation techniques.

Upon completion of the further site investigation, an Options Appraisal and Remediation Strategy will be issued by WSP for the approval of the aforementioned regulators. The strategy document will also detail the proposed method of remediation verification to enable confirmation of the satisfactory remediation of the site in due course and ensure the regulators receive appropriate validation data.

As the site is currently partially operational, with plans for eventual full occupation by a number of tenants, it will be essential to ensure that the proposed remediation activities can be managed whilst minimising disruption to the site users. Furthermore, all tenant activities should be reviewed / monitored to ensure that the risk of ongoing ground contamination is minimised.

WSP Group PLC

Appendix A Document List

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Kodak Kirkby Document List

1. Aspinwall & Company. 1990. Assessment of Groundwater Sensitivity and Potential Soil and Water Contamination at the Kodak Facility, Kirkby. December.

2. Aspinwall & Company. 1994. Phase II Site Investigation at the Kodak facility, Kirkby. March.

3. Apsinwall & Company. 1994. Phase II Site Investigation – Summary of Investigation in Northern Area. February.

4. Aspinwall & Company. 1994. Supplementary Site Investigation. September

5. Aspinwall & Company. 1995. Groundwater Monitoring – September 1995. November

6. Aspinwall & Company. 1998. Groundwater Monitoring and Additional Borehole Installation. January.

7. Aspinwall & Company. 1998. Groundwater Monitoring November 1997 Factual Report. January 16.

8. Conestoga Rovers & Associates (Europe) Ltd. 2003. Additional Groundwater Assessment. December.

9. Conestoga Rovers & Associates (UK) Ltd. 2003. Phase I Environmental Site Assessment. June.

10. Conestoga Rovers & Associates (Europe) Ltd. 2003. Phase II Environmental Site Assessment. September

11. Conestoga Rovers & Associates (Europe) Ltd. 2003. Appendix 17 – Application Site Report, Kodak Ltd. July.

12. Conestoga Rovers & Associates (Europe) Ltd. 2005. Groundwater Quality Monitoring Round Three. January.

13. Conestoga Rovers & Associates (Europe) Ltd. 2005. Groundwater Quality Monitoring Round Four. June.

14. Conestoga Rovers & Associates (Europe) Ltd. 2005. Phase II Environmental Site Investigation –The Mound. July.

15. Conestoga Rovers & Associates (Europe) Ltd. 2005. Phase II Environmental Assessment-Playing Field Area. January.

16. Conestoga Rovers & Associates (Europe) Ltd. 2006. Environmental Risk Assessment. October.

17. Conestoga Rovers & Associates (Europe) Ltd. 2006. Groundwater Quality Monitoring Round Five. April.

18. Conestoga Rovers & Associates (Europe) Ltd. 2006. Groundwater Quality Monitoring Round Six. October.

19. Conestoga Rovers & Associates (Europe) Ltd. 2007. Groundwater Quality Monitoring Round Seven. April.

20. Conestoga Rovers & Associates (Europe) Ltd. 2006. Phase II Environmental Assessment –Playing Field Area. November.

21. Conestoga Rovers & Associates (Europe) Ltd. 2006. Letter to Julia Ispentchian. Results for Kirkby Vapor Intrusion Assessment, Kodak Chemical Manufacturing Facility, Acronfield Road Kirkby, UK. April 4.

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23. Conestoga Rovers & Associates (Europe) Ltd. 2007, Final Report, Phase I and II Environmental Site Assessment, Building K33 – Eastman Chemicals; Kodak Limited, Acornfield Road, Kirkby, Liverpool, UK.

24. Conestoga Rovers & Associates (Europe) Ltd. 2007. Final Report Additional Phase II Environmental Site Assessment, Kodak Limited, Manufacturing Division, Acornfield Road, Kirkby, Liverpool, UK. May 2007.

25. Conestoga Rovers & Associates (Europe) Ltd. 2007. Report Additional Phase II Environmental Site Assessment, Kodak Limited, Manufacturing Division, Acornfield Road, Kirkby, Liverpool, UK. May 2nd.

26. Conestoga Rovers & Associates (Europe) Ltd. 2007. Geotechnical Investigation – Building K33 (Eastman Chemicals). January 2.

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28. Conestoga Rovers & Associates (Europe) Ltd. 2007. Memorandum, Kodak Kirkby – Record of telephone converstation (27/07/07), From: Neil Foster To: Julia Ispentchian. July 7.

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Appendix B Environment Agency Letter 21 December 2006

[Click here and type Appendix text.]

Our ref: CL6/KN/1051/sfc
Your ref: 033154.17/02
Date: 21st December 2006

Neil Foster
Conestoga-Rovers Associates
6 Clarendon Street
Nottingham
NG1 5HQ

Dear Neil

Kodak, Knowsley Industrial Park, Groundwater Risk Assessment,

Thankyou for sending a copy of the Environmental Risk Assessment, Final Report, Kodak Ltd, Acornfield Road, Kirkby, October 2006.

The report identified the following pollutant linkages relating to controlled waters at the site:

1) Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2) Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water drainage ditch/closed culvert.
3) Deep groundwater contaminants, via lateral migration to 250m compliance point.

Review of Risk Assessment

Pollutant Linkage 1 (Sherwood Sandstone receptor) - the shallow soil & groundwater model runs have used a declining source term and most of the contaminants have been entered as single values. Oils/hydrocarbons comprise a whole site source - the concentration has been input as a range. In most cases the source term has been entered as leachate concentration rather than soil.

The mixing zone depth was changed to 10m in a number of the model runs but it didn't make an appreciable difference to the outcome - the contaminants posing a long term risk to the major aquifer were the same as those highlighted by CRA (organic contaminants).

Pollutant Linkage 2 (Surface water receptor) - level 3a RA modelling Contamination in the perched groundwater. As far as the surface water receptor location is concerned, as groundwater has been shown to flow away from the identified ditch it's probably not realistic to have such a tight compliance point of only 30m from the site boundary.

The Environment Agency
Lutra House Dodd Way
Off Seedlee Road
Walton Summit Bamber Bridge
Preston Lancs PR5 8BX Tel: 08708 506 506 Fax: 01772 627730

Pollutant Linkage 3 (contaminants already in Sherwood Sandstone)
The site derived northwesterly flow direction in the Sherwood Sandstone is consistent with flow being influenced by the Petrolite abstraction to the west and the abstractions further north at Simonswood. These include Eagersignal Ltd (spray irrigation), City Centre Commercials (dust supression), SJ Doyle & CO (dust suppression) and R Draper (general agriculture). There is a single measurement of groundwater level in the Kodak abstraction of 6.65m - can this be referenced to mAOD and incorporated into the relevant groundwater contour plot? (Estimated level of borehole top is 45mAOD putting this at 38.35mAOD)

Section 2.4.2 identifies the Pilkington Brothers Ltd abstraction just to the north of the site as being active - in fact it's not been used since the late 1980's even though the licence has continued to be live.

The main contaminants of concern are the chlorinated solvents (TCE, cis-DCE and VC) but in the absence of these substances in shallow soils and groundwater and the lack of evidence that they have been used on site I would tend to agree with CRA's view that they originate off-site. This is a plausible explanation given that these contaminants are present in the SW corner of the site. Although up-gradient of here there is only Charley Wood and agricultural fields, when the UU abstractions were in operation, groundwater flow would have been to the east and this area of the site would then have been down-gradient of much of the Industrial Estate including Petrolite and the properties to the west.

Although probably not attributable to Kodak, level 3a QRAs for the major aquifer have been carried out for the various contaminants present in the groundwater. The entire site forms the source term. This is very conservative given that e.g. the chlorinated solvents were only encountered in the SW corner of the site. No degradation has been included despite the fact that, for the chlorinated solvents at least, the presence of breakdown products of the chlorinated solvents indicates that some degradation is taking place.

The use of a 100m thick mixing zone seems inappropriately high. CRA refer to the presence of mudstone layers within the sandstone aquifer which would limit the mixing zone thickness so we changed it to 10m. Despite this, none of the site wide contaminants exceed the WQS at the 250m compliance point, when retardation is included. So I wouldn't envisage that any action would be needed with respect to the contamination already present in the major aquifer.

Conclusion

Pollutant linkages 2 and 3 do not appear to be viable pollutant linkages. For pollutant linkage 2 the direction of flow of shallow groundwater is away from the nearest surface water receptor and for pollutant linkage 3 the source of contamination appears to be from off site and is therefore not a liability for Kodak.

Pollutant linkage 1 with respect to the organic contamination remains to be a concern because the contaminants which are reaching the major aquifer are List 1 substances. Site specific target levels for remediation should be derived for the shallow groundwater and soils. The model should also be run with a suitably conservative biodegradation

rate and the results presented for with and without degradation.

If you have any queries on this please do not hesitate to contact me.

Yours Sincerely

Sarah Corbishley
Contaminated Land Technical Officer

Tel: 01772 71 4017

cc.

Dave Logan
Knowsley MBC
Municipal Building
Cherryfield Drive
Kirkby
L32 1TX

Appendix C Contamination Summary

Zone	Visual Evidence of Contamination (Figure 12)	Soil Contamination (Figure 13)	Perched Groundwater Contamination (Figure 14)	Sherwood Sandstone Aquifer Contamination (Figure 15)
Zone 1	Numerous thin horizons exhibiting evidence of burning	Three incidences of elevated TPH were identified in samples collected within the Made Ground, ranging from 1,100mg/kg to 14,357mg/kg.	A single elevated TPH concentration recorded in 2004, although no contamination noted during the remaining 6 monitoring visits.	A single occurrence of pentachlorophenol (12ug/l) in 2003, not recorded during remaining 6 monitoring visits.
Zone 2	WSPT11 – oily land drain encountered. Strong fuel hydrocarbon odour throughout hole. Slight odour noted in sample from nearby WSPX50. Chemical odours noted down-gradient of Building 38 bulk storage area.	Elevated fuel hydrocarbons within sample from WSPT11 also including 210mg/kg PCBs. Elevated metals and TPH beneath south-eastern corner of Building 58.	Fuel hydrocarbon impact noted within samples from BH11R (also trace concentrations of several chlorinated hydrocarbons) and to a lesser extent in sample from WSPX50. Elevated ammonium down-gradient of Building 58 bulk storage area (28mg/l)	No deep wells within this zone, although BH3AS is located approximately 30m downgradient and has not recorded contamination during 7 visits.
Zone 3	Solvent odours noted within the two exploratory holes within Building 82 (Synchem).	No elevated contaminants noted within this area.	Elevated chloroethane (74ug/l), dichloroethane (25ug/l) and xylene (250ug/l) in sample from WSPX56, a well located within Building 82.	No contamination identified in samples collected within the single well in this area.
Zone 4	Several contamination observations of a varied nature, including fuel hydrocarbons and solvents.	Elevated xylene (81mg/kg) and ethylbenzene (11mg/kg) in a sample from WSPX20.	Localised TPH and BTEX impact (1.4 to 6.8mg/l), several incidences of chlorinated hydrocarbons between 10ug/l and 100ug/l. Elevated ammonium (maximum 25mg/l).	

Zone	Visual Evidence of Contamination (Figure 12)	Soil Contamination (Figure 13)	Perched Groundwater Contamination (Figure 14)	Sherwood Sandstone Aquifer Contamination (Figure 15)
Zone 5	Numerous observations of chemical / Solvent odours throughout the Made Ground and underlying Shirdley Hill Sand within the former Synchem area. In one location (BHB2) field screening evidence of contamination was noted throughout the Glacial Till to a depth of 7.0m.	Elevated TPH (maximum 5,537mg/kg and BTEX (maximum xylene concentration 450mg/kg) in samples from the former Synchem area. Highest concentrations recorded in a sample from TPZ7-15, whilst testing of sample from BHB2 recorded slightly elevated chlorinated hydrocarbons (<10mg/kg).	Testing of sample from WSPX30 recorded elevated TPH, BTEX and chloroaniline (7.8mg/l, 2.3mg/l and 0.4mg/l respectively). Testing of sample from WSPX24 recorded 55mg/l xylene as well as lower concentrations of the remaining BTEX compounds and 0.3mg/l trichloroethene.	Samples from the three deep wells in this area contain slightly elevated concentrations of chlorinated hydrocarbons (maximum concentration 22ug/l trichloroethene recorded to date).
Zone 6	Evidence of large quantities of waste disposal towards the eastern boundary. Isolated strong amine odour in TPZ6-3 which also encountered a crushed IBC.	TPH impact in BH2A and TPZ6-15. Copper concentration of 30,000mg/kg in sample from WSPX40.	Samples from two wells in this area (BH2AS and BH2) exhibit elevated TPH concentrations. Testing of sample from BH2AS also recorded xylene 1mg/l and ammonium at 27mg/l. Testing of samples from two other wells in this area did not record contamination.	Evidence of TPH impact in WSPB1 and WSPB2. Chlorinated hydrocarbon impact noted in all 4 deep wells in this area, with the highest concentration in sample from WSPB1 adjacent to the fire water pit (tetrachloroethane 1.3mg/l).
Zone 7	Several sulphur odours within this area. Two locations recorded evidence of chemical / solvent contamination (BH1 / BH1R).	TPH contamination (maximum 1,200mg/kg). Slight silver impact recorded in sample from WS31 (147mg/kg). Traces of dibenzofuran, carbazole and trichlorophenol recorded in several locations (<0.2mg/kg).	TPH, toluene and xylene contamination detected in sample from BH1.	Single well in this area (BH2AD) has not recorded elevated contaminant concentrations.

Zone	Visual Evidence of Contamination (Figure 12)	Soil Contamination (Figure 13)	Perched Groundwater Contamination (Figure 14)	Sherwood Sandstone Aquifer Contamination (Figure 15)
Zone 8	Strong ammonia / sewage odour noted in one location. Slight chemical / solvent odours noted in two further exploratory holes.	Elevated contamination not recorded within this area.	No significantly elevated results recorded.	No deep wells within this area.

Appendix D ConSim Model Parameters

Category	Parameter	Units	Value	Distribution type	Justification
Source	Dry bulk density	g/cm3	2.13	Single	CRA value
	Air filled porosity	Fraction	0.2253	Single	CRA value
	Water filled porosity	Fraction	0.3047	Single	CRA value
	Thickness	m	0.5 - 1.3	Uniform	Range of thickness of contamination observations
	Centre definition	N/A	Random sampling	N/A	N/A
	Declining source	N/A	Calculated declining source	N/A	Historical contamination
	Time offset	Years	0	N/A	N/A
	Infiltration	mm/year	252.54 - 631.35	Uniform	20% to 50% infiltration of annual precipitation as quoted by CRA
Unsaturated Pathway	Thickness	m	4 - 8	Uniform	Site measurement
	Water filled porosity	Fraction	0.3	Single	Assumption
	Dry bulk density	g/cm3	1.37 - 1.81	Uniform	CRA value
	Flow model	N/A	Porous medium	N/A	Assumption
	Unsaturated conductivity	m/s	9.64E-9 - 2.64E-6	Uniform	CRA value
	Vertical dispersivity	m	0.00115 - 0.00718	Uniform	CRA value
Aquifer	Thickness	m	200	Single	CRA value
	Dry bulk density	g/cm3	1.68 - 2.68	Uniform	CRA value
	Mixing zone thickness	m	100	Single	CRA value
	Hydraulic conductivity	m/s	2.94E-5 - 2.99E-5	Uniform	Calculated transmissivity for on-site abstraction well
	Effective porosity	Fraction	0.3	Single	Assumption
	Hydraulic gradient	N/A	0.01	Single	Site measurement

Figure 1 Site Layout

ZONE 1 – SPORTS PITCH

ZONE 1 – EASTMAN CHEMICALS

ZONE 2 – BULK STORAGE PCD

ZONE 2 – TONER STORAGE BUILDING AREA

ZONE 3 – RESERVOIR AREA

ZONE 3 – SYNCHEM BUILDING

ZONE 4 – SOLVENT STORAGE/RECLAIM AREA

GRADED PIT

ZONE 6 – MOUND/DRUM STORE AREA

ZONE 5 – ORIGINAL SYNCHEM AREA

FIRE WATER PIT

ZONE 7 – SILVER NITRATE DRAIN EXCAVATION

ZONE 8 – EFFLUENT TREATMENT PLANT

1	PCD HARDSTANDING	2ND STREET	GARAGE
2	PCD WASTE SKIP COMPOUND	CENTRAL AVENUE	COMPRESSOR & LABORATORY
3			SYN CHEM LABORATORY
4			LABORATORY
5	CHAIN-LINK STORAGE COMPOUND	NORTH STREET	LABORATORY
6	GARAGE	3RD AVENUE	PHEULAR PRODUCTION
7	SMOKERS PORTACABIN [CONTRACTORS]	4TH STREET	HIGH VACUUM LABORATORY
8	LABORATORY	WEST AVENUE	
9	LAUNDRY	4TH STREET	
10	SKIP/DRUM COMPOUND	EAST AVENUE	COLD STORE & LABORARY
11	NEUTRALISE PIT & PUMP HOUSE	WEST AVENUE	
12	FIRE STATION	2ND AVENUE	
13	STORE	2ND AVENUE	
14			LABORATORY
15	RELAY PLANT	CENTRAL AVENUE	CHEMICAL PRODUCTION
16	RELAY GENERAL DRY STORAGE AREA	3RD AVENUE	DYE LABORATORY
17			DRUM HOUSE
18	ELECTRICAL SWITCHGEAR ROOM FOR K37	CENTRAL AVENUE	
19	DRUM COMPOUND	SOUTH STREET	DARK ROOMS
20	CANTEEN	WEST AVENUE	
21	ENGINEERS STORE	4TH STREET	OLD BOILER HOUSE
22	GAS METER HOUSE	WEST AVENUE	
23	KEEP FIT CENTRE	4TH STREET	SYN CHEM
24	TELEPHONE EXCHANGE	4TH STREET	STORE
25	WASTE WATER TREATMENT PLANT	2ND AVENUE	STORE
26	COMPRESSOR HOUSE	3RD STREET	STORE
27	HIGH PRESSURE LABORATORY	NORTH STREET	
28	EFFLUENT PIT	CENTRAL AVENUE	CAR CLUB OIL STORE
29	SOLVENT STORE (WASTE SOLVENT)	SOUTH STREET	OLD SOLVENT STORE
30	SOLVENT STORE (WASTE SOLVENT)	NORTH STREET	PLANT AREA FOR OLD BLDG 15
31	HIGH VOLTAGE SUB STATION	S. W. CORNER	OLD HIGH VOLTAGE SUB-STATION
32	SUNDRY STORE	SOUTH STREET	
33	TECHNICAL DEPT. LABORATORY	NORTH STREET	
34			STORE
35			HYDROGENATOR PLANT
36	CIRCULATING PUMP HOUSE/STORE	CENTRAL AVENUE	
37	SOLVENT RECOVERY	CENTRAL AVENUE	
38	POWDER & SOLUTIONS	WEST AVENUE	
39	ADMINISTRATION OFFICES	WEST AVENUE	39A&B OLD DESIGN OFFICE PORTAKABINS
40	GATEHOUSE (SOUTH)	WEST AVENUE	
41	CENTRALISED WORKSHOP	CENTRAL AVENUE	
42	PMSD VEHICLE CHARGING BAY	CENTRAL AVENUE	OLD ATS
43	WAREHOUSE	NORTH STREET	
44	PCD TANKER OFFLOADING AREA	1ST STREET	CO2 STORE
45	GAS/OIL BULK STORAGE		
46	BOILER HOUSE	CENTRAL AVENUE	
47	SILVER NITRATE	1ST AVENUE	
48	SUB STATION	1ST STREET	HYDROQUINONNE
49	STORE	NORTH STREET	OLD ORE GRINDING
50	BULK STORAGE (SOLVENTS)	SOUTH STREET	
51	K82 EFFLUENT TANKS TO K25	EAST AVENUE	HYDROGENATION
52			HYDROGEN & CO2 STORE
53	NITRIC ACID STORAGE TANK COMPOUND	1ST AVENUE	
54	DIRTY SOLVENTS	SOUTH STREET	
55	TONER UTILITIES PLANT	1ST STREET	TECMANGAM
56	K. R. S.	2ND STREET	
57	CLEAN SOLVENTS	SOUTH STREET	
58	LIQUID OXYGEN STORE	1ST AVENUE	OLD PCD BULK LIQUID STORAGE
59			PCD DRUM HEATER
60			STORE
61	STORAGE AREA (OLD RESERVOIR)	EAST AVENUE	AIR TENT STORE
62	PILOT PLANT	2ND AVENUE	
63	SOLVENT TANKER OFFLOADING	SOUTH STREET	OLD TANKER OFFLOADING POINT
64	CONTRACTOR COMPOUND	NORTH STREET	
65			SYN CHEM
66	WAREHOUSE	CENTRAL AVENUE	SYN CHEM WAREHOUSE
67	DRUM STORE	SOUTH STREET	
68	OPEN BUNDED DRUM STORE	SOUTH STREET	OLD DRUM COMPOUND
69	M – STORES	3RD STREET	
70	BULK STORAGE P. C. D.	CENTRAL AVENUE	
71	NITROGEN BULK STORAGE	1ST STREET	
72	GAS METER HOUSING	S.W. CORNER	
73	STORE	EAST AVENUE	MCD AIRHOUSE
74	TONER DEVELOPMENT LABORATORY	1ST STREET	NORTH EFFLUENT PIT
75			LIQUID WASTE INCINERATOR
76	WATER STORAGE TANKS & PUMPS	EAST AVENUE	
77	HUMIDIRIER HOUSE	3RD STREET	SOLID WASTE INCINERATOR
78	LPG STORAGE	CENTRAL AVENUE	
79			
80	GATEHOUSE – GOODS ENTRANCE (NORTH)	WEST AVENUE	
81	SOLVENT STORE	NORTH STREET	
82	S. C.D. FACILITIES	EAST AVENUE	
83	MESSROOM & TOILET BLOCK – ENGINEERS	3RD STREET	
84	TONER STORAGE AREA	NORTH STREET	
85	COOLING TOWER & PUMP HOUSE	EAST AVENUE	
86	GLYCOL REFRIDGERATION PLANT	EAST AVENUE	
87	DRUM STORAGE COMPOUND	3RD STREET	
88	HYDROGEN TRAILER PARK	OFF EAST AVENUE	
89	PALLET STORAGE AREA	1ST STREET	
90	BUILDING 82 EFFLUENT PIT	3RD STREET	
91	BUILDING 82 LIQUID BULK STORAGE	EAST AVENUE	
92	BUILDING 82 SOLVENT BULK STORAGE	OFF SOUTH STREET	
93	NITROGEN GENERATION PLANT	1ST STREET	
94	TONER PLANT	1ST STREET	
95	NEW "MANNED" SUB-STATION	N.W. CORNER	
96	VISITORS RECEPTION	WEST AVENUE	
97			
98	TONER NITROGEN GENERATION PLANT	1ST STREET	
99	R.T.O.	EAST AVENUE	

APPROXIMATE LENGTH OF PERIMETER
5, 400 FT. / 1647 M

SITE PLAN
KIRKBY
(CHEMICAL DIVISION)

DO NOT SCALE

HISTORICAL ISSUES AND PROCESS LOCATIONS

THE HISTORICAL ISSUES AND PROCESS LOCATIONS LISTED HERE HAVE BEEN COMPILED FROM THE REPORTS IDENTIFIED IN THE BIBLIOGRAPHY AND FROM DISCUSSIONS WITH PLANT EMPLOYEES (INCLUDING THE FORMER ENVIRONMENTAL MANAGER WHO HAD WORKED AT THE PLANT FOR 30 YEARS). THE MOST RECENT PROCESS LOCATIONS ARE LISTED TO THE LEFT OF THIS PAGE AND REFER TO THE NUMBERS ON THIS FIGURE. ISSUES AND PROCESSES THAT HAVE BEEN REMOVED ARE LISTED BELOW AND ARE DESIGNATED WITH LETTERS ON THIS FIGURE.

A– MANAGEMENT OF PCD POWDERS, NON–CHLORINATED SOLVENTS (TOLUENE, XYLENE, AND DIOXANE), ACID CHLORIDES IN EXCAVATED BASINS. 1950–1967. SPOILS FROM A DRAIN INSTALLATION ACROSS THIS AREA CONTAINED NOTICABLE DEBRIS BUT NO ODOUR. 1.5 TONNES TOLUENE SPILLAGE 1988.

B– MANAGEMENT OF PCD POWDERS, NON–CHLORINATED SOLVENTS, ACID CHLORIDES IN EXCAVATED BASINS. 1950–1973

C– MANAGEMENT OF PCD POWDERS, NON–CHLORINATED SOLVENTS, ACID CHLORIDES IN EXCAVATED BASINS INCLUDING CYANIDE DRUMSTORE 1950–1973.

D– TECMANGAM TANKER LEAK (18 TONNE) 1973. TANKER BAGAN TO LEAK NEAR BUILDING 74 AND WAS MOVED TO AREA NEAR BUILDING 84 WHERE IT TOOK TWO HOURS TO SEAL.

E– VGK – MANAGEMENT OF ORGANIC RESIDUES/SCD POWDERS IN EXCAVATED BASINS. 1958–1970.

F– BURNING CHEMICAL WASTE 1968–1975. THIS BURNING OF ETHER, PETROLEUM (PET) ETHER, AND OTHER FLAMMABLE SOLVENTS WAS CONDUCTED IN DRUMS. SIGNIFICANT TESTING FOR RESIDUAL IMPACTS HAVE BEEN CONDUCTED.

G– MANGANESE DIOXIDE (NOTE STILL SEEPING (1990)), CLEANED UP AND SEEPAGE STOPPED.

H– 1968–1975– MANGANESE SULPHATE, HYDROQUINONE, ZINC, 8112 CAUSTIC/ZINC STORED ON HARDSTANDING. PHOTOCHEMICALS PLANT WAS BUILT IN 1965 AND AREA WAS FOR SUPPLY OF CHEMICALS, NO DISPOSAL.

I– MIXED ORGANIC TARS 1958–1972.

J– GROUP POLLUTION FROM EXHAUST SYSTEM 1950–1967.

L– BUILDING 15 – FORMER SYNCHEM PLANT. SUB–SURFACE ETHER AND PETROLEUM ETHER SOLVENT/ACID CONTAMINATION DISCOVERED AT SOUTHERN END OF MEZZANINE FLOOR SUPPORT 1969/1970. BUILDING DEMOLISHED AND REMOVED FROM SITE. NO EVEIDENCE OF IMPACTS REMAIN.

M– SUB SURFACE NON–CHLORINATED SOLVENT/ACID CONTAMINATION DISCOVERED (SURFACE OF WATER TABLE) WEST AND EAST SIDE ADJACENT TO DITCH DRAIN IN 1987. PIPE CARRYING ACIDIC WASTE WITHIN SURFACE DRAIN FAILED. ACIDIC WATER DAMAGED LINING. EXACT LOCATION UNKOWN, BUT LIKELY SOUTHWEST CORNER OF AREA.

N– CONTRACTORS' HUT – CO2 FOUND EMANATING FROM CONCRETE SLAB 1989. CALCIUM CARBONATE HAD BEEN STORED IN THE BUILDING. RESIDUAL PRODUCED CO2 FOR A PERIOD. NO LONGER AN ISSUE.

O– BUILDING 62. CONTAMINATION DISCOVERED DURING CONSTRUCTION IN 1975. THIS HAD BEEN THE SITE OF SEVERAL OLD MUNITIONS PLANT ERA BUILDINGS USED AS LABORATORY BUILDINGS, SOILS WERE REMOVED.

P– FORMER SOLID WASTE INCINERATOR.

Q– OLD SOLVENT DRUM STORE.

R– OLD TANKER OFF–LOADING AREA.

S– OLD SOLVENT STORE.

T– OLD DRUM COMPOUND.

U– OLD PCD BULK LIQUID STORAGE/DRUM HEATER.

V– FORMER HYDROQUINONE PRODUCTION.

W– FORMER LIQUID WASTE INCINERATOR.

X– FORMER SYNCHEM.

Y– FORMER GARAGE.

Z– FORMER GAS OIL TANKS.

AA– FORMER SYNCHEM ANCILLARY BUILDINGS.

AB– FORMER COMPRESSOR HOUSE AND LABORATORY.

AC– FORMER DYE LABORATORY.

AD– FORMER HYDROGENATION PLANT.

AE– FORMER CHEMICAL STORAGE AIR SUPPORTED TENT (BURNT 1975). WITHIN AREA G.

AF– COLLAPSED/FAILED DRAIN. AREA RESTORED, TESTING OF SOILS AND SHALLOW GROUNDWATER CONFIRM REMEDIATED.

AG– 'MOUND' AREA – HISTORICAL LANDFILLING. THE SOILS IN THIS MOUND CAME FROM FOUNDATION EXCAVATIONS AROUND THE PLANT; SYNCHEM, DRUM STORAGE, AND FIRE WATER PIT.

KEY

BUILDING PREVIOUSLY REMOVED

BULK STORAGE

HISTORICAL ISSUES

REV	DATE	BY	DESCRIPTION	CHK	APD
A	DD/MM/YY		INITIAL ISSUE		

DRAWING STATUS: DRAFT

WSP
The Alexandra, 200-220 The Quays, Salford, Greater Manchester, M50 3SP
Tel: +44 (0)161 886 2400 Fax: +44 (0)161 886 2401
http://www.wspgroup.com

CLIENT: INTERNATIONAL PROCESS PLANTS

ARCHITECT: N/A

PROJECT: KODAK, KIRKBY

TITLE: HISTORICAL AND CURRENT LAND USES

SCALE @ A1: 1:1000	CHECKED:	APPROVED:
CAD FILE: PR0328-01	DESIGN-DRAWN: AW/JME	DATE: MARCH 2007
PROJECT No: 12121392/001	DRAWING No: FIGURE 1	REV: A

© WSP Group plc

PR0328-01

Figure 2 Made Ground Thickness

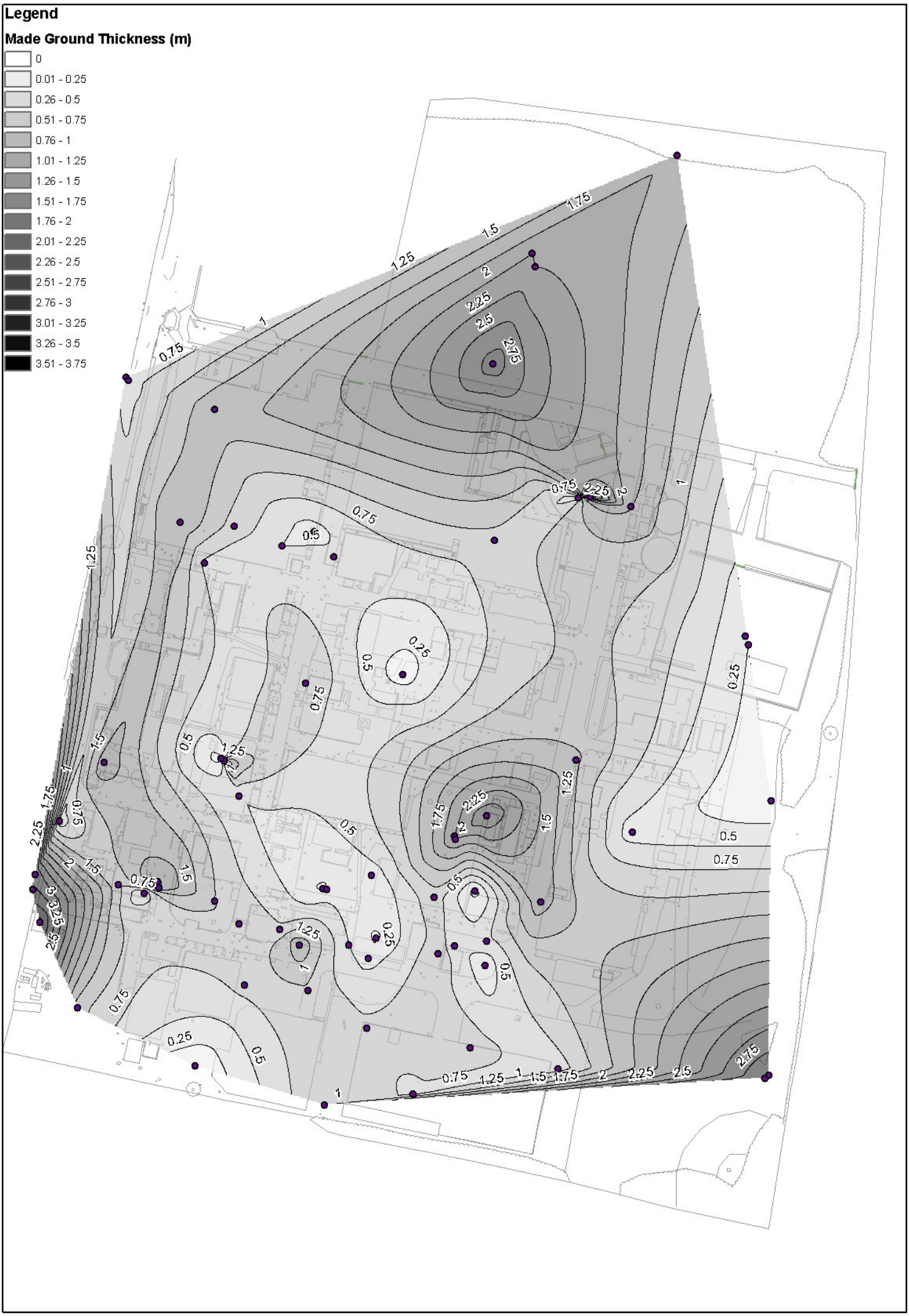
Legend
Made Ground Thickness (m)
0
0.01 - 0.25
0.26 - 0.5
0.51 - 0.75
0.76 - 1
1.01 - 1.25
1.26 - 1.5
1.51 - 1.75
1.76 - 2
2.01 - 2.25
2.26 - 2.5
2.51 - 2.75
2.76 - 3
3.01 - 3.25
3.26 - 3.5
3.51 - 3.75

Figure 3 Peat Extent & Thickness

Legend
Peat Thickness (m)
0
0.01 - 0.25
0.26 - 0.5
0.51 - 0.75
0.76 - 1
1.01 - 1.25
1.26 - 1.5
1.51 - 1.75
0.25
0.5
1
1.25
1.5
0.75
0
0.25
0
0.25
0.5
0.5
0.5
0.5
0.75

Figure 4 Shirdley Hill Sand Extent & Thickness

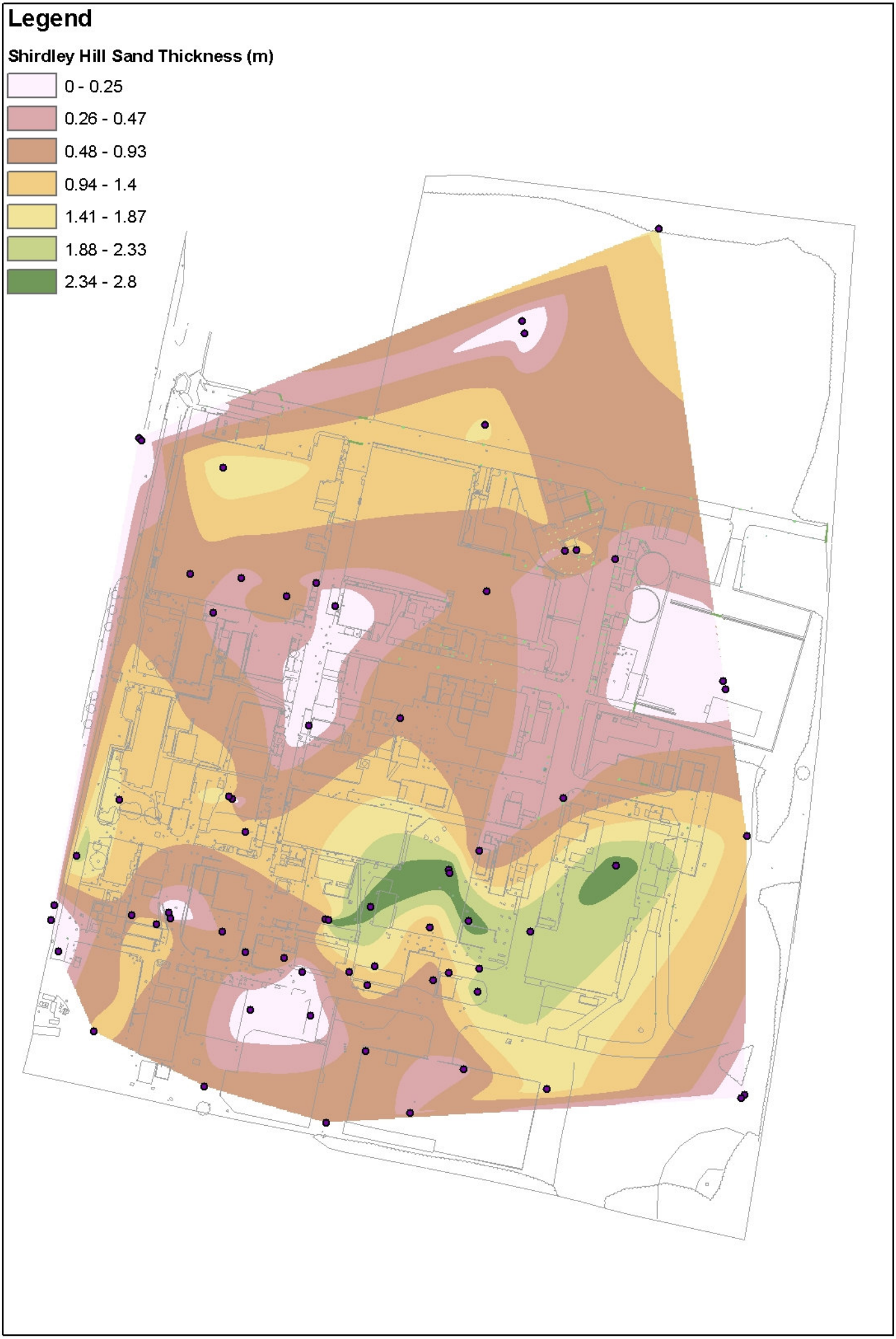
Legend
Shirdley Hill Sand Thickness (m)
0 - 0.25
0.26 - 0.47
0.48 - 0.93
0.94 - 1.4
1.41 - 1.87
1.88 - 2.33
2.34 - 2.8

Figure 5 Glacial Till Thickness

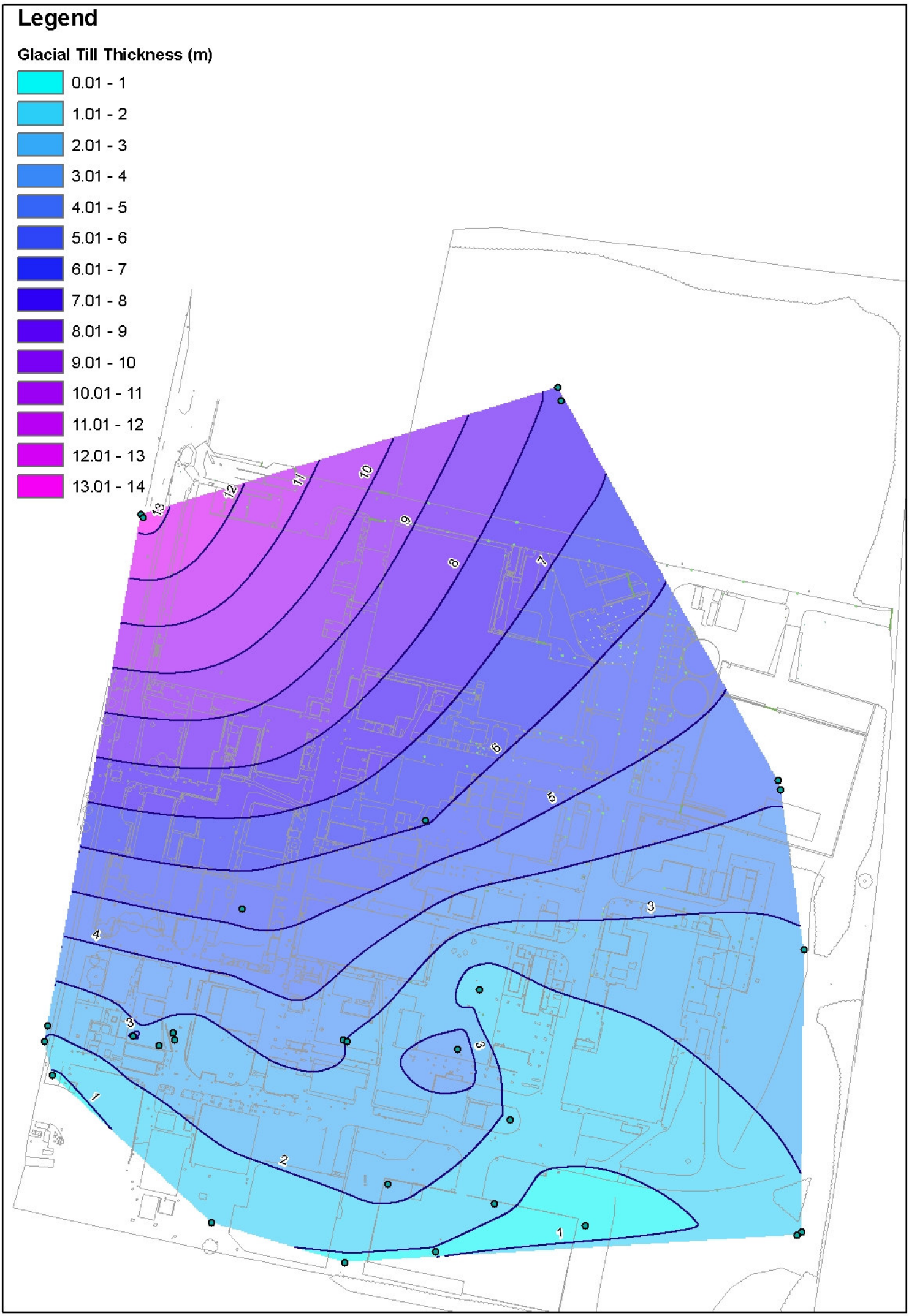
Legend
Glacial Till Thickness (m)
0.01 - 1
1.01 - 2
2.01 - 3
3.01 - 4
4.01 - 5
5.01 - 6
6.01 - 7
7.01 - 8
8.01 - 9
9.01 - 10
10.01 - 11
11.01 - 12
12.01 - 13
13.01 - 14

Figure 6 Depth To Rockhead

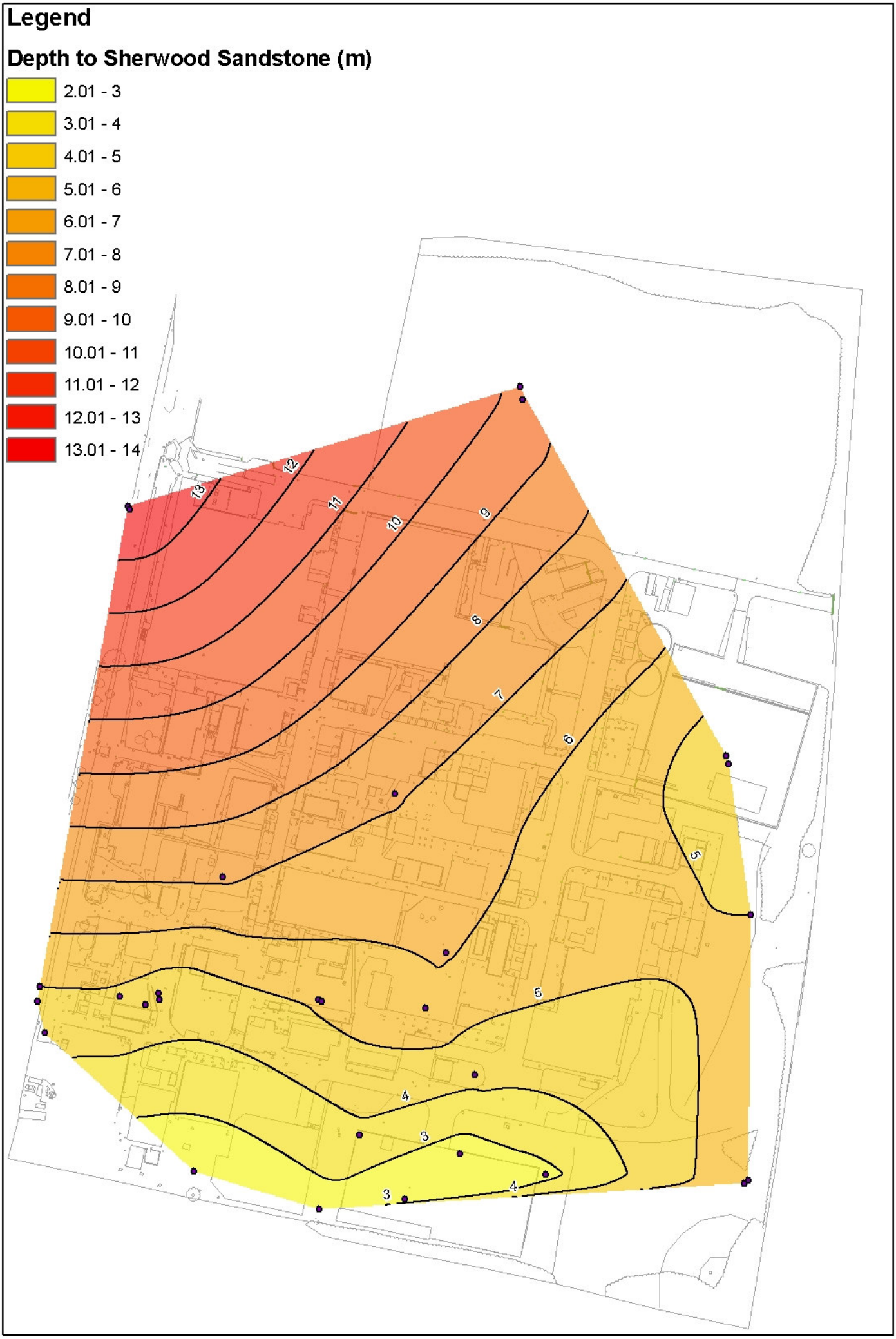
Legend
Depth to Sherwood Sandstone (m)
2.01 - 3
3.01 - 4
4.01 - 5
5.01 - 6
6.01 - 7
7.01 - 8
8.01 - 9
9.01 - 10
10.01 - 11
11.01 - 12
12.01 - 13
13.01 - 14
13
12
11
10
9
8
7
6
5
5
4
3
3
4

Figure 7 Elevation of Rockhead

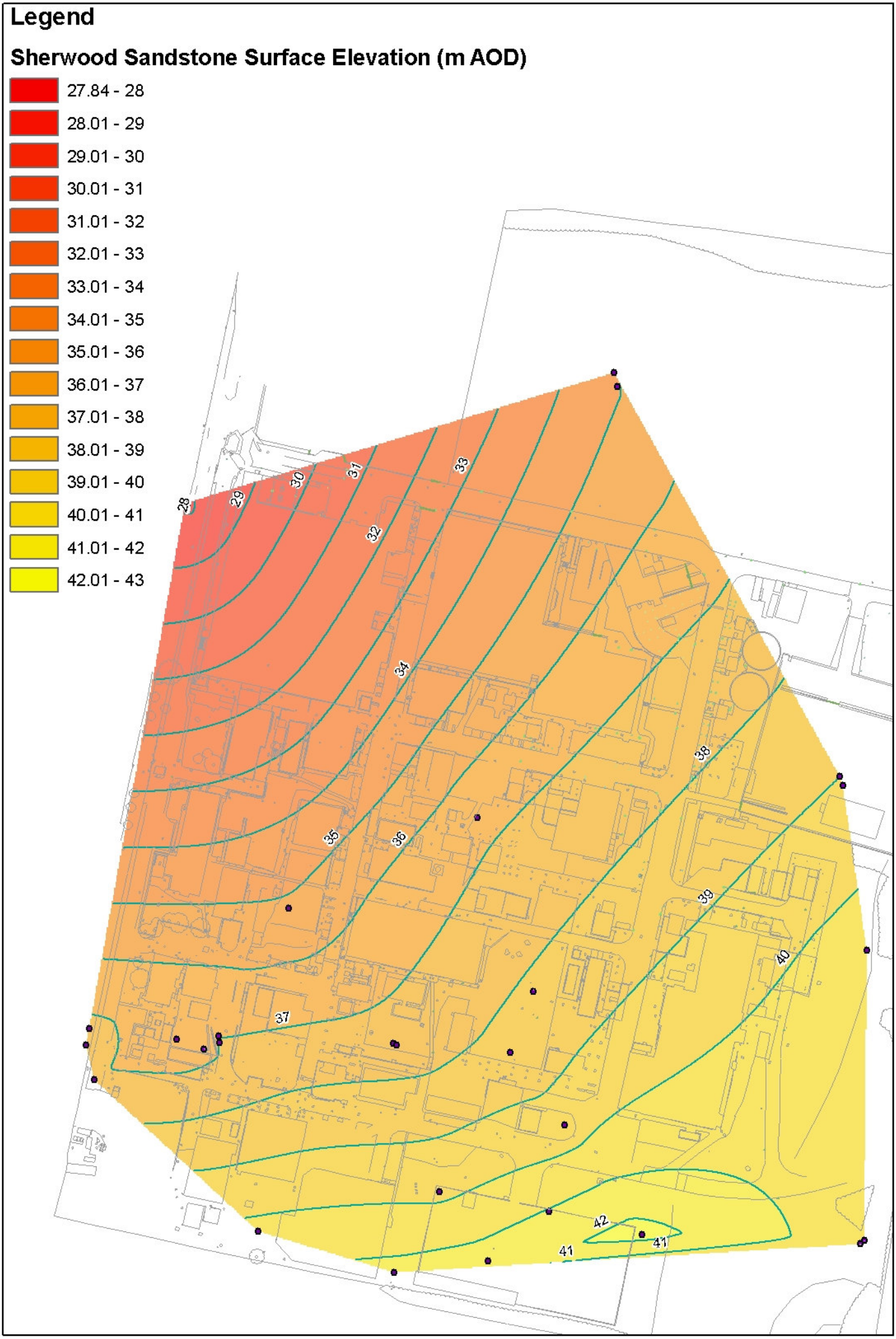
Legend
Sherwood Sandstone Surface Elevation (m AOD)
27.84 - 28
28.01 - 29
29.01 - 30
30.01 - 31
31.01 - 32
32.01 - 33
33.01 - 34
34.01 - 35
35.01 - 36
36.01 - 37
37.01 - 38
38.01 - 39
39.01 - 40
40.01 - 41
41.01 - 42
42.01 - 43
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42

Figure 8 Depth to Perched Groundwater

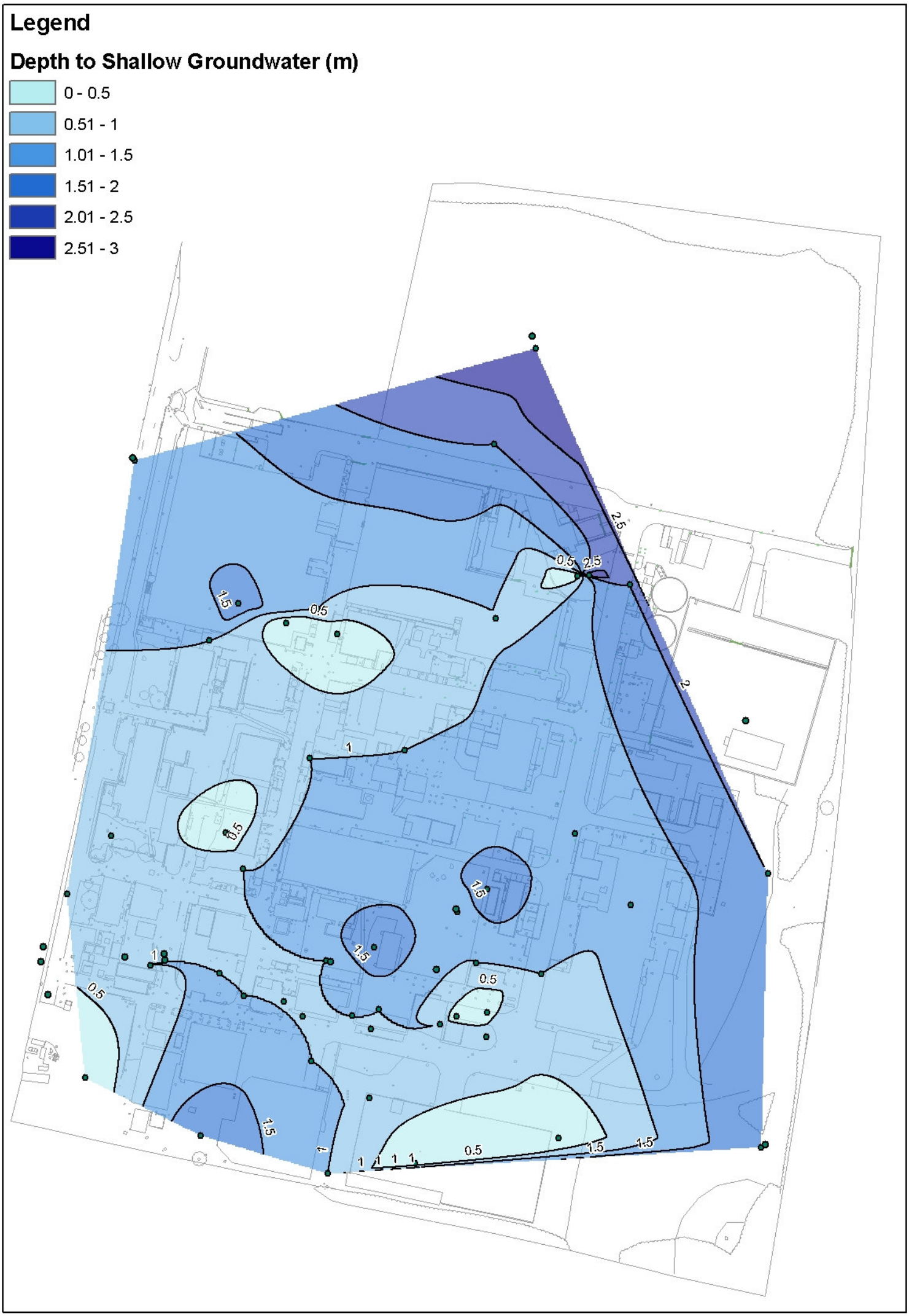
Legend
Depth to Shallow Groundwater (m)
0 - 0.5
0.51 - 1
1.01 - 1.5
1.51 - 2
2.01 - 2.5
2.51 - 3
0.5
1
1.5
2
2.5

Figure 9 Elevation of Perched Groundwater

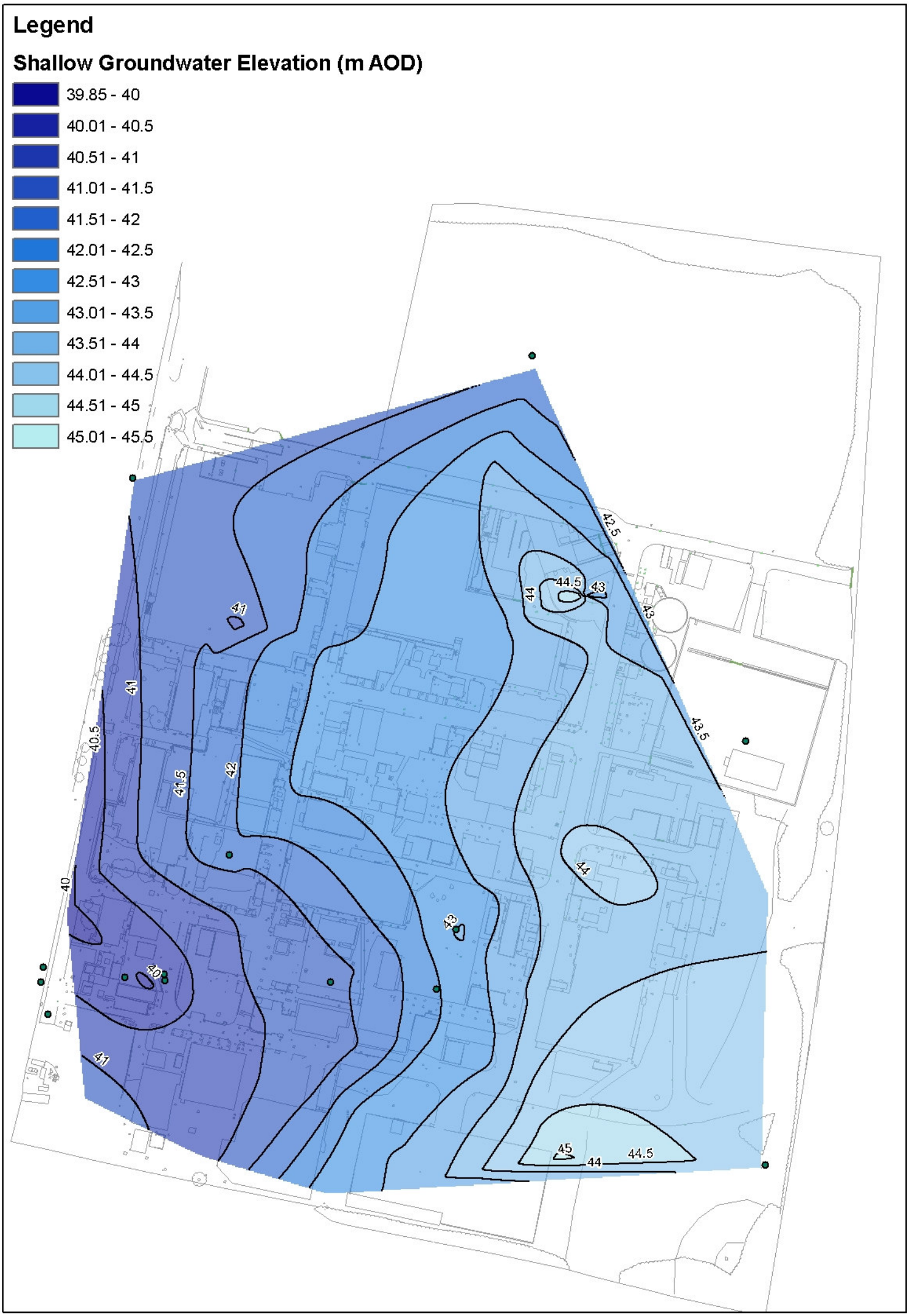
Legend
Shallow Groundwater Elevation (m AOD)
39.85 - 40
40.01 - 40.5
40.51 - 41
41.01 - 41.5
41.51 - 42
42.01 - 42.5
42.51 - 43
43.01 - 43.5
43.51 - 44
44.01 - 44.5
44.51 - 45
45.01 - 45.5
40
40.5
41
41.5
42
42.5
43
43.5
44
44.5
45

Figure 10 Depth to Deep Groundwater

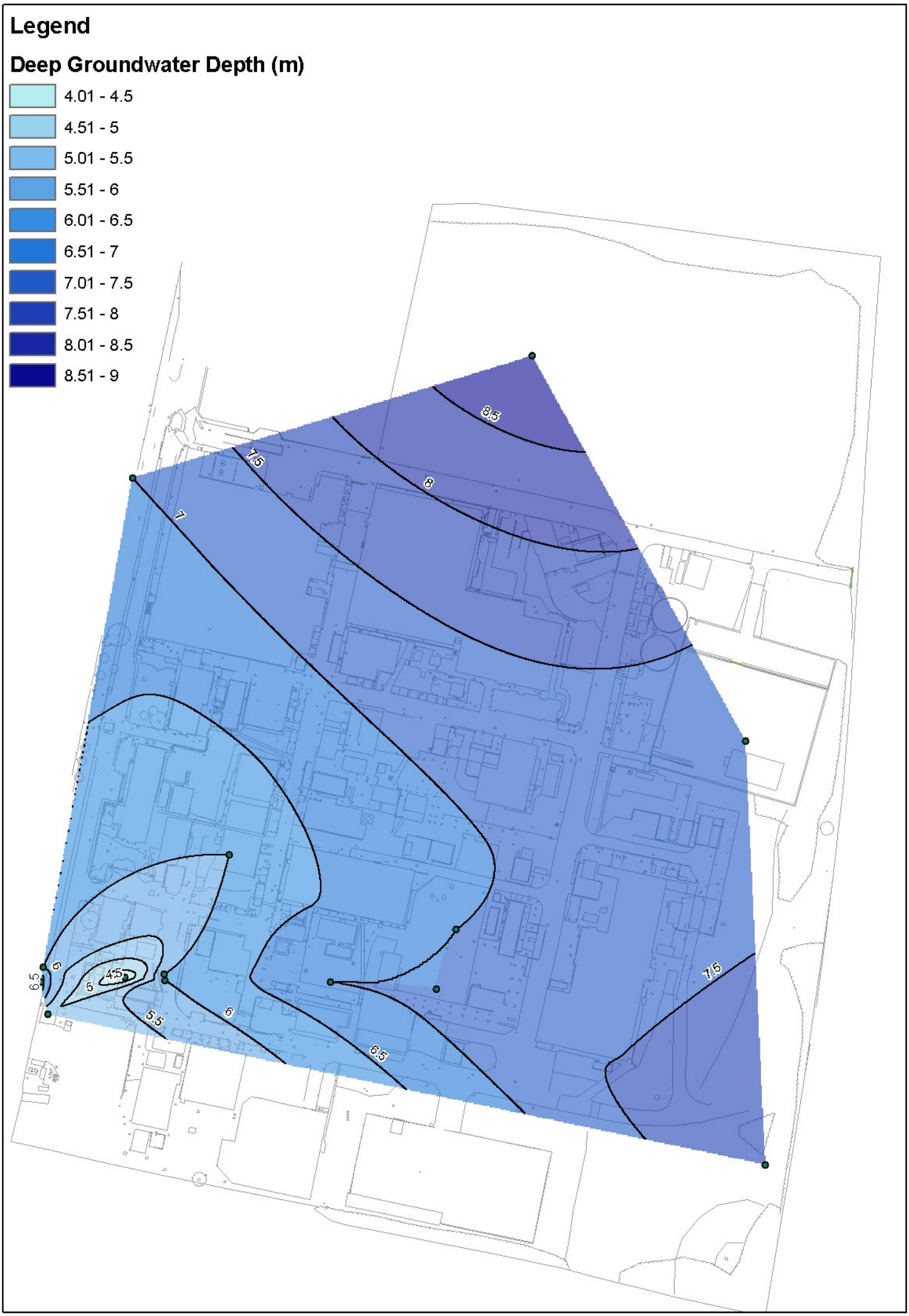
Legend
Deep Groundwater Depth (m)
4.01 - 4.5
4.51 - 5
5.01 - 5.5
5.51 - 6
6.01 - 6.5
6.51 - 7
7.01 - 7.5
7.51 - 8
8.01 - 8.5
8.51 - 9
8.5
8
7.5
7
7.5
6.5
6
5.5
6
6.5
4.5
5

Figure 11 Elevation of Deep Groundwater

Legend
Deep Groundwater Contours (m AOD)
34.52 - 35
35.01 - 35.5
35.51 - 36
36.01 - 36.5
36.51 - 37
37.01 - 37.5
37.51 - 38
35
35.5
36
36.5
37
37.5
35.5
36

Figure 12 Contamination Observations

DO NOT SCALE

OBSERVATIONS

- FUEL/ HYDROCARBON ODOUR/ VISUAL
- CHEMICAL/ SOLVENT ODOUR
- EVIDENCE OF BURNING ASH
- SIGNIFICANT VOLUME OF WASTE MATERIALS
- OTHER (SPECIIFED BELOW)

OTHER OBSERVATIONS

BH115 – 0.5–0.95m = SULPHUROUS ODOUR.

TPJ9 – DARK STAINING 0.8m.

TP14 – 4.5m STRONG SULPHUR ODOUR.

BH7 – 0–1.0m ODOUR (NOT DESCRIBED).

BH4 – PUNGENT ODOUR IN GROUND WATER.

TP1 – 0–1.0m ODOUR (NOT DESCRIBED).

TP24 – 0.6–0.8m STRONG SULPHUROUS ODOUR.

BH116 – 0.35–1.10m = SULPHEROUS ODOUR AND STAINING.

WS14 – 0.4–0.7m = FAIRLY STRONG ODOUR (NOT DESCRIBED).

WS21 – 1–1.5m = STAINING/DISCOLOURATION.

WS23 – 0–2.0m = ODOUR (NOT DESCRIBED).

WS33 – 0.3–0.6m = STAINING BLACK.

TPEZ–16 – 1.8–2.5m = SULPHUROUS ODOUR.

WSPX3 – 0.7–1.5m – SWEET ODOUR IN SAND.

WSPX37 – 0–2.0m = BLACK STAINING AND CHEMICAL ODOUR.

TPZ6–03 – 0–2.4m = AMINE ODOUR THROUGHOUT, SMALL IBC INFILL.

TPZ6–16 – 0–2.3m = STRONG SULPHUR ODOUR.

TPZ6–1 – 0–2.1m = STRONG SULPHUR ODOUR.

WSPT25 – 1.8–3.2m = STRONG ALMOND ODOUR.

WSPT20 – 2.4–3.8 = STRONG SEWAGE ODOUR.

WSPX10 – 2.5–3.0m = SLIGHT SHEEN ON GROUNDWATER.

WSPX12 – 2.2–4.6m = SEWAGE ODOUR.

WSPT11 – 1.5m = LAND DRAIN WITH OILY CONTENTS.

WSPT38 – 0.8–2.4m = VERY STRONG SEWAGE/AMMONIA ODOUR.

NOTE:

THE OBSERVATIONS LISTED WERE IDENTIFIED IN THE FIELD DURING THE SUPPLEMENTAL SITE INVESTIGATION. THEY ARE PROVIDED AS A GUIDE TO UNDERSTAND WHICH CONDITIONS MAY BE ENCOUNTERED DURING ANY EXCAVATION ACTIVITY AT THE SITE.

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ARCHITECT: N/A

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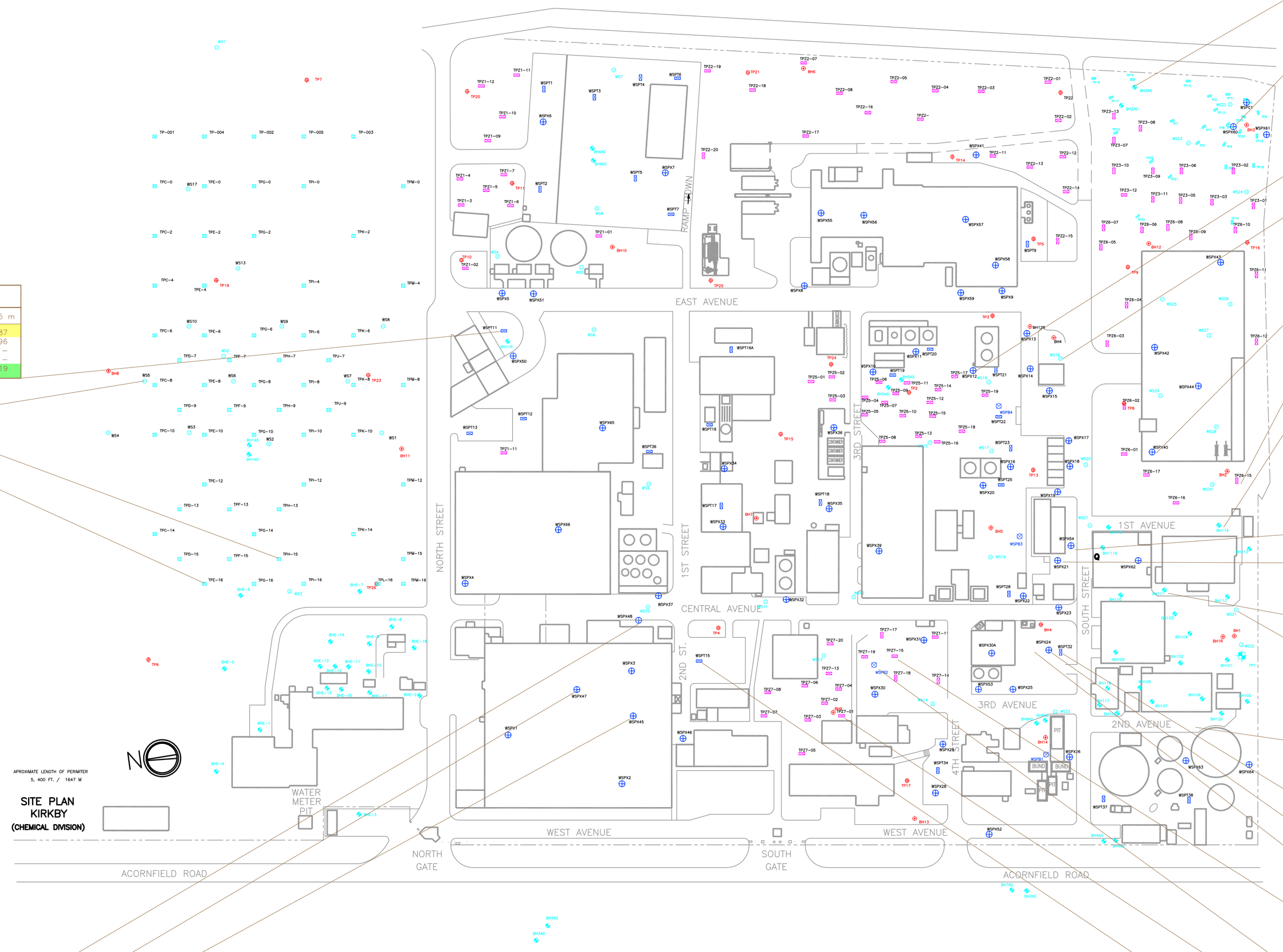
PR0328-01

Figure 13 Soil Contamination

DO NOT SCALE



KEY

- CRA TRIAL PIT
- CRA BOREHOLES
- CRA WINDOW SAMPLES
- ASPINWALL BOREHOLES
- ASPINWALL TRIAL PITS
- 2007 WINDOW SAMPLE HOLES
- 2007 DEEP BOREHOLES
- 2007 TRIAL PITS
- CRA TRIAL PIT 2007

AREA 6 - MOUND AREA		
BH2A mg/kg	1.0–1.5 m	
EPH	2,188	
WSPX60 mg/kg	0.2–0.6 m	
ARSENIC	110	
CADMIUM	17	
MERCURY	36	

AREA 4 - SOLVENT STORAGE		
WSPX20 mg/kg	0.3–0.6 m	
ETHYLBENZENE	11	
XYLENE	81	
WS19 mg/kg	0.5–1.0 m	
CARBAZOLE	1.5	
DIBENZOFURAN	3	

AREA 6 - DRUM STORAGE AREA		
WSPX40 mg/kg	0.8–1.2 m	
COPPER	30,000	
TPZ6-15 mg/kg	0.0–0.5 m	
TPH	1,200	
BH114 mg/kg	0.45 m	
TPH	3,600	
CARBAZOLE	12	
DIBENZOFURAN	16	

AREA 4 - SOLVENT STORAGE		
54-S1 mg/kg	0.6 m	
TPH	1,000	
WSPX21 mg/kg	0.5–0.8 m	
TPH	1,200	
BH111 mg/kg	0.3 m	
TPH	1,200	
ANTHROQUINONE	3.7	
DIBENZOFURAN	11	
CARBAZOLE	11	
WS31 mg/kg	0.1–1.2 m	
Ag	147	
TRICHLOROPHENOL	0.2	

AREA 8 - EFFLUENT TREATMENT PLANT		
25-S2 mg/kg	0.6 m	
TRICHLOROETHENE	0.2	
TETRACHLOROETHENE	0.2	

AREA 5 - ORGINAL SYNCHEM		
WSPT32 mg/kg	1.1 m	2.35 m
ETHYLBENZENE	2.5	2.5
XYLENE	42	11.6
WSPX24 mg/kg	0.5–1.0 m	
XYLENE	41	
15-S1 mg/kg	0.5 m	
TPH	1,600	
TPZ7-15 mg/kg	0.8–1.2 m	
C5–C13 HYDROCARBONS	5,537	
ETHYLBENZENE	85	
XYLENE	450	
WSPB2 mg/kg	3.0 m	
PHENOL	17	
DICHLOROETHENE	2.3	
TRICHLOROETHENE	2.0	
TOLUENE	1.8	
DICHLOROPROPANE	1.7	
TP27 mg/kg	1.0 m	
VANADIUM	900	
NICKEL	560	
WSPT15 mg/kg	0.8–1.0 m	
ARSENIC	110	
CADMIUM	40	
MERCURY	34	

AREA 2 - BULK STORAGE PCD		
WSPT-11 mg/kg	0.4 m	1.5 m
PCB	86	87
XYLENE	6.1	96
TPH	2,100	–
NITROPHENOL	10	–
ETHYLBENZENE	–	19
WS5 mg/kg	1.1–1.3 m	
TPH	14,357	
TPH-15 mg/kg	1.8–2.0 m	
TPH	2,900	
TPE-16 mg/kg	0.9–1.1 m	
TPH	1,100	

AREA 2 - BULK STORAGE PCD	
WSPX48 mg/kg	0.5–0.7 m
TPH	1,000
WSPX47 mg/kg	0.3–0.4 m
ARSENIC	390
WSPX46 mg/kg	0.4–0.6 m
LEAD	1,100

LOCATION
UNITS
YEAR SAMPLED
RESULT
SAMPLE ID
CONSTITUENT

AREA 6 - MOUND AREA		
BH11R mg/kg	1.0–1.5 m	
EPH	2,188	

RISK ASSESSMENT TRIGGER

GROUNDWATER PROTECTION TRIGGER
DETECTED BUT NO ACTION TRIGGERED

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PROJECT: KODAK, KIRKBY

TITLE: SOIL RESULTS SUMMARY

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12121392/001	FIGURE 13	A

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Figure 14 Perched Groundwater Contamination

DO NOT SCALE

KEY

- SHALLOW WELL (MADE GROUND, SHIRDLEY HILL SAND)
- DEEP WELL (RESPONSE ZONE)
- ASPINWALL BOREHOLES
- 2007 DEEP BOREHOLES
- 2007 WINDOW SAMPLE HOLES

BH11R	UG/L	1995	2004
TPH		–	9–52
VINYL CHLORIDE		–	9–52
DICHLOROETHANE		28–191	28–191
DICHLOROETHENE		13–81	13–81
TRICHLOROETHENE		76–250	76–250
TETRACHLOROBENZENE		3.7	3.7

LOCATION
UNITS
YEAR SAMPLED
RESULT
CONSTITUENT

WSPT11	UG/L	2007
BENZENE		640
BROMODICHLOROMETHANE		190
TRICHLOROETHANE		360
TOLUENE		220
ETHYLBENZENE		2,700
XYLENE		14,400

BH11R	UG/L	1995	2004	2005	2006
TPH		–	–	–	6,092
BENZENE		–	–	–	642
TOLUENE		–	–	–	155
ETHYLBENZENE		–	437	–	–
XYLENE		–	–	–	4,165
PHENOL		–	–	8.9	–
DICHLOROETHANE		70	–	–	–
CHLOROBENZENE		69	–	–	–

BH11R	UG/L	2007
TPH		4,200

BH1A	UG/L	2004
DRO		974

BH5AS	UG/L	2007
DRO		76

WSPX56	UG/L	2007
CHLOROETHANE		74
DICHLOROBENZENE		25
XYLENE		250

WSPX12	UG/L	2007
VINYL CHLORIDE		12
DICHLOROETHENE		4
BENZENE		60

BH12R	UG/L	1995	2000	2006
TPH		–	–	770
BENZENE		–	–	294
1,4–DIOXANE		300,000	106	–
DICHLOROETHANE		6	–	–

WSPX15	UG/L	2007
TPH		3,000
VINYL CHLORIDE		8
DICHLOROETHENE		11
BENZENE		180
ETHYLBENZENE		140

WSPX20	UG/L	2007
CHLOROBENZENE		920
DICHLOROBENZENE		25

BH5	UG/L	1995	2000	2004
DRO		–	–	1,407
1,1–DIOXONE		–	40	–
DICHLOROETHANE		2	–	–
CHLOROBENZENE		32	–	–

BH2	UG/L	2004	2005
TPH		–	420
TOLUENE		53	–
PHENOL		–	5.4

WSPX21	UG/L	2007
TPH		6,800
VINYL CHLORIDE		19
DICHLOROETHENE		99
TOLUENE		590
ETHYLBENZENE		120
XYLENE		660

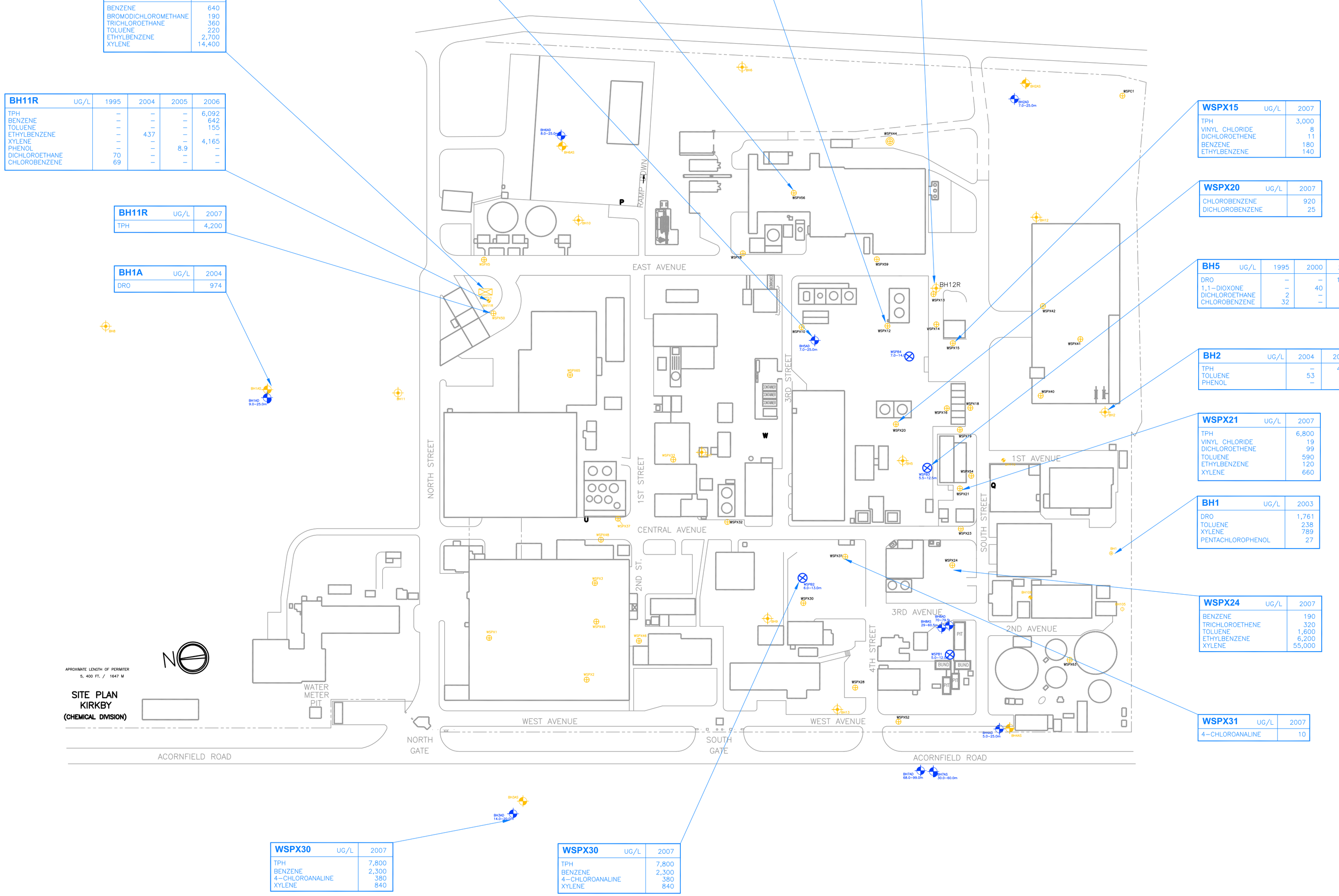
BH1	UG/L	2003
DRO		1,761
TOLUENE		238
XYLENE		789
PENTACHLOROPHENOL		27

WSPX24	UG/L	2007
BENZENE		190
TRICHLOROETHENE		320
TOLUENE		1,600
ETHYLBENZENE		6,200
XYLENE		55,000

WSPX31	UG/L	2007
4–CHLOROANALINE		10

WSPX30	UG/L	2007
TPH		7,800
BENZENE		2,300
4–CHLOROANALINE		380
XYLENE		840

WSPX30	UG/L	2007
TPH		7,800
BENZENE		2,300
4–CHLOROANALINE		380
XYLENE		840



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PROJECT: KODAK, KIRKBY

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Figure 15 Deep Groundwater Contamination

DO NOT SCALE

KEY

- SHALLOW WELL (MADE GROUND, SHIRDLEY HILL SAND)
- DEEP WELL (RESPONSE ZONE)
- ASPINWALL BOREHOLES
- 2007 DEEP BOREHOLES
- 2007 WINDOW SAMPLE HOLES

WSPB1	UG/L
TPH	9–52
VINYL CHLORIDE	9–52
DICHLOROETHANE	28–191
DICHLOROETHENE	13–81
TRICHLORETHENE	76–250
TETRACHLOROBENZENE	3.7

LOCATION
UNITS
RESULT
CONSTITUENT

BH5AD	UG/L
TRIBUTYLIN	2.5

WSPB4	UG/L
TRICHLORETHENE	22
DICHLOROETHANE	<10
DICHLOROETHENE	<10

BH1AD	UG/L
PENTACHLOROPHENOL	12

BH8AD	UG/L
TRICHLORETHENE	11–39

BH8AS	UG/L
TRICHLORETHENE	5–18

WSPB1	UG/L
TPH	9–52
VINYL CHLORIDE	9–52
DICHLOROETHANE	28–191
DICHLOROETHENE	13–81
TRICHLORETHENE	76–250
TETRACHLOROBENZENE	3.7

WSPB2	UG/L
TPH	730
VINYL CHLORIDE	16
DICHLOROETHANE	94

BH7AS	UG/L
TRICHLORETHENE	11–32
TRICHLORETHANE	12
VINYL CHLORIDE	3

BH4AD	UG/L
VINYL CHLORIDE	9–52
TRICHLORETHENE	28–191
CHLOROBENZENE	13–81
TETRACHLOROBENZENE	76–250
TRIBUTYLIN	3.7

EAST AVENUE
NORTH STREET
1ST STREET
2ND ST.
3RD STREET
4TH STREET
SOUTH STREET
CENTRAL AVENUE
1ST AVENUE
2ND AVENUE
3RD AVENUE
WEST AVENUE
WEST AVENUE
ACORNFIELD ROAD
ACORNFIELD ROAD
RAMP DOWN
NORTH GATE
SOUTH GATE
WATER METER PIT
BH12R
APPROXIMATE LENGTH OF PERIMETER 5, 400 FT. / 1647 M

SITE PLAN
KIRKBY
(CHEMICAL DIVISION)

REV	DATE	BY	DESCRIPTION	CHK	APD
A	DD/MM/YY		INITIAL ISSUE		

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PROJECT No:	DRAWING No:	REV:
12121392/001	FIGURE 15	A

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Figure 16 Tetrachloroethene Distribution in Groundwater

Legend
PCE Deep - ug/l
3
4 - 10
PCE Deep < LOD
PCE Deep < LOD
PCE Shallow <LOD
BH5AD
WSPB1

Figure 17 Trichloroethene Distribution in Groundwater

Legend
TCE Shallow - ug/l
5 - 11
12 - 22
23 - 39
40 - 191
192 - 660
TCE Shallow <LOD
TCE Deep - ug/l
5 - 11
12 - 22
23 - 39
40 - 191
192 - 660
TCE Deep < LOD
BH5AD
BH7AD
BH7AS
WSPB1
BH14
BH8AD
WSPB3
WSPB4
BH4AD
WSPX63

Figure 18 1,1 Dichloroethene Distribution in Groundwater

Legend
1,1-Dichloroethene Shallow <LOD
1,1-Dichloroethene Deep - ug/l
10
11 - 14
15
1,1-Dichloroethene Deep < LOD
BH7AS
WSPB1
BH8AS
BH8AD
BH4AD

Figure 19 Cis 1,2 Dichloroethene Distribution in Groundwater

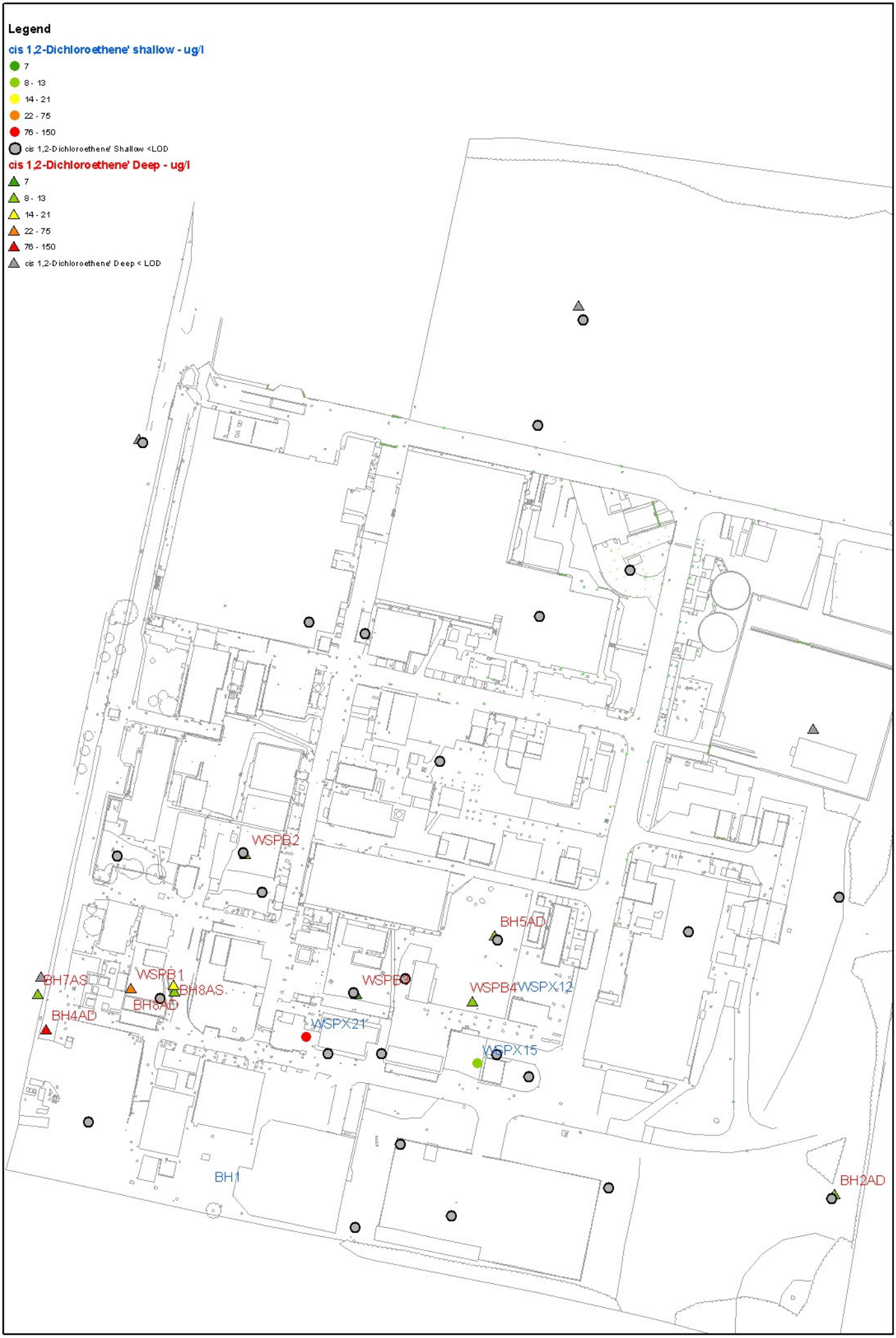
Legend
cis 1,2-Dichloroethene' shallow - ug/l
7
8 - 13
14 - 21
22 - 75
76 - 150
cis 1,2-Dichloroethene' Shallow <LOD
cis 1,2-Dichloroethene' Deep - ug/l
7
8 - 13
14 - 21
22 - 75
76 - 150
cis 1,2-Dichloroethene' Deep < LOD
WSPB2
BH5AD
BH7AS
WSPB1
BH8AS
WSPB3
WSPB4
WSPX12
BH8AD
BH4AD
WSPX21
WSPX15
BH1
BH2AD

Figure 20 Trans 1,2 Dichloroethene Distribution in Groundwater

Legend
Trans-1,2-Dichloroethene shallow - ug/l
7
8 - 13
14 - 21
22 - 75
76 - 150
Trans-1,2-Dichloroethene Shallow < LOD
'Trans-1,2-Dichloroethene' Deep - ug/l
7
8 - 13
14 - 21
22 - 75
76 - 150
'Trans-1,2-Dichloroethene' Deep < LOD
BH5AD
BH7AS
WSPB1
BH8AS
BH4AD
WSPX21

Figure 21 Vinyl Chloride Distribution in Groundwater

Legend
VC Shallow - ug/l
8
10
19
25
52
VCHL Shallow <LOD
VC Deep - ug/l
8
9 - 10
11 - 19
20 - 25
26 - 52
VC Deep < LOD
WSPB2
BH5AD
BH7AS
WSPB1
WSPX12
BH4AD
WSPX21
WSPX15

Figure 22 Tetrachloroethane Distribution in Groundwater

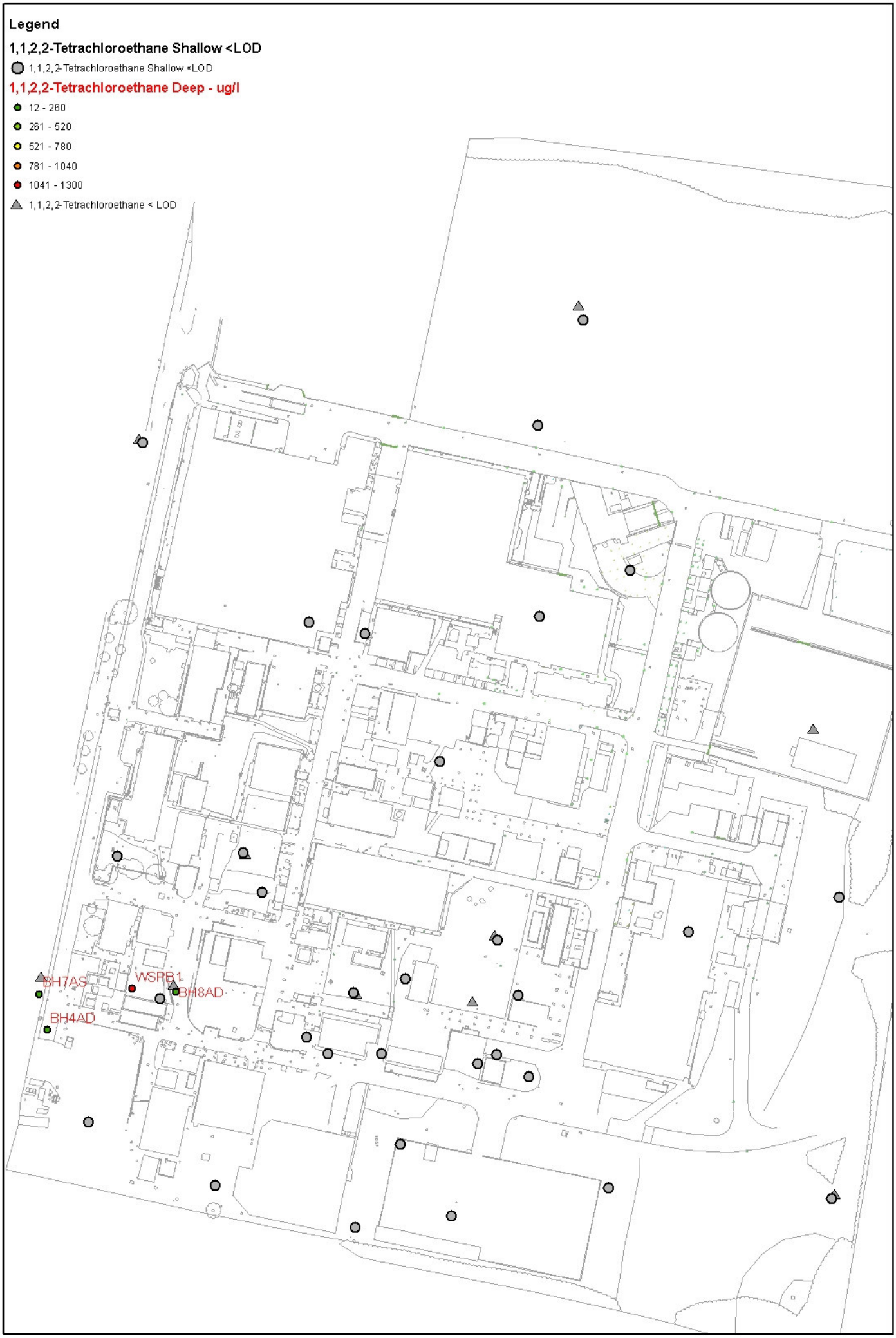
Legend
1,1,2,2-Tetrachloroethane Shallow <LOD
1,1,2,2-Tetrachloroethane Shallow <LOD
1,1,2,2-Tetrachloroethane Deep - ug/l
12 - 260
261 - 520
521 - 780
781 - 1040
1041 - 1300
1,1,2,2-Tetrachloroethane < LOD
BH7AS
WSPB1
BH8AD
BH4AD

Figure 23 1,1 Dichloroethane Distribution in Groundwater

Legend
1,1-Dichloroethane shallow - ug/l
10
25
1,1-Dichloroethane Shallow <LOD
1,1-Dichloroethane Deep - ug/l
10
11 - 14
15
1,1-Dichloroethane' Deep < LOD
WSPB2
BH5AD
WSPX56
BH7AD
BH7AS
WSPB1
BH8AD
BH8AS
WSPB3
WSPB4
BH4AD
BH12R

Factual Report on December 2007 Site Investigation

Former Kodak Site, Kirkby

Kirkby AT LLC

WSP

Issue/revision	Issue 1	Issue 2		
Remarks	Draft	Final		
Date	February 2008	April 2008		
Prepared by	C Kennedy	C Kennedy		
Signature				
Checked by	I Meyer	I Meyer		
Signature				
Authorised by	A Moore	A Moore		
Signature				
Project number	12121392(004)	12121392(004)		
File reference				

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Table of Contents

Table of Contents 3

1. Introduction 1

2. Site Investigation Summary 2

3. Chemical Analysis 11

4. Areas of Concern 13

From previous intrusive investigations within the Bulk Storage Area, numerous chemical / solvent odours have been recorded which are accompanied by predominantly BTEX and chlorinated hydrocarbon impact within soils and perched groundwater. The additional investigation within the area was performed to aid the delineation of the recorded contamination by investigating zones which lack substantial data. From the additional intrusive investigation performed on the Bulk Storage Area there does not appear to be any significantly elevated CoC recorded within the soil and perched groundwater samples analysed. 15

5. Summary 16

Appendix 1 Drawings 17

Appendix 2 Exploratory Hole Logs 18

Appendix 3 Notes on Limitations 19

Appendix 4 Chemical Data 20

FIGURES

Figure 1 Areas of Investigation

Figure 2 Zone 3 – Building 82

Figure 3 Zone 2 – Building 84

Figure 4 Zone 5 – Building 21

Figure 5 Zone 5 – Calamity Pit

Figure 6 Zone 4 – Bulk Storage Area

Figure 7 Identified areas of significant contamination around Building 84

Figure 8 Cross-section A depicting CoC affected strata within Building 84

Figure 9 Cross-section B depicting CoC affected strata within Building 84

Figure 10 Identified areas of significant contamination around Building 82

Figure 11 Cross-section A depicting CoC affected strata within Building 82

1. Introduction

1.1 BACKGROUND TO THE SITE

This report relates to the industrial site formerly operated by Kodak, located off Acornfield Road within the Kirkby Industrial Park, Kirkby, Merseyside. Acorn Properties (Kirkby) Limited (Acorn) has recently purchased the buildings and equipment and secured a long-term leasehold interest to the property from Kodak Chemicals UK Limited (Kodak).

Following the purchase, it is our understanding that Acorn will undertake a programme of refurbishment, plant sales, letting of buildings and possible limited redevelopment. It is understood that the principal site infrastructure such as roads, services and the majority of buildings will remain.

WSP Ltd (WSP) has been retained by Acorn to undertake voluntary remediation works that were identified during the due diligence process in order to manage / mitigate environmental liabilities relating to soil and groundwater contamination.

1.2 PROJECT OBJECTIVES

To facilitate Acorns purchase of the site, WSP undertook a detailed review of all existing environmental data and assisted the design of supplementary investigation. This process identified the sole outstanding potentially significant pollutant linkage relating to the site is the long term risk to deep groundwater within the Sherwood Sandstone from site-derived List 1 Substances. Review of chemical testing data has identified sources of the following chemicals, which also demonstrate the potential for migration, via perched and / or deep groundwater:

- Soil to perched groundwater – toluene, xylene and ethylbenzene.
- Perched groundwater to deep groundwater – dichloroethane, vinyl chloride.
- Soil to perched groundwater to deep groundwater – trichloroethene and dichloroethene.

The review undertaken by WSP did not identify any current statutory environmental liability relating to contamination, specifically with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations.

Acorn takes its environmental responsibilities very seriously and, notwithstanding the absence of an identified statutory liability, is keen to enhance the condition of the property in the current window of opportunity that the partially vacant site presents.

Consequently, WSP has been instructed to undertake voluntary remediation works at the site of all List 1 Substances. To gain further information on specific areas of suspected contamination WSP have undertaken further intrusive investigation works which included:

- The delineation horizontally and vertically of known PCB and TPH contamination within the underlying strata around Building 84 – Zone 2.
- The full delineation of identified contamination within Building 82 – Zone 3
- To investigate and delineate contamination around Building 21 and the Calamity Pit (in Zone 5) and around the bulk storage area (Zone 4).

1.3 REPORT OBJECTIVES

The objectives of this report are as follows:

- To delineate contaminants of concern (CoCs) around buildings 82, 84, and the bulk storage area.
- Further intrusive investigation within the footprint of the Synchem Buildings (Building 82) to aid in accessing the impact of historic processes on the underlying strata and groundwater.
- Investigate the requirement for remediation beneath Building 24 and around the Calamity Pit in Zone 5

2. Site Investigation Summary

2.1 RATIONALE FOR INTRUSIVE INVESTIGATION

From the previous investigations performed upon the site a number of gaps in information were identified which need to be addressed to assist in the design of the proposed remediation works. Below are the areas of concern which require contamination delineation works:

- Zone 3 – Building 82 (Synchem): where access has previously been limited, due to site operations and there is sufficient evidence to suggest that solvent impact may be present around the solvent mixing and chemical batching areas together with a historical leak around the chemical drains.

- Zone 2 – Building 84 (former toner storage area): PCB and deeper petroleum based contamination has been recorded within previous investigations. Delineation of these determinands is required to determine the cost vs. benefit of removing or encapsulating this area

- Zone 4 – Building 21, The Calamity Pit and Bulk Storage Area: to assess the requirement for remediation and demolition.

2.2 GROUND INVESTIGATION

2.2.1 Description of Fieldwork

The aim of the site investigation was to asses the presence and extent of CoC within the underlying strata around buildings 82, 84, 24, the Calamity Pit and the bulk storage area to allow for the design of appropriate delineation measures.

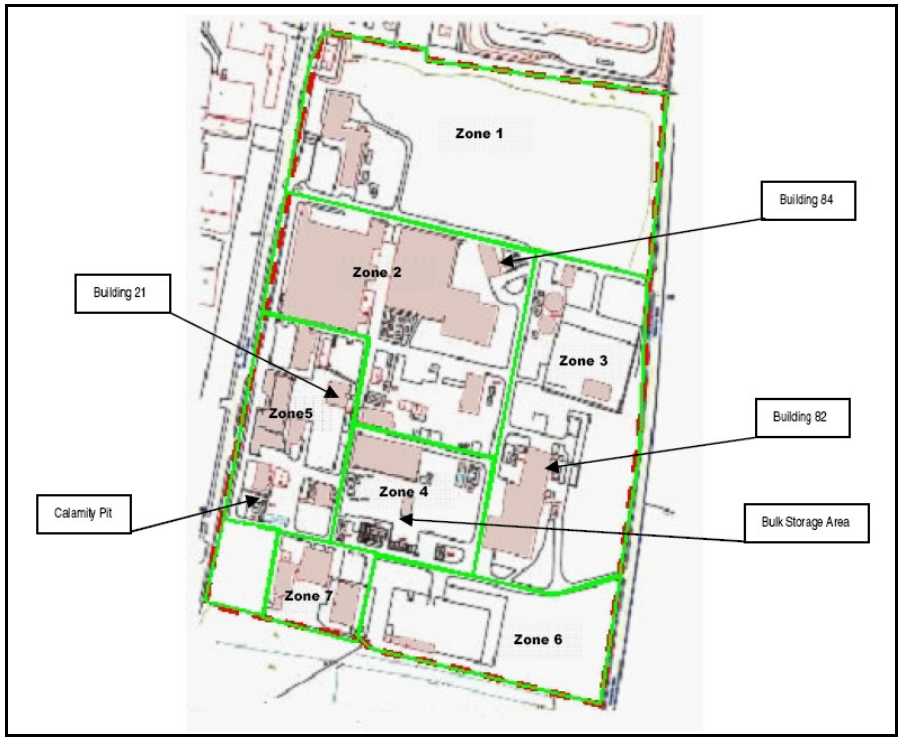

Figure 1: Areas of Investigation

Eighty two window sampling holes were progressed to a maximum of 4.90m below ground level (bgl) to assess ground conditions, and to allow the collection of chemical samples for laboratory testing. Where appropriate groundwater monitoring installations were constructed within the window sampling holes to allow collection of perched groundwater samples for chemical testing. The following table presents the number of exploratory holes driven and also the number of groundwater installations constructed within each area:

Area	Number of exploratory holes	Number of installations
Zone 3 – Building 82	13	12
Zone 2 – Building 84	57	20
Zone 5 – Building 21	7	5
Zone 5 – Calamity Pit	3	2
Zone 4 – Bulk Storage Area	2	2

2.3 BUILDING 82

Figure 2: Building 82

2.3.1 Ground Conditions

Made ground was encountered in all exploratory holes to depths of between 0.5m (WSPRA10) and 2.50m bgl (WSPRA13) and comprised of either; a soft brown gravelly clay, a sandy gravel or relict topsoil. Materials identified within the Made Ground included ash clinker, brick, concrete and limestone.

Underlying the Made Ground are interbedded sands and clays of various competence to a maximum depth of 4.00m bgl .Within WSPRA12 peaty material was encountered between 1.20m and 1.70m bgl.

Exploratory hole locations inside the building were inhibited by overhead obstructions which hindered the working operation of the drilling rig and by subsurface concrete beams which form part of the buildings foundations.

2.3.2 Contamination Observed

The following table highlights any visual or olfactory evidence of contamination noted during the intrusive works:

Exploratory Hole	Contamination noted	Depth of contamination (m bgl)
WSPRA1	Strong solvent staining and odour	0.30 – 0.70m
WSPRA1	Strong Hydrocarbon and solvent odour.	0.70 – 1.10m
WSPRA1	Solvent staining and odour.	1.10 – 2.40m
WSPRA1	Strong solvent odour.	2.50 – 4.00m
WSPRA3	Solvent odour	0.30 – 0.90m
WSPRA3	Ammonium odour	0.90 – 1.60m
WSPRA5	Strong Hydrocarbon staining and odour	0.30 – 0.90m
WSPRA5	Ammonium odour	1.80 – 1.90m
WSPRA6	Ammonium odour	2.50 – 2.70m
WSPRA6	Solvent staining and odour	3.10 – 3.50m
WSPRA6	Solvent odour	3.50 – 4.00m
WSPRA7	Strong Hydrocarbon odour	0.30 – 0.50m
WSPRA7	Ammonium odour	1.30 – 1.50m
WSPRA8	Strong Ammonium odour	0.80 – 2.30m
WSPRA9	Solvent and Ammonium odour	1.10 – 1.90m
WSPRA10	Slight Ammonium odour	0.50 – 1.10m
WSPRA10	Slight Ammonium and solvent odour	1.50 – 1.70m
WSPRA11	Hydrocarbon odour	1.10 – 1.60m

The majority of the apparent contamination was either encountered within the Made Ground or the glacial sand lenses.

2.4 BUILDING 84

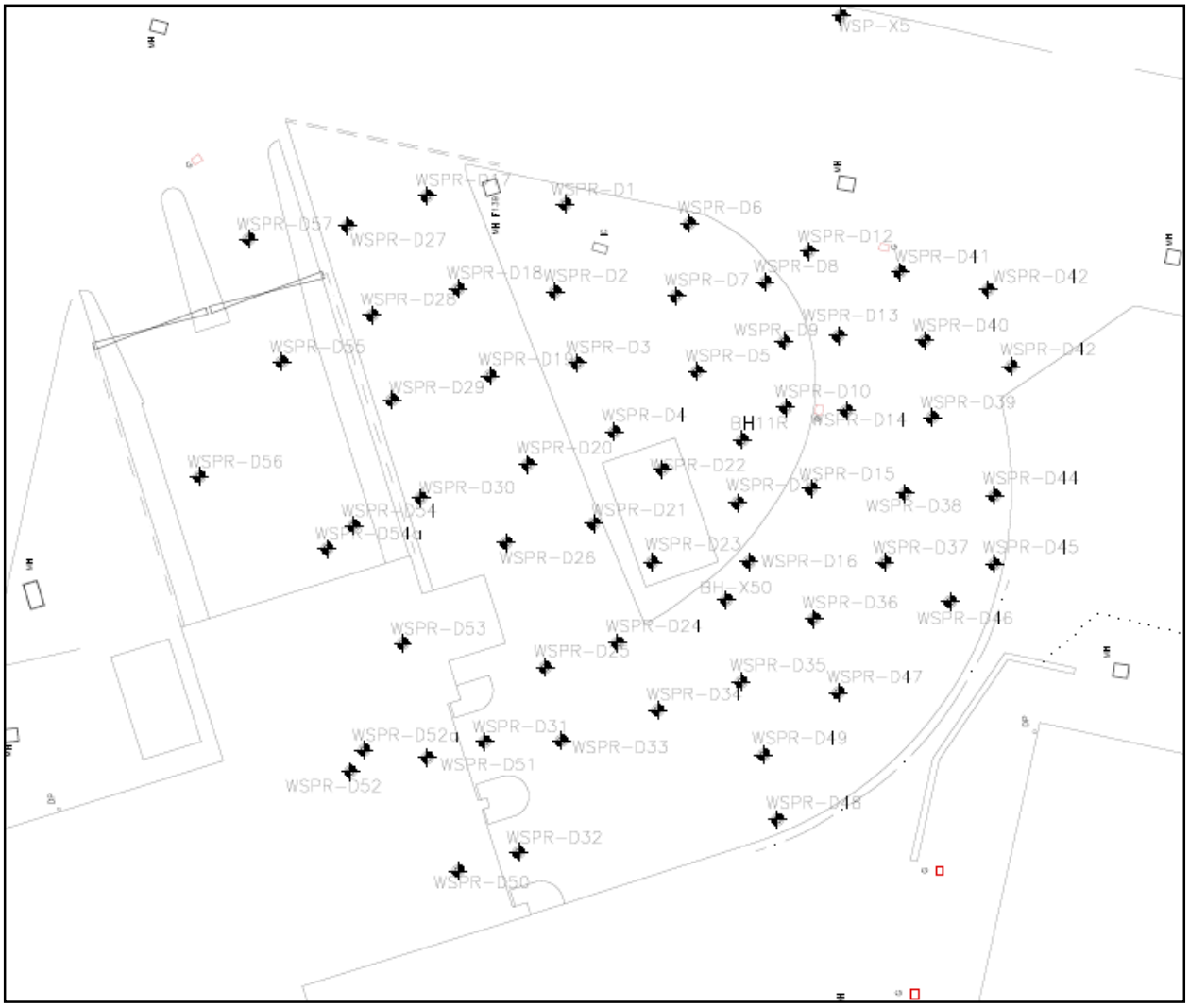

Figure 3: Building 84

2.4.1 Ground Conditions

Made ground was encountered in all exploratory holes to depths of between 0.50m (WSPD37) and 3.10m bgl (WSPRD9) and comprised of either a gravelly sand or a sandy gravel. Materials identified within the Made Ground included ash clinker, brick, glass, clay piping, concrete and limestone.

Underlying the Made Ground are interbedded sands and clays of varying competence encountered to a maximum depth of 4.00m bgl.

A number of exploratory holes had to be abandoned before reaching there desired depth due to obstructions, the following table details these.

Exploratory Hole	Depth of Obstruction	Obstruction observation
WSPRD16	2.50m bgl	None noted
WSPRD26	1.00m bgl	Possible brick structure
WSPRD33	0.60m bgl	None noted
WSPRD34	0.60m bgl	None noted
WSPRD52A	1.50m bgl	None noted
WSPRD53	0.50m bgl	None noted
WSPRD54	0.50m bgl	None noted
WSPRD55	0.60m bgl	None noted

2.4.2 Contamination Observed

The following table highlights any visual or olfactory evidence of contamination noted during the intrusive works:

Exploratory Hole	Contamination noted	Depth of contamination (m bgl)
WSPRD4	Hydrocarbon Free Phase Product	3.50 – 4.00m
WSPRD5	Hydrocarbon Sheen	1.80 – 1.90m
WSPRD8	Hydrocarbon Staining	1.40 – 1.60m
WSPRD19	Hydrocarbon Staining	1.50 – 1.60m
WSPRD20	Hydrocarbon Staining	1.60 – 1.70m
WSPRD21	Hydrocarbon Staining	0.50 – 1.50m
WSPRD23	Hydrocarbon Staining	1.00 – 2.00m
WSPRD30	Hydrocarbon Staining	1.40 – 1.70m
WSPRD31	Hydrocarbon Staining	1.20 – 1.70m
WSPRD50	Hydrocarbon Staining	1.40 -1.60m

No olfactory evidence of contamination was noted due to no significant PID readings and health and safety issues which required the engineer to wear an organic vapour filter mask.

The majority of the contamination was either encountered within the Made Ground or the glacial sand lenses.

2.5 BUILDING 21

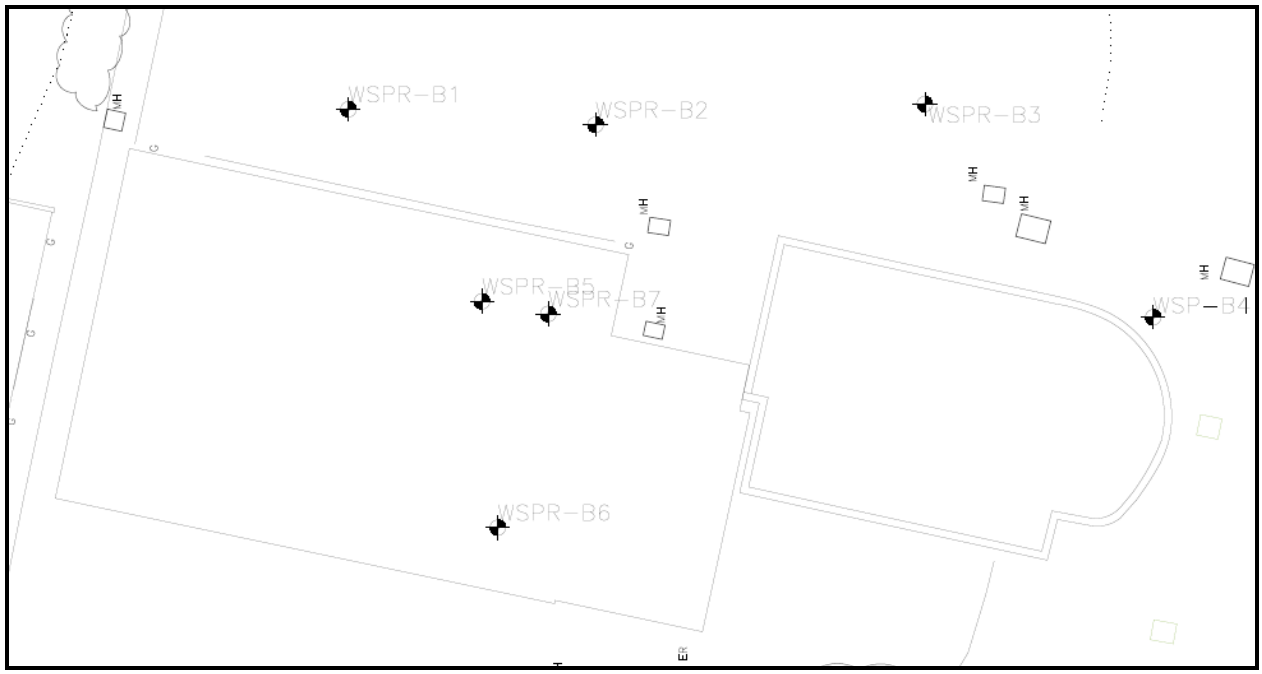

Figure 4: Building 21

2.5.1 Ground Conditions

Made ground was encountered in all exploratory holes to depths of between 0.40m (WSPRB4) and 0.80m bgl (WSPRB8) and comprised of a black sandy gravel or gravelly sand. Materials identified within the Made Ground included ash clinker, brick concrete and limestone.

Underlying the Made Ground are interbedded sands and clays of various competence to a maximum depth of 4.00m bgl.

Exploratory hole WSPRB5 which was inside Building 21 was inhibited by a concrete floor slabs in excess of 0.50mbgl, on other obstructions were observed during the investigation.

2.5.2 Contamination Observed

The following table highlights any visual or olfactory evidence of contamination noted during the intrusive works:

Exploratory Hole	Contamination noted	Depth of contamination (m bgl)
WSPRB1	Slight Hydrocarbon odour.	0.50 – 0.90
WSPRB1	Solvent odour.	1.20 – 2.00
WSPRB2	Slight solvent odour.	1.20 – 1.90
WSPRB2	Slight solvent odour.	2.30 – 4.00
WSPRB3	Hydrocarbon staining and odour.	1.20 – 1.60
WSPRB4	Hydrocarbon staining and odour.	1.40 – 1.80

The majority of the contamination was either encountered within the Made Ground or the glacial sand lenses with the exception of WSPR.B1 (1.20 – 2.00) and WSPRB2 (2.30 – 4.00) which noted solvent odours within the glacial clay.

2.6 CALAMITY PIT

Figure 5: Calamity Pit

2.6.1 Ground Conditions

Made ground was encountered in all exploratory holes to depths of between 0.50m (WSPRC1) and 1.90m bgl (WSPRC2) and comprised of a sandy gravel. Materials identified within the Made Ground included brick concrete and limestone.

Underlying the Made Ground are interbedded sands and clays of various competencies to a maximum depth of 4.50m bgl (WSPRC3).

2.6.2 Contamination Observed

During the intrusive investigation within this area no visual or olfactory evidence of contamination was noted.

2.7 BULK STORAGE AREA

Figure 6: Bulk Storage Area

2.7.1 Ground Conditions

Made ground was encountered within the two exploratory holes to a maximum depth of 1.10m bgl (WSPRE2) and comprised of a gravelly sand. Materials identified within the Made Ground included, brick and sandstone.

Underlying the Made Ground are interbedded sands and clays of various competence to a maximum depth of 4.00m bgl.

2.7.2 Contamination Observed

During the intrusive investigation within this area no visual or olfactory evidence of contamination was noted.

3. Chemical Analysis

Chemical analysis was undertaken upon the areas of concern to allow:

- Verification of the presence of significant contamination
- Detailed delineation of various determinands within the areas of concern
- provide information on the quality of shallow perched groundwater beneath the site;

Chemical testing was carried out at Alcontrol Geochem, Chester. Testing certificates and details of the quality assurance, quality control and accreditation for the laboratories are shown in Appendix C.

3.1 ANALYSES

The following table depicts the specific determinands tested and quantity of chemical analysis performed on soil samples obtained from each of the areas of concern:

Area	Number of Samples Tested	Type of Analysis
Building 84	114	PCB, Speciated TPH, VOC
Building 82	22	VOC, SVOC, Speciated TPH
Building 21	8	Speciated TPH,
Calamity Pit	3	VOC, SVOC
Bulk Storage Area	4	Speciated TPH, VOC, SVOC

The range of analytes were determined by testing any contaminants which appeared elevated from the previous investigation and also testing for known chemicals used within the areas of concern. This allowed delineation of any previously recorded contamination and verification on whether the area poses a significant contamination risk.

A Photo Ionisation Detector (PID) was used during the intrusive works to gain further information regarding VOC contamination within the underlying strata. Due to the lack of significantly elevated readings recorded (presented within exploratory hole logs within Appendix B), it is considered unnecessary to discuss these results further.

A similar suite of analysis was undertaken for water samples obtained from the exploratory holes containing installations.

3.2 SUMMARY OF ENVIRONMENTAL RISK ASSESSMENT

The environmental risk assessment for areas of concern has assumed a continued industrial use and considered potential risks to human health and the wider environment. None of the identified receptors are considered to be at significant risk from contamination beneath the study area.

WSP has calculated remedial targets for soils and perched groundwater (reference 1). The chemical data collated from the intrusive investigation was subsequently compared to these values in order to assess whether an environmental risk is present within the subject areas or not.

Remedial targets produced for the voluntary remediation works are summarised in the table below:

	Former Synchem Area		Bulk Storage Area & Building 82		Building 84 BH11R Hot-Spot	
Contaminant	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)
Benzene	17	11	29	17	7	7
Toluene	729	466	125	37	4660	38
Ethylbenzene	261	111	71	20	39	15
Xylene	362	119	90	20	1500	17
Trichloroethene	3.2	2.1	13.5	7	NR	NR
Dichlorethene	12	5.7	41	23	NR	NR
Dichloroethane	NR	NR	4	2.1	NR	NR
Vinyl Chloride	NR	NR	0.85	0.55	NR	NR

* NA – Contaminant not applicable in this area.

4. Areas of Concern

From the intrusive investigation Building 84 and Building 82 are considered to be potential risks in terms of recorded contamination within the underlying strata and perched groundwater. The following section details the reasoning behind this statement.

4.1 BUILDING 84

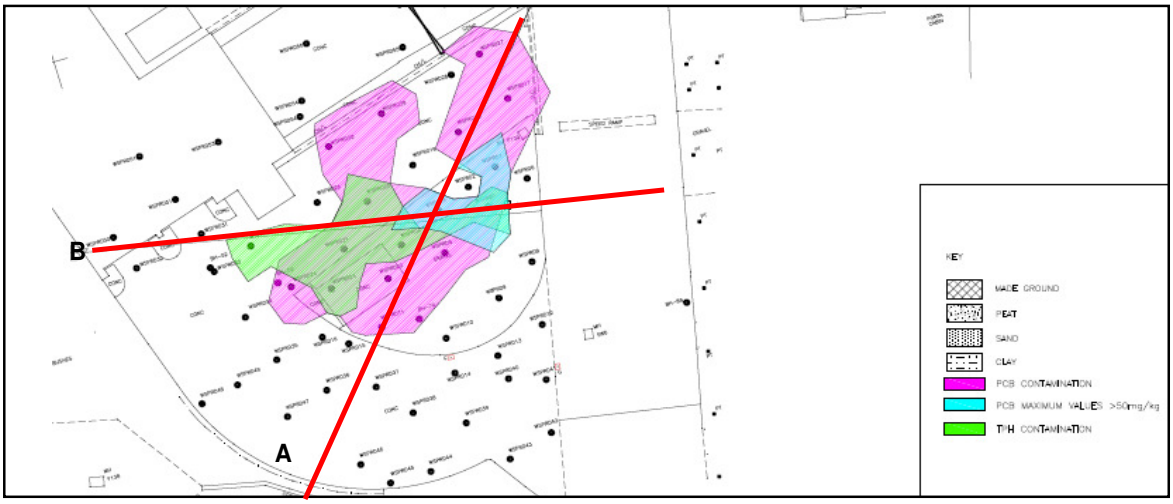

Figure 7 Identified areas of significant contamination around Building 84

From the chemical data recovered for Building 84 there appears two main contaminants of concern (CoC), PCB's and TPH's, which are affecting different strata at varying depths. A detailed drawing depicting the affected areas and strata is presented on Drawing 2 located within Appendix A.

Due to the high density of exploratory holes within the area (3.00m grid) the areas affected by elevated PCB have been sufficiently delineated.

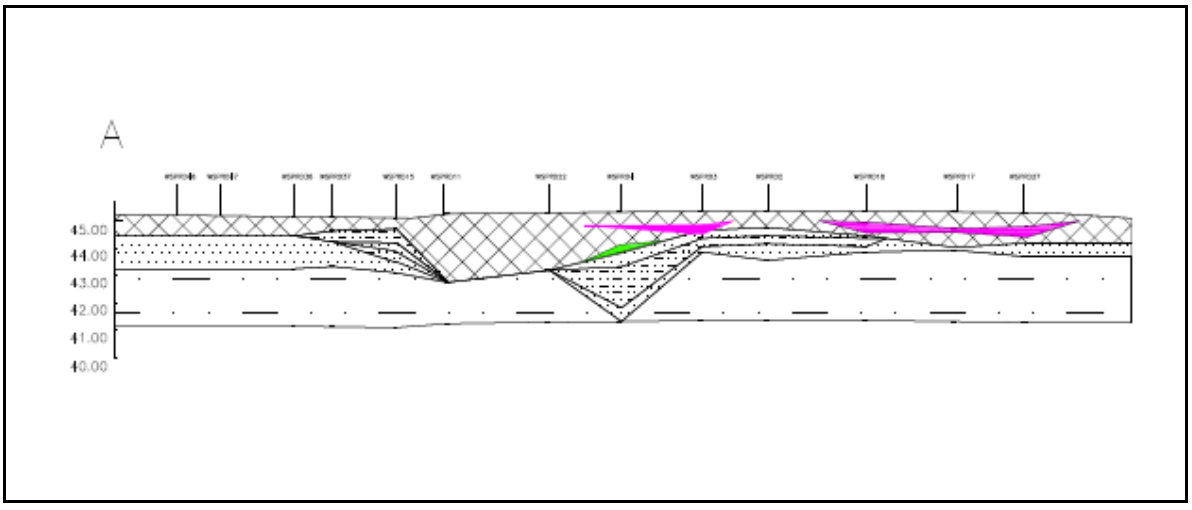

Figure 8 Cross-section A depicting CoC affected strata within Building 84

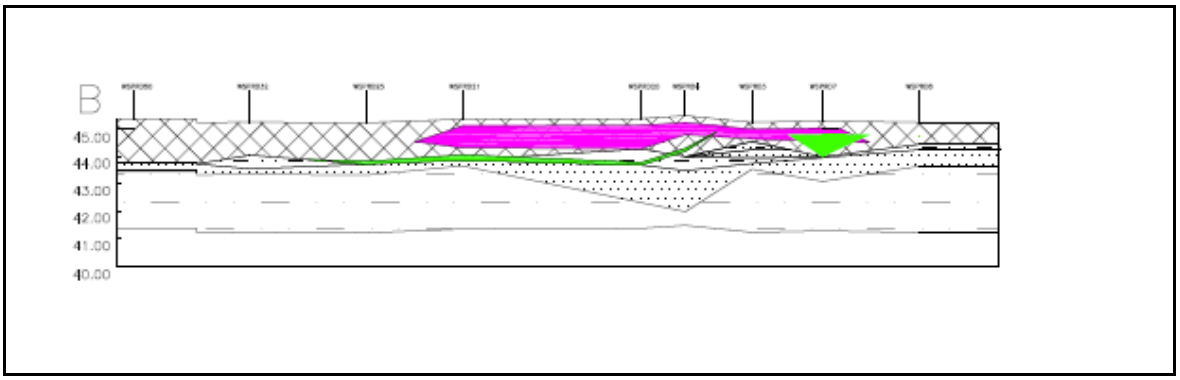

Figure 9 Cross-section B depicting CoC affected strata within Building 84

Elevated PCB contamination has been encountered sporadically within the central and north-eastern corner. The impacted strata appears to be the shallow Made Ground indicating that the PCB probably were imported to the area via fill as anecdotal evidence suggests that a land raising exercise may have occurred within this area. This argument is further strengthened by third party knowledge that historically the area was used as a dumping ground for any spoil materials recovered from site.

The nature of the recorded elevated TPH within the central area of Building 84 indicates a historical spillage which has migrated vertically and horizontally through the underlying strata. The likely centre point of the contamination appears to be around WSPR21 with the elevated values recorded within a glacial sand lens. The glacial clay beneath the sand appears to have inhibited the vertical migration any further.

Free phase product identification analysis classification was undertaken on two samples WSPRD4 and WSPRD21. From the information received it is considered that the product recovered is used engine oil.

No perched groundwater contamination was recorded from the samples tested.

4.2 BUILDING 82

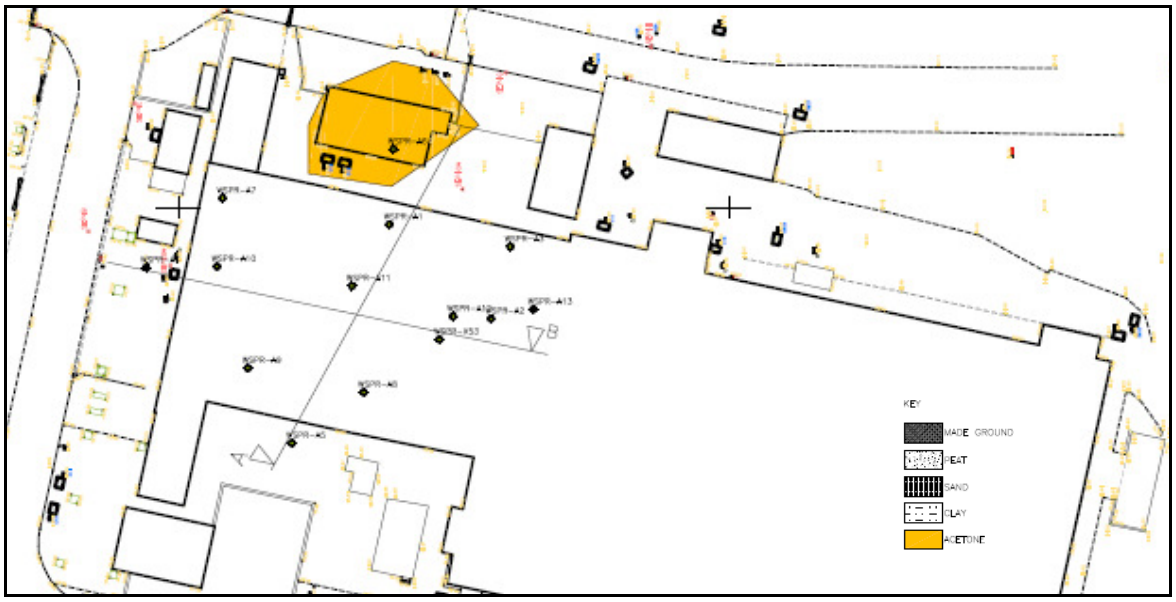

Figure 10 Identified areas of significant contamination around Building 82

From the chemical data recovered for Building 82 elevated Acetone appears to be the only CoC, which is located within a localised area around WSPRA6. A detailed drawing depicting the affected area and strata is presented on Drawing 3 within Appendix A.

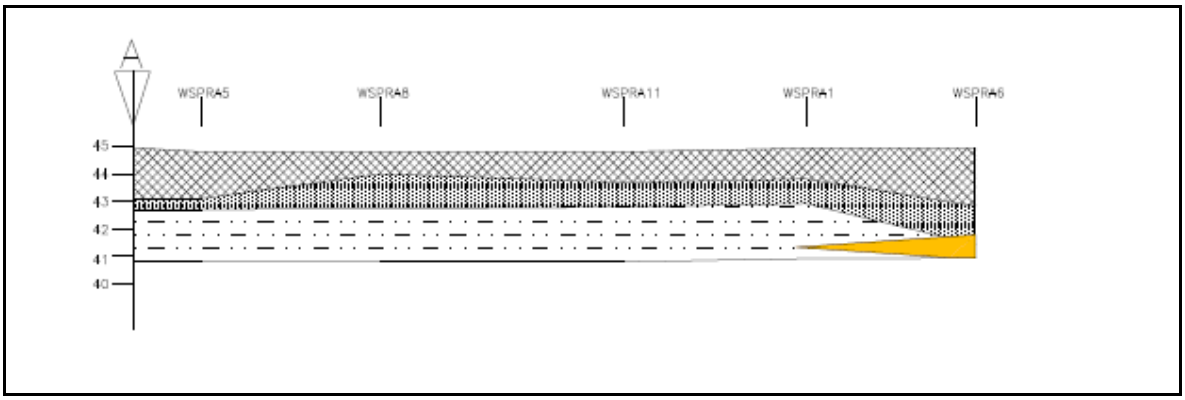

Figure 11 Cross-section A depicting CoC affected strata within Building 82

By looking at the cross-section figure 11 the Acetone contamination is localised to the glacial sand and that the underlying glacial clay is inhibiting the vertical migration towards the sandstone aquifer.

No perched groundwater contamination was recorded from the two perched groundwater samples tested.

4.3 BUILDING 21

From the intrusive investigation performed on Building 21 there does not appear to be any significantly elevated CoCs recorded within the soil and perched groundwater samples analysed, therefore further works within this area appear unnecessary at this time

4.4 CALAMITY PIT

From the intrusive investigation performed on the Calamity Pit there does not appear to be any significantly elevated CoCs recorded within the soil and perched groundwater samples analysed, therefore further works within this area appear unnecessary at this time.

4.5 BULK STORAGE AREA

From previous intrusive investigations within the Bulk Storage Area, numerous chemical / solvent odours have been recorded which are accompanied by predominantly BTEX and chlorinated hydrocarbon impact within soils and perched groundwater. The additional investigation within the area was performed to aid the delineation of the recorded contamination by investigating zones which lack substantial data. From the additional intrusive investigation performed on the Bulk Storage Area there does not appear to be any significantly elevated CoC recorded within the soil and perched groundwater samples analysed.

5. Summary

BUILDING 82

From the intrusive works performed localised PCB and TPH contamination exists within the shallow strata.

BUILDING 84

From the intrusive works performed localised Acetone contamination exists around WSPRA6

BUILDING 21

No additional contamination was noted during the most recent intrusive investigation therefore no additional works are considered necessary in addition to the remediation measure already agreed.

CALAMITY PIT

No contamination was noted during the intrusive investigation therefore no further works are considered necessary.

BULK STORAGE AREA

No additional contamination was noted during the most recent intrusive investigation therefore no additional works are considered necessary in addition to the remediation measure already agreed.

Appendix 1 Drawings

Appendix 2 Exploratory Hole Logs

WSP Environmental
200-220 The Quays, Salford
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Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A1
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					(0.40) 0.70	Brown gravelly SAND. Gravel is fine to coarse, angular to subrounded of sandstone with rare gravels of brick and concrete (MADE GROUND)			
0.60						0.30 - 0.70 Strong solvent staining and odour.			
					(0.40) 1.10	Black slightly gravelly clayey SAND with frequent rootlets. Gravel is fine to coarse, angular to subrounded of sandstone (MADE GROUND - Relic Topsoil).			
						0.70 - 1.10 Strong Hydrocarbon and Solvent odour.			
1.50					(1.40)	Brown fine rounded SAND (GLACIAL DEPOSITS). 1.10 - 2.40 Strong solvent staining and odour.			
					2.50	2.40 - 2.50 Slight water ingress.			
					(1.44)	2.50 - 4.00 Strong solvent odour. Soft to firm grey slightly sandy CLAY with some rootlets (GLACIAL DEPOSITS).			
3.10					4.00	Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. Groundwater encountered at 2.40m bgl. Visual and olfactory evidence of solvent contamination from 0.30-4mbgl, olfactory evidence of hydrocarbon contamination from 0.7-1.1m bgl. Window sample installed upon completion. Response zone from 1.00-4.00m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A10
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					0.50	Grey fine to coarse, angular to subrounded sandy GRAVEL of limestone and concrete (MADE GROUND - MOT).			
0.80					(0.60) 1.10	Brown gravelly SAND. Gravel is fine to coarse, angular to subrounded of sandstone (MADE GROUND). 0.50 - 1.10 Slight ammonium odour.			
1.50					(1.10) 2.20	Brown medium to fine rounded slightly gravelly SAND. Gravel is fine to medium, subangular to rounded of sandstone (GLACIAL DEPOSITS). 1.50 - 1.70 Ammonium and solvent odour.			
2.50					(1.80) 4.00	Firm to stiff brown slightly gravelly CLAY with interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A11
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30)	CONCRETE			
					0.30				
					0.40	Soft grey slightly gravelly CLAY. Gravel is fine to coarse, angular to subrounded of concrete and limestone (MADE GROUND).			
0.50					(0.50)	Brown gravelly SAND. Gravel is fine to coarse, angualar to subrounded of sandstone and rare brick (MADE GROUND).			
					0.90				
					1.10	Black peaty clayey SAND with frequent rootlets and organic material (POSSIBLE RELIC TOPSOIL).			
						Brown rounded fine to medium SAND (GLACIAL DEPOSITS). 1.10 - 1.60 Hydrocarbon odour.			
1.50					(0.90)				
					2.00				
						Firm brown slightly gravelly CLAY with frequent interbedded sand lenses (GLACIAL DEPOSITS).			
					(2.00)				
					4.00				
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A12
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					(0.50) 0.80	Brown very sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of limestone and concrete (MADE GROUND - MOT).			
					(0.40) 1.20	Black clayey slightly gravelly SAND. Gravel is fine to medium, subangular to rounded of brick and sandstone (MADE GROUND - POSSIBLE MOT).			
1.30					(0.50) 1.70	Black slightly clayey PEAT with high organic content.			
					(0.70) 2.40	Brown medium to fine rounded SAND (GLACIAL DEPOSITS).			
2.30					(1.60) 3.50	Firm becoming Stiff brown slightly gravelly CLAY with interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS). Slight water ingress.			
3.30					4.00	Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A13
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					(1.80) 2.10	Brown clayey very sandy GRAVEL with rootlets. Gravel is fine to coarse, angular to subrounded of brick, concrete and sandstone (MADE GROUND).			
1.10									
					2.20	Black sandy CLAY (MADE GROUND - RELIC TOPSOIL).			
2.30					(0.30) 2.50	Black slightly sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of ash and clinker (MADE GROUND).			
					(1.50) 4.00	Brown rounded fine to medium SAND (GLACIAL DEPOSITS). 3.20 Blown sands with water ingress.			
						Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A3
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					(0.50) 0.80	Brown slightly gravelly SAND. Gravel is fine to coarse, angular to subrounded of concrete and sandstone (MADE GROUND).			
0.80					0.90	Black SAND AND GRAVEL. Gravel is fine to coarse, angular to subrounded of ash and clinker (MADE GROUND). 0.80 - 0.90 Strong solvent odour.			
					(0.70) 1.60	Brown very gravelly SAND. Gravel is fine to coarse, angular to subrounded of sandstone (MADE GROUND). 0.90 - 1.60 Slight hydrocarbon odour.			
					1.70	Soft brown sandy CLAY with frequent rootlets (MADE GROUND - RELIC TOPSOIL)			
1.80					(0.40) 2.10	Black clayey slightly peaty SAND (GLACIAL DEPOSITS).			
					(0.60) 2.70	Brown fine to medium rounded SAND (GLACIAL DEPOSITS). 2.10 - 2.70 Water ingress.			
2.50					(1.30) 4.00	Soft to firm grey slightly sandy CLAY (GLACIAL DEPOSITS).			
						Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. Groundwater encountered at 2.10m bgl. Visual and olfactory evidence of solvent contamination from 0.80-0.9mbgl, olfactory evidence of hydrocarbon contamination from 0.9-1.6m bgl, visual and olfactory evidence of hydrocarbon contamination from 2.10-2.70m bgl. Window sample installed upon completion. Response zone from 1.00-4.00m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A4
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					(0.40) 0.70	Grey coarse angular GRAVEL of limestone and sandstone (MADE GROUND - MOT)			
0.80					(0.60) 1.30	Black sandy clayey GRAVEL. Gravel is fine to coarse, angular to subrounded of brick concrete and sandstone (MADE GROUND). 0.90 - 1.00 BRICK COBBLE.			
1.80					(2.70)	Soft brown mottled grey slightly gravelly slightly sandy CLAY. Gravel is fine to medium, subangular to subrounded of sandstone (MADE GROUND).			
3.50					4.00	Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. Groundwater encountered at 2.10m bgl. No visual or olfactory evidence of contamination observed during excavation. Window sample installed upon completion. Response zone from 1.00-3.40m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP WINDOW SAMPLE LOG LOGSA1-C3.GPJ AGS_3.1_ALL.GDT 11/12/07

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Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				A5
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	Grey coarse angular GRAVEL of limestone and sandstone (MADE GROUND - MOT)			
0.50					(0.60) 0.90	Grey coarse angular GRAVELS AND COBBLES of sandstone (MADE GROUND). 0.30 - 0.90 Strong Hydrocarbon odour and Heavy Staining.			
					(0.30) 1.20	Brown sandy Gravel. Gravel is fine to coarse, angular to subrounded of brick and sandstone (MADE GROUND). 0.90 - 1.00 ammonium Staining.			
1.50					(0.50) 1.70	Brown black clayey SAND with frequent rootlets (MADE GROUND - RELIC TOPSOIL).			
					(0.40) 2.10	Medium dense brown fine to medium, rounded SAND (GLACIAL DEPOSITS). 1.80 - 1.90 Strong ammonium odour.			
3.50					(1.90) 4.00	Soft brown slightly sandy CLAY with interbedded sand lenses (GLACIAL DEPOSITS).			
						Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. No groundwater encountered. Visual and olfactory evidence of hydrocarbon contamination from 0.30-0.9m bgl, visual evidence of ammonia contamination from 0.90-1.00m bgl, visual and olfactory evidence of ammonia contamination from 1.80-1.90m bgl. Window sample installed upon completion. Response zone from 1.00-4.00m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				A6
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.20	CONCRETE			
					(1.60) 1.80	Light Brown grey very sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of sandstone and limestone (MADE GROUND - MOT).			
1.90					(0.30) 2.10	Black brown clayey SAND with rare sandstone gravels and frequent rootlets (MADE GROUND - POSSIBLE RELIC TOPSOIL)			
2.50					(1.40) 3.50	Loose brown medium to fine rounded SAND (GLACIAL DEPOSITS). 2.50 - 2.70 Strong ammonium odour and heavy odour. 3.10 - 3.50 Strong solvent odour.			
3.40					(0.50) 4.00	Stiff brown gravelly CLAY with interbedded sand lenses. Gravel is fine to coarse, subangular to rounded of sandstone (GLACIAL DEPOSITS). 3.50 - 4.00 Solvent odour becoming less prevalent with depth.			
						Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. No groundwater encountered. Visual and olfactory evidence of ammonia contamination from 2.50-2.70m bgl, visual and olfactory evidence of solvent contamination from 3.1-4m bgl. Window sample installed upon completion. Response zone from 1.00-3.50m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				A7
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
0.50					(0.60) 0.90	Light brown gravelly SAND. Gravel is fine to coarse, angular to subrounded of sandstone and rare brick (MADE GROUND) 0.30 - 0.50 Strong hydrocarbon odour.			
					1.10	Black brown clayey SAND with rare sandstone gravels and frequent rootlets (MADE GROUND - RELIC TOPSOIL)			
1.40					(0.40) 1.50	Brown rounded fine to medium SAND (GLACIAL DEPOSITS). 1.30 - 1.50 Strong ammonium odour.			
					(2.50) 4.00	Soft brown slightly gravelly CLAY with interbedded sand lenses. Gravel is fine to medium, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
3.50						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

Window sample complete at 4.00m bgl. No groundwater encountered. Visual and olfactory evidence of ammonia contamination from 2.50-2.70m bgl, visual and olfactory evidence of solvent contamination from 3.1-4m bgl. Window sample installed upon completion. Response zone from 1.00-3.50m bgl.

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				A8
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.40) 0.40	CONCRETE			
					(0.40) 0.80	Brown gravelly SAND. Gravel is fine to coarse, angular to subrounded of sandstone and concrete (MADE GROUND).			
1.20					(1.20) 2.00	Black rounded medium to fine SAND with rare sandstone gravels (GLACIAL DEPOSITS). 0.80 - 2.00 Strong ammonium and solvent odour with heavy staining.			
2.10					(2.00) 4.00	Soft to firm grey slightly gravelly slightly sandy CLAY with frequent interbedded sand lenses. Gravel is fine to medium, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				A9
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.40) 0.40	CONCRETE			
					(0.40) 0.80	Brown sandy Gravel. Gravel is fine to coarse, angular to subrounded of sandstone and concrete (MADE GROUND).			
					(0.30) 1.10	Black brown clayey slightly gravelly SAND with frequent rootlets . Gravel is fine to coarse, angular to subrounded of brick and sandstone (MADE GROUND - RELIC TOPSOIL).			
1.50					(0.90) 2.00	Loose brown medium to fine rounded SAND (GLACIAL DEPOSITS). 1.10 - 1.90 Solvent and ammonium odour.			
2.50					(2.00) 4.00	Soft brown slightly gravelly sandy CLAY. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS). 2.00 - 4.00 Becoming less sandy with depth.			
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B1
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.20	CONCRETE			
					0.30	Red brown sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of brick and concrete (MADE GROUND).			
					0.50	Black gravelly SAND. Gravel is fine to coarse, angular of coal and ash (MADE GROUND).			
0.50					(0.40)	Dense brown rounded SAND (GLACIAL DEPOSITS).			
0.60					0.90	0.50 - 0.90 Slight hydrocarbon odour.			
					(0.30)	Grey SAND with frequent pockets of firm CLAY (GLACIAL DEPOSITS).			
					1.20	Soft to firm brown mottled grey slightly sandy slighty gravelly CLAY with some interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
1.50					(0.80)	1.20 - 2.00 Slight solvent odour.			
					2.00	Firm brown slightly gravelly CLAY with rare interbedded sand lenses (GLACIAL DEPOSITS).			
					(2.00)				
					4.00	Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B2
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.20	CONCRETE			
					0.40	Red black very sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of brick, concrete and sandstone (MADE GROUND).			
0.60					(0.80) 1.20	Brown fine to medium rounded SAND (GLACIAL DEPOSITS).			
					(0.70) 1.90	Firm to stiff brown slightly gravelly CLAY with interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS). 1.20 - 1.90 Slight solvent odour.			
2.10					(0.40) 2.30	Grey clayey SAND. Gravel is fine to coarse, subangular to rounded of sandstone (GLACIAL DEPOSITS). 2.00 - 2.30 Slight organic odour and water ingress.			
3.50					(1.70) 4.00	Soft to firm brown mottled grey slightly sandy slighty gravelly CLAY with some interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS). 2.30 - 2.40 Slight solvent odour.			
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B3
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.10	TARMAC			
					0.30	CONCRETE			
					0.40	BRICK COBBLE.			
0.70					(0.50) 0.90	Light brown fine angular SAND (MADE GROUND - BEDDING GROUND).			
1.50					(0.70) 1.60	Grey medium to fine SAND (GLACIAL DEPOSITS). 0.90 - 1.60 Hydrocarbon odour and staining.			
3.50					(2.20) 3.80	Soft to firm grey slightly gravelly slightly sandy CLAY with frequent interbedded sand lenses. Gravel is fine to medium, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
						Hole complete at 3.80mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B4
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.10	Asphalt			
					0.30	CONCRETE			
					0.40	Brown gravelly SAND. Gravel is fine to coarse, angular to subrounded of brick and sandstone (MADE GROUND).			
0.60						Brown fine to medium rounded SAND (GLACIAL DEPOSITS). 0.40 - 1.80 Hydrocarbon odour and staining.			
					(1.40)				
1.40									
					1.80				
						Stiff grey slightly gravelly CLAY. Gravel is medium to fine, subangular to subrounded of sandstone (GLACIAL DEPOSITS). 2.20 - 4.00 Becoming very stiff.			
					(2.20)				
3.10									
					4.00	Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B5
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.30) 0.30	CONCRETE			
					0.50	Grey COBBLES AND GRAVELS of SANDSTONE (MADE GROUND).			
						Hole ended at 0.50mbgl due to obstruction.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B6
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.50) 0.50	CONCRETE			
0.60					(0.30) 0.80	Black clayey gravelly SAND. Gravel is fine to coarse, angular to subrounded of brick, concrete and sandstone (MADE GROUND).			
					(0.70) 1.50	Loose brown medium to fine rounded SAND (GLACIAL DEPOSITS).			
1.40									
2.50					(2.50) 4.00	Soft to firm brown mottled grey slightly sandy slighty gravelly CLAY with some interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS). 1.50 - 4.00 Becoming stiffer with depth.			
						Hole complete at 4.00mbgl.			

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Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
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WINDOW SAMPLE LOG

Project				BOREHOLE No
				B7
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.40) 0.40	CONCRETE			
0.50					0.60	Black sandy GRAVEL. Gravel is fine to coarse, angular to subrounded of brick, concrete, ash and clinker (MADE GROUND).			
					(0.50) 1.10	Fine brown rounded SAND (GLACIAL DEPOSITS).			
1.50					(2.90)	Soft brown slightly sandy gravelly CLAY with interbedded sand lenses. Gravel is fine to medium, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
3.50						3.00 - 4.00 Becoming very stiff.			
					4.00	Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				C1
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.50)	Grass over brown clayey gravelly SAND. Gravel is fine to coarse, angular to subrounded of brick, concrete and sandstone (MADE GROUND).			
					0.50				
					(1.20)	Loose grey fine to medium, rounded SAND.			
1.10									
					1.70				
					1.80	Black peaty sandy CLAY.			
					(0.30)	Loose brown fine to medium SAND (GLACIAL DEPOSITS).			
					2.10				
2.20					(0.40)	Soft grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, angular to subrounded of concrete and limestone (MADE GROUND).			
					2.50				
					(1.50)	Firm becoming Stiff brown slightly gravelly CLAY with interbedded sand lenses. Gravel is medium to fine, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
3.50									
					4.00				
						Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				C2
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.80)	Brown slightly gravelly SAND. Gravel is fine to coarse, angular to subrounded of brick and sandstone (MADE GROUND).			
1.10									
					1.80				
					1.90	BRICK COBBLE.			
					(0.30)	Loose brown medium to fine rounded SAND (GLACIAL DEPOSITS).			
					2.20				
2.20					2.30	Brown clayey SAND with frequent organic material (GLACIAL DEPOSITS).			
						Soft to firm light brown slightly sandy gravelly CLAY. Gravel is fine to coarse subrounded to rounded of sandstone (GLACIAL DEPOSITS).			
					(1.70)				
3.80									
					4.00	Hole complete at 4.00mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

WSP Environmental
200-220 The Quays, Salford
M50 3SP
Telephone: 0161 886 2400
Fax: 0161 886 2402

WINDOW SAMPLE LOG

Project				BOREHOLE No
				C3
Job No	Date	Ground Level (m N/A)	Co-Ordinates (N/A)	
Supervising Engineer		Client		Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					0.10	TARMAC			
					0.30	CONCRETE			
					0.40	BRICK COBBLE.			
					(0.40) 0.80	Grey sandy fine to coarse, angular to subrounded GRAVEL of concrete, limestone and sandstone (MADE GROUND).			
0.90					(1.40) 2.20	Loose brown medium to fine rounded SAND (GLACIAL DEPOSITS). 1.30 - 2.20 Sandstone gravel present. 1.80 - 2.20 Natural organic odour.			
1.90					(2.30) 4.50	Firm brown mottled grey gravelly slightly sandy CLAY. Gravel is fine to coarse, subangular to rounded of sandstone (GLACIAL DEPOSITS).			
4.20					(0.40) 4.90	WEATHERED SANDSTONE.			
						Hole refused at 4.90mbgl.			

DRAFT

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt

GENERAL REMARKS

All dimensions in metres Scale 1:37.5	Contractor / Driller	Method/Plant Used Window sample	Logged By CK

Appendix 3 Notes on Limitations

Appendix 4 Chemical Data

Our ref: 080110.EA.13010908.IM

07 January 2010

Sarah Corbishley
Contaminated Land Technical Officer
Environment Agency
Lutra House
Doddy Way
Off Seedlee Road
Walton Summit
Bamber Bridge
Preston
PR5 8BX

Dear Sarah

Zone 5 Groundwater Validation, Former Kodak Chemical Site, Kirkby.

Further to your letter of the 19th October 2009 ref CL6/KN/1051/sfc, WSP Remediation is writing to provide validation information regarding the quality of shallow groundwater with respect to historic contamination within Zone 5 of the aforementioned site following the undertaking of shallow soils remediation works. The details of the soil remediation works have been previously submitted within report Ref: Zone 5 Remediation Validation, Former Kodak Site, Kirkby.

Background

The Former Synchem Area (Zone 5) had been identified as a principle area of concern as previous investigations had found the area to have the highest percentage of samples with evidence of contaminant impact. A Quantitative Risk Assessment and Remediation Options Appraisal derived the Proposed Acceptance Criteria and formed the remediation design in response to elevated TPH, BTEX and chlorinated solvent concentrations identified within the made ground, underlying Shirdley Hill Sand and localised shallow groundwater. In this area there is also evidence of limited downward migration directly through the Glacial Till.

Remedial targets derived for the Zone 5 remediation works are summarised below:

	Zone 5 (Former Synchem Area)	
Contaminant	**Soil Target (mg/kg)**	**Perched Groundwater Target (mg/l)**
Benzene	17	11
Toluene	729	466
Ethylbenzene	261	111
Xylene	362	119
Trichloroethene	3.2	2.1
Dichloroethene	12	5.7
Dichloroethane	NR	NR
Vinyl Chloride	NR	NR

** NR-Contaminant not recorded in this area*

Remedial Works

The soil remedial works within Zone 5 involved the excavation of shallow soils and structures within the footprint of the Former Synchem Area which extended to the low permeability Glacial Till. Approximately 3,300m3 of soil was treated on site. Both the excavation and treated soil were successfully validated and soils were re-used as backfill. The base of the excavation was profiled and concrete crush, generated from the extensive underground structures removed, was used in the backfill to aid perched groundwater removal and sampling from the 11 installed sumps. The soil remedial works ran from April 2008 to September 2008.

Plate 1: Installation of sumps to the excavation prior to the backfill of a crush liner and treated soil.

Groundwater Results Analysis

In order to compare groundwater quality pre and post the remedial works, data from two different sets of monitoring points has had to be used. Due to the intrusive nature of the soil remediation works, all wells located within the footprint of the excavations were decommissioned and removed. In replacement a network of 11 sumps were installed within the footprint of the excavations with additional window samples installed in between. The distribution of these monitoring locations is shown in Figure 1, Appendix A. All relevant Laboratory analysis is also appended to this letter in Appendix C.

In determining any betterment or requirement for further works, initial site investigation groundwater data has been compared with that collected from the sumps post the remedial works and in order that an overall picture of the area is examined these have been averaged across the 11 sumps. The series of figures located within Appendix B compare the concentrations of the contaminants of concern from each monitoring well within the footprint of the excavation (prior to the remediation works), against the average data from the 11 sumps (post the remediation works).

The pre-remediation works data was collected in 2007 and early 2008 whilst the post excavation data was collected during August 2008 and October 2008. The contaminants of concern have been divided into chlorinated solvent compounds and BTEX compounds.

Chlorinated Solvents
The compounds 1,1 Dichloroethene, Trans-1,2-Dichloroethene and 1,2 Dichloroethane were not detected within the shallow monitoring wells pre remedial works or the sumps post remedial works.

The remaining chlorinated solvents of concern, namely; Trichloroethene, cis 1,2, Dichloroethene and 1,1 Dichloroethane were all detected in the August 2008 post the remedial works. Average concentrations were slightly above those of individual wells monitored pre remedial works but values did not exceed 10ug/l. The chlorinated solvent Trichloroethene was detected in the greatest concentration; 15ug/l was detected within SUMP3. No chlorinated solvents of concern were detected during the October 2008 event.

BTEX compounds
When comparing pre-remedial well data to the average of the sump data post remedial works, a reduction in all BTEX compound concentrations within the shallow groundwater is indicated. The greatest concentration of BTEX compounds pre-remediation works were observed within monitoring well WSP-X24 during 2007 with the exception of Benzene where the maximum concentration was recorded within monitoring well WSP-X30 during 2007. The greatest observed BTEX compound reduction is that of m & p Xylene, from 37,000ug/l recorded within monitoring well WSP-X24 in 2007 to an average of below 100ug/l following the remedial works. The greatest concentration of a BTEX compound in an individual sump, post remedial works, was 130ug/l of m & p Xylene detected within SUMP 3 and SUMP11 during the August 2008 monitoring event.

Finally a comparison of the post remediation maximum concentrations of the contaminants of concern is summarised in the table below.

	Zone 5 (Former Synchem Area)	
Contaminant	**Perched Groundwater Target (mg/l)**	**Highest post remedial concentration (mg/l)**
Benzene	11	0.061
Toluene	466	0.079
Ethylbenzene	111	0.041
Xylene	119	0.226
Trichloroethene	2.1	0.015
Dichloroethene	5.7	0.008
Dichloroethane	No Target	0.004
Vinyl Chloride	No Target	0.003

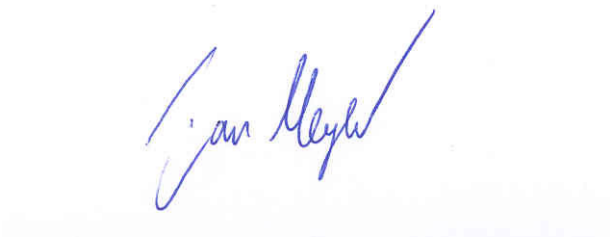
Conclusions
Though groundwater monitoring has identified 'new contamination' within the Zone 5 area (of a separate contaminant profile to the historical contamination), Validation data collected from the 11 sumps and window samples following the completion of the Zone 5 Soils remediation works demonstrated that all contaminants of concern post remedial works were significantly below the agreed criteria.

Furthermore by comparison with original site investigation data detailed above, it has been demonstrated that general betterment of the shallow groundwater has occurred as a result of the soils remediation works, particularly with respect to BTEX compounds.

As such it is the opinion of WSP Remediation that notwithstanding any potential future works required as a result of 'new contamination', there are no further works required with respect to historical contamination of the shallow groundwater within the Zone 5 area.

If you could confirm whether you are in agreement with this position we would be most grateful. Furthermore should you have any queries regarding anything detailed above or any other matter, please do not hesitate in contacting me.

Yours faithfully



Ian Meyer
Principal Engineer
DDI: 07713985796

Zone 5 Remediation Validation
Former Kodak Site, Kirkby

Acorn Properties (Kirkby) Ltd

September 2009

WSP

QM

Issue/revision	Draft	Draft 2	Final
Remarks	Draft	Issue 1	
Date	July 09	September 09	October 09
Prepared by	Kirsty Monaghan	Kirsty Monaghan	Kirsty Monaghan
Signature			
Checked by	Ian Meyer	Ian Meyer	Ian Meyer
Signature			
Authorised by	Dave Rix	Dave Rix	Dave Rix
Signature			
Project number	13010908-001	13010908-001	13010908-001
File reference	13010908-VRZ5	13010908-VRZ6	13010908-final

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Contents

EXECUTIVE SUMMARY

1 Introduction **1**

2 The Site **3**

3 Remediation Strategy **5**

4 Zone 5 Remediation Works **7**

5 Zone 5 Completion **16**

Appendix A Site Plan & Drawings
- Figure 1 Site Location
- Figure 2 Zone Locations
- Figure 3 DNA / Nutrient & Surface Soil Sample Locations
- Figure 4 Excavation Extent Plan
- Figure 5 Validation Soil Sample Locations

Appendix B Photographic Record

Appendix C List of Previous Documentation

Appendix D Laboratory Data
- 1 DNA and Nutrient Data
- 2 Top Soil Data from the Northern Excavation
- 3 Data from Samples Collected During the Excavations
- 4 Windrow Treatment Data
- 5 Full Kodak Suit Sample Check
- 6 Off Site Disposal Data
- 7 Validation Data
- 8 Geotechnical Data

Appendix E Duty of Care Information
- 1 Landfill Tax Exemption Certificate
- 2 Disposal Permits
- 3 Waste Carriers Certificates
- 4 MTL Licenses
- 5 Consignment Notes Samples
- 6 Air Quality

Executive Summary

WSP has been retained by Acorn Properties (Kirkby) Ltd (Acorn) to design, undertake and validate voluntary remediation works upon soil and shallow groundwater on the former Kodak Chemicals UK Ltd facility (the site), Kirkby in order to discharge potential future liabilities resulting from historic contamination.

During the Second World War the site was developed on previously agricultural land as part of the Kirkby Munitions Factory which was operational until 1946. In 1949 Kodak purchased a long-term lease on the property, and whilst initially operations were small-scale, over time production increased and diversified. At the end of 2006 Kodak production ceased. Subsequently, Acorn purchased the buildings and equipment from Kodak, and obtained a long-term leasehold agreement for the site, in October 2007.

The voluntary remediation works were identified during the due diligence process in order to manage / mitigate environmental liabilities relating to historic near surface soil and shallow groundwater contamination. Four particular areas of concern were identified, including the subject of these works, the Former Synchem area in the west of the site (to aid description the site was split into 8 zones, the Former Synchem area was demarcated to be within Zone 5).

Quantitative Risk Assessment was undertaken to assess risks to human health and controlled waters, from which remedial targets were derived to validate the remediation of the Former Synchem area (amongst others).

Further to the demolition of residual buildings and the removal of surface concrete, remedial works were subsequently undertaken to address issues associated with the Former Synchem area within Zone 5. These included soil excavation, on site treatment, passive perched water removal, validation, and reinstatement with treated soils. The works included two excavations to the north and south respectively. Approximately 1,937 m^3 of soils were excavated and treated from the northern excavation with 1,308m^3 of soils excavated and treated from the southern excavation. In addition 1,594m^3 of surface concrete was broken out and 278 Tonnes of material disposed of off site as non hazardous waste.

The works were completed successfully on time and within budget, and the remediated area is considered suitable for future development for a continued industrial or commercial end use.

This executive summary provides information for use as an overview of the completed remediation project. Any design works should use the appropriate data presented in the full validation report.

1 Introduction

1.1 BACKGROUND AND AUTHORISATION

In October 2007 Acorn Properties (Kirkby) Limited (Acorn) purchased the buildings and equipment and secured a long-term leasehold interest to an industrial facility (the site) formerly operated by Kodak Chemicals UK Ltd, located off Acornfield Road within the Kirkby Industrial Park, Kirkby, Merseyside.

To facilitate Acorn's purchase of the site, (now known as Image Business Park), WSP undertook a detailed review of all existing environmental data and assisted the design of a supplementary investigation. This process resulted in the establishment of the 'known contamination' at the site as of October 2007, the date of the transaction.

The review undertaken by WSP did not identify any current statutory environmental liability relating to contamination, specifically with regard to Part IIA of the Environmental Protection Act 1990 and the 1989 Water Resources Act. However, Acorn takes its environmental responsibilities seriously and, notwithstanding the absence of an identified statutory liability, was keen to enhance the condition of the property in the window of opportunity that the partially vacant site presented. To aid description, the site was divided into 8 zones as shown in Figure 2, included in Appendix A of this report. Four areas of concern were initially identified, namely:

- Zone 2 – Building 84;
- Zone 3 – Building 82;
- Zone 4 - Bulk Storage area; and
- Zone 5 - Former Synthetic (Synchem) Manufacturing area.

Relatively isolated impacts were identified within Zones 2 and 3, whilst more widespread impacts were noted in Zones 4 and 5. Pertinent to these works, key pollutant linkages identified included shallow soil leaching of organic (List 1) contaminants into perched groundwater with potential subsequent vertical migration and/or leakage through or around the Glacial Till into the Sherwood Sandstone aquifer in the former synthetic chemicals manufacturing area which had been demolished in the late 1970's. The presence of source concentrations (both in the shallow soils and perched waters) were concluded to be sufficiently elevated to require remediation and pathway management.

Consequently, WSP was instructed to undertake voluntary remediation works at the site[1]. The objectives were as follows:

- to remediate 'known contamination' at the site to levels determined by quantitative risk assessment[2];
- to obtain regulatory support (specifically from the Environment Agency (the Agency) and Knowsley Metropolitan Borough Council (KMBC)) for the proposed remediation activities and ultimately their confirmation that the works have been completed and validated accordingly; and
- upon completion of the remediation works, to obtain written confirmation from the regulators that, with respect to the 'known contamination', the site is in a satisfactory state with regard to Part IIA of the Environmental Protection Act 1990 and the 1989 Water Resources Act.

In line with the stated objectives the proposed remedial targets for Zone 5 were derived and submitted to the Environment Agency in March 2008[2] with a Remediation Options Appraisal and Detailed Methodology submitted in April 2008[3]. Both these documents were agreed in correspondence received in April 2008[4].

[1] Former Kodak Chemicals Ltd Site, Voluntary Remediation Strategy, Acorn Properties (Kirkby) Ltd. WSP. November 2007.
[2] Proposed Remedial Targets, Former Kodak Site Kirkby, Kirkby AT LLC. WSP. March 2008.
[3] Remediation Options Appraisal & Detailed Methodology, Former Kodak Chemicals Ltd Site, April 2008
[4] EA Correspondence CL6/KN/1051/sfc -11th April 2008.

1.2 OBJECTIVES / BRIEF

This report describes the remediation works carried out at the site in the area of the Former Synchem Building within WSP Zone 5:

- the report provides background to the remedial methodology selected, and summarises pertinent general site conditions;
- describes the remediation works undertaken; and
- considers the final site condition.

2 The Site

2.1 SITE DESCRIPTION AND LOCATION

2.1.1 Image Business Park

The site is located on the eastern edge of Knowsley Industrial Park. A site location plan is provided as Figure 1 and a site layout plan as Figure 2, Appendix A (for ease of consideration the site was split into 8 zones, as shown on Figure 2, based on historical / current land uses and detailed previously in the Proposed Remedial Targets document[2]).

Site Address	Acornfield Road, Kirkby, Merseyside. L33 7UF
National Grid Reference	SJ 437988
Size	15 hectares

Approximately three quarters of the site was unoccupied during the remediation works, with the remainder of the site occupied by three companies:

- Ames Goldsmith Ltd, who took over the Silver Nitrate production in the south of the site in early 2007;
- Eastman Chemicals Ltd, who continued occupation of a building in the northwest of the site for research purposes; and
- Future Industrial Services Ltd, who took a lease for areas in the southeastern corner of the site from 2008 and operated a waste transfer area, with intent to expand operations into fly ash processing and solvent recycling at a later date.

The site is bounded to the west by Acornfield Road, beyond which are a number of industrial premises. An industrial site also bounds the north. Knowsley Industrial Park Perimeter Road forms the eastern boundary, beyond which lies agricultural land. This includes a former municipal landfill (now restored and used for grazing) to the southeast. The southern boundary is adjacent to woodland.

2.1.2 Former Synchem

The Former Synchem building was located in the western side of Zone 5 as depicted in the Figure 2- Zone Locations. During the late 1970's the building was demolished to surface level and subsequently buildings 15, 18 and 66 were constructed inside its former footprint. In addition to these buildings there existed a bunded tank base to the west of Building 15 (subsequently removed), and a services gantry which runs at height adjacent to 4th street and which remained intact throughout the works.

2.2 SITE HISTORY

Until WWII the site was situated within a rural, agricultural setting. In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. Initial operations were apparently small-scale; expanding in the 1950's when production was relocated from Kodak's Harrow facility in London.

Photochemicals production by Kodak ceased at the end of 2006 and the majority of the facility has been decommissioned. The current site layout comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. The grassed north-eastern corner of the site was formerly a sports pitch.

2.3 ENVIRONMENTAL SETTING

2.3.1 Geology

The area of the works is underlain by a sequence of Made Ground overlying drift deposits of Shirdley Hill Sand and Glacial Till above bedrock of Sherwood Sandstone.

- Investigations have recorded Made Ground across the whole area generally between 1 and 2m thick, though deeper sections were encountered in connection with historic structures.
- Shirdley Hill Sand was found to be present as a thin horizon (generally less than 1m thick) across the majority of the area overlying the Glacial Till.
- Glacial Till was found to be present beneath the entire area and is generally described as sandy, occasionally gravelly clay. Discrete sandy horizons have also been recorded within the Till, although these are laterally discontinuous.
- The depth to the top of the Sherwood Sandstone recorded as being approximately 5m below surface though this was not encountered during the soils excavation due to the depth of the works.

2.3.2 Hydrogeology

Two distinct groundwater bodies are present beneath the area; a perched groundwater within the Made Ground/Shirdley Hill Sand, resting on the Glacial Till and the main groundwater body within the underlying Sherwood Sandstone.

The perched groundwater was found to be continuous across the excavation area and site wide monitoring has indicated a general flow direction to the west / southwest. Data for the Sherwood Sandstone indicates a flow direction to the northwest.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone. Given the groundwater flow directions, the two bodies appear to be operating independently. However, evidence of local limited downward migration through the Glacial Till has been noted particularly in the Zone 5 area of the site.

2.3.3 Hydrology

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 30m to the south of the site. Previous works have indicated that the water level within the ditch is higher than perched groundwater levels; consequently migration of groundwater to this receptor from site is considered unlikely. No other significant surface water features have been identified within a 500m radius of the study area.

2.4 FORMER SYNCHEM

Within the area of current concern in Zone 5, the early synthetic chemicals manufacturing buildings, (believed to be the source of identified impacts), were demolished and replaced (by Building 82 at the east of the site) in the late 1970s. The footprint of the buildings remaining largely vacant thereafter with the exception of Buildings 15, 18 and 66 which were mainly steel framed structures covering approximately 25 percent of the original footprint.

Investigation of the Former Synchem area identified elevated concentrations of Total Petroleum Hydrocarbons (TPH), Benzene, Toluene, Ethylbenzene and Xylene (BTEX) and chlorinated hydrocarbons within the Made Ground and the underlying Shirdley Hill Sand. Within this area there was also evidence of limited downward migration directly through the Glacial Till to a depth of at least 7.0m.

3 Remediation Strategy

3.1 REMEDIAL OBJECTIVES

The standard of remediation to be achieved under Part IIA is set out within Part 4 of Chapter C of DETR circular 02/2000. In the first instance the standard required/sought for each pollutant linkage is as follows:

- Ensuring that the linkage is no longer a significant linkage, by doing one or more of the following:
  - removing or treating the pollutant;
  - breaking or removing the pathway; or
  - protecting or removing the receptor.
- Remedying the effect of any significant harm or pollution of controlled waters which is resulting, or has already resulted from the significant pollutant linkage;
- Should these aims not be wholly achievable given the circumstances of the site then a lower standard of remediation is acceptable. This standard should be that which comes as close as practicable to breaking the significant pollutant linkages whilst fully mitigating the harm or pollution caused. Failing that then any measures that mitigate as far as practicable the harm or pollution caused would be acceptable; and
- Within the context of the site these aims are focussed upon the prevention of migration of List 1 substances into the Sherwood Sandstone.

3.2 PROPOSED ACCEPTANCE CRITERIA

The objective of the voluntary remediation works was to ensure that deep groundwater quality does not deteriorate beneath the site (discounting off-site sources of contamination). Consequently, remedial targets for soils and perched groundwater were derived by assuming a compliance point at the site boundary, or the base of the unsaturated zone depending on the nature of the contaminant.

Remedial targets produced for the voluntary remediation works in the Former Synchem derived in the Proposed Remedial Targets report [2] are summarised in the table below:

	Zone 5 (Former Synchem Area)	
Contaminant	Soil Target (mg/kg)	Perched Groundwater Target (mg/l)
Benzene	17	11
Toluene	729	466
Ethylbenzene	261	111
Xylene	362	119
Trichloroethene	3.2	2.1
Dichloroethene	12	5.7

3.3 REMEDIATION METHODOLOGY

Further to the acceptance of remediation criteria for Zone 5 a Remediation Options Appraisal was undertaken for the area and a subsequent detailed methodology developed[3]. The screening matrix for Zone 5 indicated that excavation and removal of the soil source by either disposal or treatment were the most practicable options. After consideration of these two options in greater detail, ex-situ bioremediation was selected as the chosen option for Zone 5.

As part of the remedial works it was necessary to undertake an amount of enabling works in the excavation area. These included the delineation of the contaminated area, bacterial strain analysis of the soil conditions, demolition of Buildings 66 and 15, decommissioning of active wells within the area and segregation of the area from the rest of site with the use of anti-climb fencing. Historical foundations were then to be removed and impacted soils excavated and treated through bioremediation. The extent of the excavation was to be determined through the undertaking of validation sampling based on a 10m grid as detailed in the Remediation Options Appraisal and Detailed Methodology[3].

After validation, all excavated soils were to be validated as passing the predetermined acceptance criteria and then replaced and compacted in the original excavation.

3.4 REGULATORY LIAISON

Liaison between WSP and the regulators concerning the Zone 5 Soils Remediation have been ongoing for some time in the form of meetings, correspondence and reports. Key contacts are detailed below for the sake of clarity:

- 11th November 2007 – Initial Meeting with Environment Agency and Knowsley MBC;
- 12th March 2008 – Submission of Proposed Remedial Targets[2] report to all parties by WSP;
- 11th April 2008 – Acceptance of remedial targets letter received from the Environment Agency;
- 29th April 2008 - Submission of Remediation Options Appraisal and Detailed Methodology report[4] as well as Factual report on December 2007 Site investigation report[5];
- 13th May 2008 – Acceptance of appraisal and methodology with request for clarification of validation criteria received from the Environment Agency;
- 16th May 2008 – Clarification of validation criteria by WSP (ref: 160508.EA.13010908.im); and
- 7th August 2008 – Site visit undertaken by Environment Agency and Knowsley MBC.

[5] Factual Report on December 2007 Site Investigation, Former Kodak Chemicals, Kirkby- April 2008

4 Zone 5 Remediation Works

4.1 INTRODUCTION

This section details the remediation works undertaken by WSP within Zone 5 of the site.

4.2 ENABLING WORKS

4.2.1 Delineation

As part of the design works for the Zone 5 soils remediation, intrusive investigation works were undertaken in December of 2007. These works were fully reported in the Factual Report on December 2007 Site Investigation[5] but in summary included a targeted investigation into the ground conditions underneath Building 21(the Former Boiler House) and surrounding the Fire Water or Calamity Pit; both in Zone 5. The investigation discovered no significant contamination and as such aided in delineating the extent of the required demolition and excavation works.

4.2.2 Demolition

Further to the delineation investigation, demolition works were undertaken by subcontractors under the instruction and control of the site landlord, Acorn Developments. Works included the demolition of buildings 15 and 66 within the former Synchem area to ground level. WSP Remediation had no involvement with this work other than the specification of which structures needed removing to facilitate the remediation.

4.2.3 Borehole and Service Decommissioning

Prior to the start of the soils excavation, 4 groundwater monitoring wells required decommissioning, with the aim to reduce the potential for vertical movement of impacted groundwater during the earthworks operations. One shallow groundwater monitoring well was located within the southern excavation area and two shallow and one deep monitoring well was located within the northern excavation area. All four monitoring wells were decommissioned by displacement grouting in line with Environment Agency guidance. During March 2008 a bentonite cement slurry mix was pumped into all four wells via a grout pump and left to set. The 4 wells in question were; WSP X24, WSP X31, WSP B2 and WSP X30.

In addition all site drainage within the footprint of the proposed excavation was sealed and decommissioned.

4.2.4 Site Set-up

The entire footprint of the Former Synchem area, 4th Street and the southern end of Central Street was enclosed by a perimeter anti-climb fence to avoid contact between heavy plant, deep excavations, contaminated soils and other site users from the third week of April 2008. This ensured that access to the area was only permitted to the area as necessary under the supervision of WSP.

4.3 SOIL NUTRIENTS AND BACTERIAL INVESTIGATION

Ex-situ bioremediation was deemed a preferable method for the treatment of Zone 5 soil due to the nature of the target contaminants and soil characteristics. However, prior to the earthworks, further investigation into the nutrient and bacterial content of the soil was required as an indication of treatment rates and to establish whether the use of additives would be advantageous.

4.3.1 Methodology

Micro-organisms require nutrients to support cell growth in order to sustain the bioremediation process. The ratio of organic carbon, nitrogen and phosphorus can determine the effectiveness of contaminant breakdown. If there is an indication of a deficiency, nutrients can be added to the soil. Excessive quantities of nutrients such as phosphate and sulphate can also inhibit the bioremediation process.

DNA analysis is a relatively new tool used with the aim to establish efficiency of bioremediation. The total population of bacteria per gram is counted and the proportion of bacteria capable of contaminant breakdown is also investigated. The DNA strains associated with contaminant degradation can be identified and has been investigated within the

indigenous bacterial population. The contaminants of concern within WSP Zone 5 have previously been identified as predominantly BTEX based, therefore DNA strains associated with the aerobic breakdown of Ttoluene, Xylene and Phenolic compounds were investigated. This analysis gives an indication as to the degree the bacteria population have adapted to use the residual contaminants as a substrate, and whether encouraging bacterial growth during the bioremediation process will result in an accelerated contaminant breakdown.

Soil samples were collected prior to the main excavations for both nutrient and DNA analysis; locations of samples are detailed within Figure 3, Appendix A. Two trial pits were dug in the northern excavation and two from the southern excavation with a soil sample collected from each trial pit from the horizon considered to be of greatest contamination. A fifth sample was collected immediately to the south of the southern excavation and used as a bacterial control, this area was considered un-impacted by contamination (it was not deemed necessary to analyse this sample for its nutrient content).

4.3.2 Results

Nutrients and DNA Profiling

The nutrient and DNA profiling results have been divided into the southern and northern excavation for reporting purposes. A typical nutrient ratio of carbon, nitrogen and phosphorus recommended for microbial degradation is in the range of 100:10:1 and 100:10:5. The samples collected from the northern excavation contained average nutrient proportions of 100:0.001:0.1 and the southern excavation contained an average ratio 100:0.002:0.4.

Soil moisture content was also recorded; the results were an averaged as 16.8% and 15.1% for the northern and southern excavation respectively. The ideal range is between 12%-30%.

The total bacterial populations from all five soil samples ranged from $1x10^{6}$ and $1x10^{7}$ colonies per gram of soil. A proportion of bacteria within all the samples contained indigenous micro-organisms capable of the aerobic degradation of BTEX; the sample collected from outside the contaminated impacted area contained only a small proportion of Toluene degrading bacteria.

All nutrient and DNA data is located within Appendix D1.

4.3.3 Conclusions

The ratios of available nutrients appeared to be considerably removed from the recommended proportions; of particular note are the low concentrations of nitrogen. However, the DNA analysis suggested that the bacteria within the excavations was highly adapted to degrade the target contaminants, this is particularly true of the southern excavation soil. The control soil sample analysis supported the DNA data.

It was therefore not considered necessary to add nutrients to the soil to boost nutrient ratios initially due to the encouraging bacteria DNA analysis results.

4.4 EXCAVATION

The Zone 5 excavation incorporated the footprint of the historic Synthetic Chemicals building, previously demolished. The excavation was split into two sections due to 4th Street which runs east to west (which contains and supports vital site services), dissecting the area into the southern and northern excavations. The Made Ground and Shirdley Hill Sand, above the Glacial Till had been identified for removal. The depth of the excavation ranged from approximately 1.5m to 2.5m below ground level as the surface of the glacial till increases with depth towards the south.

4.4.1 Control of Excavation and Environmental Monitoring

A WSP Remediation engineer supervised removal of the excavated material. A Photo Ionisation Detector was used daily during excavation periods to ensure volatiles were at an acceptable level as determined in the deployment of the Mobile Treatment License and help ensure that only contaminated materials were removed.

Any water collecting within the base of the excavation was removed via a tractor & bowser and treated within a designated water treatment system prior to discharge to foul sewer under an agreed consent to discharge.

4.4.2 Progression

Prior to the commencement of operations the northern excavation area had been capped with a 200mm layer of turf above a layer of reinforced concrete. Eight soil samples were taken for chemical analyses to determine whether this layer of soil required treatment. The results identified it as complying with site criteria, and so it was removed and stockpiled on the eastern end of the playing field within Zone 1. The sample locations are shown on Figure 3, Appendix A and the laboratory reports are included in Appendix D2.

Following the turf removal, the surface concrete breakout began in the third week of April 2008. Removal and transportation of contaminated soil to the on site treatment bed commenced in the third week of May 2008 following the deployment of the Mobile Treatment License (MTL). Soil was first removed from the southern excavation until completion in late June 2008; delay on the completion of the excavation was caused by unexpected substantial underground structures which required breaking out and removal. The excavation of material within the northern excavation occurred between the second week of June and the second week of July. Treatment of all impacted soil removed from Zone 5 was complete and validated by the last week of July 2008. The maximum extent of the excavations is displayed in Figure 4 in Appendix A. Following verification of the treatment of excavated material, reinstatement began and by the second week of August the southern and northern excavations were reinstated with soil. As a part of the reinstatement works, 11 no. perched groundwater monitoring sumps were installed against the potential for ongoing perched groundwater treatment; the monitoring of these will be discussed in a separate report. Finally, compaction of the southern excavation was not completed until the last week of September 2008 due to poor weather conditions but included the installation of a crushed concrete running layer and geogrid on the southern excavation. .

4.4.3 Structures

Part of the reasoning behind the selection of an excavation based technique in this area was due to the number of foundations which had not been removed as part of the historical demolition. In order to guarantee that potential sources of contamination could be identified and treated it was felt imperative that these foundations were removed as part of the works. The subsurface structures were extensive in both the northern and southern excavations.

Within the southern excavation, a previously unidentified, unused sprinkler main branch which entered the southern boundary of the excavation was encountered. This needed to be decommissioned and removed prior to the main excavation works. The sprinkler branch was blanked off at the main sprinkler ring located outside the excavation to allow the pipe work within the excavation area to be removed.

Photo 1: Breaking out concrete at surface in the southern excavation.

The southern excavation contained a second layer of reinforced concrete approximately 0.2m below the surface concrete layer; the concrete layers were separated by a sandy infill. Beneath these concrete layers, covering an area of approximately one third of the southern excavation was a heavily reinforced concrete lattice structure. The ring beams, on an approximate grid of 3m by 2m, were 0.75m in width and 1m thick which required breaking out and removal. The lattice foundations were also supporting building 18, a small electrical switch gear room which was scheduled to remain. To avoid any damage from breaking out the concrete, D Drill Ltd were commissioned to drill interconnecting cores separating the lattice beneath building 18 and the lattice within the excavation.

Photo 2: Structures in southern excavation.

At several locations where the concrete ring beams intersected, concrete piles were observed, which extended below the base of the excavation (3.5mbgl). The piles were broken off approximately 0.5m below the base of the excavation and were sealed with the Glacial Till. The deepest portions of the piles have remained in-situ. The presence of piles may have contributed to the apparent vertical migration of historic contamination in this area. The location of these piles is depicted in Figure 4, Appendix A.

The northern excavation also contained several substantial subsurface structures, typically, reinforced concrete pads, concrete beams and steel joists that required removal. Piles driven to 4 metres below ground level were also removed from this area. Other substantial structures that required breaking up and removing included, two lift bases which were approximately 3.5m by 2.5m with a depth of 1.7m, and three 1000 gallon tanks. The three tanks were each approximately 3m by 1.5m and were tile lined. All three tanks held liquid and had been in-filled with loose gravel, however visual evidence and odour did suggest the tanks were impacted by petroleum hydrocarbons.

Photo 3: Lift base in northern excavation.

All recovered hardstanding was crushed and recycled for use either in the base of the excavation to aid drainage and create a running layer, or as a top dressing material.

4.4.4 Contaminant Observation

Visual and olfactory evidence of contamination was apparent throughout the excavations, particularly in areas of greater porosity (sandy lenses). Fuel and sulphur odours where observed during the southern excavation works. The southern excavation revealed that the Shirdley Hill Sands contained a small layer of brown/red hydrocarbon product, held by the blue clay at the base of the excavation. This area appeared to be only impacting an approximate soil thickness of 0.02m; this impacted layer was evident on the south, east and west of the excavation sides and so covered the majority of the southern excavation. A sample of the seepage from this layer was collected with the aim of identifying the product. Although the laboratory analysis proved inconclusive, it was suggested that the high concentration of Bromated compounds detected may be associated with fire retardant or lubrication products. The report detail can be found in Appendix D3, (*sample I.D Z5-SE prod).* Volatile organic compound analyses from a soil sample taken from this impacted area identified the presence of BTEX compounds, at least an order of magnitude below the site criteria, the laboratory results can also be found in Appendix D3 (*sample I.D Z5-SW prod).*

Photo 4: Product in southern excavation

The northern excavation presented greater visual and olfactory observations of hydrocarbon sheens and fuel odours, than those within the southern excavation. Isolated patches of hydrocarbon sheen and fuel odours were noted. A soil sample was collected for identification purposes from one of the three tanks previously mentioned within Section 4.4.3, containing loose gravel which appeared to be stained purple. This sample recorded a Zinc level of 100mg/l, Toluene and Xylene where also present at concentrations of 54mg/l and 100mg/l (*sample I.D- CENTRAL TANK ZONE 5 W).* A water sample was also taken from one of the tanks which emitted a strong petroleum hydrocarbon odour; globules of product were also visible (*sample I.D- N-UST).* This sample recorded a 330mg/kg concentration of total petroleum hydrocarbons, the majority of which was held within the petroleum range. A soil sample was also taken from a patch of black sandy material for chemical analysis (*sample I.D- Z5-N-BS).* The results described a 610mg/kg of total petroleum hydrocarbon predominantly within the diesel range. The laboratory results above mentioned can be found in Appendix D3.

Photo 5: Northern excavation contamination.

During the Zone 5 excavations the P.I.D monitoring of volatiles was predominately less than 10ppm, which is below the 50ppm action limit.

4.4.5 Water Management

During the progression of the dig, the base of the excavation was profiled to encourage drainage of rain and groundwater to sump areas. Water was collected periodically from these sump areas via a tractor bowser and transported to the water treatment system located within the soil treatment area. Once the water had been treated it was discharged to foul sewer in accordance with our consent to discharge. Due to wet weather, dewatering the excavations became a significant impediment to excavation progression.

4.4.6 Housekeeping

A road sweeper was required to keep access routes clean during the earthworks operations. Also, to prevent dust becoming a nuisance in dry weather, recycled water was used to dampen the roads and treatment bed.

4.4.7 Validation

Once the excavations were completed, validation samples were collected in accordance with the 'Remediation Options Appraisal & Detailed Methodology' [3], at a sampling frequency from the excavation base of 1 per 10m grid and from the sides at 10m intervals. A total of 64 validation samples were taken from the two Zone 5 excavations, 40 from the northern excavation and 24 from the southern excavation, the locations of which can be found in Figure 5, Appendix A.

Samples were analysed for volatile organic compounds which included the seven contaminants previously identified within Zone 5. All the sample results are at least an order of magnitude lower than the risk assessment derived remedial targets.

In addition a limited supplementary intrusive investigation was undertaken to assess whether the material underlying 4th Street and Central Avenue in between the two excavations justified further remediation. Laboratory analysis of recovered soil samples indicated that no further action was warranted. Window sample locations are depicted in Figure 4 Appendix A with the relevant validation test results included in Appendix D.

4.5 SOIL TREATMENT

4.5.1 Treatment Undertaken

All excavated material was transported via dumper truck to the first bay of the soil treatment area. The material was then processed by a vibrating plate screener to remove the oversized proportion. The fine material was formed into numbered windrows on the main area (second bay) of the soil treatment bed, and turned weekly. The treatment bed had a maximum capacity 7 windrows at a time due to space constraints, however a total of 19 windrows were formed in the treatment of the Zone 5 material.

Photo 6: Soils treatment area with windrows.

The materials from the two excavations were kept separate re-sampled and chemically analysed for the 'Full Kodak Suite' at a frequency of 1 sample per 1000m^3 prior to re-deposition into their relevant excavations. The 'Full Kodak Suite' included speciated Total Petroleum Hydrocarbon, CLEA metals and Volatile Organic Compounds. No material recovered from either the southern or northern excavation was unsuitable for onsite treatment. (The relevant laboratory reports can be found in Appendix D5).

The oversized material recovered from the screener was subsequently separated into material types. Material deemed suitable for backfill was stockpiled, crushed to a grading of 6F2 and sampled at a frequency of 1 per 1000m^3 for analysis by the 'Full Kodak Suite' prior to re-use. Though this analysis highlighted the presence of metals in both the treated soil and the crush material, concentrations were insignificant.

Earthworks Quantities Summary Table

Material	Material State	Quantity
Northern Excavation (cut value)	Treated and redeposited	1,936.8 m^3
Southern Excavation (cut value)	Treated and redeposited	1,308.6 m^3
Crush 6F2 grading	Used for the base and surface of excavations	1,594 m^3
Topsoil and unused crush material	Disposal off site as non-hazardous	278 tonnes

4.5.2 Validation

Soil samples were taken for laboratory analysis every 200m^3 of soil or every windrow (depending on which was the smaller volume), to benchmark the progress of the soil treatment. The scheduled analysis was based upon the contaminants of concern and thus was predominantly concerned with Volatile Organic Compounds. Once a sample passed the site criteria, the material which it represented was considered successfully treated. This material was then stockpiled at the east end of the playing field within Zone 1, prior to deposition. This allowed more material to be formed into windrows in the second bay.

A summary of the successful laboratory results can be found in Table 1, Appendix D4. The full laboratory analysis report is also located in Appendix D4.

4.5.3 Waste Disposal

As previously discussed, no material recovered from the Zone 5 excavation was unsuitable for treatment. However, remaining top soil containing 'rebar' and surplus crushed concrete, which was not required to level the excavations, required offsite disposal. Representative samples were taken for characterisation and submitted for chemical analysis which was supplied to the intended landfill site where the material classification was confirmed as non hazardous and accepted. A total of 15 lorry loads equalling 278 tonnes were sent to Lyme and Wood Landfill operated by Cory Environmental under the appropriate duty of care.

The laboratory analysis results of these samples are included as Appendix D6.

Copies of the duty of care information are included in Appendix E.

4.6 REINSTATEMENT

Once laboratory analysis had verified the success of the soil treatment and the validation samples from the excavation base and sides were below the site remedial criteria, the excavation reinstatement works could commence.

4.6.1 Excavation Backfill and Sump Installation

Reinstatement began with the grading of the natural clay base (Glacial Till) to encourage perched groundwater flow towards the locations designed to accommodate groundwater sumps. The base of the northern excavation was graded from the north to south in line with the original lithology and three sumps were installed along the southern edge for potential perched groundwater treatment. The southern excavation was graded using a peak and trough method to channel perched groundwater towards the sumps. Three troughs which run north to south are intercepted by a total of 8 sumps.

6F2 graded crushed concrete was laid across the entire base of the southern excavation and the southern end of the northern excavation as a bedding layer.

Photo 7: Southern excavation sumps

Treated soil was backfilled in 100mm layers, and compacted using a vibrating roller. The material removed from the southern excavation, was returned to its origin, whilst material reinstated into the northern excavation originated from both. The top of the southern excavation has been covered with a 200mm running layer of crushed concrete incorporating a geogrid. Poor weather during the earthworks and an accidental water release from the Future

Industrial Services compound into the excavation resulted in much of the compaction works having to be redone. The northern excavation surface is currently a combination of a crushed concrete dressing and the replaced topsoil that was originally stripped away.

Photo 8: Backfilled excavations

4.6.2 Geotechnical Validation

Both the bioremediated soils and the broken out and crushed concrete were tested for geotechnical properties. Samples were submitted to the following tests as appropriate:

- particle Size Distribution;
- liquid and Plastic Limits;
- moisture Content;
- optimum Moisture Content; and
- maximum Dry Density.

The data from these laboratory tests were used to classify the material using table 6/1 and 6/2 of the Specification for Highways Works. Placement and compaction of the material was then undertaken using a method based approach as determined by table 6/4 of the same document. Geotechnical results for the material can be found in Appendix D8.

5 Zone 5 Completion

5.1 FINAL ZONE 5 CONDITIONS

Site ground levels have been returned to an elevation similar to those found prior to the remediation works with the area left generally level, (although not as a finished development platform). The exception is a downward slope on the northern excavation towards the south, as per the pre-works condition. The southern excavation holds a surface layer of geogrid and crushed concrete. The northern excavation is also partially dressed with a layer of crushed concrete.

Kerbing which surrounded three sides of the southern excavation was damaged during the earthworks, and as such, has been replaced. Kerbing was also added to the remaining northern side with the aim to limit surface runoff entering the area.

5.2 REMAINING CONTAMINATION WITHIN ZONE 5

Whilst the identified dig areas have been excavated and treated and the excavation validated, plus additional investigation works carried out, the possibility that isolated pockets of contaminated materials remain cannot be discounted. It is considered that the soil source contaminant mass reduction that has been achieved should result in ongoing betterment of the perched groundwater quality and ultimately the sandstone aquifer below.

5.3 RESIDUAL HUMAN HEALTH RISK ASSESSMENT

There was no specific human health risk associated with the contamination within Zone 5. The results of the validation sampling indicate that the removal of the contaminants of concern in the targeted areas of the site was achieved successfully and that the samples demonstrate compliance with the Zone 5 remediation targets.

5.4 OPTIONS FOR REDEVELOPMENT

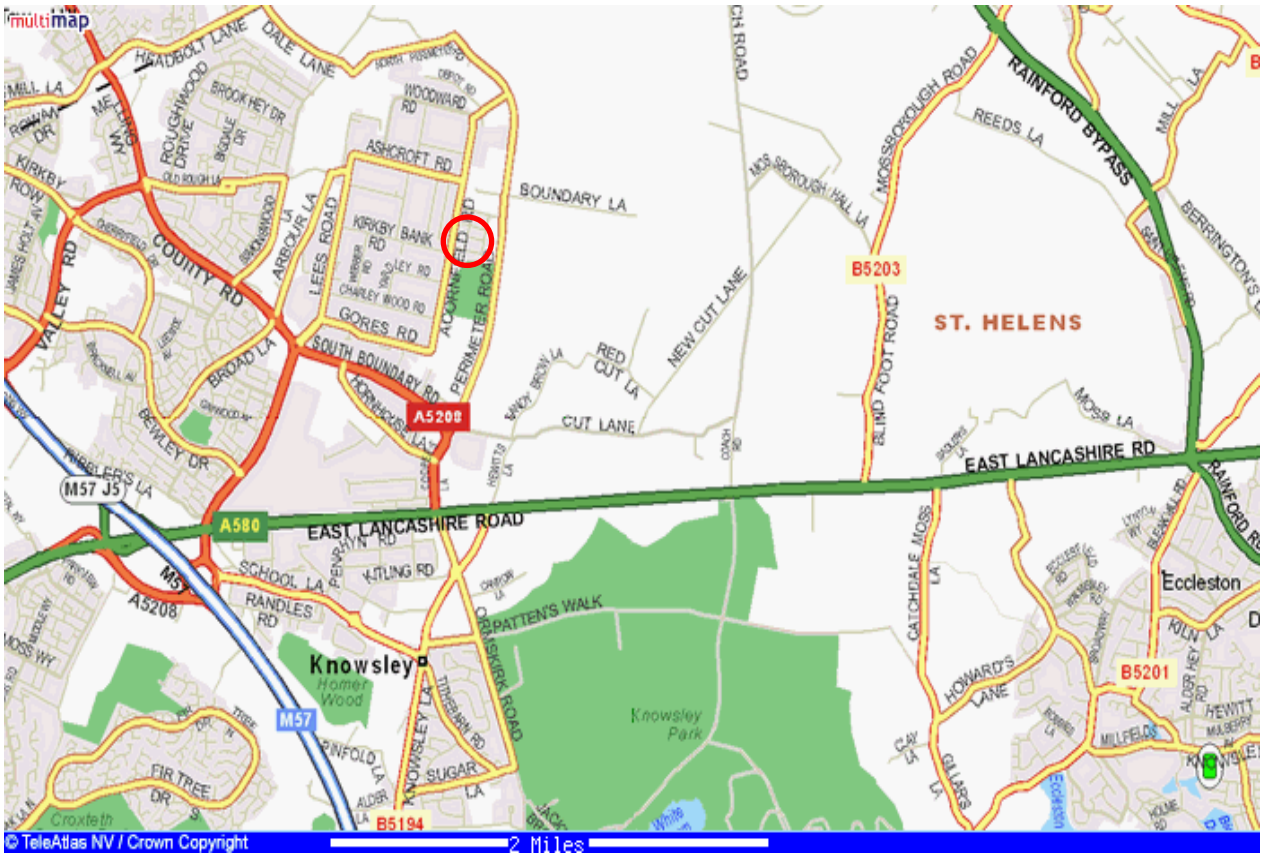
Zone 5 is now suitable for redevelopment for a commercial / industrial end use. Notwithstanding this, the shallow soils at the site will be variable in character and strength and are unlikely to be suitable as a bearing stratum for shallow foundations, this is evident in the extensive foundations encountered during the excavations. Therefore, appropriate geotechnical consideration shall be required in future development proposals, both for building structures and hardstanding / roads.

Appendix A Site Plan & Drawings

Site Plan & Drawings

Figure 1	Site Location
Figure 2	Zone Locations
Figure 3	DNA / Nutrient & Surface Soil Sample Locations
Figure 4	Excavation Extent Plan
Figure 5	Validation Soil Sample Locations

Site Location Plan



Key:

Approximate Site Location

N

WSP REMEDIATION
Fairway House
Paramount Business Park
St Mellons
Cardiff
CF3 0LW
Tel: +44 (0) 2920 366300
Fax: +44 (0) 2920 366394

Figure Number: 1

IMPORTANT – Please Read

This drawing is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project details adjacent. WSP accepts no liability for the mis-interpretation or use of this illustration by any other parties.

Site:	Project No:	Created By:	Date:
Former Kodak Chemicals, Kirkby	13010908	IM	11/03/2008
Title: Site Location Plan	**Client:** Kirkby AT LLC		

Key

- Zone Boundary
- Buildings
- Roads & Curbs
- 66 Demolished Buildings

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: Issue 1

WSP
Fairway House, Paramount Business Park, St Mellons, Cardiff CF3 8LW
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http://www.wspgroup.com

CLIENT: Kirkby AT LLC

ARCHITECT: IM

PROJECT: Former Kodak Chemicals, Kirkby

TITLE: Figure 2 – Zone Locations

SCALE @ SIZE:	CHECKED:	APPROVED:
1:2000@A3	DWR	DWR
CAD FILE: 13010908im	DESIGN/DRAWN: IM	DATE: 07/10/2009'

PROJECT No:	DRAWING No:	REV:
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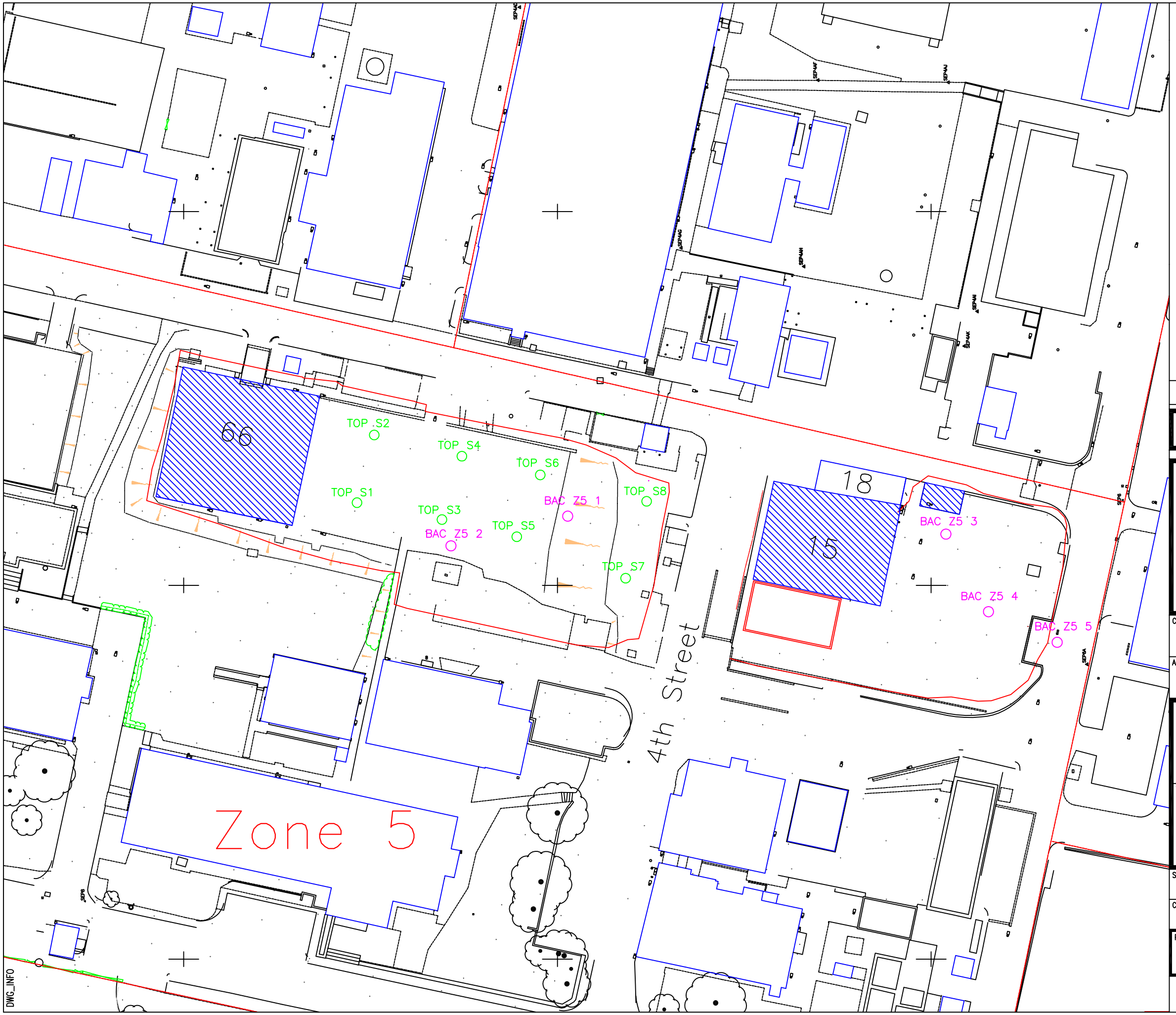

Key

- Zone Boundary
- Buildings
- Roads & Curbs
- TOP_S1 — Surface soil sample location
- BAC_Z5_4 — DNA sample location

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: Issue 1

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CLIENT: Kirkby AT LLC

ARCHITECT: IM

PROJECT: Former Kodak Chemicals, Kirkby

TITLE: Figure 3 – DNA/Nutrient and Surface Soil Sample Locations

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PROJECT No:	DRAWING No:	REV:
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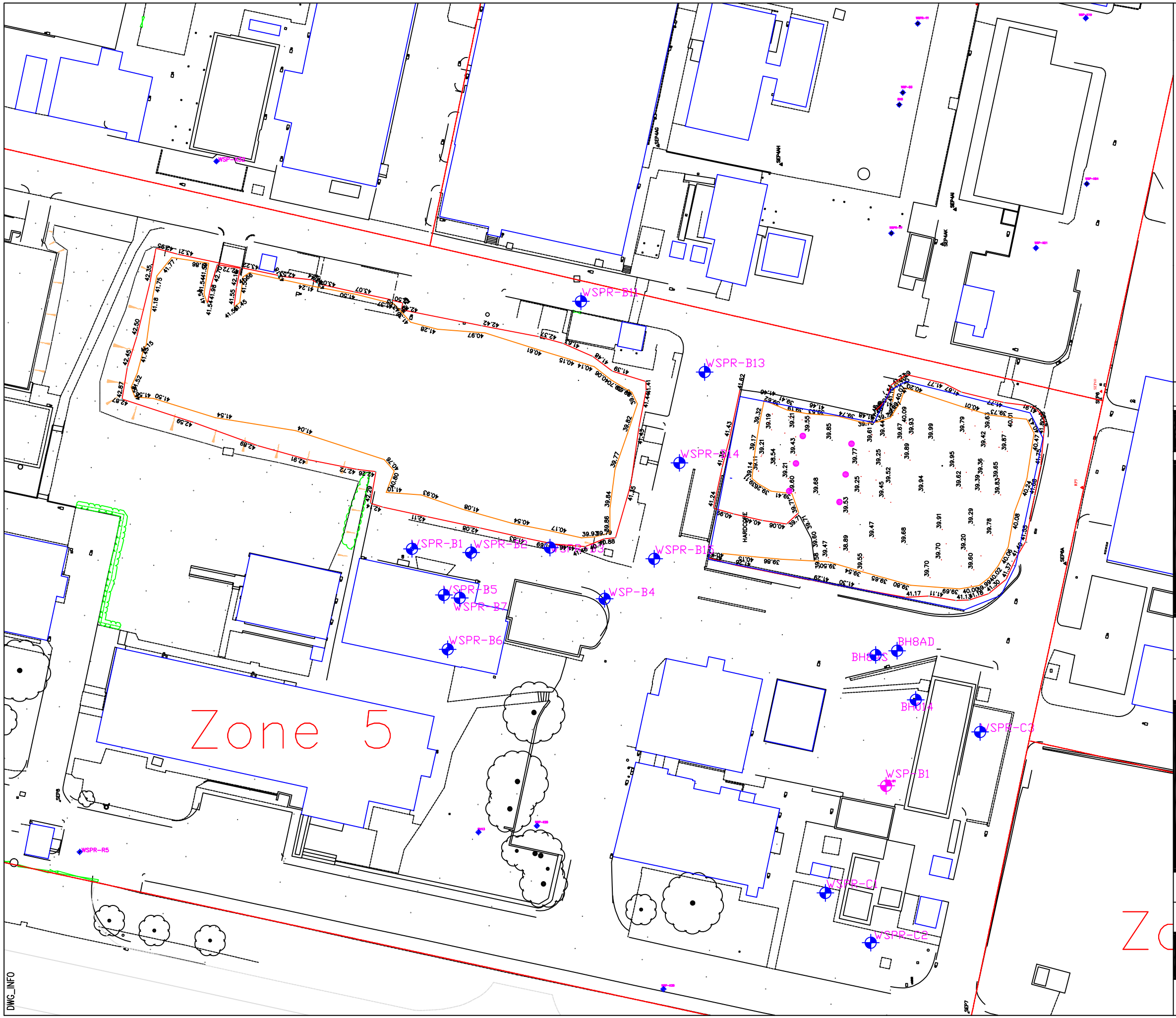

Key

- Zone Boundary
- Buildings
- Roads & Curbs
- Excavation Edges
- 39.52 Excavation Spot Level
- Residual Pile Location

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: Issue 1

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CLIENT: Kirkby AT LLC

ARCHITECT: IM

PROJECT: Former Kodak Chemicals, Kirkby

TITLE: Figure 4 – Excavation Extent Plan

SCALE @ SIZE:	CHECKED:	APPROVED:
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CAD FILE: 13010908im	DESIGN/DRAWN: IM	DATE: 07/10/09
PROJECT No: 13010908	DRAWING No: 4	REV: B

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Key

- Zone Boundary
- Buildings
- Roads & Curbs
- Z5B11 ⊕ Validation Sample Location

REV	DATE	BY	DESCRIPTION	CHK	APD

DRAWING STATUS: Issue 1

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CLIENT: Kirkby AT LLC

ARCHITECT: IM

PROJECT: Former Kodak Chemicals, Kirkby

TITLE: Figure 5 – Validation Soil Sample Locations

SCALE @ SIZE:	CHECKED:	APPROVED:
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CAD FILE:	DESIGN/DRAWN:	DATE:
13010908im	IM	07/10/09

PROJECT No:	DRAWING No:	REV:
13010908	5	A

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Appendix B Photographic Record

Photograph 1: Breaking up of the surface concentre from the Southern Excavation. A second layer of concrete also required breaking out only 10cm below the surface layer. The Northern excavation only required a turf scrape.

Photograph 2: Breaking up of the substantial reinforced concrete lattice subsurface structures within the southern excavation.

Photograph 3: Pumping out of the excavations was required regularly. The upper brown strata is the targeted impacted sand layer, the dark grey layer at the base of the excavation is the containing clay.

Photograph 4: The concrete and steal underground structures of the northern excavation.

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Project:

Former Kodak Chemicals, North Kirkby

Title:

Zone 5 Soil Remediation Site Photographs

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Photograph 5: One of three brick and tile lined pits within the Northern Excavation. Phase separated product is visible on the surface; laboratory results also indicated BTEX compounds were present.

Photograph 6: Final depth of the northern excavation.

Photograph 7: Bioremediation of the excavated Zone 5 soil, treatment is undertaken within the onsite treatment bed. Once validated, material was stock piled on the north playing field prior to re-deposition.

Photograph 8: Trenches are formed within the clay base, sump pipe work were installed in the dips prior to the laying down of a base layer of crush material and the re-deposition of the treated soil. This allowed efficient groundwater monitoring and removal.

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Title:

Zone 5 Soil Remediation Site Photographs

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Photograph 9: The material was re-deposited and compressed in thin layers. Crush material from the underground structures was used to line the base of the excavations and surround the sumps. Concrete rings are required to support the manhole covers.

Photograph 10: The finished is near flat and dressed with concrete crush material recovered from the underground structures. The sumps are accessed and protected by heavy duty manhole covers.

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Project:

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Title:

Zone 5 Soil Remediation Site Photographs

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Appendix C List of Previous Documentation

1. Aspinwall & Company. 1990. Assessment of Groundwater Sensitivity and Potential Soil and Water Contamination at the Kodak Facility, Kirkby. December.

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6. Aspinwall & Company. 1998. Groundwater Monitoring and Additional Borehole Installation. January.

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8. Conestoga Rovers & Associates (Europe) Ltd. 2003. Additional Groundwater Assessment. December.

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13. Conestoga Rovers & Associates (Europe) Ltd. 2005. Groundwater Quality Monitoring Round Four. June.

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38. Kodak. 1990. Minutes of Meeting to Discuss Groundwater Project. September 26.

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40. Kodak. 2005. Kodak Ltd Chemical Manufacturing IPPC Application & Supporting Information. August.

41. Northern Foundations. 1992. Report on Ground Investigation at Acornfield Road, Kirkby. May.

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43. Worm Eye Geotechnical. 1998. Proposed RTO Project. August 19.

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45. Worms Eye Geotechnical. 2000. Tank Bunds, Kodak Ltd. September 11.

46. Worms Eye Geotechnical. 2000. Proposed New Tank Bund: Building 82 – West Side. August 13.

47. Conestoga Rovers & Associates (Europe) Ltd. 2007. Additional Phase II Environmental Site Assessment – May 02 2007.

48. Conestoga Rovers & Associates (Europe) Ltd. Phase II Environmental Assessment – Former Effluent and Treatment Plant – June 21, 2007.

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50. Proposed Remedial Targets, Former Kodak Site Kirkby, Kirkby AT LLC. WSP. March 2008.

51. Acceptance of remedial targets letter received from the Environment Agency- 11th April 2008.

52. Factual Report on December 2007 Site Investigation, Former Kodak Chemicals, Kirkby- April 2008.

53. Remediation Options Appraisal & Detailed Methodology, Former Kodak Chemicals Ltd Site, April 2008.

54. Acceptance of appraisal and methodology with request for clarification of validation criteria received from the Environment Agency - 13th May 2008.

ALL REFERENCES SHOULD BE WRITTEN IN THE SAME FORMAT

Appendix D Laboratory Data

Hard Copy

Excavation Validation Summary Tables

Electronic Copy

1 DNA and Nutrient Data
2 Top Soil Data from the Northern Excavation
3 Data from Samples Collected During the Excavations
4 Windrow Treatment Data
5 Full Kodak Suit Sample Check
6 Off Site Disposal Data
7 Validation Data
8 Geotechnical Data

ZONE 5 SOUTHERN EXCAVATION VALIDATION SUMMARY TABLE

NB BDL = Below Laboratory Detection level
Values are ug/l

Validation sample ID	Benzene	Toluene	Ethylbenzene	p/m-Xylene	o-Xylene	Total Xylene	cis-1-2-Dichloroethene	Trichloroethene	1.1-Dichloroethene
Soil Remedial targets	17,000	729,000	261000	362000 total		362,000	42000	3200	12000
Z5B1	170	1200	1400	7100	3900	11000	13	85	BDL
Z5B2	320	1700	1200	5800	3000	8800	BDL	BDL	BDL
Z5B3	13	BDL	6	39	23	62	BDL	BDL	BDL
Z5B4	580	1400	1500	7300	3600	10900	69	26	BDL
Z5B5	1500	1100	1100	5100	3100	8200	270	23	BDL
Z5B6	2000	94	190	830	430	1260	6	BDL	BDL
Z5B7	10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B8	12	BDL	74	140	100	240	BDL	BDL	BDL
Z5B9	120	9	39	130	73	203	24	13	BDL
Z5-B10	53	9	65	150	92	242	87	BDL	BDL
Z5E1	64	11	140	610	520	1130	BDL	BDL	BDL
Z5E2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E3	BDL	BDL	34	59	86	145	BDL	BDL	BDL
Z5E4	BDL	BDL	5	BDL	BDL	BDL	BDL	BDL	BDL
Z5-N1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5-N2	BDL	BDL	7	36	100	136	BDL	BDL	BDL
Z5-N3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5S1	83	310	640	3600	5300	8900	BDL	BDL	BDL
Z5S2	BDL	28	8	42	45	87	BDL	BDL	BDL
Z5S3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W1	BDL	37	85	1700	2300	4000	BDL	BDL	BDL
Z5W2	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W3	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5-W4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

ZONE 5 NORTHER EXCATION VALIDATION SUMMARY TABLE

	Benzene	Toluene	Ethylbenzene	p/m-Xylene	o-Xylene	Total Xylene	cis12Dichloroethene	Trichloroethene	1.1-Dichloroethene
Soil Remedial targets	17,000	729,000	261000	362000 total		362,000	42000	3200	12000
Z5B11	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B12	12	8	220	500	40	540	BDL	BDL	BDL
Z5B13	34	BDL	16	38	BDL	38	BDL	BDL	BDL
Z5B14	29	54	360	1500	390	1890	BDL	BDL	BDL
Z5B15	BDL	25	210	700	120	820	BDL	BDL	BDL
Z5B16	33	290	690	2300	490	2790	BDL	17	BDL
Z5B17	82	130	130	480	200	680	31	39	BDL
Z5B18	30	2200	560	1700	560	2260	4200	BDL	BDL
Z5B19	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B20	BDL	BDL	5	BDL	BDL	BDL	BDL	23	BDL
Z5B21	BDL	BDL	10	21	BDL	BDL	BDL	BDL	BDL
Z5B22	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B23	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B24	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B25	BDL	BDL	33	37	BDL	BDL	BDL	BDL	BDL
Z5B26	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B27	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B28	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B29	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B30	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5B31	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E7	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E8	BDL	6	8	BDL	12	12	BDL	BDL	BDL
Z5E10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5E11	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5N4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5N5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5N6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5S4	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5S5	BDL	BDL	9	BDL	BDL	BDL	BDL	BDL	BDL
Z5S6	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W10	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W6	BDL	13	67	260	98	358	BDL	BDL	BDL
Z5W7	BDL	BDL	150	670	BDL	670	BDL	BDL	BDL
Z5W8	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W9	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W11	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Z5W5	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

ELECTRONIC DATA

Appendix E Duty of Care Information

1 Landfill Tax Exemption Certificate
2 Disposal Permits
3 Waste Carriers Certificates
4 MTL Licenses
5 Consignment Notes Samples
6 Air Quality

Landfill Tax
(Contaminated Land)

WSP Remediation Ltd
Fairway House
Paramount Business Park
St Mellons
Cardiff
CF3 0LW

Landfill Tax Coordination Unit
H M Customs & Excise
Dobson House
Regent Centre
Gosforth
Newcastle upon Tyne
NE3 3PF

☎ 0191 2011 748
Fax 0191 2011 723

19th August 2008

Dear Sirs,

Application For Contaminated Land Exemption

Ref. No.: 19763

Site: Former Kodak Chemicals Ltd
Acornfield Road
Knowsley Industrial Park
North Kirkby, Merseyside
L33 7UF

Please find your Part A certificate for the above application enclosed.

As a condition of the exemption, you are required to maintain a record of all waste which has been exempted (i.e. dates and amounts disposed to landfill sites and names and addresses of the landfill sites concerned). This should be available for inspection by Customs & Excise at any time.

When the last disposal has taken place you should forward a copy of this record either to the officer who dealt with your application, or to this office.

Yours faithfully,

Landfill Tax

Contaminated Land Unit

CLA

Landfill Tax
Contaminated Land Certificate
Part A

Certificate Number: CL-28584

WSP Remediation Ltd
Fairway House
Paramount Business Park
St Mellons
Cardiff
CF3 0LW

Issued by: Landfill Tax Coordination Unit
H M Customs & Excise
Dobson House
Regent Centre
Gosforth
Newcastle upon Tyne
NE3 3PF

☎ 0191 2011 748
Fax 0191 2011 723

19th August 2008

This certificate is issued under the provisions of section 43B of the Finance Act 1996 (inserted by The Landfill Tax (Contaminated Land) Order 1996).

The land identified by your application dated 7th August 2008 is deemed to be contaminated for the purposes of Landfill Tax.

.....

Authorised person

Important

Part A of the certificate does not entitle site operators to exempt waste arising from contaminated land from Landfill Tax.

Approval for operators to exempt such waste will be given in Part B of this certificate which will be sent to the site operators once they have been nominated by the applicant.

Site operators may only exempt from Landfill Tax that waste removed from contaminated land for which they hold a valid Part B certificate.

Landfill Tax
(Contaminated Land)

WSP Remediation Ltd
Fairway House
Paramount Business Park
St Mellons
Cardiff
CF3 0LW

Landfill Tax Coordination Unit
H M Customs & Excise
Dobson House
Regent Centre
Gosforth
Newcastle upon Tyne
NE3 3PF

☎ 0191 2011 748
Fax 0191 2011 723

19th August 2008

Dear Sirs,

Please find Part B of your Landfill Tax, Contaminated Land Certificate enclosed.

Yours faithfully,

Landfill Tax

CLB

Application Copy

Landfill Tax
Contaminated Land Certificate
Part B

Certificate Number: CL-28584

Cory Environmental (Central) Ltd
c/o Cory Environmental (Central) Ltd
Unit 3-6
Greyfriars Business Park
Frank Foley Way
Greyfriars Stafford
ST16 2ST

Issued by: Landfill Tax Coordination Unit
H M Customs & Excise
Dobson House
Regent Centre
Gosforth
Newcastle upon Tyne
NE3 3PF

☎ 0191 2011 748
Fax 0191 2011 723

19th August 2008

This certificate is issued under the provisions of section 43B of the Finance Act 1996 (inserted by The Landfill Tax (Contaminated Land) Order 1996).

The land identified in the application of WSP Remediation Ltd dated 7th August 2008 relating to waste arising from the reclamation of land at:

Former Kodak Chemicals Ltd
Acornfield Road
Knowsley Industrial Park
North Kirkby, Merseyside
L33 7UF

has been certified as contaminated.

With effect from 19th August 2008, you are authorised to exempt from Landfill Tax a maximum of 39 tonnes of waste arising from the reclamation of land at the above address when disposed at:

Himley Quarry Landfill Site
Oak Lane
Kingswinford
Dudley
West Midlands
DY6 7LP

Contact is Mark Faulkner (Amy knows him)

Landfill Tax Registration Number: 01682-0175-43000

.....

Authorised person

Important
Landfill Site Operators

This certificate only relates to Landfill Tax.
It does not override your obligations under environmental legislation.
A copy of this part of the certificate has been sent to the applicant.

creating a better place

Environment Agency

INFORMATION SHEET

ENVIROMENTAL PROTECTION ACT 1990
ENVIRONMENTAL PERMITTING REGULATIONS 2007

Licence Holder: WSP Remediation Limited

Licence Number: EAWML 30297

Date: 20th March 2009

As certified by the notification sent to Nathan Price on 20th March 2009 by John Morton, Senior Engineer, the company's Registered Office Address was changed:

WSP Remediation Limited
Company Registration No: **02623378** (unchanged)

Previous Registered Office Address: **2 Ty Nant Court**
Morganstown
Cardiff
CF15 8LW

New Registered Office Address: **WSP House**
70 Chancery Lane
London
WC2A 1AF

Signed:

Karen Andrews
Permitting Team Leader
Authorised to sign on behalf of the Agency

Dated: 20th March 2009

INVESTOR IN PEOPLE

creu lle gwell
creating a better place

Asiantaeth yr Amgylchedd Cymru
Environment Agency Wales

ENVIRONMENTAL PROTECTION ACT 1990.
SECTION 37

WASTE MANAGEMENT LICENCE
NOTICE OF MODIFICATION

LICENCE REF No: EAWML30297 **LICENCE HOLDER:** WSP Remediation Limited 2 Ty Nant Court Morganstown Cardiff CF15 8LW **Company Registration Number** 02623378	**FACILITY TYPE:** Mobile Treatment Licence

WHEREAS on the 14 July 2000 the Environment Agency issued a waste management licence in pursuance of its powers under Part II of the Environmental Protection Act 1990

AND WHEREAS on 02 August 2002 the Agency modified the conditions of the said licence, pursuant to Section 37(1) (b) of the Environmental Protection Act 1990

AND WHEREAS on 17 May 2004 the Agency modified the conditions of the said licence, pursuant to Section 37(1) (a) of the Environmental Protection Act 1990

NOTICE IS HEREBY GIVEN that the Agency modifies the conditions of the said licence in accordance with Section 37(1)(a) of the Environmental Protection Act 1990 and as set out in the Schedule attached to this notice.

Signed _____ Dated 15/5/06

CHRISTOPHER WRIGHT
Team Leader – Regulatory Waste

This modification shall take effect on 16 May 2006 at 00.01 hours

YOUR ATTENTION IS DRAWN TO THE RIGHTS OF APPEAL DETAILED AT THE END OF THIS MODIFICATION

Environment Agency Wales
Rivers House
St Mellons Business Park
St Mellons
Cardiff
CF3 0EY
DX Address 121375
Telephone: - 08708 506506
Fax: - 02920 362487

Asiantaeth yr Amgylchedd Cymru
Plas-yr-Afon
Parc Busnes Llaneirwg
Llaneirwg
Caerdydd
CF3 0EY
Cyfeiriad DX 121375
Ffon:- 08708 506506
Ffacs:- 02920 362487

ENVIRONMENT AGENCY

Permit with introductory note

Pollution Prevention and Control Regulations 2000

Landfill for Non-hazardous Wastes

Cory Environmental (Central) Ltd
Land off Vista Road
Haydock
St Helens
Merseyside

Permit number

BX 7886 (formerly BX 7878; formerly BL 7523)

Environment Agency
Appleton House, 430 Birchwood Boulevard, Birchwood, Warrington WA3 7WD

WASTE CHARACTERISATION SUMMARY

All sections **must** be completed prior to disposal
Further supporting information such as
MSDS/analysis/site investigation report must be included

CORY ENVIRONMENTAL

Customer name WSP REMEDIATION		**Quote Number**	14547
Address Fairway House, Paramount Business Park, St Mellons, Cardiff CF3 0LW			
Telephone no 02920 366 300		**Fax no** 02920 366 394	
Contact name KIRS M MONAGHAN		**Contact mobile no** 07713 985 796	
Email KIRS M MONAGHAN@WSPGROUP.COM			
Waste producer name & address (site address) FORMER KODAK CHEMICALS LTD, ACORN FIELD RD KNOWSLEY INDUSTRIAL PARK, NORTH KIRKBY MERSEYSIDE L33 7UF.		**Standard Industry Category (SIC) Code**	90.03
Full waste description concrete crush and top soil.		**List of Wastes (EWC) code**	17 01 07 L7 05 04
If soil, site description (tick)	BROWNFIELD ✓	GREENFIELD	
Waste production process (including characteristics of raw materials and products)	Left over concrete crust and a small proportion of top soil from the remediation works undertaken upon material onsite.		
Waste type (tick)	NON-HAZARDOUS ✓	HAZARDOUS	
Category of landfill waste is able to be disposed of at	INERT	NON-HAZARDOUS ✓	STABLE, NON-REACTIVE / HAZARDOUS
Describe the **method of pre-treatment** the waste has been subject to		**If NO treatment, confirm how waste meets pre-treatment requirements:**	It is inert waste for which treatment is not technically feasible ☐ / It is waste other than inert waste and treatment would not reduce its quantity or the hazards ☐
Hazard code (if hazardous)		**Hazardous Waste Premises Code**	_ _ _ _ _
Appearance (including colour)	Light brown / Sandy / Gravely	**Describe any odours**	NONE
Can the waste be recycled?	**YES** **NO**	**Type of vehicle** waste to be delivered in	
Quantity & frequency		**Start date**	
Analysis/MSDS must be attached (WAC leaching & solid analysis if waste is hazardous)			..... pages

ALL WASTE PRODUCERS MUST READ AND SIGN

I confirm on behalf of the waste producer that the above and attached information is correct and accurate and should the waste characteristics alter, I will notify the landfill operator prior to disposal.
I confirm also that the waste has been characterised and sampled in line with a sampling plan, written in accordance with any applicable guidance or legislation in force at the time of disposal.
All waste sent to landfill has been pre-treated such that it is compliant with Environment Agency guidance pursuant to the Landfill Directive & latest relevant guidance.

Signed Jan Meyer **Company** WSPR

Name ~~5/11/08~~ JAN MEYER **Position** PRINCIPAL **Date** 5/11/08

Please return with relevant information to:

Cory Environmental Resource Management, Greyfriars Business Park, Frank Foley Way, Stafford, ST16 2ST

Tel 01785 251555 **Fax 01785 251666**

Environment Agency

CERTIFICATE OF REGISTRATION UNDER THE CONTROL OF POLLUTION (AMENDMENT) ACT 1989

Regulation Authority

Name: E A National Customer Contact Centre

Address: The Quadrant
99 Parkway Avenue
Sheffield

Post Code: S9 4WG

Tel: 08708 506 506 Telex: Fax:

The following information is hereby certified by the above-mentioned authority to be information which at the date of this certificate† is entered in the register which they maintain under regulation 3 of the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991:-

Name(s) of registered carrier: D Morgan Plc

Registration number: NSO/544007/CB

Business name (if any): D Morgan Plc

Address of registered carrier's principal place of business: New Hey
Chester Road
Great Sutton
South Wirral
CH66 2LS

Tel: 0151 3398113 Telex: Fax: 0151 3471254

Date of registration: 10/05/2007

Date of expiry of registration*: 09/05/2010

Date on which last amendment (if any) was made to the carrier's entry in the register: 10/05/2007

Signature of authorised officer of the regulation authority: J. Quinn Date: - 5 APR 2007

Joseph Quinn

[See over]

CONVEYANCE NOTE DM 192935

D. MORGAN PLC

New Hey, Chester Road, Great Sutton, Ellesmere Port, CH66 2LS.
Tel: 0151-339 8113 Fax: 0151-347 1254

HIRE • EARTHWORKS • ENVIRONMENTAL • CONTRACTS

CONTROL OF POLLUTION ACT (Amendment) 1989

Carrier's Registration No: CHS 133495 Issuing Authority: CHESHIRE

Date: 26-11-08

Vehicle Reg. No: MX06 DTU

Place of loading: W.P.S. KODAK KNOWSLEY

Delivered To: CORY HAYDOCK

Delivery Location:

Driver's Name: D. NASH

LOAD SIZE: 2 AXLE | 3 AXLE ✓ | 4 AXLE

	tonnes	Kg
GROSS		
TARE		
NET		

Description of Material/Comments: CONCRETE & SOIL EWC-170504 Booking No LW 080056

TIME

PLACE OF WEIGHING

TICKET NUMBER

DATE 26/11/08

SIGNATURE

WHITE - Customer YELLOW - Office YELLOW - Book

*CPA CONDITIONS APPLY

WASTE TRANSFER NOTE

CORY ENVIRONMENTAL NORTH & WEST
Tel 01785 251555 Fax 01785 251666

Cory Environmental (Central) Ltd., Registered in England No. 2773558
Registered Office 2, Coldbath Square, London EC1R 5HL
VAT Reg. No. 577 3648 93 LFT Reg. No. 01682 0175 43000

CORY ENVIRONMENTAL

WEIGHBRIDGE TICKET

Site: Lyme and Wood Site Permit/Licence: BX 7886 IJ

Customer: WSPREMED
WSP Remediation Ltd
2 Ty Nant Court
Morganstown
Cardiff

CF15 8LW

Date: 26/11/2008 Ticket No. LY215066

Transaction Type: ACCOUNT

INCOMING

Waste Carrier Reg. No.: NSO/544007/CB

Carrier: D Morgan Plc
New Hey
Chester Rd
Great Sutton

Vehicle Reg. No.: MX06DTU

Weighbridge Operator Name: NLARSEN-OSBORNE

Weighbridge Operator's Signature:

Lists of Wastes (EWC) Code: 17 05 04

Waste Description: Top soil and crushed concrete

Source: Liverpool

Transfer Note No.: 192935

Order No.: 11392/529/AH

Waste Stream No.: LW080056

	KG	Tally Roll No.	Date & Time
Gross	30400	208562	26/11/08 09:25
Tare	13400	197979	26/11/08 09:42
Net	17000	Measure : 17.00 T	

Net £
LFT £
VAT £
Gross £

Driver's Signature

Driver's Name (Print) D NASH

By signing this document, the customer confirms that the waste as described has been PRE-TREATED such that it is compliant with Environment Agency pre-tre nt criteria pursuant to the Landfill Directive & latest relevant guidance.

SECURITY NO. C 047619

VAT is at the Standard Rate. Landfill Tax (LFT) is not recoverable as input VAT

This transaction is subject to Cory Environmental (Central) Ltd. Conditions of Disposal, copies of which were made available to the Customer's Representative on arrival at the site

3 WEEK EXAMPLE OF DUST AND VOLATILE MONITORING ASSOCIATED WITH ZONE 5 SOIL EXCAVATION, TRANSPORT AND TREATMENT

Date	Time at start	Weather Conditions	Dust		Treatment bed				Site Boundary			Boundary of excavation	Key activities/Comments
			Conditions	Response	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7		
20/05/2008	12:00	Sunny	Line sources	Damping down transport paths	0.8	0.9	0	1.4	0	0	0	1.3	Excavating south side of Zone 5
21/05/2008	10:00	O Cast	Low-med line source	Damping down and floor washing	0	0.5	0.2	1.4	0	0	0	1.1	Excavating south side of Zone 5
22/05/2008	13:00	O Cast/Int and breezy	Med. Line source	Dampen down	0	0.1	1.1	0.8	0	0	0	9.8	Excavating south side of Zone 5. Dig face was next to excavation boundary
23/05/2008	09:00	O Cast	Low	None	0	0.3	0.2	0	0	0	0	2.3	Breaking up and transporting concrete
26/05/2008	Monday Bank Holiday				n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
27/05/2008	10:00	O Cast	Low	None	0.1	0.9	0.4	0	0	0	0	5	Excavating south side of Zone 5
28/05/2008	13:00	Heavey rain	None	None	0.1	0.1	0.3	0	0	0	0	0	Breaking up and transporting concrete
29/05/2008	10:00	O Cast	None	None	0.1	0.3	0.5	0	0	0	0	0	Breaking up and transporting concrete
30/05/2008	12:00	O Cast	Low	None	0	0.1	0.7	0	0	0	0	0	Breaking up and transporting concrete
02/06/2008	13:00	O Cast	Low	None	0.1	0.2	0.5	0	0	0	0	0	Breaking up and transporting concrete
03/06/2008	12:00	Showers	none	None	0.3	0.1	0.5	0.1	0	0	0	0.2	Excavating south side of Zone 5
04/06/2008	09:00	Sunny	Low	Sweeper	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	Excavating south side of Zone 5
05/06/2008	09:00	Sunny	Low	None	0.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	Excavating south side of Zone 6
06/06/2008	09:00	Sunny	Low	Sweeper	0	0	0.2	0.2	0	0	0	0	Moving remediated material off treatment bed
09/06/2008	09:00	Sunny	Med. Line source	Dampening down	0	0	0	0	0	0	0	0	Organising treatment bed
10/06/2008	09:00	Sunny	Med. Line source	Dampening down	0.1	0.1	0.2	0	0	0	0	0	
11/06/2008	12:00	Sunny	Med. Line source	Sweeper	0	0.1	0.1	0	0	0	0	0	
12/06/2008	11:00	Sunny	Med. Line source	None	0	0.1	0.2	0	0	0	0	0	Breaking out concrete and moving stock piles

creating a better place

Environment Agency

Our ref: CL6/KN/1051/sfc
Your ref:
Date: 13th January 2010

Ian Meyer
WSP Remediation
Fairway House
Paramount Business Park
St Mellons
Cardiff
Wales
CF3 0LW

Dear Ian

Image Business Park, Knowsley Industrial Park

Thankyou for sending a copy of the Zone 5 Groundwater Validation, Former Kodak Chemical Site, Kirkby, WSP, 7th January 2010.

Two rounds of post remediation groundwater sampling were carried out in August and September 2008. Normally we would expect a minimum of 3 to 6 months of post remediation groundwater monitoring in order to confirm that no rebound is occurring in the treated area, however due to the new contamination event which occurred in this area of the site in November 2008 I am willing to accept the two months of monitoring for closing out the historical contamination remedial works in Zone 5.

All of the post remediation groundwater concentrations of BTEX and solvents were below the agreed remedial targets for perched groundwater. Therefore no further work is required regarding historical contamination in Zone 5.

Further work is required to investigate the impact of the new contamination event from November 2008.

If you have any queries on this please do not hesitate to contact me.

Yours Sincerely

Corbishley

Sarah Corbishley
Contaminated Land Technical Officer

Tel: 01772 71 4017

cc.

The Environment Agency
Lutra House Dodd Way
Off Seedlee Road
Walton Summit Bamber Bridge
Preston Lancs PR5 8BX Tel: 08708 506 506 Fax: 01772 627730

ea/lh/e/std

creating a better place

Environment Agency

Our ref: CL6/KN/1051/sfc
Your ref:
Date: 19th October 2009

Ian Meyer
WSP Remediation
Fairway House
Paramount Business Park
St Mellons
Cardiff
Wales
CF3 0LW

21 OCT 2009

Dear Ian

Image Business Park, Knowsley Industrial Park

Thankyou for sending a copy of the Zone 5 Remediation Validation for Former Kodak Site, Kirkby, WSP, September 2009.

I am satisfied that the remediation of historically contaminated soils in Zone 5 of the site has been carried out in accordance with the previously agreed method statement and remedial targets.

Since the validation work was carried out there has been a contamination event due to a leak of effluent from a drain which has contaminated shallow groundwater in the area of the southern excavation of Zone 5. Further discussion is required regarding the impact of this contamination. I look forward to discussing this at our meeting on 11th November 2009.

If you have any queries on this please do not hesitate to contact me.

Yours Sincerely

S Corbishley

Sarah Corbishley
Contaminated Land Technical Officer

Tel: 01772 71 4017

cc.

Dave Logan
Knowsley MBC
Municipal Building

UNITED BY OUR DIFFERENCE

WSP

Acorn Business Park

Sherwood Sandstone Condition Report

Acorn Developments Ltd

August 2010

Issue/revision	Issue 1	Issue 2
Remarks		Minor revisions
Date	August 2010	October 2010
Prepared by	R Lawless	R Lawless
Signature		
Checked by	R Clayton	R Clayton
Signature		
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Signature		
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Reg. No: 01152332

Contents

1	Introduction	1
2	Site Setting	2
3	Contamination Status of Sherwood Sandstone	5
4	Chlorinated Aliphatic Hydrocarbon (CAH) Contaminant Dynamics	7
5	Review of Potential Sources of CAH Contamination	12
6	Environmental Risk Assessment	17
7	Conclusions	20

Appendix A Document List
Appendix B Remedial Targets Worksheets

Figure 1 Historical Land Uses
Figure 2 Site Layout & Leased Areas
Figure 3 Glacial Till Thickness
Figure 4 Depth to Rockhead
Figure 5 Rockhead Elevation
Figure 6 Perched Groundwater Elevations
Figure 7 Deep Groundwater Elevations
Figure 8 Vertical Separation Between Groundwater Bodies
Figure 9 Deep Groundwater Monitoring Well Locations
Figure 10 1,1,2,2 Tetrachloroethane Degradation Pathways
Figure 11 March 2010 1,1,2,2 Tetrachloroethane Distribution in Deep Groundwater
Figure 12 1,1,2,2 Tetrachloroethane Distribution 2003 to 2010
Figure 13 Cross Section with 1,1,2,2 Tetrachloroethane and Trichloroethene Concentrations
Figure 14 March 2010 Trichloroethene Concentrations in Deep Groundwater
Figure 15 Trichloroethene Distribution 2003 to 2010
Figure 16 Elevated 1,1,2,2 Tetrachloroethane in Soils & Perched Groundwater

1 Introduction

1.1 AUTHORISATION

WSP Environmental Ltd incorporating WSP Remediation Limited (WSP) has been commissioned by Acorn Developments Ltd to undertake an assessment of the condition of the Sherwood Sandstone aquifer beneath the former Kodak site located off Acornfield Road, Kirkby, Merseyside.

1.2 BACKGROUND

The former Kodak site has been the subject of voluntary remediation works since 2007. These works have been undertaken by WSP and comprised localised remediation of historically contaminated soils and shallow (perched) groundwater to prevent ongoing release of potentially hazardous contaminants arising from historic site operations and activities to the underlying sandstone aquifer. Close consultation has been maintained with the Environment Agency and Knowsley Metropolitan Borough Council, both of which have expressed support for the voluntary remediation.

The Environment Agency has requested production of a stand-alone report considering the condition or contamination status of the Sherwood Sandstone aquifer beneath the site. The Sherwood Sandstone is classified as a Principal Aquifer and is a regionally important source of potable water.

The Environment Agency has previously commented on contamination risks to the Sherwood Sandstone aquifer from the subject site (letter dated 21 December 2006). At this time, the contaminants present within the Sherwood Sandstone beneath the study area (trichloroethene, cis1,2 dichloroethene and vinyl chloride) were not considered to have been derived from the site and no risks were identified to a hypothetical down-gradient receptor 250m off-site due to the anticipated degradation and attenuation.

1.3 REPORT OBJECTIVES

The objectives of this report are as follows:

- Summarise the contamination status of the Sherwood Sandstone beneath the site; to identify elevated contaminants and consider distribution changes over time.
- Consider the extent to which the identified contaminants may have been derived from the subject site and / or other sources.
- Assess risk to controlled waters posed by contamination identified within the Sherwood Sandstone aquifer.

1.4 REFERENCE DATA / INFORMATION

The site has been subject to several intrusive investigations which have resulted in the installation of numerous monitoring wells. Periodic monitoring of groundwater quality was undertaken by Conestoga Rovers & Associates (Europe) Ltd (CRA) between 2003 and 2007, prior to WSP's involvement with the site.

Since 2007, WSP has undertaken quarterly monitoring of groundwater quality and from 2003 to the present (most recent monitoring event July 2010) there are a total of 17 monitoring events where a wide range of shallow and deep wells were sampled and analysed.

A full list of relevant reports / data is provided as Appendix A.

2 Site Setting

2.1 SITE DESCRIPTION & SETTING

The Site occupies an area of approximately 15.0Ha on the eastern edge of Knowsley Industrial Park. Until 2007, the site was occupied by Kodak for photochemicals production. Production ceased at the end of 2006 and the majority of the facility was decommissioned by Kodak in 2007.

The current layout comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. All roadways and loading areas are surfaced with concrete hardstanding. The north-eastern corner of the site was until recently utilised as a sports pitch (grassed) and now stands vacant (and grassed).

The Site is bounded to the west by Acornfield Road, beyond which are a number of industrial premises. An industrial site also bounds the north. Perimeter Road forms the eastern boundary, beyond which lies agricultural land. This includes a former municipal landfill (now restored and used for grazing) to the southeast. Woodland is present adjacent to the southern boundary.

2.2 HISTORICAL & CURRENT LAND USES

2.2.1 Historical Uses

Until WWll the study area was situated within a rural, agricultural setting. In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). The site was used as a filling factory, where explosives were loaded into various types of ammunition cases. The Munitions Factory covered 743 acres, with the majority located off-site, to the west of Acornfield Road and only covered a small part of the Kodak site. Within the subject site a number of small buildings were constructed within the south-western corner, together with a rectangular feature close to the eastern boundary, anecdotal information suggesting this was a fresh water reservoir. The buildings on site were reportedly used as explosive test bays. The presence of earth bunds around some of the buildings suggests that explosives may have been stored on site.

The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. It appears that initially operations were small-scale with 9 employees occupying the former MoD buildings, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's additional facility in Harrow, London. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

In 1969 production on site diversified to produce chemicals not specifically for the photochemicals industry. Initially this involved the production of hydroquinone and tecmangam (manganese ammonium sulphate) with production of benzoquinone added in 1971 but ceased in 1974.

The synthetic chemicals manufacturing buildings were demolished and replaced in the late 1970s. The Powders & Solutions Department was closed in 2001 and the installation ceased production at the end of 2006. A plan of the site circa 2006 is presented as Figure 1, highlighting historical land uses and areas of potential environmental concern.

2.2.2 Current Land Use

The current layout consists of numerous industrial buildings with associated tank farms, overhead pipework, offices, roadways and areas of landscaping. Four companies currently reside and utilise approximately a quarter of the property:

- Ames Goldsmith Ltd operate a silver nitrate production facility;
- Eastman Chemicals Ltd undertake research;

- Future Industrial Services Ltd (Future) have taken on a lease to site areas for various waste management activities; and,
- MRM Ltd undertakes the recycling of plaster board to provide feed stocks to the cement industry.

The current layout of the site and extent of leased areas is presented as Figure 2.

2.3 GEOLOGY

Published geological mapping indicates the study area to be underlain by Shirdley Hill Sand, and then subsequently by Glacial Till and Sherwood Sandstone. Site investigations have generally confirmed this sequence and also encountered peat locally.

Made Ground is present across the whole site, generally between 1m and 2m thick, although a maximum of 7m was recorded in the south-eastern corner (in an area of historical landfilling/raising). Peat has been identified locally and reaches a maximum thickness of 1.75m in the east of the site.

Shirdley Hill Sand is present as a thin horizon (generally less than 1m thick) across the majority of the site although it is absent from some areas including beneath parts of the former playing fields and the Former Synchem Area. It has also been removed to facilitate construction of the reservoir in the north-eastern corner. This stratum is locally associated with impersistent peat horizons, predominantly in the east.

Glacial Till was found to be present beneath the entire study area (with a single possible exception) and is observed to thin from the northwest to the southeast. The Glacial Till is generally described as sandy, occasionally gravelly clay. Discrete sandy horizons have been recorded within the Till, although these are laterally discontinuous. The thickness of this stratum is presented in Figure 3.

The depth to the top of the Sherwood Sandstone varies from in excess of 14m in the northwest to less than 2m in the extreme south of the site and closely corresponds with the Glacial Till thickness. The variation in depth to rockhead is presented in Figure 4 with the elevation of rockhead presented as Figure 5.

2.4 HYDROGEOLOGY

2.4.1 Introduction

Groundwater level monitoring has been undertaken and reported in detail twice by Aspinwall in the 1990s and a further seven occasions by CRA from 2003 to 2007 inclusive. WSP has recorded groundwater levels across the site quarterly since January 2008. This has confirmed a generally consistent groundwater regime, both in terms of levels and predicted flow directions.

Two distinct groundwater bodies are present beneath the site; a perched groundwater within the Made Ground / Shirdley Hill Sand, resting on the Glacial Till and the deep groundwater body within the underlying Sherwood Sandstone.

2.4.2 Perched Groundwater

The perched groundwater is nearly continuous across the study area, and is only locally absent beneath some of the larger existent structures. Monitoring indicates a flow direction to the west / southwest (Figure 6).

2.4.3 Deep Groundwater

Data obtained for the Sherwood Sandstone between 1994 and the present indicates a flow direction to the northwest (Figure 7). Anecdotal information from the Environment Agency suggests that the flow direction within the Sherwood Sandstone may have altered over time in response to commencement / cessation of abstractions and historically flow may have been to the east.

Groundwater within the Sherwood Sandstone is confined by the overlying Glacial Till. Across the majority of the site the Sherwood Sandstone appears to be fully saturated and sub-artesian conditions are evident, although the potentiometric head is still below the level of groundwater within the overlying Shirdley Hill Sand.

2.4.4 Continuity between Groundwater Bodies

Groundwater elevations for the two groundwater bodies indicate a distinct and continuous vertical separation of a minimum of several metres, as highlighted on Figure 8. The vertical difference between the two groundwater bodies increases steadily from south (approximately 2.5m) to north (in excess of 6m). This closely follows the trend of Glacial Till thickness.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone. Given the groundwater flow directions, the two bodies appear to be operating independently. However, it has been surmised that limited downward migration through the Glacial Till may be possible locally, which may be due to its relatively high sand / gravel content, penetration by structures and locally limited thicknesses.

Evidence of downward migration within the Glacial Till has been observed in a single exploratory hole to date, (WSPB2) located within the Former Synchem Area. Within WSPB2 field screening evidence of contamination was noted throughout the Glacial Till to a depth of 7.0m and laboratory soil testing confirmed slightly elevated contaminant concentrations at this depth

Furthermore, there are several locations where recharge to the Sherwood Sandstone may be occurring from the shallower body, namely:

- The fire water pit (also known as the Calamity Pit), which is at least 4.7m deep, with adjacent Glacial Till thickness 4.9m.
- Foundations associated with the original Synchem buildings in Zone 5, which are piled and likely to rest on the Sherwood Sandstone.
- The southern part of the site where two borehole logs (BH12 and WSP-R8) do not identify the presence of Glacial Till, with Made Ground directly overlying Sherwood Sandstone.
- The former effluent treatment plant in the southwest of the site, where evidence gained during decommissioning in 2007 suggests a possible linkage between the perched groundwater and the underlying aquifer via chemical drainage sumps/chambers which extend to depths ranging from 2m to 3.7m below ground level (bgl) with a corresponding thickness of Glacial Till of 0.3m and 0.9m respectively.

It is possible that two underground storage tanks (USTs - the only two recorded on site) and the “graded” pit all located in the centre of the site were installed close to the top of the Sherwood Sandstone at circa 3.1m bgl in this area although construction details of the USTs and pit are unknown.

2.4.5 On-Site Abstraction Well

There is a deep groundwater abstraction well located in Building 47 (within the south western area of the site), utilised by Ames Goldsmith within their silver nitrate manufacturing process. Groundwater monitoring since 2003 has indicated groundwater flow direction within the Sherwood Sandstone to be unaffected by the presence of this abstraction point. Dataloggers were installed within BH8AS and BH7AS to record groundwater levels on a continuous basis. The conclusions were as follows:

- BH8AS (100m from the abstraction) – short term slight influence on groundwater level noted.
- BH7AS (200m from the abstraction) – no discernable influence on groundwater level.

The monitoring well is used periodically / intermittently and only limited data was available from the operators, therefore the pumping effect is not currently quantifiable.

3 Contamination Status of Sherwood Sandstone

3.1 DATABASE

A total of 22 monitoring wells have been installed into the Sherwood Sandstone aquifer across the study area between 2003 and 2009. This has provided good general site coverage and also allowed the targeting of areas of potential concern.

The majority of response zones within the monitoring wells are relatively shallow within the sandstone, being between approximately 10m and 20m below ground. However, two wells (BH7AD and BH8AD) were installed to a much greater depth in the sandstone; 70m to 90m and 80m to 100m respectively.

Four monitoring wells have been installed on an adjacent strip of land to the west of Acornfield Road (owned by Knowsley MBC) to provide off-site down-gradient sentinel wells, enabling assessment of any off-site migration of contaminants (BH7AS, BH7AD, WSP-R6 and BH3AD). The location of all existing deep monitoring wells is presented as Figure 9.

The chemical testing database for groundwater within the Sherwood Sandstone includes a wide range of potential contaminants. To summarise, laboratory data is available for the following groups of chemicals:

- Metals
- Inorganic species including sulphate, chloride, sulphide, ammonium, pH and cyanide
- Total Petroleum Hydrocarbons (TPH) by various methods
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Volatile Organic Compounds (VOCs)
- Semi-Volatile Organic Compounds (SVOCs)
- Ketones and formaldehyde

3.2 ELEVATED CONTAMINANTS

Contaminant concentrations have been compared to relevant available screening criteria. Given the sensitivity of the aquifer, UK Drinking Water Standards (DWS) have been utilised wherever possible. Where a DWS is not available for a substance, other relevant screening criteria have been used, including England & Wales Environmental Quality Standards (EQS).

For illustration the maximum individual recorded contaminant concentrations exceeding screening criteria are summarised in the following table:

Determinand	Maximum Concentration (ug/l)	Location	Date of Maximum Concentration	Screening Value (ug/l)
Aluminium	213	BH4AD	June 2003	200
Iron	27,000	BH5AD	June 2003	200
Nickel	400	BH5AD	April 2005	20
Selenium	34	BH8AD	January 2006	20
Arsenic	64	BH1AD	January 2006	10
Manganese	9,269	BH2AD	June 2003	50

Determinand	Maximum Concentration (ug/l)	Location	Date of Maximum Concentration	Screening Value (ug/l)
Benzene	18	BH7AS	October 2003	1
TPH	390	BH3AD	October 2003	50
Trichloroethene	1,400	WSP-B1	June 2010	10
Vinyl Chloride	43	BH7AS	July 2009	0.5
1,1 Dichloroethene	96	WSP-R3	April 2009	N/A
Cis 1,2 Dichloroethene	160	WSP-R5	January 2008	N/A
Trans 1,2 Dichloroethene	66	WSP-B1	March 2007	N/A
1,1,2,2 Tetrachloroethane	2,800	WSP-B1	July 2008	N/A
1,1,2 Trichloroethane	44	WSP-B1	July 2008	N/A
1,2 Dichloroethane	17	BH8AS	October 2008	3
Pentachlorophenol	12	BH1AD	June 2003	40
Chlorobenzene	81	BH4AD	October 2003	50

Dissolved oxygen levels are generally depleted, ranging between 0.8% and 9.5% saturation, with a mean of 3.0% saturation (<0.5mg/l), suggesting mildly to strongly reducing conditions. Dissolved oxygen is particularly depleted in wells where contamination has been recorded, for example WSP-B1 (1.9%).

3.3 DISCUSSION OF RESULTS

3.3.1 Metal Contaminants

Of the metal contaminants highlighted in the above table, aluminium, nickel, selenium and arsenic are localised with elevated concentrations sporadic / infrequent.

Iron and manganese are widespread across the site and are attributed to the natural geochemistry, particularly given the reducing conditions recorded within the aquifer.

3.3.2 Organic Contaminants

The two most elevated organic contaminants are 1,1,2,2 tetrachloroethane and trichloroethene. These two species are consistently present within several monitoring wells and are discussed in greater detail in the following section.

The majority of the remaining organic determinands are degradation compounds of the two aforementioned contaminants, whilst others such as benzene and chlorobenzene appear to be co-contaminants present in association with trichloroethene and 1,1,2,2 tetrachloroethane at substantially lower concentrations.

4 Chlorinated Aliphatic Hydrocarbon (CAH) Contaminant Dynamics

4.1 INTRODUCTION

As previously stated, 2 CAHs have been recorded within the aquifer:

- 1,1,2,2 tetrachloroethane is a chlorinated aliphatic hydrocarbon (CAH with four chlorines), once widely used as a solvent, refrigerant, weedkiller and intermediate in the production of trichloroethene. One of the many reported former uses for this chemical was in photographic films, although there is no documented use of the chemical at the subject site.
- Trichloroethene is a CAH (three chlorines) used as a general solvent on a much wider scale than 1,1,2,2 tetrachloroethane.

4.2 ENVIRONMENTAL FATE

In pure-phase, both 1,1,2,2 tetrachloroethane and trichloroethene are dense non-aqueous phase liquids (DNAPLs). Any free-phase product will settle vertically through groundwater until a low permeability layer is reached. The Environment Agency's 'Illustrated Handbook of DNAPL Fate and Transport in the Subsurface' (2003) suggests that DNAPL may be present upstream of a monitoring well if groundwater concentrations exceed 1% of the effective solubility of the relevant contaminant (although this is only one line of evidence).

For 1,1,2,2 tetrachloroethane and trichloroethene this would require groundwater concentrations of 28mg/l and 13mg/l respectively and maximum groundwater concentrations beneath the site are an order of magnitude lower. Within the groundwater data therefore, there is no evidence of the presence of DNAPL.

Both 1,1,2,2 tetrachloroethane and trichloroethene degrade in the environment under certain conditions. 1,1,2,2 tetrachloroethane degrades biotically via dichloroelimination and hydrogenolysis under anaerobic conditions and also abiotically (dehydrochlorination also under anaerobic conditions). Trichloroethene degrades biotically under anaerobic conditions via hydrogenolysis.

Degradation of 1,1,2,2 tetrachloroethane and trichloroethene involves the removal of one or more chlorine atoms ultimately through to ethane and ethene respectively. Degradation of the parent compounds appears to operate fastest under strongly reducing or methanogenic conditions, whilst daughter compounds may degrade under a wider range of environmental conditions. Vinyl chloride will biodegrade under both aerobic and anaerobic conditions although aerobic degradation is more rapid.

Figure 10 summarises the degradation pathways for both 1,1,2,2 tetrachloroethane and trichloroethene. Published studies of the environmental fate of 1,1,2,2 tetrachloroethane (such as Michelle M. Lorah et al, U.S Geological Survey 2005) indicate that dichloroelimination and hydrogenolysis operate together, with dichloroethene and vinyl chloride generally present in the highest proportions as daughter compounds. Abiotic degradation of 1,1,2,2 tetrachloroethane to trichloroethene reportedly only accounts for a few % of total degradation if biotic degradation is active.

Migration of the aforementioned CAHs through the environment will vary due to chemical specific properties, particularly organic carbon partition coefficient (Koc) and Henry's Law Constant. Generally, Koc decreases as the number of chlorine atoms reduce, with consequent increase in mobility. Therefore, degradation products of 1,1,2,2 tetrachloroethane have the potential to migrate faster than the parent compound. Henry's Law Constant increases through each stage of degradation, with resultant increased potential for volatilisation. Daughter compounds of 1,1,2,2 tetrachloroethane can be expected to migrate at a slightly faster rate, but also possibly to volatilise / degrade faster under appropriate conditions.

4.3 1,1,2,2 TETRACHLOROETHANE DISTRIBUTION IN SHERWOOD SANDSTONE

Of the 22 Sherwood Sandstone monitoring wells on site, 11 have recorded 1,1,2,2 tetrachloroethane at least once. 6 of these wells have consistently recorded concentrations, since commencement of monitoring in 2003. The table overleaf summarises the monitoring data for 1,1,2,2 tetrachloroethane in the Sherwood Sandstone for the 22 wells:

Exploratory Hole	Date Monitoring Well Installed	Minimum Concentration (ug/l)	Mean Concentration (ug/l)	Maximum Concentration (ug/l)	Date of Maximum
BH1AD	2003	<1	N/A	N/A	N/A
BH2AD	2003	<1	N/A	N/A	N/A
BH3AD	2003	<1	N/A	N/A	N/A
BH4AD	2003	<3	118	250	April 2005
BH5AD	2003	<1	N/A	N/A	N/A
BH6AD	2003	<1	N/A	N/A	N/A
BH7AS	2003	<1	26	70	March 2010
BH7AD	2003	<1	N/A	N/A	N/A
BH8AS	2003	<1	47	560	October 2008
BH8AD	2003	<1	31	300	March 2010
WSPB1	2007	1,300	1,958	2,800	July 2008
WSPB2	2007	<1	N/A	N/A	N/A
WSPB3	2007	<1	4	14	August 2008
WSPB4	2007	<2	5	24	July 2008
WSP-R1	2008	<1	N/A	N/A	N/A
WSP-R2	2008	<1	4	12	January 2009
WSP-R3	2008	<2	4	12	January 2008
WSP-R4	2008	<1	N/A	N/A	N/A
WSP-R5	2008	<1	N/A	N/A	N/A
WSP-R6	2009	<2	2	2.6	July 2010
WSP-R7	2009	320	412	510	January 2010
WSP-R8	2009	150	263	340	March 2010

The distribution of 1,1,2,2 tetrachloroethane across the study area has remained fairly consistent, with the highest concentrations in the south-western corner of the site. Figure 11 (using March 2010 data) presents the typical distribution of 1,1,2,2 tetrachloroethane detections and concentrations. 1,1,2,2 tetrachloroethane distribution has not varied significantly during the monitoring programme, as indicated on Figure 12, which provides time-series distribution plots from 2003 to 2010.

1,1,2,2 tetrachloroethane is present in groundwater at the up-gradient southern boundary (WSP-R8), with a maximum concentration of 340ug/l recorded to date. Concentrations are observed to increase through the site, peaking at 2,800ug/l in WSPB1 which is located close to the Calamity Pit.

Concentrations are observed to fall down-gradient of WSPB1 through wells BH7AS (70ug/l) and WSP-R6 (2.6ug/l) with BH3AD and WSP-R5 the furthest down-gradient deep wells not having recorded the contaminant. 1,1,2,2 tetrachloroethane concentrations through the south-western corner of the site have been presented together with a geological cross section as Figure 13. This highlights the presence of the contaminant as groundwater enters the site, and the increase and subsequent decrease in concentration as groundwater migrates to the northwest.

No significant fluctuations in 1,1,2,2 tetrachloroethane concentrations have been detected between 2003 and 2010, with the exception of BH8AS, which generally contains trace levels (<50ug/l) but spiked in quarters 2 and 3 2008 with a maximum concentration of 560ug/l.

Of the two deeper wells installed in the Sherwood Sandstone, BH7AD has not recorded 1,1,2,2 tetrachloroethane, whilst BH8AD has recorded low concentrations on a consistent basis.

4.4 TRICHLOROETHENE DISTRIBUTION IN SHERWOOD SANDSTONE

Of the 22 monitoring wells, 16 have recorded elevated concentrations of trichloroethene on at least one occasion. Of these, 6 have consistently recorded concentrations (the same 6 as 1,1,2,2 tetrachloroethane). The data is summarised in the table below:

Exploratory Hole	Date Monitoring Well Installed	Minimum Concentration (ug/l)	Mean Concentration (ug/l)	Maximum Concentration (ug/l)	Date of Maximum
BH1AD	2003	<1	N/A	N/A	N/A
BH2AD	2003	<1	N/A	N/A	N/A
BH3AD	2003	<1	N/A	N/A	N/A
BH4AD	2003	28	87	193	September 2004
BH5AD	2003	<1	4	11	September 2004
BH6AD	2003	<1	N/A	N/A	N/A
BH7AS	2003	<1	56	170	March 2010
BH7AD	2003	<1	N/A	N/A	N/A
BH8AS	2003	5	16	58	October 2008
BH8AD	2003	11	21	79	March 2010
WSPB1	2007	530	900	1,400	June 2010
WSPB2	2007	<1	N/A	N/A	N/A
WSPB3	2007	<1	4	6.3	April 2009
WSPB4	2007	<1	14	22	March 2007
WSP-R1	2008	<1	3	7.4	January 2010
WSP-R2	2008	<1	3	7	January 2009
WSP-R3	2008	<1	11	20	March 2010
WSP-R4	2008	<1	3	6.7	April 2009

Exploratory Hole	Date Monitoring Well Installed	Minimum Concentration (ug/l)	Mean Concentration (ug/l)	Maximum Concentration (ug/l)	Date of Maximum
WSP-R5	2008	<1	3	5	July 2008
WSP-R6	2009	<1	2	3.9	July 2010
WSP-R7	2009	320	350	470	January 2010
WSP-R8	2009	27	36	44	July 2010

The distribution of trichloroethene in the Sherwood Sandstone is similar to that of 1,1,2,2 tetrachloroethane, although trace concentrations have been recorded over a wider area, including the south-eastern boundary (WSP-R1) and the north (WSP-R4). A typical distribution (March 2010) of trichloroethene is presented as Figure 14. The distribution of trichloroethene does not appear to have altered significantly over time as demonstrated on the time-series plots presented as Figure 15.

Consistently elevated trichloroethene has been recorded in wells located in the south-western corner of the site. WSP-R8, located on the up-gradient southern boundary contains trichloroethene (maximum concentration 44ug/l) indicating that groundwater is impacted as it enters the site. Concentrations increase across the site to WSPB1 (maximum concentration 1,400ug/l) and subsequently reduce such that off-site down gradient well WSP-R6 has a maximum concentration of 3.9ug/l, and BH3AD not having recorded trichloroethene. The variation of trichloroethene concentrations across the south-western corner of the site is presented as Figure 13.

The majority of monitoring wells have not recorded variations in trichloroethene concentrations during the monitoring period. However, this is with the following exceptions:

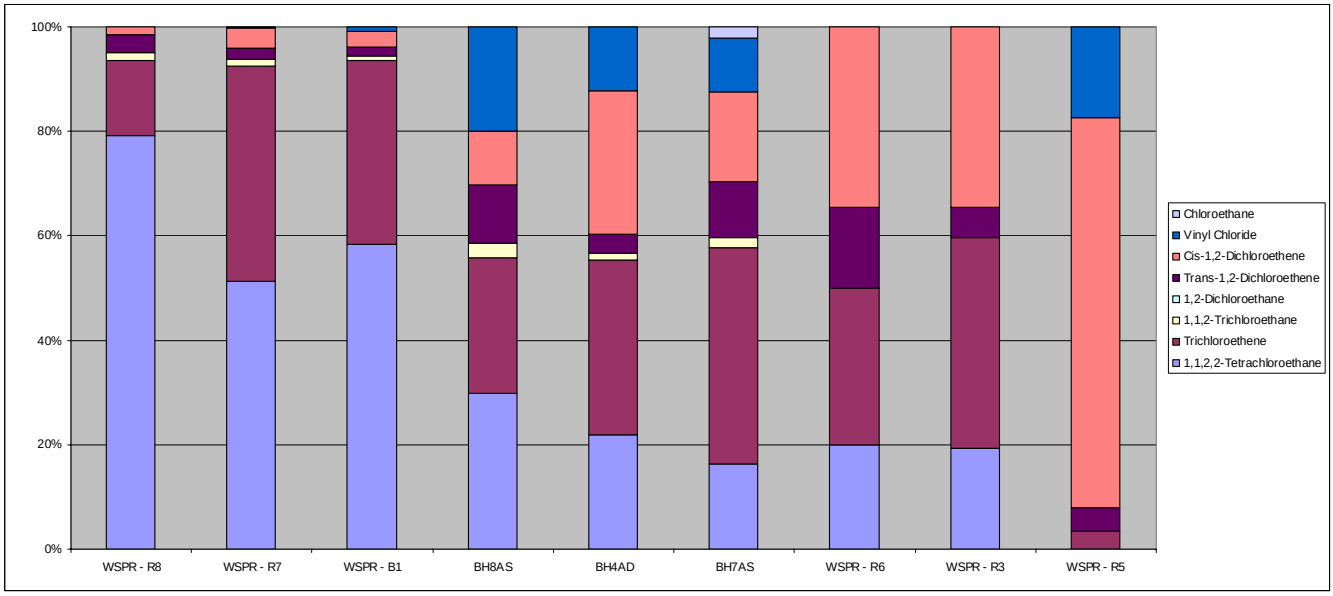
- Between 2003 and February 2009 BH7AS recorded a maximum of 32ug/l trichloroethene. Since April 2009 the concentrations have risen and range between 96ug/l and 170ug/l; concentrations remain consistently at this higher range, although show no sign of increasing further.
- WSPB1 has recorded gradual rises in trichloroethene concentrations, from 660ug/l in March 2007 to peak at 1,400ug/l in June 2010, although subsequent monitoring recorded a fall to 1,200ug/l.

Of the two monitoring wells with deeper response zones within the Sherwood Sandstone, WSP7AD has not recorded trichloroethene to date, whilst WSP8AD has recorded a maximum concentration of 79ug/l.

4.5 NATURAL ATTENUATION

As discussed in Section 4.2, both 1,1,2,2 tetrachloroethane and trichloroethene will degrade under favourable conditions to a series of daughter compounds, some of which are shared.

The graph below presents the relative percentages of parent and daughter compounds for key monitoring wells in the south-western corner of the site:



The monitoring wells on the chart have been positioned such that those with greatest proportion of parent compounds are on the left, whilst those with the highest proportion of daughter compounds are on the right hand side. The order of the wells forms a direct line from the southern boundary (WSP-R8) through the site down-gradient in a north-westerly direction to the off-site monitoring wells (WSP-R5), indicating the presence of relatively undegraded CAHs at the up-gradient boundary and highly degraded CAHs down-gradient of the site.

The least degraded sample was obtained from WSP-R8 on the southern boundary. This well contains the highest proportion of 1,1,2,2 tetrachloroethane, only traces of dichloroethene and no vinyl chloride. WSP7, approximately 50m down-gradient of WSP-R8 contains a higher proportion of trichloroethene, but otherwise is very similar. WSPB1, located another 50m down-gradient has a similar composition to WSP-R8 and WSP-R7, although higher concentrations of dichloroethene are now present, together with low concentrations of vinyl chloride.

The remaining wells through the site contain progressively lower proportions of the parent compounds, such that WSP-R5 off site has elevated dichloroethene and vinyl chloride but no 1,1,2,2 tetrachloroethane and only a trace of trichloroethene.

The evidence relating to daughter compounds indicates that biodegradation of the CAH contamination is active beneath the site. The data also indicates that the least degraded contamination is present on the southern boundary, suggesting an off-site source for at least a proportion of the identified contamination.

5 Review of Potential Sources of CAH Contamination

5.1 HISTORICAL LAND USES

5.1.1 On-Site

The site has been put to industrial use since 1940. The south-western corner of the site was originally used as research / test laboratories as part of the adjacent munitions factory. Subsequently the site was developed as a photochemicals manufactory by Kodak. The existing MOD buildings are understood to have been retained for some time (several still remain) whilst the synthetic photochemical manufacturing buildings were constructed slightly further north.

During Kodak's occupation, the south-western corner of the site became the location for a large effluent treatment plant, which treated all of the site's effluents prior to discharge to foul sewer. Anecdotal information WSP received in 2007 indicates that Kodak may have been paid to receive and treat effluents from other occupiers of the industrial park, although no details are available.

Other activities in this part of the study area included the construction of the Calamity Pit and adjacent pH balancing pits, also forming part of the effluent management system. Adjacent to the southern boundary, to the east of the effluent treatment plant, a silver nitrate plant was established. This is still operational and owned by Ames Goldsmith Ltd. To the north of this plant, Kodak constructed a silver recycling facility.

The effluent treatment plant was decommissioned and demolished in 2007. This was undertaken by CRA on behalf of Kodak and WSP was not involved with this operation; no significant sources of contamination were identified during the works and no remediation was considered necessary. These works were reported to and approved by the Environment Agency during 2007.

There is no recorded use of either 1,1,2,2 tetrachloroethane or trichloroethene on site as part of the various former uses. It is almost certain neither were used by Kodak post 1978 when a new photochemicals plant was built that only utilised a narrow range of non-chlorinated solvents. However, operations during the 1950s and 1960s are less clear and Kodak has not provided information relating to chemicals used at this time. It is possible that either / both may have been used, possibly in experimental quantities.

5.1.2 Off-Site

Off-site potential sources of the two subject contaminants exist. There is evidence that contamination is entering the site from the south. This adjacent plot of land is undeveloped and currently disused and heavily vegetated (it is locally designated as a Site of Biological Interest). The area was used historically by the MOD during the operation of the adjacent munitions factory and was utilised as a location for the burning and burial of faulty munitions. This involved the building of several tracks into the heavily wooded site. After WWll the site was leased to Petrolite Ltd for a number of years. Petrolite did not undertake any development activities, although they operate a large chemicals plant further to the west within the industrial park and it is not known if the undeveloped land was utilised for any purpose. It is understood that this piece of land is currently owned by Knowsley MBC.

A second off-site potential source is a former landfill site to the south-east of the subject property, to the east of Perimeter Road. It is understood that this landfill was unlined and filled prior to development of tight operational / legislative controls. The nature of the fill is unknown but understood to include both domestic and industrial wastes. WSP-R1 and BH1AD are both situated adjacent to the relevant boundary area; both have recorded intermittent contamination (including traces of trichloroethene), although not at concentrations observed within the south-western corner of the site.

5.1.3 Influence of Regional Groundwater Flow

As discussed in Section 2.4.3, it is understood that regional groundwater flow within the Sherwood Sandstone may have reversed following a reduction in groundwater abstraction from the aquifer. The current flow direction to the northwest is likely to be the natural order; historical operation of several potable abstraction boreholes resulted in flow

to the east until cessation of pumping (date unknown). Therefore, the potential for contamination to have migrated from the west, beneath the subject site and now back again cannot be discounted. Furthermore, evidence of this occurrence is provided by the occasional trace of tributyltin recorded in wells across the study area (although not since 2007) from a documented off-site source.

5.2 SOIL LABORATORY DATA

Laboratory chemical testing data for on-site soils has been obtained during several periods from 1994 through to 2007 and both 1,1,2,2 tetrachloroethane and trichloroethene (as part of a VOC suite) have been tested for on numerous occasions. In total, 248 soil samples have been submitted for VOC analysis since 2003. All results for 1,1,2,2 tetrachloroethane and trichloroethene were below detection limit, with the following exceptions:

Exploratory Hole	Depth (m)	1,1,2,2 Tetrachloroethane Concentration (ug/kg)	Trichloroethene Concentration (ug/kg)	Investigation
BH6AS	0.25 – 1.0	<DL	7	CRA 2003 site-wide
WS30	0.25 – 0.95	<DL	1	CRA 2003 site-wide
BH101B	0.6	51	<DL	CRA 2006 Silver Nitrate Plant
BH118A	0.7	540	<DL	CRA 2006 Silver Nitrate Plant
BHE-2	0.7 – 1,0	<DL	1	CRA 2007 Eastman Plant
WSPT5	0.6 – 0.8	<DL	4	CRA / WSP 2007 site-wide
TP301	0.9 – 1.1	200	<DL	CRA 2007 Effluent Treatment Plant
TP301	2.1 – 2.4	<DL	20	CRA 2007 Effluent Treatment Plant
TP304	0.9 – 1.2	<DL	59	CRA 2007 Effluent Treatment Plant
TP313	2.4 – 2.6	<DL	12	CRA 2007 Effluent Treatment Plant
WSPX63	1.6 – 2.0	35	<DL	CRA / WSP 2007 site
WSPX63	2.0 – 2.2	190	85	CRA / WSP 2007 site

<DL = Less than relevant detection limit

The location of these elevated soil concentrations are presented on Figure 16. Trichloroethene has been detected in discrete locations across the site, as follows:

- BH6AS and WSPT5 are located in the surface water reservoir built to support the munitions factory and located in the north-eastern corner of the site.
- WS30 is located close to the southern boundary in a grassed area to the east of the Silver Nitrate plant and to the west of the former drum compound now occupied by Future Industrial Services Ltd.
- BHE-2 is located within the Eastman Chemicals leased area in the northwest of the site.
- TP301, TP304, WSPX63 and TP313 are all located within the former Effluent Treatment Plant area in the south-western corner of the site.

Four locations have recorded 1,1,2,2 tetrachloroethane. Two (BH101B and BH118A) were obtained from within the Silver Nitrate plant close to the southern boundary, with the remaining two located within the former Effluent Treatment Plant area in the south-western corner of the study area.

Conclusion:

A comprehensive data set exists for shallow soil horizons. The concentrations recorded are considered to be relatively minor and suggest there is very limited impact of soils on the site from the 2 CAHs of concern identified within the deep groundwater.

5.3 PERCHED GROUNDWATER LABORATORY DATA

A large database of perched groundwater chemical testing data has been developed since 2003, with a total of 17 monitoring rounds from a site-wide network of wells. In addition to this regular monitoring, specific areas have been subjected to perched groundwater sampling & analysis as part of targeted investigations.

No samples of perched groundwater obtained during quarterly monitoring have recorded the presence of 1,1,2,2 tetrachloroethane. A single sample of perched groundwater was found to contain 1,1,2,2 tetrachloroethane during a specific investigation. MW301 was found to contain 5ug/l of 1,1,2,2 tetrachloroethane when sampled in 2007. This monitoring well was located within the former Effluent Treatment Plant area.

Trichloroethene has been recorded slightly more frequently in perched groundwater, in the following locations:

- BH14 recorded 1ug/l in 2003 and 2.4ug/l in March 2010. This well is located adjacent to the Calamity Pit.
- WSPX12 has recorded between 3.5ug/l and 8.5ug/l during 2009 and 2010, being located at the eastern end of Future Industrial Services Ltd leased area.
- WSPX21 has recorded between 3.3ug/l and 36ug/l during 2009 and 2010 and is located towards the western end of the Future Industrial Services Ltd leased area.
- WSPX23 has recorded between 2.9ug/l and 9.5ug/l during 2009 and 2010 and is located immediately to the west (down-gradient) of the Future Industrial Services Ltd leased area.
- Within the northern part of Building 82 in Zone 3 a number of remediation wells have recorded trichloroethene in a well-defined hot spot with an area of less than 10m by 10m. WSPR-A19 recorded the highest concentration of trichloroethene (4,200ug/l) in March 2010.

The recent identification of trichloroethene in WSPX12, WSPX21 and WSPX23 is attributed to an uncontrolled release of effluent associated with Future Industrial Services Ltd's operations.

The distribution of trichloroethene beneath Building 82 coincides precisely with the distribution of acetone, which has been attributed to spillages associated with operations in this area since 1980. This suggests that trichloroethene may have been used within this building, possibly to clean the plant's pipework. The high density of remediation wells in this area has enabled the extent of trichloroethene to be well defined and no migration from the immediate source area is evident.

Conclusion:

A comprehensive baseline data set exists for perched groundwater across the site. The vast majority of results have not detected the presence of trichloroethene or 1,1,2,2 tetrachloroethane and significantly below the concentrations recorded in the underlying deep groundwater. This is with the exception of a localised source of trichloroethene beneath Building 82, which is located 240m to the northwest of WSPB1 and not considered to have resulted in significant migration or impact to the Sherwood Sandstone.

5.4 DISCUSSION

Laboratory analysis of deep groundwater demonstrates general co-incidence of 1,1,2,2 tetrachloroethane and trichloroethene, although 1,1,2,2 tetrachloroethane appears to predominate on the southern boundary, with trichloroethene increasing in concentration through the site to WSPB1. The two contaminants can therefore be assumed to be derived from broadly the same source, most likely disposal/release of a small quantity of waste solvent.

Based on the distribution of CAHs within the Sherwood Sandstone, it is concluded that the source of the CAH impact was on the southern boundary in the vicinity of WSP-R8 and / or off-site to the south. Given the increasing trend of concentrations as groundwater migrates through the site, additional historical sources may be evident within the former Kodak premises. However, given the absence of any significant impact to soils and perched groundwater, any on-site sources are considered to be historical and most probably transmitted directly to the underlying aquifer.

As discussed in Section 5.1 above, there is no recorded usage of CAHs on the subject site. Site investigation data for much of the study area has not identified the presence of 1,1,2,2 tetrachloroethane or trichloroethene. This includes the main historical chemical process areas, such as the original Synchem buildings, recently subject of remedial works, and the associated bulk storage areas. The only part of the site where 1,1,2,2 tetrachloroethane has been detected on site is to the south of South Street within the former Effluent Treatment Plant and Silver Nitrate Plant areas.

The Effluent Treatment Plant was reportedly constructed in 1991. This was situated on the former location of three small buildings associated with the munitions works. The Silver Nitrate Plant was constructed in 1968 and was previously occupied by some of the earliest Kodak buildings.

Trichloroethene has been recorded in an area of less than 10m by 10m beneath the New Synchem building in Zone 3, associated with acetone and in close proximity to a hole in the factory floor beneath the main chemical mixing desk. This indicates possible use of trichloroethene in the New Synchem process (constructed circa 1980). There is no evidence for migration of trichloroethene associated with this source, and this occurrence is considered unrelated to the CHC impacted Sherwood Sandstone elsewhere on site.

The south-western corner of the site was the focus of the initial Kodak activities upon occupation in 1949, as the company utilised the existing buildings and constructed additional workspace in the surrounding area. No information is available concerning the chemicals used during this time, although production is understood to have been on a small scale using traditional laboratory equipment / containers, with no bulk storage of chemicals as such. Anecdotal information obtained from Kodak employees in 1990 indicates that informal burial and disposal of solid and liquid wastes was common practice across much of the site in the 1950s and 1960s. Evidence of this has been noted during investigations across the playing fields in the north, around the New Synchem building in the east, around the current bulk storage areas in the centre of the site and also along the southern strip. Reportedly contaminated soils were removed from site during construction of the drum compound located to the east of the Silver Nitrate Plant in the 1980s.

Given the anecdotal information regarding the history of the south-western corner of the site, it is likely that small-scale disposal of wastes occurred during the early years of Kodak's occupation. This is not unusual in the context of the wider study area, however, the strip of land to the south of South Street contains very little in the way of Glacial Till to provide protection to the underlying Sherwood Sandstone. Traces of 1,1,2,2 tetrachloroethane have been recorded beneath both the Effluent Treatment Plant and Silver Nitrate Plant.

With the limited thickness of Glacial Till in the potential source area, any chemicals disposed/spilled will have the potential to migrate vertically into the Sherwood Sandstone relatively unimpeded. Perched groundwater in this part of the site is present, but is impersistent and groundwater sampling activities have generally been hampered by limited recoverable quantities for testing. However, of those wells tested in this area (including BH105, BH108, BH113, BH115, MW301, MW302, MW303, MW304 and WSPX63) only 1 sample, MW301 has recorded the presence of 1,1,2,2 tetrachloroethane at a concentration of 5ug/l.

Conclusion:

Based in this review:

- There is evidence of a historical on-site source of 1,1,2,2 tetrachloroethane to the south of South Street. This may be supplemented by an off-site source to the south or indicate that the source extends right upto the southern boundary.
- The residual contamination is likely to be present at significant depth solely within the deep groundwater between South Street and the southern site boundary.

- Negligible contamination has been identified at shallow depth in soils or perched groundwater and the residual contaminant is considered to be at a depth and solely within the Sherwood Sandstone itself.

6 Environmental Risk Assessment

6.1 CRA 2006 DQRA

In 2006 Conestoga Rovers & Associates (Europe) Ltd (CRA), working on behalf of Kodak produced a DQRA for the subject site, which was submitted to the Environment Agency for comment / approval. CRA identified three main potential pollutant linkages with respect to controlled waters, as follows:

1. Shallow soil and groundwater contaminants, via leaching and vertical migration to deep groundwater in the Sherwood Sandstone aquifer.
2. Shallow soil and groundwater contaminants, via leaching and lateral migration to surface water channel 30m to the south of the site boundary.
3. Deep groundwater contaminants, via lateral migration to a theoretical 250m distant compliance point down-gradient of the site.

CRA utilised a commercially available risk assessment package, Consim V2, published by Golder Associates / Environment Agency to model predicted concentrations of contaminants down-gradient of an assumed source.

With respect to the above linkages, CRA concluded the following:

1. Long term risks exist to deep groundwater quality 250m from the site boundary relating to benzene, xylene and TPH, particularly with respect to BH11R.
2. This pollutant linkage is not considered by CRA to be valid, as the watercourse in question is up-hydraulic gradient from groundwater beneath the Kodak site.
3. No long term risks identified with respect to groundwater quality 250m from the site, from pre-existing contamination beneath the study area.

The Environment Agency reviewed the risk assessment produced by CRA and provided their formal response in a letter dated 21 December 2006. This letter generally approved the findings of the QRA and agreed that Pollutant Linkages 2 and 3 'do not appear to be viable pollutant linkages'. However, the Agency reserved concern in relation to Linkage 1, 'because the contaminants which are reaching the major aquifer are List 1 Substances' and requested more detailed modelling and the derivation of site-specific remedial targets to determine the need for any remediation works.

6.2 SUMMARY OF 2008 DQRA

In March 2008 WSP issued a DQRA for the subject site (ref. 12121392/003/8466(2)). This provided proposed remediation targets for soil and perched groundwater across several areas of environmental concern. The report also acknowledged the presence of pre-existing contamination within the Sherwood Sandstone and modelled the potential for off-site migration and associated risks to controlled waters. The report was submitted to and approved by the Environment Agency and formed the basis for the subsequent remediation works currently ongoing.

The DQRA produced by WSP in 2008 modelled risks to a hypothetical groundwater abstraction borehole 250m down-gradient from the site. This is the same basis for a risk assessment completed by CRA in 2006 and also approved by the Agency.

The WSP 2008 DQRA assumed a contamination source area within the Sherwood Sandstone around WSPB1 and BH4AD and modelled the following contaminants:

- 1,1,2,2 tetrachloroethane
- Trichloroethene
- 1,2 dichloroethene (cis and trans)
- 1,2 dichloroethane

- Vinyl chloride

The ConSim modelling tool was utilised to predict contaminant concentrations at the hypothetical off-site receptor (250m off-site down-gradient) via lateral flow within the Sherwood Sandstone aquifer. All contaminants were predicted to be below relevant screening criteria, with the exception of trichloroethene with a predicted concentration of 15ug/l against a screening value of 10ug/l (UK Drinking Water Standard).

6.3 POST 2008 CHANGES

The 2008 DQRA utilised published biodegradation half-lives to simulate attenuation along the migration pathway. Since this work was completed, additional down-gradient wells have been installed and it is now possible to calibrate degradation rates by using the site-specific contaminant concentrations as a guide. Specifically, it is possible to use down-gradient wells WSP-R5, WSP-R6 and BH7AS to measure the rate of degradation during migration.

The installation of WSP-R7 and WSP-R8 has facilitated a better understanding of the nature and possible location of the contamination source. It appears that at least part of the source is located adjacent to the southern boundary. In 2008 the source was centred around the Calamity Pit (WSPB1 and BH4AD) which is approximately 80m down-gradient of WSP-R8. Given the presence of degradation compounds within wells around the Calamity Pit, it is concluded that WSPB1 represents part of the pathway. However, the increased concentrations also suggest that this area of the site is a combination of source area and pathway for contamination derived from further up-gradient.

The 2008 DQRA utilised maximum recorded source concentrations when modelling migration. The maximum concentrations at the time were as follows:

- 1,1,2,2 tetrachloroethane 1,300ug/l (recorded March 2007) – maximum now 2,800ug/l (recorded July 2008)
- Trichloroethene 660ug/l (recorded March 2007) – maximum now 1,400ug/l (recorded June 2010)

6.4 CALIBRATION OF DQRA MODEL

WSP has utilised the Environment Agency Remedial Targets Worksheet (v.3.1) to vary the degradation half-life of the two CAHs to arrive at the known down-gradient concentrations. Given the lack of evidence for degradation of contaminants at source, the degradation option '*within dissolved phase only*' has been selected.

The following table summarises the calculated half-life values based on calibrations between the source (WSPB1) and down-gradient wells BH7AS, WSP-R5 and WSP-R6.

Down-Gradient Well	Distance from Source to Receptor	Change in 1,1,2,2 Tetrachloroethane Concentration (mean)	1,1,2,2 Tetrachloroethane Calculated Half-Life	Change in Trichloroethene Concentration (mean)	Trichloroethene Calculated Half-Life
BH7AS	120m	1,958ug/l to 26ug/l (1.3%)	160 days	900ug/l to 56ug/l (6%)	300 days
WSP-R5	200m	1,958ug/l to <1ug/l (0.05%)	160 days	900ug/l to 3ug/l (0.3%)	250 days
WSP-R6	160m	1,958ug/l to 2ug/l (0.1%)	150 days	900ug/l to 2ug/l (0.22%)	180 days

WSP-R5 and WSP-R6 are not directly down hydraulic gradient of WSPB1 and therefore an allowance has been made within the model for these boreholes being off-set from the centre of the plume.

The calculated half-lives for 1,1,2,2 tetrachloroethane are consistently between 150 and 160 days. Published half-life values for this contaminant range between 7 and 28 days (ConSim) and 45 days (RBCA). The site-derived half-life values may indicate that deep groundwater is not under the consistently strongly reducing conditions that result in the optimum degradation of this compound.

The calculated half-lives for trichloroethene vary between 180 days and 300 days. Published values for this contaminant vary between 33 and 230 days (ConSim) and upto 1,653 days (RBCA), although this latter value is based on aerobic conditions within the aquifer. The American Petroleum Institute *'Anaerobic Degradation Rates of Organic*

Chemicals in Groundwater; a Summary of Field and Laboratory Studies' (1997) reports a mean degradation rate of all published field and laboratory studies at the time as 277 days, which fits closely with the site-derived values.

6.5 REVISED DQRA

WSP has utilised the above maximum calculated half-lives and input maximum recorded source concentrations to date to simulate migration through the Sherwood Sandstone. The table below presents predicted concentrations at various points down-gradient from the source, considered for the purposes of the DQRA to be centred on WSPB1 (as this is the closest source area to the site boundary, some 80m).

Contaminant	Source Concentration	Concentration at Site Boundary	Concentration 100m Off-Site	Concentration 250m Off-Site	Point at Which DWS Reached (10ug/l)
1,1,2,2 Tetrachloroethane	2,800ug/l	130ug/l	6ug/l	0.1ug/l	163m (83m off-site)
Trichloroethene	1,400ug/l	220ug/l	30ug/l	1.5ug/l	228m (148m off-site)

The Remedial Target Worksheets are presented as Appendix B for reference.

Conclusion:

The DQRA presented in 2008 and based on published half-life values predicted concentrations at the 250m off-site receptor as follows:

- 1,1,2,2 tetrachloroethane - $7.1E^{-13}$ ug/l
- Trichloroethene – 15ug/l.

The revised DQRA has resulted in higher predicted off-site concentrations of 1,1,2,2 tetrachloroethane, but lower concentrations of trichloroethene, which in 2008 was predicted to slightly exceed the UK Drinking Water Standard (DWS) 250m off-site. The 2010 DQRA indicates that both contaminants will fall well below the DWS at the 250m hypothetical receptor. On this basis, the contamination within the Sherwood Sandstone is not considered to pose a significant risk to controlled water receptors; a conclusion reached in the 2008 DQRA document and supported and strengthened by the additional evidence collected since.

7 Conclusions

7.1 SCOPE OF REVIEW

WSP has undertaken an assessment of the condition of the Sherwood Sandstone beneath the former Kodak site. This has comprised a review of all relevant desk-based and site investigation data held for the property. Representative and comprehensive chemical testing data is available for an 8 year period spanning 2003 to 2010.

The review has included consideration of potential sources for contaminants of concern (CoCs) and the undertaking of detailed quantitative risk assessment (DQRA) on CoCs to determine potential for migration and risks to wider groundwater quality.

7.2 KEY FINDINGS OF REVIEW

The key findings of this review are as follows:

- The review of groundwater chemical testing data within the Sherwood Sandstone has identified two key CoCs, namely 1,1,2,2 tetrachloroethane and trichloroethene, both of which are chlorinated aliphatic hydrocarbons (CAHs).
- Both 1,1,2,2 tetrachloroethane and trichloroethene exhibit similar distributions within the Sherwood Sandstone aquifer and are present in the south-western corner of the site in the area of the Silver Nitrate Plant and the former Effluent Treatment Plant.
- These are identified as possible historical sources of the observed CAH contamination within the Sherwood Sandstone aquifer although any such impacts are likely to have occurred prior to 1967.
- There is no evidence that contamination sources (of CAHs or any other contaminants) to the north of South Street have impacted on groundwater quality in the Sherwood Sandstone, including the four areas subject to current remediation.
- Following a detailed review of unsaturated zone chemical data it is concluded that there are no significant residual shallow sources of this contamination and the residual contaminants rest solely in the Sherwood Sandstone aquifer.
- Potential unknown historical release to the Sherwood Sandstone aquifer (of a small quantity of solvent) could have been accelerated by the absence of cohesive superficial deposits in this area (the south western corner) of the site.
- Off-site source(s) of contamination may also contribute to the observed CAH impacts within the Sherwood Sandstone aquifer.
- Changing groundwater flow patterns, resulting from reductions in groundwater abstraction in the region, may contribute to the observed fluctuations in the contaminant profile within the Sherwood Sandstone aquifer.
- Lines of evidence confirm that CAH are attenuated within the Sherwood Sandstone aquifer and biodegradation is taking place.

7.3 SUMMARY OF RISKS TO CONTROLLED WATERS

Utilising site-specific contamination distribution data, WSP calibrated the 2008 DQRA and provided a site specific predictive model of CAH migration off-site in the Sherwood Sandstone aquifer. The revised DQRA indicates that both 1,1,2,2 tetrachloroethane and trichloroethene will be significantly below UK Drinking Water Standards at the previously agreed hypothetical receptor some 250m off site.

On the basis of the likely age of the CAH contamination, the apparently stable contaminant plume geometry and the predictions of the calibrated DQRA, no significant risks to controlled water resources are evident and natural attenuation processes are considered to be operating effectively to limit off-site migration.

7.4 IMPLICATIONS FOR EXISTING SITE REMEDIAL STRATEGY AND REMEDIATION WORKS

WSP developed a site remediation strategy designed to ensure that conditions within the Sherwood Sandstone aquifer beneath the site were maintained through the removal of shallow contamination sources identified within soils and perched groundwater around historical site operations and, in particular, to prevent the ongoing release of List 1/hazardous substances to the Sherwood Sandstone aquifer.

This detailed review of the comprehensive chemical data set that exists on the site for soils, perched groundwater and deep groundwater, confirms that shallow sources of contamination have been adequately characterised and addressed by the WSP remediation works.

No evidence of residual sources of contamination has been identified within the shallow soil and perched groundwater horizons and it is concluded that the observed CAH contamination is residual within the Sherwood Sandstone aquifer only.

On this basis no further remediation works are proposed for the shallow soil and perched groundwater horizons.

7.5 FUTURE CONSIDERATIONS

The evidence of impact to the Sherwood Sandstone to the south of South Street highlights the vulnerability of the aquifer in this area and sensitivity to activities conducted at the surface. It is therefore recommended that all current and future activities be subjected to an appropriate level of care and scrutiny to effectively manage the risk of future pollution.

WSP ENVIRONMENTAL LIMITED

Appendices, Figures & Tables

Appendix A Document List

Kodak Kirkby Document List

1. Aspinwall & Company. 1990. Assessment of Groundwater Sensitivity and Potential Soil and Water Contamination at the Kodak Facility, Kirkby. December.

2. Aspinwall & Company. 1994. Phase II Site Investigation at the Kodak facility, Kirkby. March.

3. Apsinwall & Company. 1994. Phase II Site Investigation – Summary of Investigation in Northern Area. February.

4. Aspinwall & Company. 1994. Supplementary Site Investigation. September

5. Aspinwall & Company. 1995. Groundwater Monitoring – September 1995. November

6. Aspinwall & Company. 1998. Groundwater Monitoring and Additional Borehole Installation. January.

7. Aspinwall & Company. 1998. Groundwater Monitoring November 1997 Factual Report. January 16.

8. Conestoga Rovers & Associates (Europe) Ltd. 2003. Additional Groundwater Assessment. December.

9. Conestoga Rovers & Associates (UK) Ltd. 2003. Phase I Environmental Site Assessment. June.

10. Conestoga Rovers & Associates (Europe) Ltd. 2003. Phase II Environmental Site Assessment. September

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Appendix B Remedial Targets Worksheets

Model Input Parameters	Value	Units	Justification
Introduction			
Site Name	Acorn Business Pa	Notes:	
Site Address	Kirkby		
Completed By	R Lawless		
Date	03/09/2010		
	1	1	
Tier 1 Soils			
Water Filled Porosity	0.1	Fraction	Previously used value
Air Filled Porosity	0.1	Fraction	Previously used value
Bulk Density	1.8	g/cm3	Previously used value
Fraction of Organic Carbon in Unsaturated Zone	0.001	Fraction	Previously used value
Tier 2 Soils			
Infiltration	0.0003	m/d	Previously used value
Area of Contaminant Source	2400	m2	Previously used value
Length of contaminant source in direction of groundwater flow	30	m	Previously used value
Saturated aquifer thickness	200	m	Previously used value
Hydraulic Conductivity of aquifer in which dilution occurs	2.56	m/d	Previously used value
Hydraulic gradient of water table	0.01	Fraction	Previously used value
Width of contaminant source perpendicular to groundwater flow	80	m	Previously used value
Enter mixing zone depth	10	m	Previously used value
Abstraction rate	1000	m3/d	Previously used value
Surface water flow upstream of discharge points - low flow conditions	1000	m3/d	Previously used value
Tier 3 Soils			
Width of plume in aquifer at source	80	m	Previously used value
Plume thickness in aquifer at source	10	m	Previously used value
Bulk density of aquifer materials	1.9	g/cm3	Previously used value
Effective porosity of aquifer	0.3	Fraction	Previously used value
Hydraulic gradient	0.01	Fraction	0
Hydraulic conductivity of saturated aquifer	2.56	m/d	0
Distance to compliance point	228	m	0
Distance (lateral) to compliance point perpendicular to flow direction	0	m	0
Distance (depth) to compliance point perpendicular to flow direction	0	m	0
Fraction of Organic Carbon in Aquifer	0.017	Fraction	0
Time since pollutant entered groundwater	9.9E+99	d	
Enter if not Calculated			
Longitudinal dispersivity	22.8	m	
Transverse dispersivity	2.28	m	
Vertical dispersivity	0.228	m	
Tier 3 Groundwater			
Width of plume in aquifer at source (perpendicular to flow)	80	m	0
Plume thickness at source	10	m	0
Saturated aquifer thickness	200	m	0
Bulk density of aquifer materials	1.9	g/cm3	0
Effective porosity of aquifer	0.3	Fraction	0
Hydraulic gradient	0.01	Fraction	0
Hydraulic conductivity of aquifer	2.56	m/d	0
Distance to compliance point	228	m	0
Distance (lateral) to compliance point perpendicular to flow direction	0	m	0
Distance (depth) to compliance point perpendicular to flow direction	0	m	0
Time since pollutant entered groundwater	9.9E+99	d	
Longitudinal dispersivity	22.8	m	
Transverse dispersivity	2.28	m	
Vertical dispersivity	0.228	m	

Modelling Scenario Options	
Tier 1 Soil	
Method of defining partition co-efficient	Calculate for non-polar organic chemicals
Tier 2 Soil	
Target for Tier 2 Soil Assessment	Groundwater abstraction
Mixing zone depth by specifying or calculating depth	Calculate
Tier 3 Soil	
Analytical solution	Ogata Banks
Method of defining partition co-efficient	User specified value for partition coefficient
Dispersivity defined by	Calculating dependant on distance to compliance point
Nature of decay rate	Biodegradation rate is for substance in water
Tier 3 Groundwater	
Select analytical solution	Ogata Banks
Enter method of defining partition co-efficient	Calculate for non-polar organic chemicals
Define dispersivity, Check box if thin aquifer.	Calculating dependant on distance to compliance point
Select nature of decay rate	Biodegradation rate is for substance in water
Vertical Dispersion Geometry	Vertical dispersion in one direction

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Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

	Variable	Value	Unit	Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.40E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	3.00E+02	days	*RBCA Database*
Calculated decay rate	λ	2.31E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	8.00E+01	m	*0*
Plume thickness at source	Sy	1.00E+01	m	*0*
Saturated aquifer thickness	da	2.00E+02	m	*0*
Bulk density of aquifer materials	ρ	1.90E+00	g/cm^3	*0*
Effective porosity of aquifer	n	3.00E-01	fraction	*0*
Hydraulic gradient	i	1.00E-02	fraction	*0*
Hydraulic conductivity of aquifer	K	2.56E+00	m/d	*0*
Distance to compliance point	x	2.28E+02	m	*0*
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	*0*
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	*0*
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.14E+00	l/kg	*see options*
Longitudinal dispersivity	ax	2.28E+01	m	*see options*
Transverse dispersivity	az	2.28E+00	m	*see options*
Vertical dispersivity	ay	2.28E-01	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	8.53E-02	m/d
Retardation factor	Rf	1.46E+01	fraction
Decay rate used	λ	1.59E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.86E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	9.91E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.41E+02**	

Remedial Targets

Remedial Target		**1.41E+00**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**228**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**9.91E-03**	**mg/l**	Ogata Banks
after		**9.9E+99**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.70E-02	fraction
Organic carbon partition coefficient	Koc	1.26E+02	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.14E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

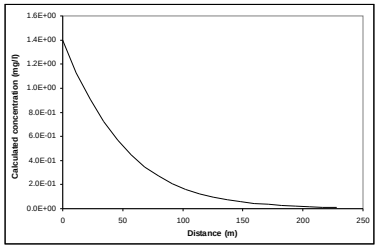
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	2.28E+01	6.58E+00	m
Transverse dispersivity	**az**	0.00E+00	2.28E+00	6.58E-01	m
Vertical dispersivity	**ay**	0.00E+00	2.28E-01	6.58E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Acorn Business Park
Completed by:	R Lawless
Date:	03/09/2010
Version:	1

Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	1.4E+00
11.4	1.13E+00
22.8	9.08E-01
34.2	7.24E-01
45.6	5.71E-01
57.0	4.47E-01
68.4	3.47E-01
79.8	2.69E-01
91.2	2.08E-01
102.6	1.61E-01
114.0	1.24E-01
125.4	9.63E-02
136.8	7.45E-02
148.2	5.77E-02
159.6	4.47E-02
171.0	3.47E-02
182.4	2.70E-02
193.8	2.10E-02
205.2	1.63E-02
216.6	1.27E-02
228.0	9.91E-03

R&D Publication 20 Remedial Targets Worksheet, Release 3.1

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		1,1,2,2 Tetrachloroethane		from Level 1
Target Concentration	C_T	1.00E-01	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to dissolved pollutants only

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.80E+00	mg/l	
Half life for degradation of contaminant in water	$t_{1/2}$	1.60E+02	days	*RBCA Database*
Calculated decay rate	λ	4.33E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	8.00E+01	m	*0*
Plume thickness at source	Sy	1.00E+01	m	*0*
Saturated aquifer thickness	da	2.00E+02	m	*0*
Bulk density of aquifer materials	ρ	1.90E+00	g/cm^3	*0*
Effective porosity of aquifer	n	3.00E-01	fraction	*0*
Hydraulic gradient	i	1.00E-02	fraction	*0*
Hydraulic conductivity of aquifer	K	2.56E+00	m/d	*0*
Distance to compliance point	x	2.28E+02	m	*0*
Distance (lateral) to compliance point perpendicular to flow direction	z	0.00E+00	m	*0*
Distance (depth) to compliance point perpendicular to flow direction	y	0.00E+00	m	*0*
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	1.32E+00	l/kg	*see options*
Longitudinal dispersivity	ax	2.28E+01	m	*see options*
Transverse dispersivity	az	2.28E+00	m	*see options*
Vertical dispersivity	ay	2.28E-01	m	*see options*

Calculated Parameters

	Variable		
Groundwater flow velocity	v	8.53E-02	m/d
Retardation factor	Rf	9.35E+00	fraction
Decay rate used	λ	4.63E-04	d^{-1}
Rate of contaminant flow due to retardation	u	9.12E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.55E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.81E+03**	

Remedial Targets

Remedial Target		**1.81E+02**	**mg/l**	For comparison with measured groundwater concentration.
Ogata Banks				
Distance to compliance point		**228**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.55E-03**	**mg/l**	Ogata Banks
after		**9.9E+99**	**days**	

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Select Method for deriving Partition Co-efficient (using pull down menu)

Calculate for non-polar organic chemicals

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc	1.70E-02	fraction
Organic carbon partition coefficient	Koc	7.76E+01	l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	1.32E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

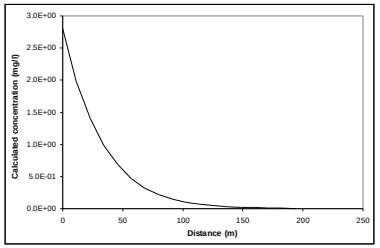
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	2.28E+01	6.58E+00	m
Transverse dispersivity	**az**	0.00E+00	2.28E+00	6.58E-01	m
Vertical dispersivity	**ay**	0.00E+00	2.28E-01	6.58E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best described by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Acorn Business Park
Completed by:	R Lawless
Date:	03/09/2010
Version:	1

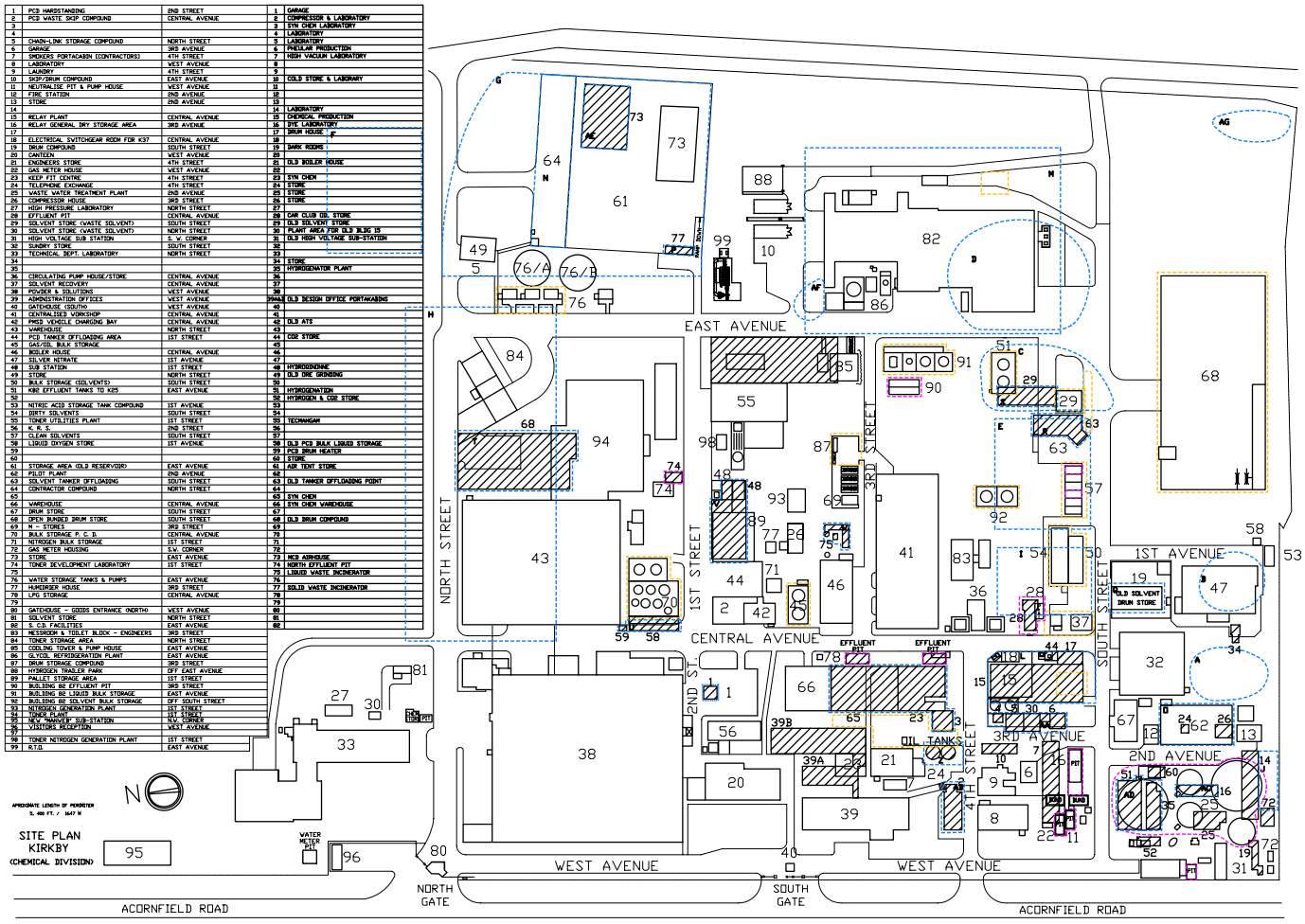
Calculated concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Concentration
	mg/l
0	2.8E+00
11.4	1.99E+00
22.8	1.41E+00
34.2	9.87E-01
45.6	6.86E-01
57.0	4.72E-01
68.4	3.23E-01
79.8	2.20E-01
91.2	1.50E-01
102.6	1.02E-01
114.0	6.95E-02
125.4	4.73E-02
136.8	3.22E-02
148.2	2.20E-02
159.6	1.50E-02
171.0	1.02E-02
182.4	7.01E-03
193.8	4.79E-03
205.2	3.29E-03
216.6	2.25E-03
228.0	1.55E-03

Figure 1 Historical Land Uses

DO NOT SCALE



1	PCD HARDSTANDING	2ND STREET	1	GARAGE
2	PCD WASTE SKIP COMPOUND	CENTRAL AVENUE	2	COMPRESSOR & LABORATORY
3			3	SYN CHEM LABORATORY
4			4	LABORATORY
5	CHAIN-LINK STORAGE COMPOUND	NORTH STREET	5	LABORATORY
6	GARAGE	3RD AVENUE	6	PHOSLAM PRODUCTION
7	SMOKERS PORTACABIN (CONTRACTORS)	4TH STREET	7	HIGH VACUUM LABORATORY
8	LABORATORY	WEST AVENUE	8	
9	LAUNDRY	4TH STREET	9	
10	SKIP/DRUM COMPOUND	EAST AVENUE	10	COLD STORE & LABORARY
11	NEUTRALISE PIT & PUMP HOUSE	WEST AVENUE	11	
12	FIRE STATION	2ND AVENUE	12	
13	STORE	2ND AVENUE	13	
14			14	LABORATORY
15	RELAY PLANT	CENTRAL AVENUE	15	CHEMICAL PRODUCTION
16	RELAY GENERAL DRY STORAGE AREA	3RD AVENUE	16	DYE LABORATORY
17			17	DRUM HOUSE
18	ELECTRICAL SWITCHGEAR ROOM FOR K37	CENTRAL AVENUE	18	
19	DRUM COMPOUND	SOUTH STREET	19	DARK ROOMS
20	CANTEEN	WEST AVENUE	20	
21	ENGINEERS STORE	4TH STREET	21	OLD BOILER HOUSE
22	GAS METER HOUSE	WEST AVENUE	22	
23	KEEP FIT CENTRE	4TH STREET	23	SYN CHEM
24	TELEPHONE EXCHANGE	4TH STREET	24	STORE
25	WASTE WATER TREATMENT PLANT	2ND AVENUE	25	STORE
26	COMPRESSOR HOUSE	3RD STREET	26	STORE
27	HIGH PRESSURE LABORATORY	NORTH STREET	27	
28	EFFLUENT PIT	CENTRAL AVENUE	28	CAR CLUB OIL STORE
29	SOLVENT STORE (WASTE SOLVENT)	SOUTH STREET	29	OLD SOLVENT STORE
30	SOLVENT STORE (WASTE SOLVENT)	NORTH STREET	30	PLANT AREA FOR OLD BLDG 15
31	HIGH VOLTAGE SUB STATION	S. W. CORNER	31	OLD HIGH VOLTAGE SUB-STATION
32	SUNDRY STORE	SOUTH STREET	32	
33	TECHNICAL DEPT. LABORATORY	NORTH STREET	33	
34			34	STORE
35			35	HYDROGENATOR PLANT
36	CIRCULATING PUMP HOUSE/STORE	CENTRAL AVENUE	36	
37	SOLVENT RECOVERY	CENTRAL AVENUE	37	
38	POWDER & SOLUTIONS	WEST AVENUE	38	
39	ADMINISTRATION OFFICES	WEST AVENUE	39	OLD SESSION OFFICE PORTACABINS
40	GATEHOUSE (SOUTH)	WEST AVENUE	40	
41	CENTRALISED WORKSHOP	CENTRAL AVENUE	41	
42	PMSD VEHICLE CHARGING BAY	CENTRAL AVENUE	42	OLD ATS
43	WAREHOUSE	NORTH STREET	43	
44	PCD TANKER OFFLOADING AREA	1ST STREET	44	COZ STORE
45	GAS/OIL BULK STORAGE		45	
46	BOILER HOUSE	CENTRAL AVENUE	46	
47	SILVER NITRATE	1ST AVENUE	47	
48	SUB STATION	1ST STREET	48	HYDRODINONE
49	STORE	NORTH STREET	49	OLD DRC GRINDING
50	BULK STORAGE (SOLVENTS)	SOUTH STREET	50	
51	KB2 EFFLUENT TANKS TO K25	EAST AVENUE	51	HYDROGENATION
52			52	HYDROGEN & COZ STORE
53	NITRIC ACID STORAGE TANK COMPOUND	1ST AVENUE	53	
54	DIRTY SOLVENTS	SOUTH STREET	54	
55	TONER UTILITIES PLANT	1ST STREET	55	TECHANGAM
56	K. R. S.	2ND STREET	56	
57	CLEAN SOLVENTS	SOUTH STREET	57	
58	LIQUID OXYGEN STORE	1ST AVENUE	58	OLD PCD BULK LIQUID STORAGE
59			59	PCD DRUM HEATER
60			60	STORE
61	STORAGE AREA (OLD RESERVOIR)	EAST AVENUE	61	AIR TENT STORE
62	FOLIE PLANT	2ND AVENUE	62	
63	SOLVENT TANKER OFFLOADING	SOUTH STREET	63	OLD TANKER OFFLOADING POINT
64	CONTRACTOR COMPOUND	NORTH STREET	64	
65			65	SYN CHEM
66	WAREHOUSE	CENTRAL AVENUE	66	SYN CHEM WAREHOUSE
67	DRUM STORE	SOUTH STREET	67	
68	OPEN BUNDED DRUM STORE	SOUTH STREET	68	OLD DRUM COMPOUND
69	M - STORES	3RD STREET	69	
70	BULK STORAGE P. C. D.	CENTRAL AVENUE	70	
71	NITROGEN BULK STORAGE	1ST STREET	71	
72	GAS METER HOUSING	S.W. CORNER	72	
73	STORE	EAST AVENUE	73	MCB ASBHOUSE
74	TONER DEVELOPMENT LABORATORY	1ST STREET	74	NORTH EFFLUENT PIT
75			75	LIQUID WASTE INCINERATOR
76	WATER STORAGE TANKS & PUMPS	EAST AVENUE	76	
77	HUMIDRISER HOUSE	3RD STREET	77	SOLID WASTE INCINERATOR
78	LPG STORAGE	CENTRAL AVENUE	78	
79			79	
80	GATEHOUSE - GOODS ENTRANCE (NORTH)	WEST AVENUE	80	
81	SOLVENT STORE	NORTH STREET	81	
82	S. C.D. FACILITIES	EAST AVENUE	82	
83	MESSROOM & TOILET BLOCK - ENGINEERS	3RD STREET		
84	TONER STORAGE AREA	NORTH STREET		
85	COOLING TOWER & PUMP HOUSE	EAST AVENUE		
86	GLYCOL REFRIDGERATION PLANT	EAST AVENUE		
87	DRUM STORAGE COMPOUND	3RD STREET		
88	HYDROGEN TRAILER PARK	OFF EAST AVENUE		
89	PALLET STORAGE AREA	1ST STREET		
90	BUILDING 82 EFFLUENT PIT	3RD STREET		
91	BUILDING 82 LIQUID BULK STORAGE	EAST AVENUE		
92	BUILDING 82 SOLVENT BULK STORAGE	OFF SOUTH STREET		
93	NITROGEN GENERATION PLANT	1ST STREET		
94	TONER PLANT	1ST STREET		
95	N.G.V. MANVEIP SUB-STATION	N.W. CORNER		
96	VISITORS RECEPTION	WEST AVENUE		
97				
98	TONER NITROGEN GENERATION PLANT	1ST STREET		
99	R.T.Q.	EAST AVENUE		

HISTORICAL ISSUES

A- DISPOSAL OF PCD POWDERS, SOLVENTS, ACID CHLORIDES. 1950-1967. 1.5 TONNES TOLUENE SPILLAGE 1988.

B- AS FOR A 1950-1973 AC AMINE SPILLAGE (3 OCCASIONS) 1982-1988.

C- AS FOR A INCLUDING CYANIDE DRUMSTORE 1950-1973. TECHANGAM TANKER LEAK (18 TONNE) 1973.

D- AS FOR A 1960-1971.

E- VGK - ORGANIC RESIDUES/SCD POWDERS 1958-1970.

F- BURNING DOMESTIC AND CHEMICAL WASTE 1968-1975.

G- MANGANESE DIOXIDE (NOTE STILL SEEPING (1990))FIRE OF STORE TENT 1975.

H- 1968-1975- MANGANESE SULPHATE, HYDROQUINONE, ZINC, 812 CAUSTIC/ZINC. VARIOUS CHEMICALS BURNT.

I- MIXED ORGANIC TARS 1958-1972.

J- GROUP POLLUTION FROM EXHAUST SYSTEM 1950-1967.

K- SMALL AMOUNT OF CATALYST/ORGANICS

L- BUILDING 15 - FORMER SYNCHEM PLANT. SUB-SURFACE SOLVENT/ACID CONTAMINATION DISCOVERED AT SOUTHERN END OF MEZZANINE FLOOR SUPPORT 1969/1970.

M- SUB SURFACE SOLVENT/ACID CONTAMINATION DISCOVEERD (SURFACE OF WATER TABLE) WEST AND EAST SIDE ADJACENT TO DITCH DRAIN IN 1987. EXACT LOCATION UNKOWN.

N- CONTRACTORS HUT - CO2 FOUND EMENATING FROM CONCRETE SLAB 1989.

O- BUILDING 62. CONTAMINATION DISCOVERED DURING CONSTRUCTION IN 1975.

P- FORMER SOLID WASTE INCINERATOR.

Q- OLD SOLVENT DRUM STORE.

R- OLD TANKER OFF-LOADING AREA.

S- OLD SOLVENT STORE.

T- OLD DRUM COMPOUND.

U- OLD PCD BULK LIQUID STORAGE/DRUM HEATER.

V- FORMER HYDROQUINONE PRODUCTION.

W- FORMER LIQUID WASTE INCINERATOR.

X- FORMER SYNCHEM.

Y- FORMER GARAGE.

Z- FORMER GAS OIL TANKS.

AA- FORMER SYNCHEM ANCILLARY BUILDINGS.

AB- FORMER COMPRESSOR HOUSE AND LABORATORY.

AC- FORMER DYE LABORATORY.

AD- FORMER HYDROGENATION PLANT.

AE- FORMER AIR TENT (BURNT 1975).

AF- COLLAPSED/FAILED DRAIN.

AG- 'MOUND' AREA- HISTORICAL LANDFILLING.

REV	DATE	BY	DESCRIPTION	CHK	APD
A	DD/MM/YY		INITIAL ISSUE		

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The Alexandra, 200-220 The Quays, Salford, Greater Manchester, M50 3SP
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CLIENT: INTERNATIONAL PROCESS PLANTS

ARCHITECTS: N/A

PROJECT: KODAK, KIRKBY

TITLE: HISTORICAL AND CURRENT LAND USES

SCALE @ A1:	CHECKED:	APPROVED:
1:1000	TT	RL
CAD FILE:	DESIGN/DRAWN:	DATE:
	AW	MARCH 2007
PROJECT No:	DRAWING No:	REV:
12121392/001	FIGURE 1	A

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Figure 2 Site Layout & Leased Areas

Key:

- Future Industrial Services Leased Area
- Eastman Company Leased Area
- Ames Goldsmith Leased Area
- MRM Leased Area

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http://www.wspgroup.com

Site:
Former Kodak Chemicals,
Kirkby

Drawing Number:
Figure 2

Title:
Site Plan Showing Indicative Leased Areas

Scale @ A1:	Checked:	Approved:
1:1000	RL	DR
Project No:	**Created By:**	**Date:**
13010908	JPM	01/09/2010

Client:
Kirkby At LLC

Figure 3 Glacial Till Thickness

Legend

- Deep Boreholes

m

- 0 - 1
- 1.01 - 2
- 2.01 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 7
- 7.01 - 8
- 8.01 - 9
- 9.01 - 10
- 10.01 - 11
- 11.01 - 12
- 12.01 - 13
- 13.01 - 14

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CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Glacial till Thickness (m)

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NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	13/08/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 3	A

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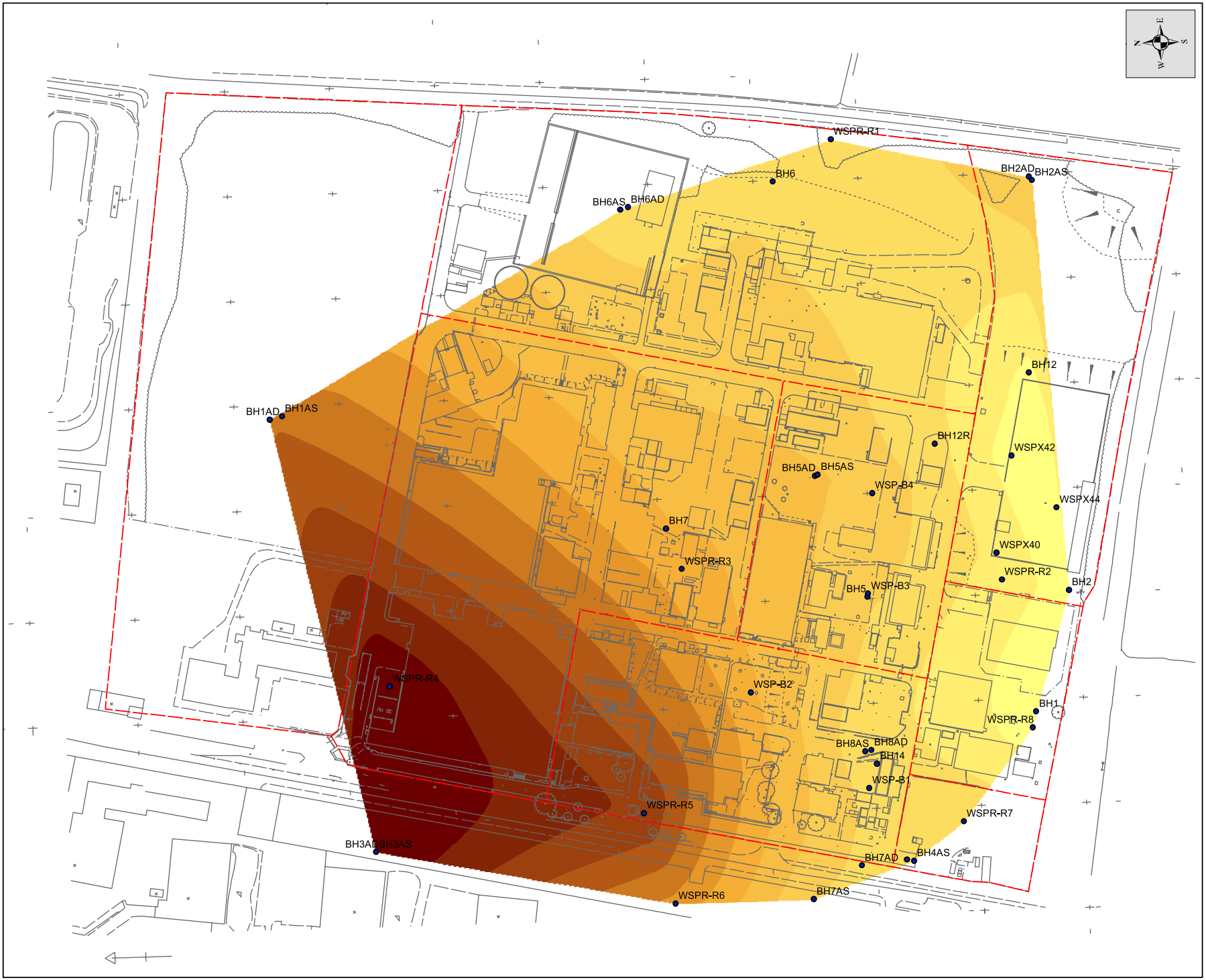
Figure 4 Depth to Rockhead



Legend

Depth to Rockhead

m

- 2 - 3
- 3.01 - 4
- 4.01 - 5
- 5.01 - 6
- 6.01 - 7
- 7.01 - 8
- 8.01 - 9
- 9.01 - 10
- 10.01 - 11
- 11.01 - 12
- 12.01 - 13
- 13.01 - 14

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PROJECT: Image Business Park Remediation

TITLE: Depth to Rockhead (m)

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	13/08/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 4	A

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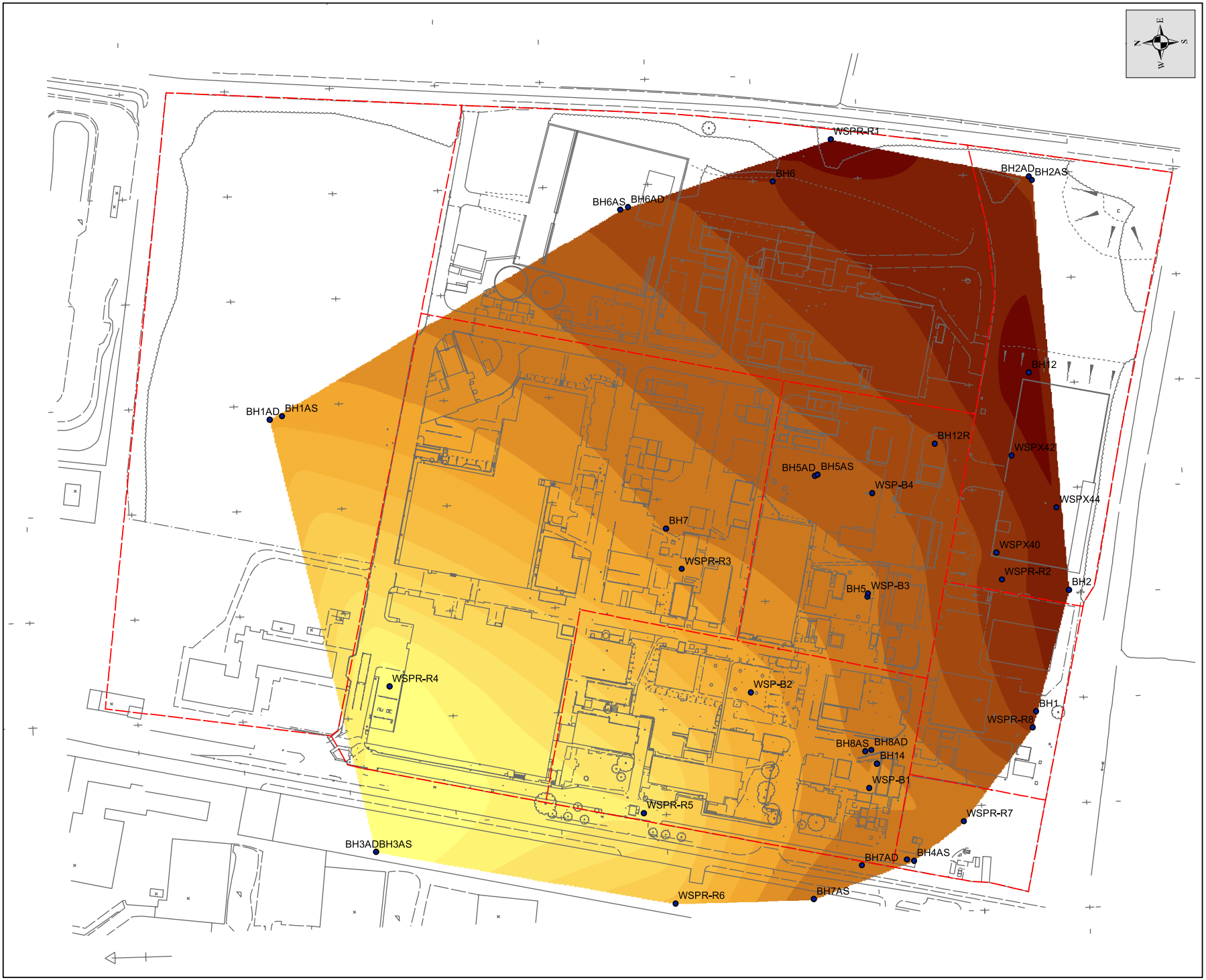
Figure 5 Rockhead Elevation



Legend

- Depth to Rockhead

mAOD

- 27.85 - 28.83
- 28.84 - 29.81
- 29.82 - 30.79
- 30.8 - 31.77
- 31.78 - 32.75
- 32.76 - 33.73
- 33.74 - 34.71
- 34.72 - 35.69
- 35.7 - 36.67
- 36.68 - 37.65
- 37.66 - 38.63
- 38.64 - 39.61
- 39.62 - 40.59
- 40.6 - 41.57
- 41.58 - 42.55

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TITLE: Rockhead Elevation (mAOD)

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NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	13/08/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 5	A

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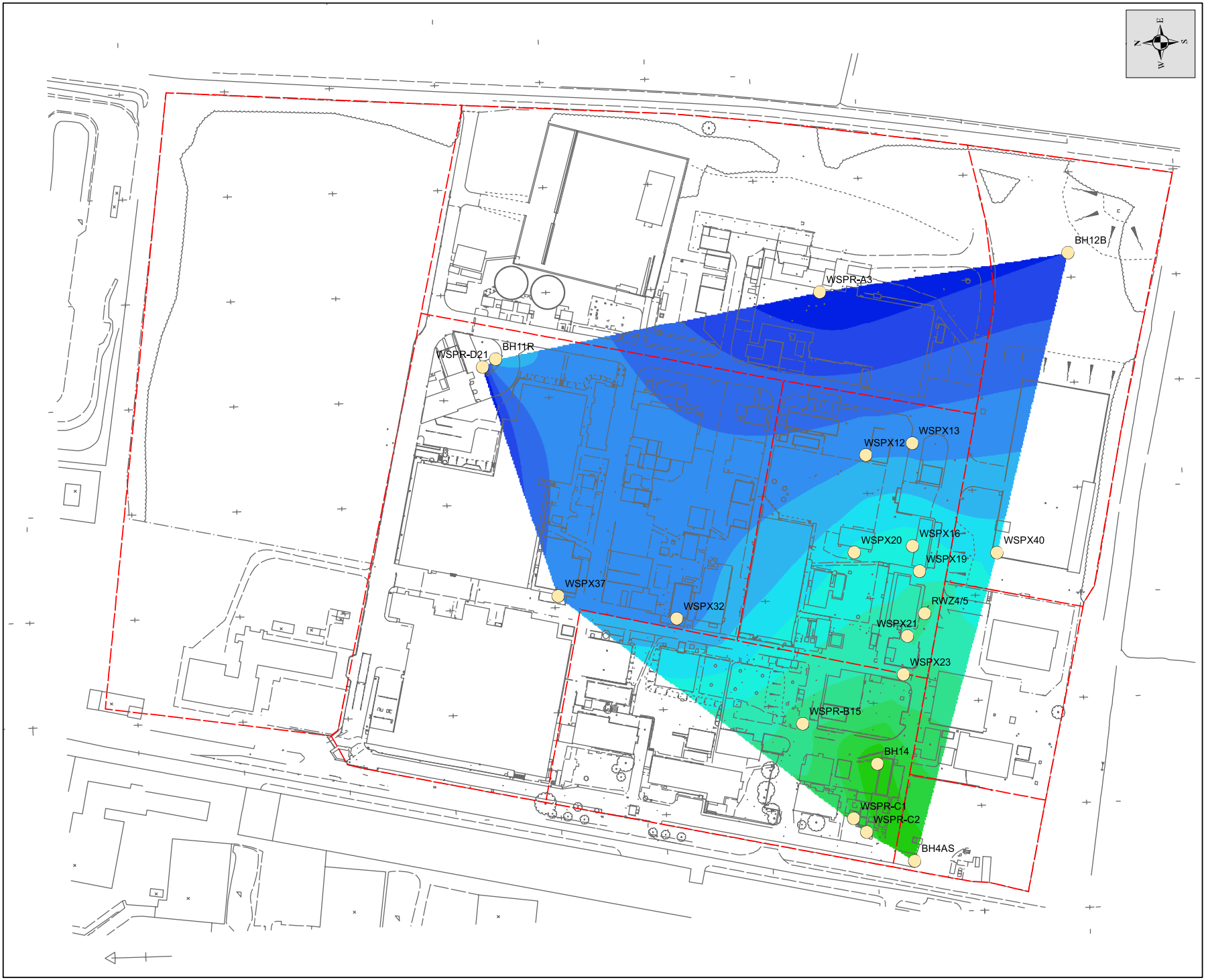
Figure 6 Perched Groundwater Elevations



Legend

Shallow Monitoring Wells

mAOD

- 39.19 - 39.58
- 39.59 - 39.98
- 39.99 - 40.37
- 40.38 - 40.77
- 40.78 - 41.16
- 41.17 - 41.56
- 41.57 - 41.95
- 41.96 - 42.34
- 42.35 - 42.74
- 42.75 - 43.13
- 43.14 - 43.53
- 43.54 - 43.92

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TITLE: Perched Groundwater Elevation (mAOD)

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N/A	JPM	13/08/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 6	A

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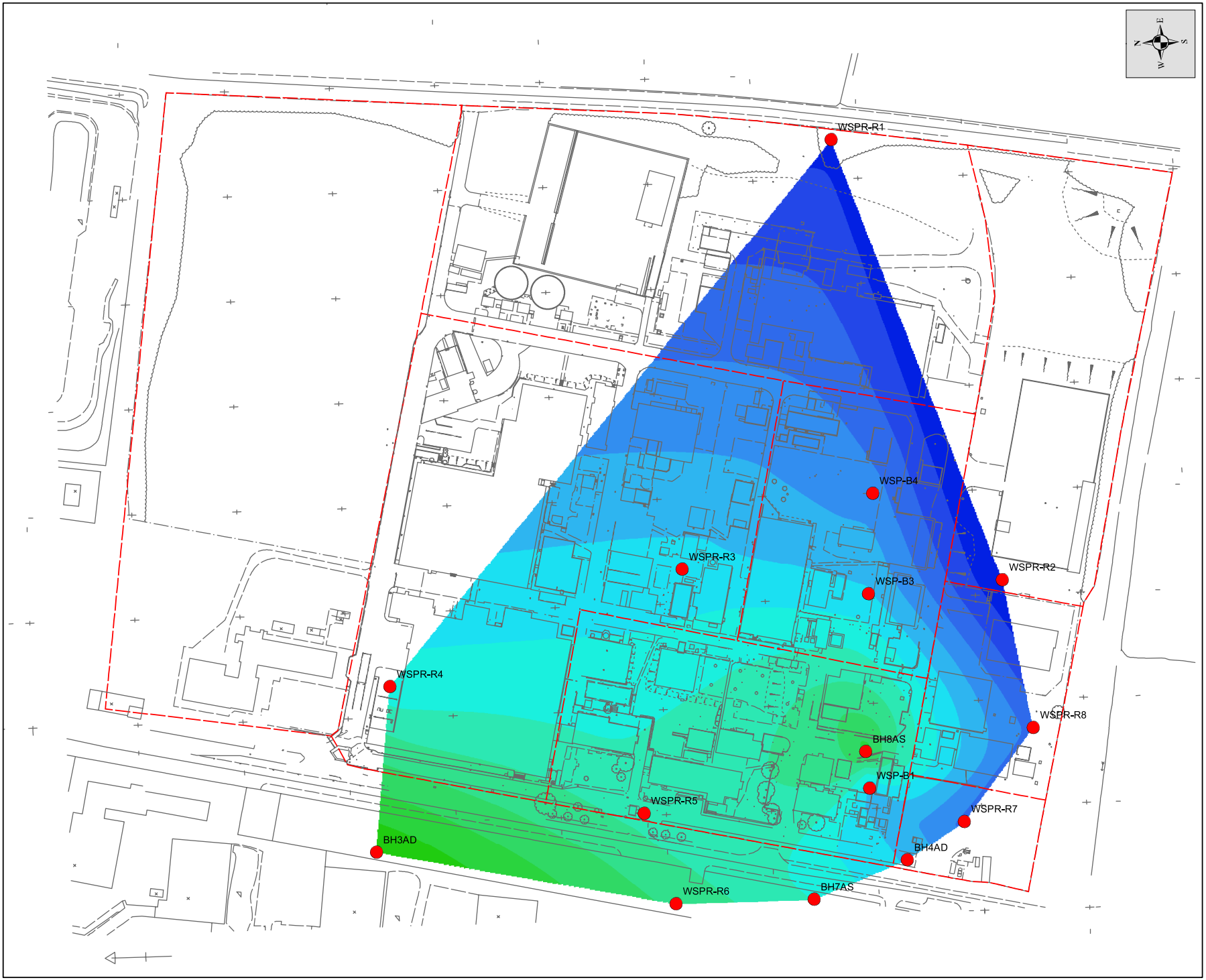
Figure 7 Deep Groundwater Elevations



Legend

Deep Monitoring Wells

mAOD

- 34.98 - 35.26
- 35.27 - 35.54
- 35.55 - 35.82
- 35.83 - 36.09
- 36.1 - 36.37
- 36.38 - 36.65
- 36.66 - 36.93
- 36.94 - 37.21
- 37.22 - 37.48
- 37.49 - 37.76
- 37.77 - 38.04
- 38.05 - 38.32

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PROJECT: Image Business Park Remediation

TITLE: Deep Groundwater Elevation (mAOD)

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Figure 8 Vertical Separation between Groundwater Bodies

Legend

- Shallow Monitoring Wells
- Deep Monitoring Wells

Vertical Separation (metres)

- 2.31 - 2.5
- 2.51 - 3
- 3.01 - 3.5
- 3.51 - 4
- 4.01 - 4.5
- 4.51 - 5
- 5.01 - 5.5
- 5.51 - 6
- 6.01 - 6.5

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TITLE: Vertical Separation Between Groundwater Bodies

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FILE NAME:	DRAWN:	DATE:
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Figure 9 Deep Groundwater Monitoring Well Locations

Legend

- Deep Monitoring Wells

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PROJECT: Image Business Park Remediation

TITLE: Deep Monitoring Well Locations

SCALE:	CHECKED:	APPROVED:
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FILE NAME:	DRAWN:	DATE:
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13010908	Figure 9	A

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Figure 10 1,1,2,2 Tetrachloroethane Degradation Pathways

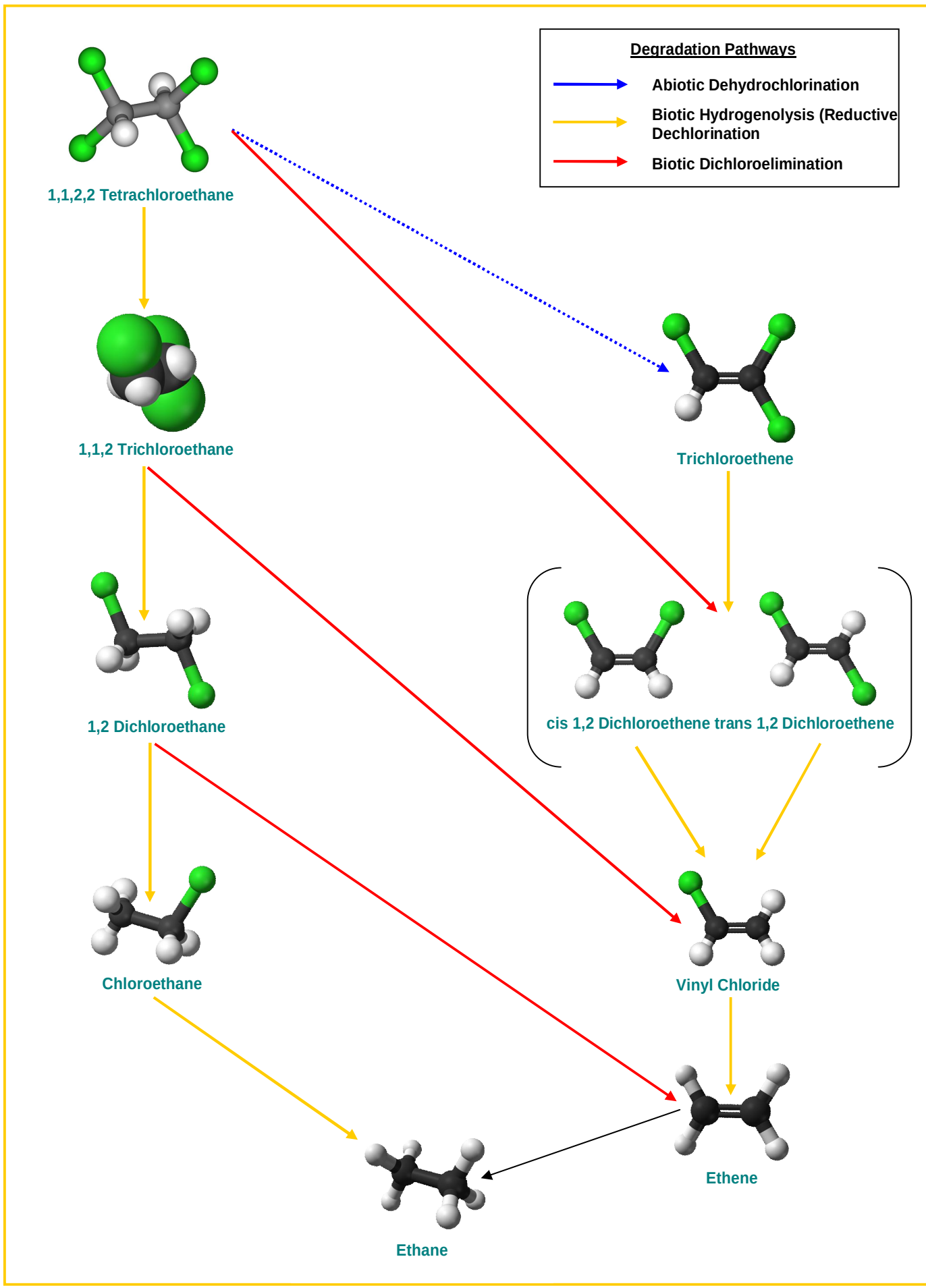
Degradation Pathways
Abiotic Dehydrochlorination
Biotic Hydrogenolysis (Reductive Dechlorination
Biotic Dichloroelimination
1,1,2,2 Tetrachloroethane
1,1,2 Trichloroethane
Trichloroethene
1,2 Dichloroethane
cis 1,2 Dichloroethene
trans 1,2 Dichloroethene
Chloroethane
Vinyl Chloride
Ethene
Ethane

Figure 11 March 2010 1,1,2,2 Tetrachloroethane Distribution in Deep Groundwater

Legend

1122 TCE

ug/l

- 1.0 - 2.7
- 2.8 - 7.7
- 7.8 - 77.0
- 77.1 - 340.0
- 340.1 - 1900.0

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CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: 1122, Tetrachloromethane Concentrations In Deep Boreholes

SCALE	CHECKED	APPROVED
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FILE NAME: N/A	DRAWN: JPW	DATE: 15/06/2010
PROJECT No: 13010908	DRAWING NO: Figure 1	REV: A

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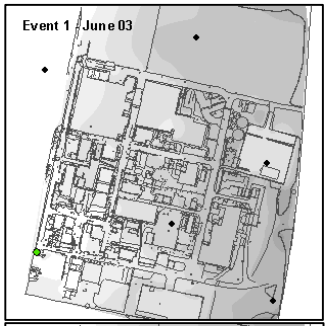
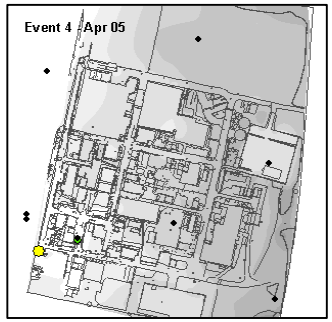
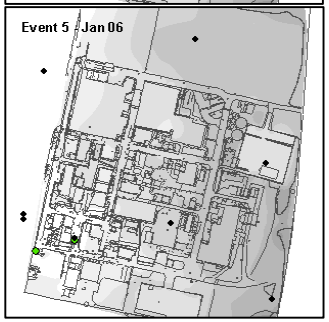
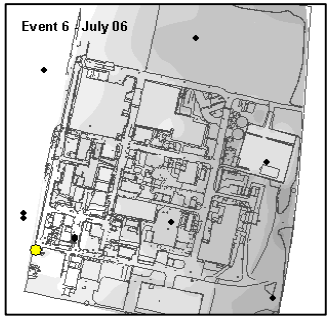
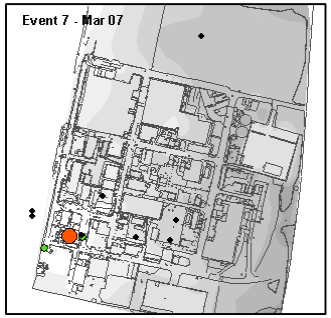
Figure 12 1,1,2,2 Tetrachloroethane Distribution 2003 to 2010

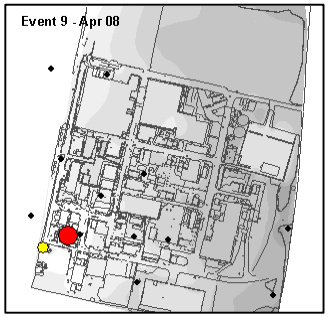


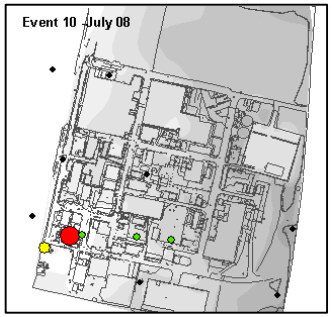


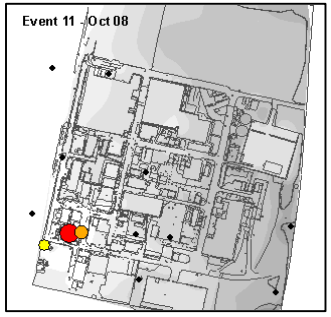


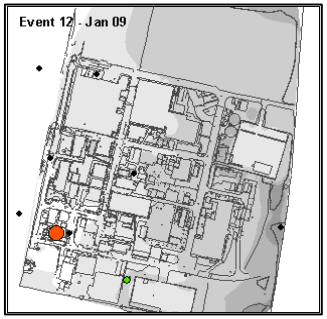


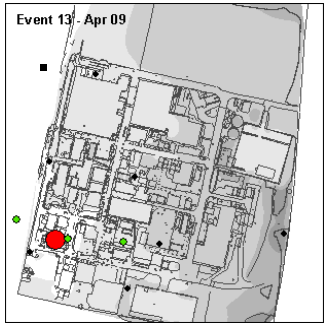


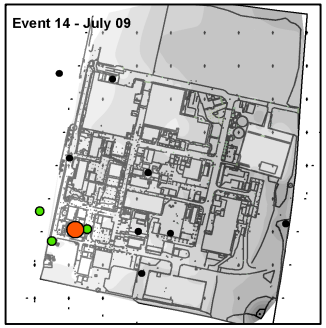


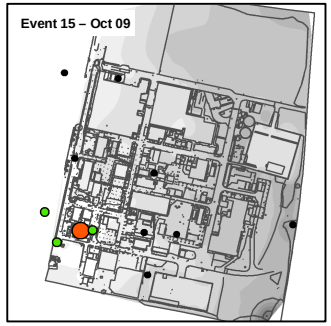












Key:

1,1,2,2-Tetrachloroethane
ug/l

- <LDL
- >LDL - 100.00
- 100.01 - 500.00
- 500.01 - 1000.00
- 1000.01 - 2000.00
- 2000.01 - 3000.00

N

0 37.5 75 150 225 300 Meters

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http://www.wspgroup.com

Site:
Former Kodak chemical site, Acornfield Road,
North Kirkby, Merseyside

Figure Number:
Figure 12

Title:
1,1,2,2-Tetrachloroethane distribution within the Deep aquifer

Project No:	Created By:	Date:
13010908-001	TCW	August 2010

Client:
Acorn Developments (Kirkby) Ltd

Figure 13 Cross Section with 1,1,2,2 Tetrachloroethane and Trichloroethene Concentrations

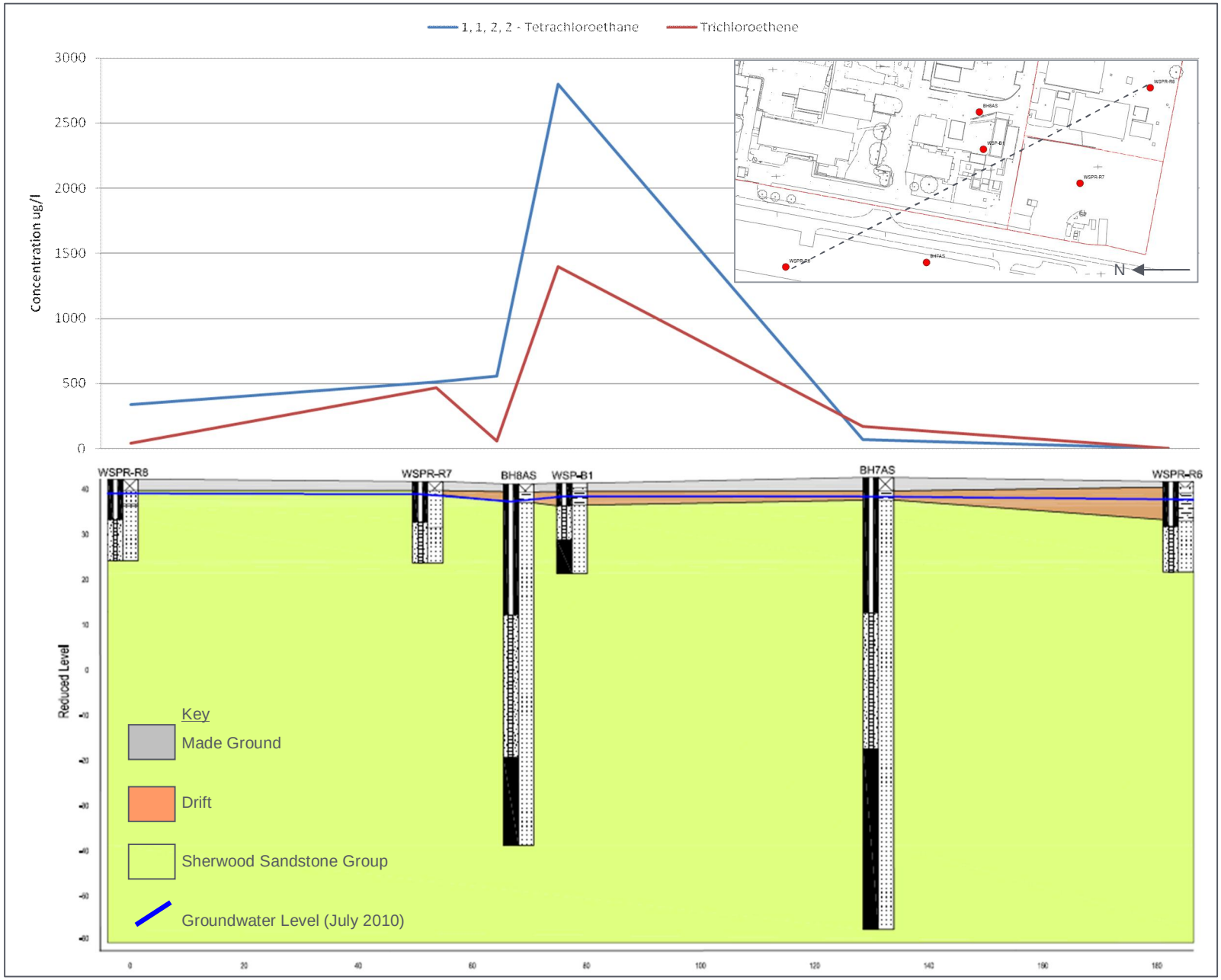
1, 1, 2, 2 - Tetrachloroethane
Trichloroethene
Concentration ug/l
3000
2500
2000
1500
1000
500
0
WSPR-R8
WSPR-R7
BH8AS
WSP-B1
BH7AS
WSPR-R6
N
Reduced Level
Key
Made Ground
Drift
Sherwood Sandstone Group
Groundwater Level (July 2010)

Figure 14 March 2010 Trichloroethene Concentrations in Deep Groundwater

Legend

TRCE

ug/l

- 2.0
- 2.1 - 20.0
- 20.1 - 780.8
- 780.9 - 1040.4
- 1040.5 - 1300.0

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Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Trichloroethene Concentrations in Deep Boreholes

SCALE	CHECKED	APPROVED
NTS	RL	DR
FILE NAME: N/A	DRAWN: JPM	DATE: 15/06/2010
PROJECT No: 13010908	DRAWING NO: Figure 2	REV: A

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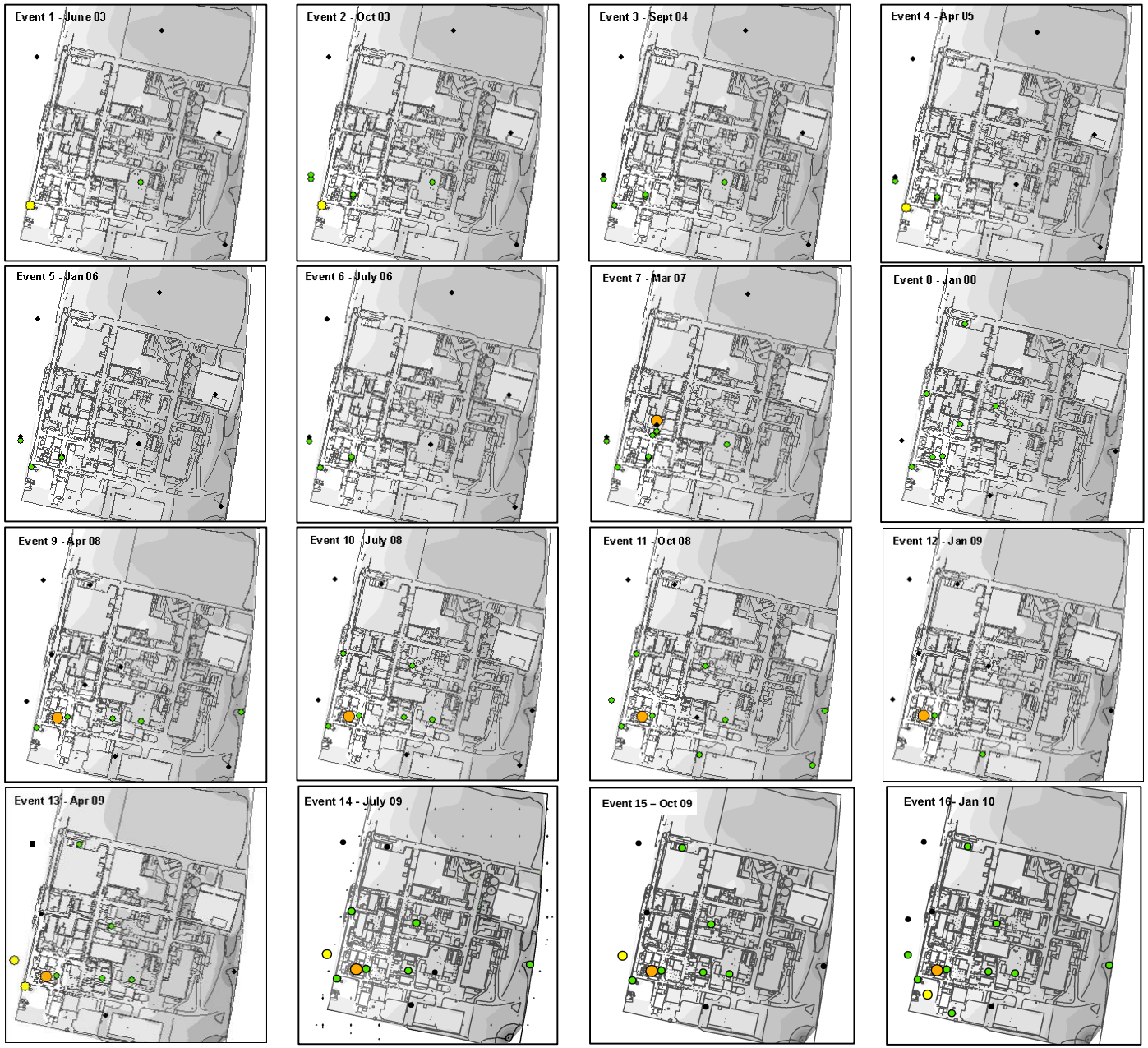
Figure 15 Trichloroethene Distribution 2003 to 2010



Key:

Trichloroethene

ug/l

- <LDL
- >LDL - 100.00
- 100.01 - 500.00
- 500.01 - 1000.00
- 1000.01 - 2000.00
- 2000.01 - 3000.00

N

0 37.5 75 150 225 300 Meters

IMPORTANT – Please Read

This drawing is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project details below. WSP accepts no liability for the mis-interpretation or use of this illustration by any other parties.

WSP

REMEDIATION

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Site:
Former Kodak chemical site, Acornfield Road,
North Kirkby, Merseyside

Figure Number:
Figure 15

Title:
Trichloroethene distribution within the Deep aquifer

Project No:	Created By:	Date:
13010908-001	TCW	August 2010

Client:
Acorn Developments (Kirkby) Ltd

Figure 16 Elevated 1,1,2,2 Tetrachloroethane in Soils & Perched Groundwater

Trichloroethene in soil

1,1,2,2 Tetrachloroethane in soil

Trichloroethene and 1,1,2,2 Tetrachloroethane in soil

Trichloroethene in Perched Groundwater

1,1,2,2 Tetrachloroethane in Perched Groundwater

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CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Figure 16

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FILE NAME: N/A	DRAWN: JPM	DATE: 13/08/2010
PROJECT No: 13010908	DRAWING NO:	REV: A

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creating a better place

Our ref: CL6/KN/1051/sfc
Your ref:
Date: 25th October 2010

Richard Lawless
WSP Environmental
The Victoria
150-182 The Quays
Salford
Manchester
M50 3SP

Dear Richard

Image Business Park, Knowsley Industrial Park

Thankyou for sending me a copy of the Sherwood Sandstone Condition Report, Acorn Business Park, Acorn Developments Ltd, WSP, August 2010.

The aim of the report was to further analyse the data relating to chlorinated hydrocarbons found in the sandstone aquifer beneath the site to consider the extent to which they may have been derived from the site or other sources and to assess the risk to the water quality in the wider aquifer.

We have reviewed the report and have the following comments:

The area of Sherwood Sandstone contamination in the southwest corner of the site is located in an area where the drift is quite thin, which at face value would have suggested Kodak as the source. However, as no soil source has been located in this area it would appear that this could just be a coincidence. Given the amount of site investigation that has been carried out, together with other lines of evidence, supports the presence of an off-site source which is outside the control and responsibility of Acorn Developments Ltd. The Ames Goldsmith's on-site abstraction borehole appears unaffected by the contamination and we have no evidence to suggest that other abstractors on the estate are being adversely impacted.

There is reference to the increase in concentration of PCA and TCE in boreholes across the south western corner of the site as potentially indicating that additional historical sources may be evident within the former Kodak premises. However, this apparent increase could be a function of the boreholes being located in different parts of the dissolved plume such that the borehole towards the edge of the site, with lower contaminant concentration, is further from the centre-line of the plume than the borehole which is further inside the site boundary.

Although not mentioned in the report, the 1:10,560 scale geological map (Lancs 100SW) shows the Sherwood Sandstone strata to dip in a north westerly

The Environment Agency
Lutra House Dodd Way
Off Seedlee Road
Walton Summit Bamber Bridge
Preston Lancs PR5 8BX Tel: 08708 506 506 Fax: 01772 627730

direction where there is a window in the mapped drift, around the south western part of the industrial estate. Although it is not absolutely certain that this same dip direction will prevail beneath the former Kodak site, it does raise the possibility that if the source of the observed contamination is a DNAPL spill on land to the southeast of the site, the dip in the strata could have directed the contamination towards the former Kodak site. The dissolved concentrations observed on site don't indicate a DNAPL source close by but this wouldn't preclude one more distant from the site.

We are satisfied with the Remedial Targets Methodology risk assessment that has been carried out for the chlorinated hydrocarbons and there appears to be no unacceptable risks to the aquifer at the 250m compliance distance or the much more distant public water supplies.

In conclusion we are satisfied with the assessment as carried out by WSP and the conclusions that they have drawn in this report, therefore we do not require any further action with respect to chlorinated hydrocarbons in the Sherwood Sandstone aquifer beneath the site.

If you have any queries on this please do not hesitate to contact me.

Yours sincerely

S Budworth

Sarah Budworth
Contaminated Land Technical Officer

Tel: 01772 71 4017

cc.

Dave Logan
Knowsley MBC
Municipal Building
Cherryfield Drive
Kirkby
L32 1TX

Knowsley Council

FAO Mr David Rix
WSP Remediation Ltd.
The Victoria
150-182 The Quays
Manchester
M50 3SP

Tel No: 0151 443 4727
E.mail:dave.logan@knowsley.gov.uk
Fax: 0151 443 5438
Ref: DAL/WSPR
Please ask for: David Logan
25 November 2010

BY POST AND E-MAIL

Dear Mr Rix,

Voluntary Remediation Works, Former Kodak site, Knowsley Industrial Park

I refer to the works which have been carried out by WSP Remediation in respect of historical contamination known to be present on the site and intended to remove risks to human health and groundwater with the current form of site operations. The site was split into eight zones and based on site investigations and risk assessment a number of remediation strategies were produced, namely for Zones 2, 3, 4 and 5. For the majority of the site remediation of groundwater was the primary concern.

Validation reports have now been produced for all these areas and I am satisfied that the work has been carried out in accordance with the agreed remedial strategies.

I am aware that further remediation work is currently underway that is not related to the original site condition (the so called "new contamination"). In addition I should like to note that further risk assessment in relation to human health may be required if this involves built development.

Please let me know if you have any queries on this matter.

Yours sincerely,

D. Logan.

Dave Logan
Principal Officer (Environmental Protection)

Kodak Decommissioning Report

Acorn Developments (Kirkby) Limited

December 2010

QM

Issue/revision	Issue 1	Issue 2
Remarks	Draft	Final
Date	01/12/2010	21/12/2010
Prepared by	John Morton	John Morton
Signature		
Checked by	Dave Rix	Dave Rix
Signature		
Authorised by	Neil Shaw	Neil Shaw
Signature		
Project number	13010908	13010908
File reference	13010908/Dec10/DR	

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Contents

1	Introduction	3
2	Decommissioning Methodology	4
3	Decommissioning Works	5

1 Introduction

1.1 BACKGROUND

1.1.1 In October 2007 Acorn Developments (Kirkby) Limited (Acorn), purchased the buildings and equipment and secured a long-term leasehold interest to an industrial facility (the site) formerly operated by Kodak Chemicals UK Ltd, located off Acornfield Road within the Knowsley Industrial Park, Kirkby, Merseyside.

1.1.2 To facilitate Acorn's purchase of the site, (now known as Image Business Park), WSP undertook a detailed review of all existing environmental data and assisted the design of a supplementary investigation. This process resulted in the establishment of the 'known contamination' at the site as of October 2007, the date of the transaction.

1.1.3 The review undertaken by WSP did not identify any current statutory environmental liability relating to contamination, specifically with regard to Part IIA of the Environmental Protection Act 1990 and the 1989 Water Resources Act. However, Acorn takes its environmental responsibilities seriously and, notwithstanding the absence of an identified statutory liability, was keen to enhance the condition of the property in the window of opportunity that the partially vacant site presented. To aid description, the site was divided into 8 zones as shown in Figure 1, included in Appendix A of this report. Four areas of concern were initially identified, namely:

- Zone 2 – Building 84;
- Zone 3 – Building 82;
- Zone 4 – Bulk Storage area; and
- Zone 5 – Former Synthetic (Synchem) Manufacturing area.

1.1.4 Relatively isolated impacts were identified within Zones 2 and 3, whilst more widespread impacts were noted in Zones 4 and 5. Pertinent to these works key pollutant linkages identified included shallow soil leaching of organic (List 1) contaminants into perched groundwater with potential subsequent vertical migration and/or leakage through or around the Glacial Till into the Sherwood Sandstone aquifer in the former synthetic chemicals manufacturing area which had been demolished in the late 1970's. The presence of source concentrations (both in the shallow soils and perched waters) were concluded to be sufficiently elevated to require remediation and pathway management.

1.1.5 Consequently, WSP was instructed to undertake voluntary remediation works at the site. The objectives were as follows:

- To remediate 'known contamination' at the site to levels determined by quantitative risk assessment;
- To obtain regulatory support (specifically from the Environment Agency (the Agency) and Knowsley Metropolitan Borough Council (KMBC)) for the proposed remediation activities and ultimately their confirmation that the works have been completed and validated accordingly;
- Upon completion of the remediation works, to obtain written confirmation from the regulators that, with respect to the 'known contamination', the site is in a satisfactory state with regard to Part IIA of the Environmental Protection Act 1990 and the 1989 Water Resources Act; and,
- To decommission all remedial works and make good all areas in which remediation equipment was installed.

1.2 DECOMMISSIONING OBJECTIVES

- Decommission all existing monitoring wells, installed by WSP, since 2007;
- Remove groundwater treatment systems and associated infrastructure from Zones 2, 3 and 4;
- Install a concrete pad to cap the air sparge remediation area adjacent to Building 84 in Zone 2;
- Decommission all wells in road ways, filling access chambers with concrete, removing lids and reinstate with tarmac; and
- General clearance of any WSP equipment and infrastructure from the site.

2 Decommissioning Methodology

2.1 OVERVIEW

2.1.1 Since 2007 WSP (Environmental and Remediation) has installed a total of 152 monitoring locations. All of which required decommissioning with the exception of those which are expressly requested to be retained by third parties. Any wells retained by third parties are the sole liability of the party which made the request (See Figure 9, Appendix A). All wells were decommissioned in accordance with the Environment Agency guidance document "Decommissioning Redundant Boreholes and Wells" and the Standard Guide for Decommissioning of Groundwater Wells, Vadose Monitoring Devices and Other Devices for Environmental Activities published by ASTM international (reference D5299-99 (Re-approved 2005)). Both documents are included in Appendix B.

2.2 LEGAL FRAMEWORK

2.2.1 Under the Groundwater Regulations, 1998 and in accordance with the EC Groundwater Directive (80/68/EEC) discharge into the groundwater of substances in List I of the Directive is prohibited and discharges of substances in List II must be minimised so as to prevent pollution.

2.2.2 Given the number of monitoring wells on site, and the current usage of areas of the site for the handling and transfer of waste chemicals, the risk of contaminants entering the groundwater via monitoring well installations was considered high.

2.3 MONITORING WELLS

2.3.1 150 monitoring locations were installed by WSP, providing coverage across seven of the eight zones on site (See Figures 1 to 8 in Appendix A). No wells were installed in Zone 1. Section 3 details the decommissioning works, undertaken by WSP, which have taken place in each zone.

2.4 DETAILED METHODOLOGY

2.4.1 Prior to commencing decommissioning works on site a Decommissioning Programme and Detailed Methodology was issued as part of the Health and Safety obligations under CDM (Report reference 13010908.Decom.Oct10, dated October 2010. This report is included in Appendix C and should be consulted to provide further information on the detail of the decommissioning processes undertaken.

3 Decommissioning Works

3.1 ZONE 2

3.1.1 Pre-2010 Monitoring Well Decommissioning

The following four Zone 2 wells were decommissioned in March 2008 during the active remediation phase of the project: WSPX1, WSPX2, WSPX3 and WSPX45.

3.1.2 2010 Monitoring Well Decommissioning

The following 41 wells were decommissioned in Zone 2 during October and November 2010 (See Figure 2, Appendix A):

WSPR-D1	WSPR-D11	WSPR-D12	WSPR-D14	WSPR-D18	WSPR-D19	WSPR-D20	WSPR-D21	WSPR-D23
WSPR-D25	WSPR-D29	WSPR-D30	WSPR-D31	WSPR-D35	WSPR-D37	WSPR-D39	WSPR-D4	WSPR-D42
WSPR-D45	WSPR-D46	WSPR-D47	WSPR-D48	WSPR-D50	WSPR-D52	WSPR-D53	WSPR-D56	WSPR-D57
WSPR-D59	WSPR-D60	WSPR-D61	WSPR-D62	WSPR-D63	WSPR-D64	WSPR-D65	WSPR-D7	BH11R
WSPR-R3	WSPR-R4	WSPX32	WSPX37	WSPX50				

3.1.3 System Decommissioning

The air sparge remediation system was dismantled and removed from site in November 2010. All associated pipe work and infrastructure was removed and disposed off. The power supply, taken from Building 84, was taken back to its source (a socket on the side of the building, see Figure 2).

3.1.4 Concrete Pad Reinstatement

As part of the operation of the air sparge system an area of soft ground (approximately 165m^2) was covered with a geotextile membrane (See Figure 2). Upon completion of the remediation works in Zone 2 the geotextile was removed and a nominal 150mm thick concrete pad was reinstated. The pad was installed in November 2010 to a specification agreed with Acorn.

3.1.5 Re-use of Materials from Zone 2

Approximately 16 tonnes of material was removed as part of the pad preparation works in Zone 2. The material was stockpiled on site and tested for characterisation (laboratory data is included in Appendix D). The material was re-used on site in Zone 5.

3.2 ZONE 3

3.2.1 Pre-2010 Monitoring Well Decommissioning

WSP monitoring wells WSPX5, WSPX8 and WSPX59 were decommissioned in March 2008 during the active remediation phase of the project.

3.2.2 2010 Monitoring Well Decommissioning

The following 24 wells were decommissioned in Zone 3 during November 2010 (See Figure 3, Appendix A):

WSPR-A1	WSPR-A10	WSPR-A11	WSPR-A12	WSPR-A13	WSPR-A15	WSPR-A16	WSPR-A17	WSPR-A18
WSPR-A19	WSPR-A2	WSPR-A20	WSPR-A21	WSPR-A22	WSPR-A23	WSPR-A24	WSPR-A3	WSPR-A4
WSPR-A5	WSPR-A6	WSPR-A7	WSPR-A8	WSPR-A9	WSPR-R1			

3.2.3 System Decommissioning

The Zone 3 dual phase vacuum extraction (DPVE) system was dismantled and removed from site in November 2010. All associated pipe work and infrastructure was removed and disposed off. The power supply, taken from the junction

box behind Building 82, was taken back to its source (see Figure 3). The concrete pad and block work bund has been left *in situ* with the approval of Acorn..

3.3 ZONE 4

3.3.1 Pre-2010 Monitoring Well Decommissioning

The following four Zone 2 wells were decommissioned during the active remediation phase of the project: WSPX10, WSPX15 (March 2008), WSPX14 and WSPX18 (June 2009).

3.3.2 2010 Monitoring Well Decommissioning

The following 24 wells were decommissioned in Zone 4 during November 2010 (See Figure 4, Appendix A):

WSP-B4	WSPX12	WSPX13	WSPX19	WSPX20	WSPX54	RWZ4/1	RWZ4/10	RWZ4/11
WSZ4/12	RWZ4/13	RWZ4/14	RWZ4/15	RWZ4/17	RWZ4/18	RWZ4/19	RWZ4/2	RWZ4/3
RWZ4/4	RWZ4/5	RWZ4/6	RWZ4/7	RWZ4/8	RWZ4/9			

3.3.3 System Decommissioning

The Zone 4 DPVE system was dismantled and removed from site in November 2009. All associated pipe work and infrastructure was removed and disposed off. The power cable, taken from the distribution board behind Building 82 to the shed between the bunded pad and Building 82 (SRM area), has been left *in situ* for potential future use. The supply is still live. The concrete pad, block work bund and security fencing has been left *in situ* with the approval of Acorn for use by SRM.

3.3.4 System Infrastructure Decommissioning

The Zone 4 DPVE system included a number of buried services in the road which is adjacent to the land leased by Future Industrial Service (FIS). All the wells, which were installed in chambers within the road, were filled with concrete and the lids removed and reinstated with tarmac. Buried services installed by WSP do not include any live electricity or water supplies. The ducts and system pipe work, which was installed to link the wells back to the system, will remain sealed *in situ*.

3.3.5 Wells Retained for Continued Use by Third Parties

FIS requested the retention of the following wells in Zone 4 for their ongoing compliance monitoring: RWZ4/1, RWZ4/9, RWZ4/16, WSP-B3 and WSPX21. Acorn Developments requested the retention of the following wells in Zone 4 for the ongoing monitoring of the “New Contamination” remediation scheme: WSPX21 & WSPX23.

3.3.6 Lost/Destroyed Wells

WSPR-E1 and WSPR-E2 were not located on site and are presumed lost/destroyed. WSPX16, which was located to the south of FIS’s leased area, has been lost beneath a concrete bund installed by FIS in November/December 2010.

3.4 ZONE 5

3.4.1 Pre-2010 Monitoring Well Decommissioning

In Zone 5, WSPX24, WSPX30, WSPX31 and WSP-B2 were located in the area which was excavated as part of the Zone 5 soil remediation works. These wells were removed during the excavation works. WSPX28 was decommissioned in March 2008.

3.4.2 2010 Monitoring Well Decommissioning

The following 22 wells were decommissioned in Zone 5 during October and November 2010 (See Figure 5, Appendix A).

WSPR-B1	WSPR-B2	WSPR-B3	WSPR-B4	WSPR-B6	WSPR-B11	WSPR-B12	WSPR-B13	WSPR-B14
WSPR-B15	WSPR-C2	WSPR-R5	WSPX46	WSPX52A	SUMP 4	SUMP 5	SUMP 6	SUMP 7
SUMP 8	SUMP 9	SUMP 10	SUMP 11					

3.4.3 Wells Retained for Continued Use by Third Parties

Acorn requested the retention of the following wells in Zone 5 for the ongoing monitoring of the "New Contamination" remediation scheme: WSP-B1, WSPR-C1, SUMP 1, SUMP 2 and SUMP 3.

3.5 ZONE 6

3.5.1 Monitoring Well Decommissioning

WSP decommissioned WSPX40 in March 2009 and WSPX44 in March 2008. WSPR-R2 was decommissioned during November 2010 (See Figure 6, Appendix A). FIS requested that WSPX40B be retained for its ongoing compliance monitoring.

3.6 ZONE 7

3.6.1 Monitoring Well Decommissioning

WSP decommissioned one monitoring well, WSPR-R8, in Zone 7 during November 2010 (See Figure 7, Appendix A).

3.7 ZONE 8

3.7.1 Monitoring Well Decommissioning

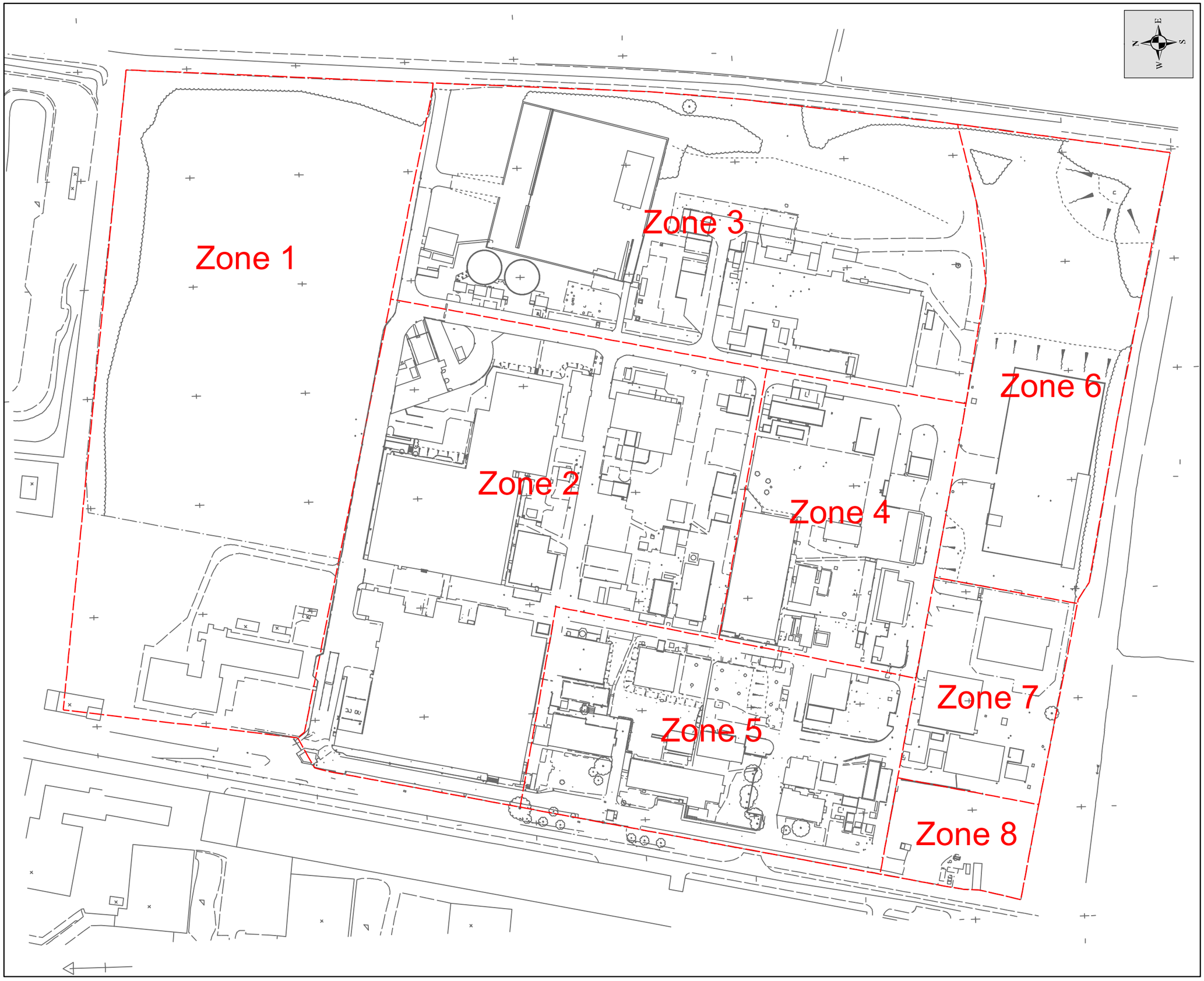
WSP decommissioned WSPR-R7 in Zone 8 during November 2010 (See Figure 8, Appendix A). WSPX63 was destroyed during the effluent treatment plant demolition in August 2007.

3.8 OFF SITE WSP MONITORING WELLS

3.8.1 WSP decommissioned one well (WSPR-R6) located in the car park on the western side of Acornfield Road in November 2010.

Appendix A Figures

FIGURE NUMBER	TITLE	DESCRIPTION
1	Site Plan Showing Zones	Site wide plan showing all remediation zones
2	WSP Wells Decommissioned in Zone 2	Detail of WSP wells decommissioned in Zone 2
3	WSP Wells Decommissioned in Zone 3	Detail of WSP wells decommissioned in Zone 3
4	WSP Wells Decommissioned in Zone 4	Detail of WSP wells decommissioned in Zone 4
5	WSP Wells Decommissioned in Zone 5	Detail of WSP wells decommissioned in Zone 5
6	WSP Wells Decommissioned in Zone 6	Detail of WSP wells decommissioned in Zone 6
7	WSP Wells Decommissioned in Zone 7	Detail of WSP wells decommissioned in Zone 7
8	WSP Wells Decommissioned in Zone 8	Detail of WSP wells decommissioned in Zone 8
9	Wells Retained For Further Site Use	Location of WSP wells retained by third parties (FIS & Acorn)
10	Zone 2 Reinstatement	Drawing detailing condition of Building 84 remediation area in Zone 2 post remediation
11	Zone 3 Reinstatement	Drawing detailing condition of Building 82 remediation area in Zone 3 post remediation
12	Zone 4 – Indicative Location of Buried Services and Remaining Remediation Infrastructure	Drawing showing detail of Zone 4 remediation area post remediation



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PROJECT: Image Business Park Remediation

TITLE: Site Plan Showing Zones

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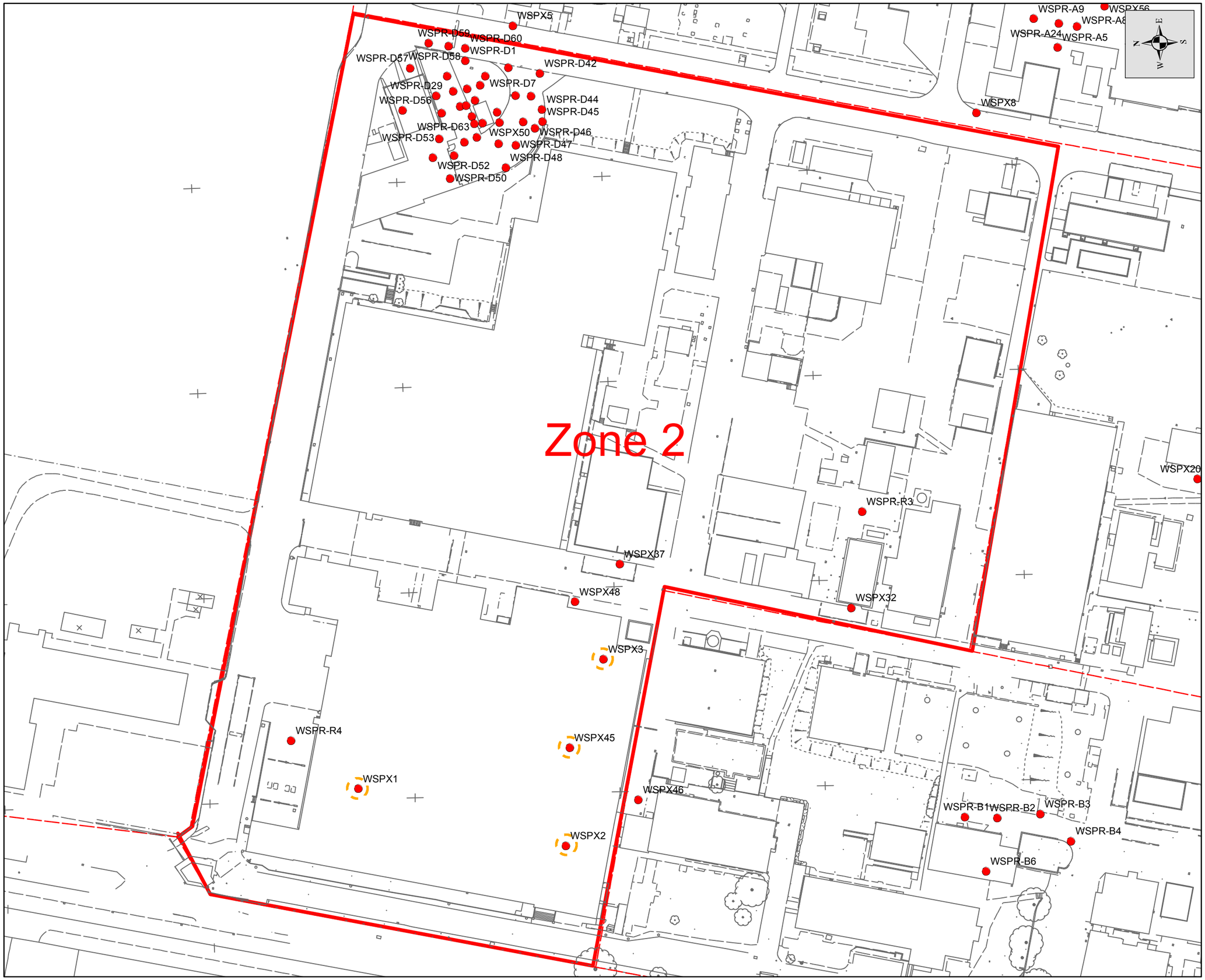

Legend

- WSP Wells Decommissioned in 2010
- WSP Wells Decommissioned Pre 2010

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PROJECT: Image Business Park Remediation

TITLE: WSP Wells Decommissioned in Zone 2

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Zone 3

WSPR-R1

WSPR-A16
WSPR-A15
WSPR-A17
WSPR-A6
WSPR-A19
WSPR-A7
WSPR-A3
WSPR-A4
WSPR-A23
WSPR-A1
WSPR-A11
WSPR-A13
WSPR-A10
WSPX56
WSPR-A2
WSPR-A9
WSPR-A8
WSPR-A24
WSPR-A5
WSPX8
WSPX59

WSPX5
WSPR-D59
WSPR-D60
WSPR-D1
WSPR-D57
WSPR-D58
WSPR-D42
WSPR-D7
WSPR-D29
WSPR-D39
WSPR-D56
WSPR-D44
WSPR-D45
WSPR-D63
WSPX50
WSPR-D46
WSPR-D53
WSPR-D47
WSPR-D52
WSPR-D35
WSPR-D48
WSPR-D50

WSPX12
WSPX13
RWZ4/17
RWZ4/15
RWZ4/18
WSPX14
RWZ4/14
RWZ4/19
WSPX15
RWZ4/12
RWZ4/13

Legend

- WSP Well Decommissioned in 2010
- WSP Wells Decommissioned Pre 2010

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TITLE: WSP Wells Decommissioned in Zone 3

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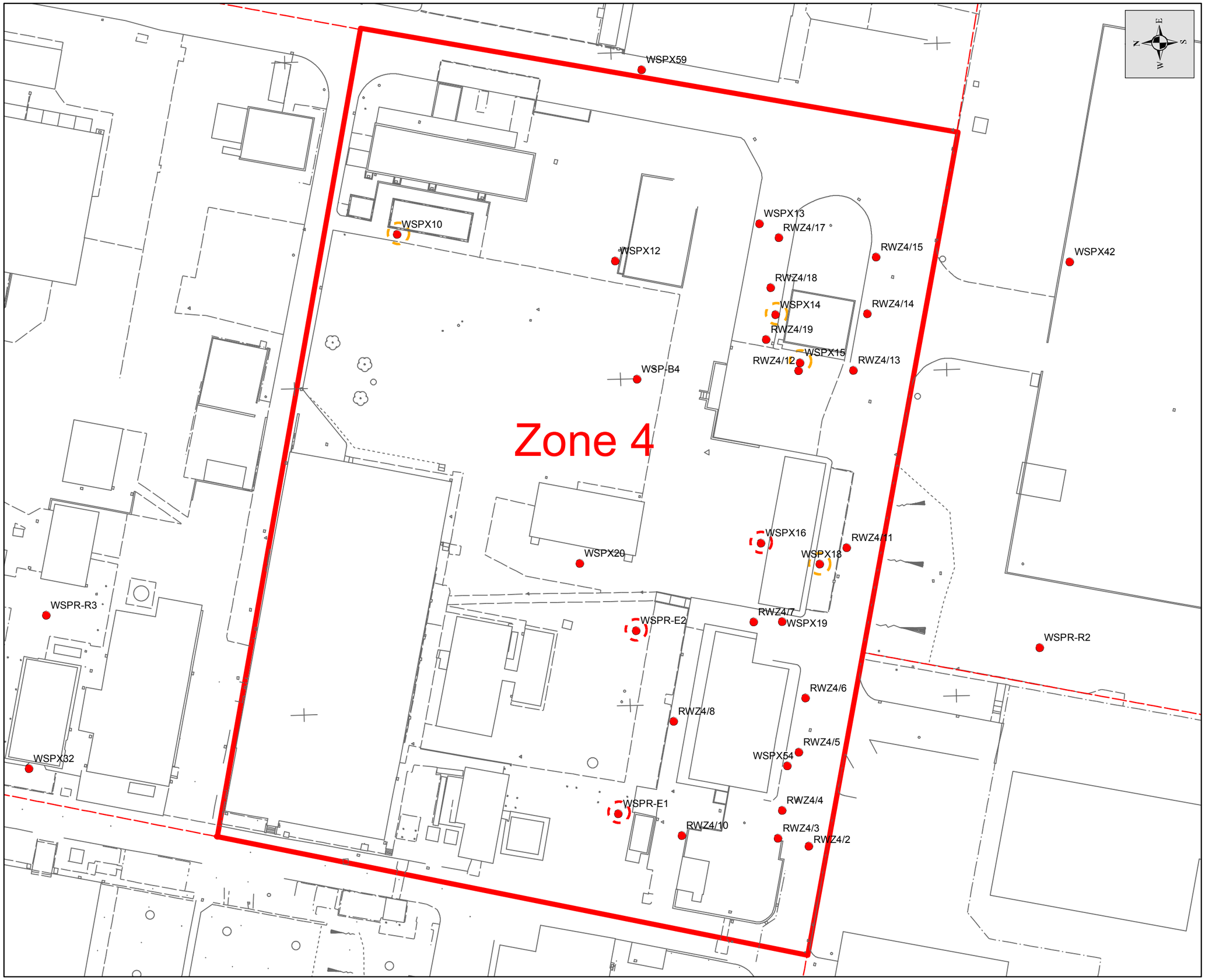

Legend

- WSP Wells Decommissioned in 2010
- WSP Wells Decommissioned Pre 2010
- Lost WSP Wells

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TITLE: WSP Wells Decommissioned in Zone 4

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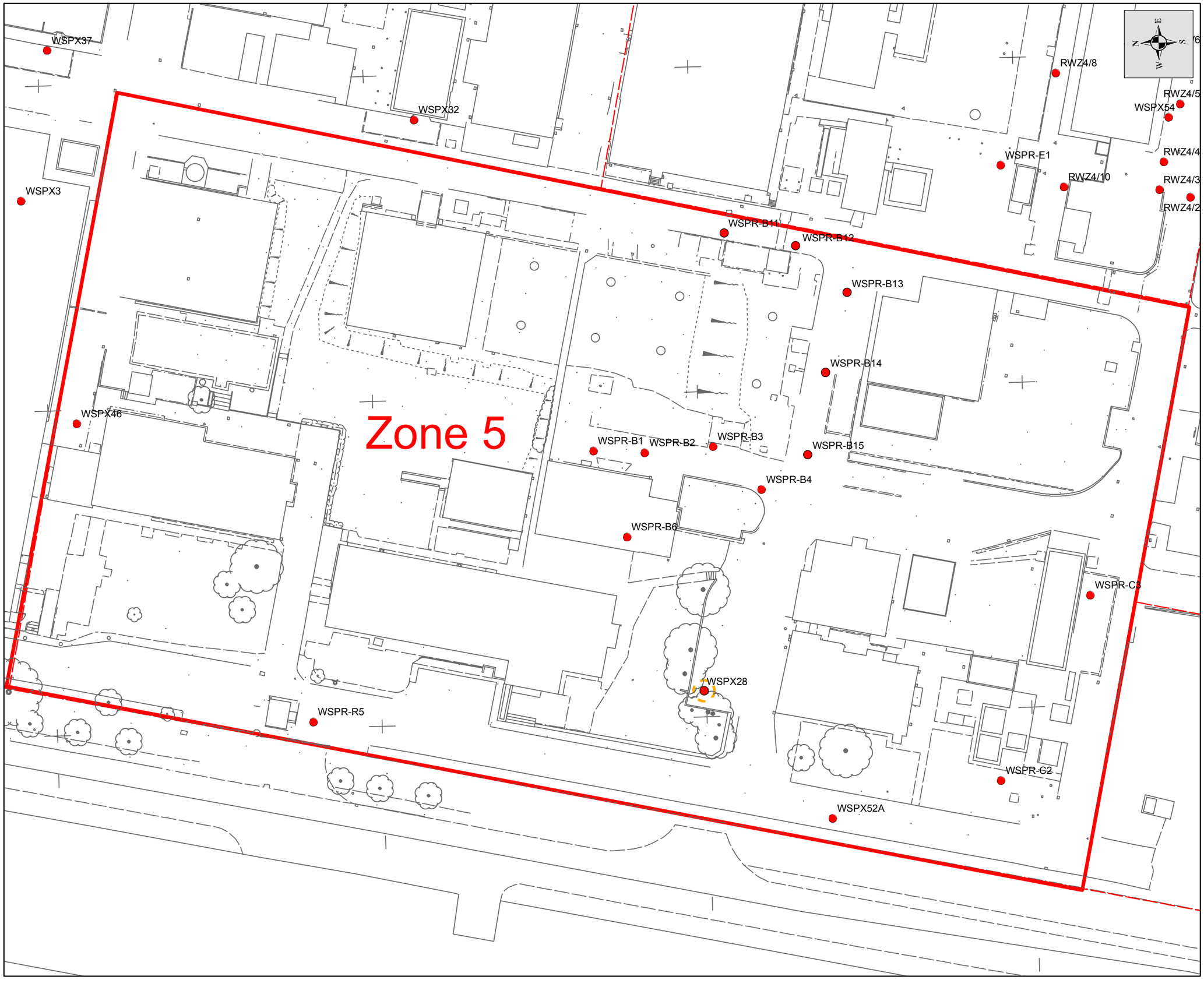

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- WSP Wells Decommissioned in 2010
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CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: WSP Wells Decommissioned in Zone 5

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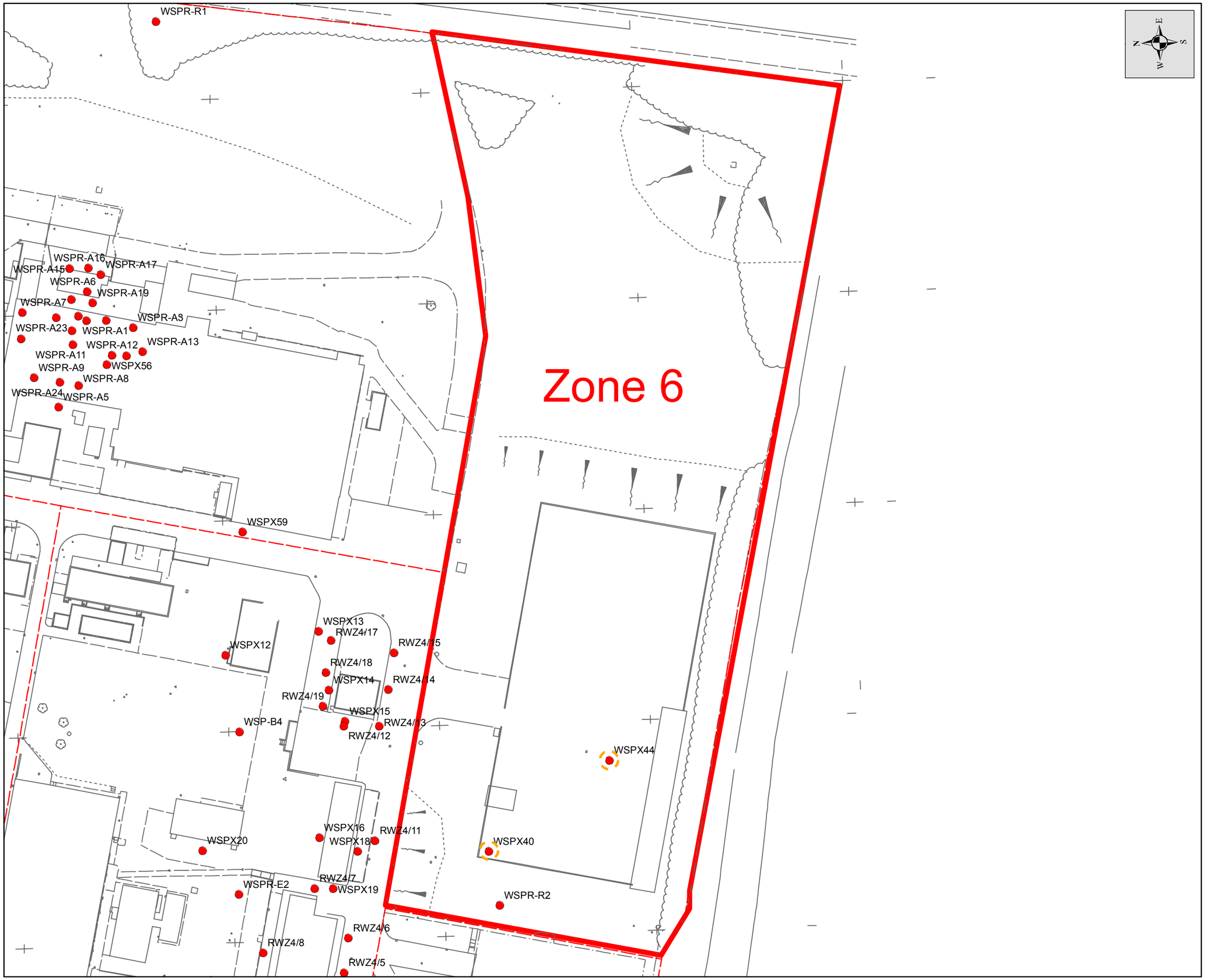

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- WSP Wells Decommissioned in 2010
- WSP Wells Decommissioned Pre 2010

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CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: WSP Wells Decommissioned in Zone 6

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13010908	Figure 6	A

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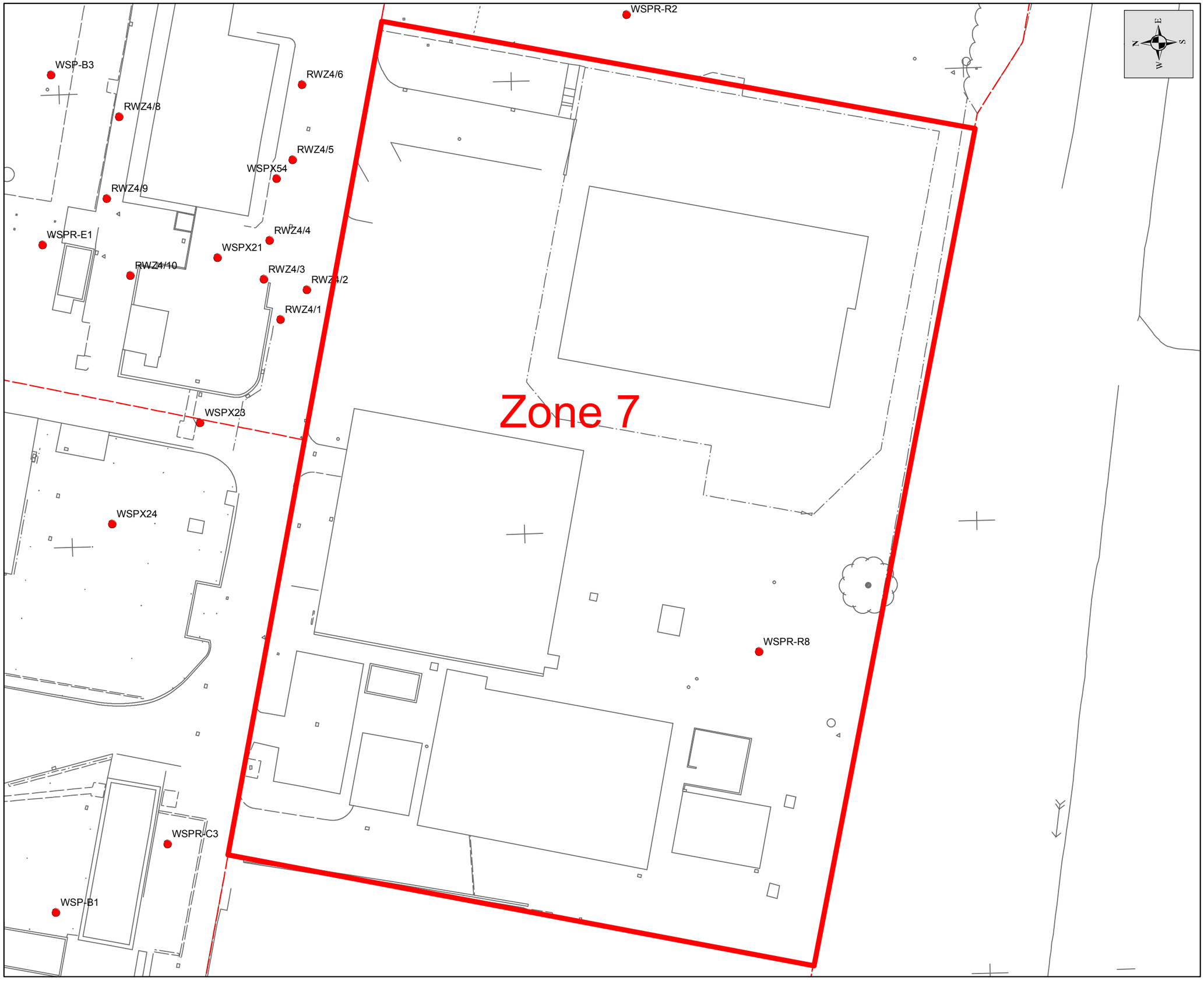

Legend

- Decommissioned WSP Wells

DRAWING STATUS: DRAFT

WSP

Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: WSP Wells Decommissioned in Zone 7

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	30/11/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 7	A

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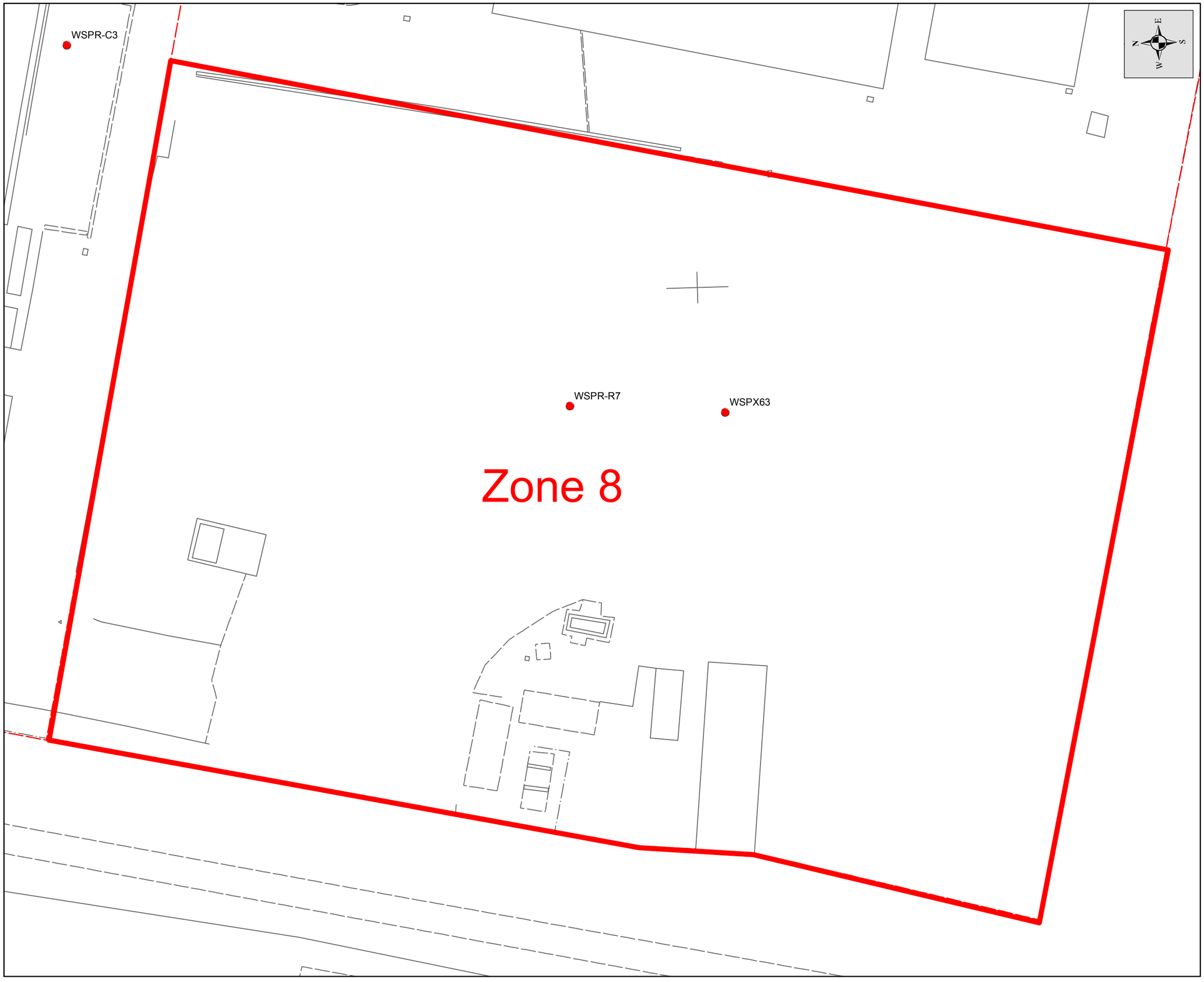

Legend

- Decommissioned Wells

DRAWING STATUS: DRAFT

WSP
Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: WSP Wells Decommissioned in Zone 8

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	30/11/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 8	A

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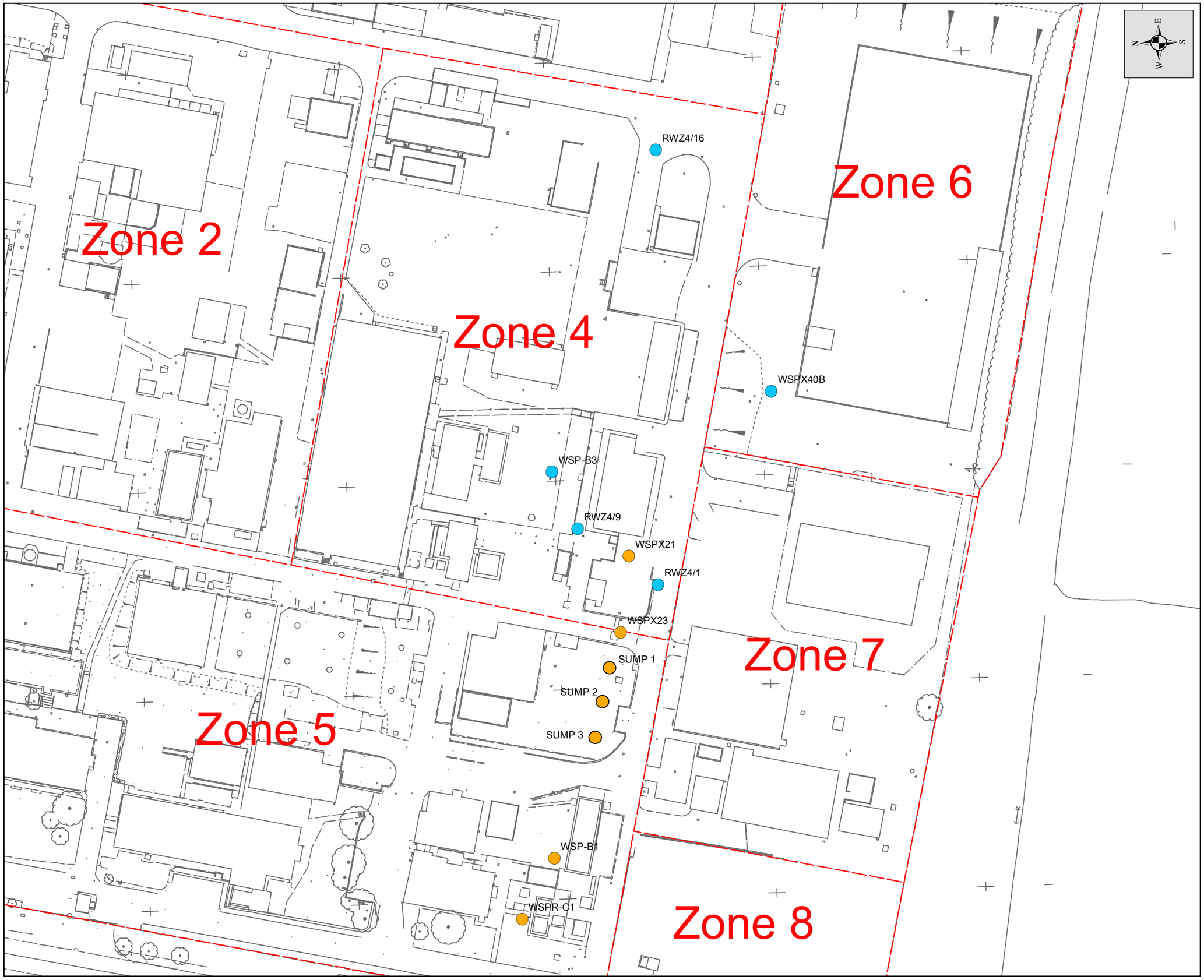

Legend

- WSPX40 Beneath FIS Cabin
- FIS Monitoring Wells
- New Contamination Monitoring Wells

DRAWING STATUS: DRAFT

WSP
Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Wells Retained for Further Site Use

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	30/11/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 9	A

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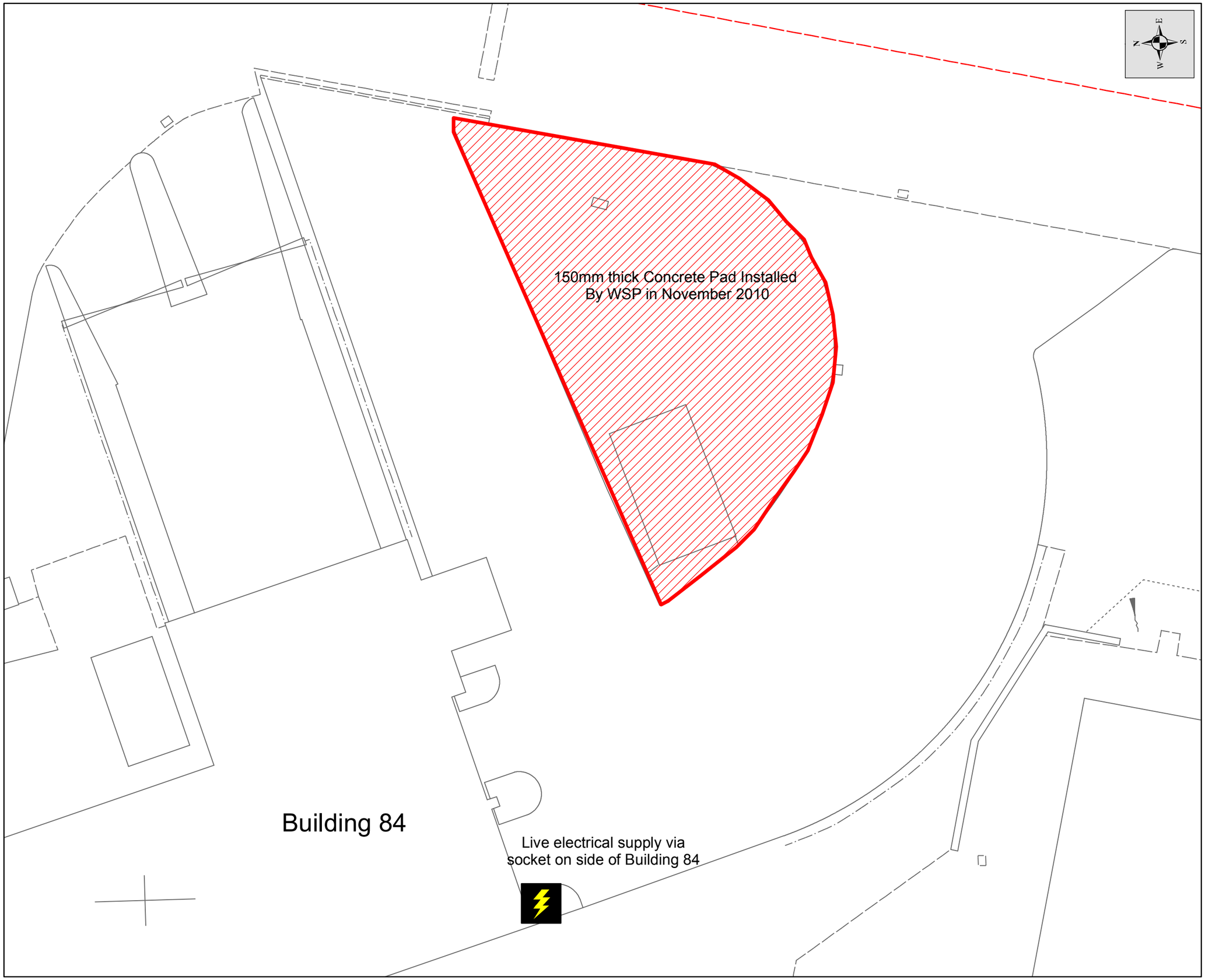

Current Location of Live Electrical Supply

Concrete Pad Area

DRAWING STATUS: DRAFT

WSP
Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Zone 2 Reinstatement

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	02/12/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 10	A

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Bunded concrete pad, installed
by WSP will remain in situ.
Area = 50m^2
Capacity = Approx 15m^3
Thickness = 100mm Nominal

Direction of Fall

10m

Sump

5m

The power cable for the Zone 3 System
has been totally removed back to the
breaker behind Building 82

Building 82

Current Location of Live Electrical Supply

Bunded Concrete Pad

DRAWING STATUS: DRAFT

WSP
Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Zone 3 Reinstatement

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	02/12/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 11	A

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Zone 4 Concrete Bund Construction
Dimensions = 13.35m x 7.9m
Thickness = 100mm Nominal
Area = 96.43m^2
Capacity = Approx 30m^3

N
E
S
W

Current Location of Live Electrical Supply

Bunded Concrete Pad

Decommissioned Draw Pit

Decommissioned Well Chamber Concrete Filled

Decommissioned Well

Decommissioned Change of Direction Chamber

Buried Ductwork (Redundant)

DRAWING STATUS: DRAFT

WSP
Fairway House, Paramount Business Park, Cardiff, CF30LW
Tel: 02920 366 300 Fax 02920 366 394
http://www.wspgroup.com

CLIENT: Acorn Developments (Kirkby) Ltd

PROJECT: Image Business Park Remediation

TITLE: Zone 4 - Indicative Location of Buried Services and Remaining Remediation Infrastructure

SCALE:	CHECKED:	APPROVED:
NTS	RL	DR
FILE NAME:	DRAWN:	DATE:
N/A	JPM	02/12/2010
PROJECT No:	DRAWING NO:	REV:
13010908	Figure 12	A

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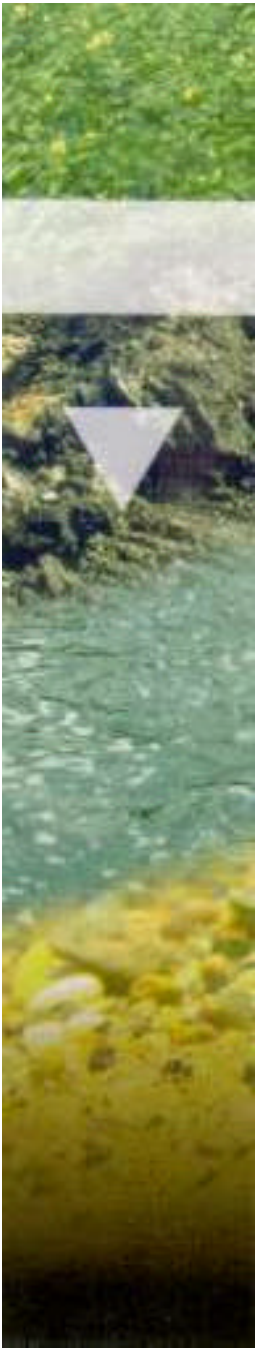
Appendix B Supporting Documentation



National Groundwater and Contaminated Land Centre

Decommissioning Redundant Boreholes and Wells

Environment Agency

Decommissioning Redundant Boreholes and Wells in order to Protect Groundwater Resources.

1. Scope

This booklet is intended to assist with the decommissioning of redundant boreholes or wells in the context of protecting groundwater. It suggests a number of best practice options. It must be understood that other factors (for example ground and site conditions or health and safety issues) must be carefully considered before any final decisions are made and expert, site specific advice should always be sought. Boreholes near landfills or other sources of soil gas may also require venting to prevent the build-up of noxious or explosive gas.

2. Legal Framework

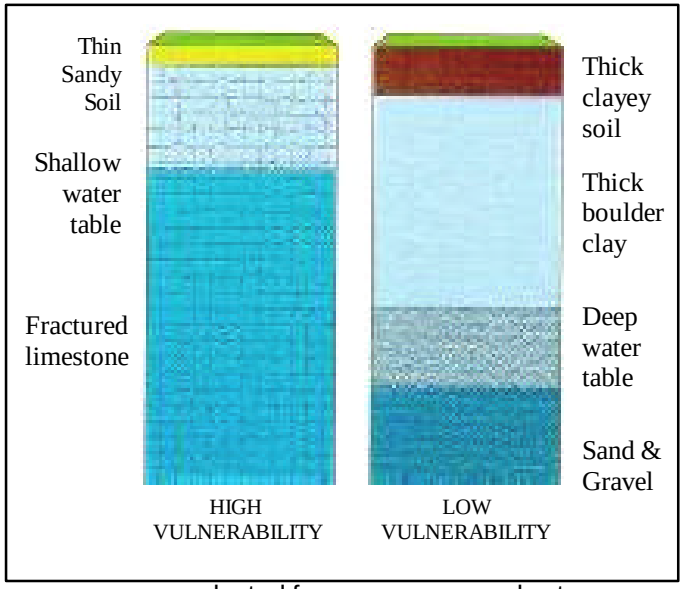
The Environment Agency is responsible for the protection of "controlled waters" from pollution under the Water Resources Act, 1991. Similar controls are in place in Scotland through the Control of Pollution Act, 1974 (as amended) and in Northern Ireland through the Water Act, 1972. It is an offence to cause pollution of controlled waters either

deliberately or accidentally.
" Controlled waters" includes all watercourses and groundwater contained in underground strata (or aquifers).

The Agency also has a specific duty to prevent groundwater pollution by certain listed substances under the Groundwater Regulations, 1998. These regulations complete the transposition of the EC Groundwater Directive (80/68/EEC) into UK law. Discharge into groundwater of substances in List I of the directive is prohibited, and discharges of substances in List II must be minimised so as to prevent pollution.

The Environment Agency in England and Wales also has powers under Section 71 of the Water Industry Act, 1991 to prevent wastage of water resources from uncontrolled artesian overflows.

FIGURE 1
The factors controlling vulnerability of aquifers to pollution



3. Introduction

Boreholes and wells are constructed for a variety of purposes: to abstract water; to collect geological information; to investigate and sample soils and groundwater etc. Often, old wells are found on properties that are now connected to a mains water supply, and boreholes and wells may become redundant.

Improperly abandoned boreholes and wells may act as preferential pathways for contaminant movement, leading to the contamination of groundwater, or contributing to the loss of aquifer yield and potentiometric head (water pressure), or result in the mixing of groundwaters of variable quality from different aquifers. They may also present a physical hazard.

Boreholes and wells that are no longer required therefore need to be made safe, structurally stable and backfilled or sealed to prevent groundwater pollution and flow of water between different aquifer units. However, in certain circumstances they may be adapted for use as a groundwater monitoring facility, where this is appropriate. ***It is normally inappropriate and may be unacceptable to convert redundant wells and boreholes to soakaways for the disposal of foul or surface water due to the inherent risk of groundwater pollution.*** The advice of the Agency should always be sought in such cases.

Artesian boreholes (where groundwater in a confined aquifer is at sufficient pressure to cause water to discharge at the ground surface without any pumping) present different problems and warrant special attention to prevent wastage of groundwater resources either by the flow of water from one usable aquifer unit into another unusable unit, or mixing of clean and polluted groundwaters.

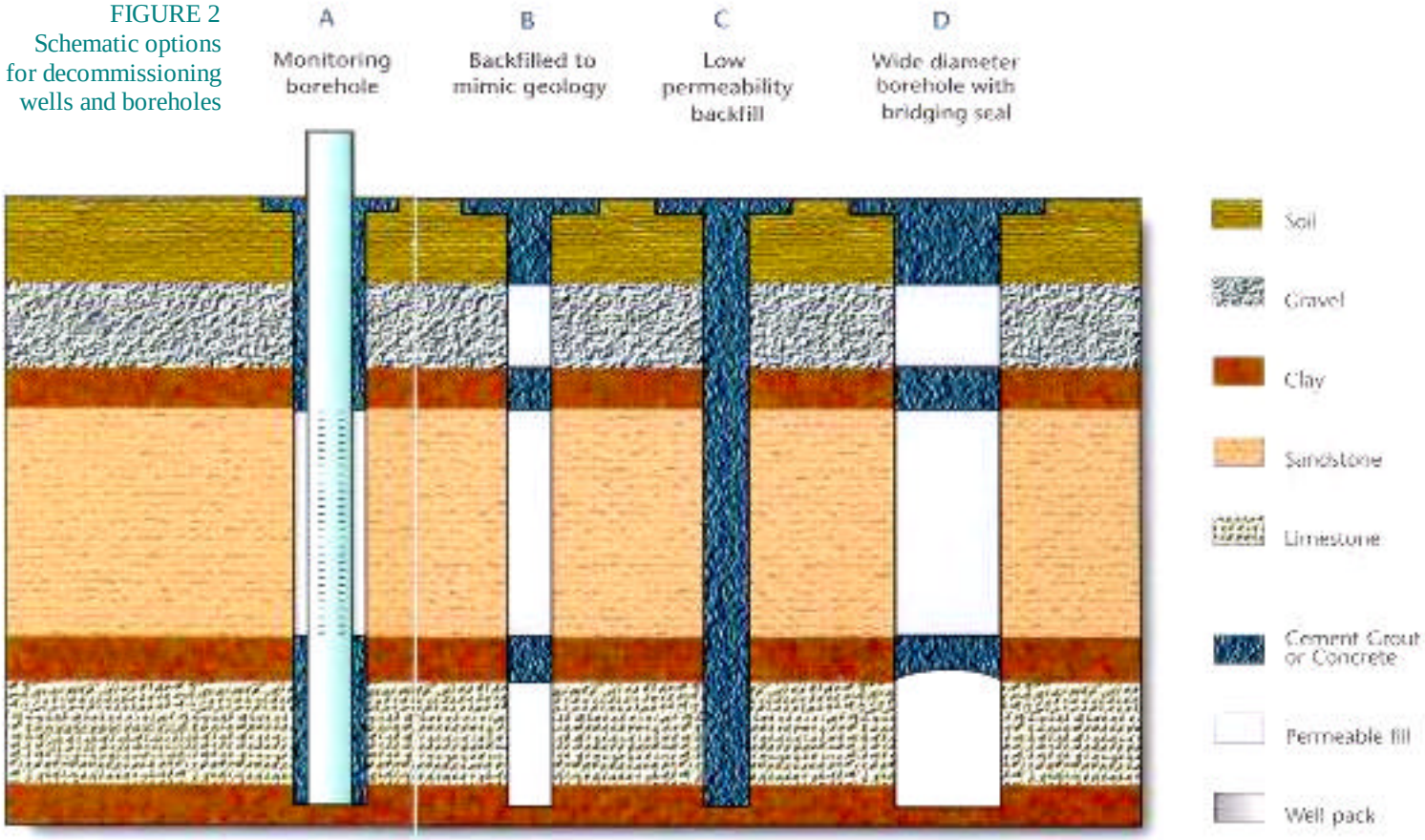
4. Borehole of well construction

Before considering how best to backfill and seal a borehole or well, or whether it can be put to an alternative use, for example as a groundwater monitoring facility, it is necessary to obtain information on the geological strata encountered by the borehole and its completion details. These will include the depth of the borehole, its diameter(s) and construction details (casing, screen and pack). These details may be obtained from site records, the original driller's log(s), or the British Geological Survey. Once all available information has been collated and assessed, the most appropriate course of action can be determined.

5. Conversion to groundwater monitoring points

Redundant boreholes have the potential for conversion into groundwater monitoring boreholes if the data collection exercise described in Section 4 (above) indicates that the boreholes intersect important aquifer units (in terms of resource and quality), and are constructed so that representative groundwater samples may be collected or water levels measured. The ideal borehole construction and completion is dictated by the geological strata encountered and its intended use. Boreholes which intersect a single aquifer unit may be cased through the unsaturated zone, but open hole (or screened) below the water table. Boreholes in complex geologies are likely to require casing over most of the depth of borehole with the exception of the aquifer unit(s) of interest **(*see Fig.2(A)*)**. These details must be established when considering conversion of the borehole to a monitoring point along with the ultimate purpose that the monitoring facility will serve.

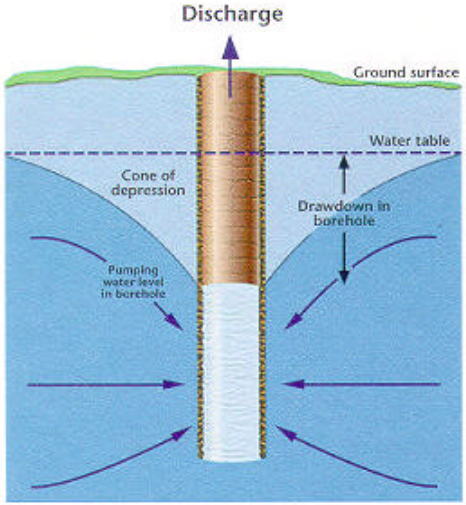
FIGURE 2
Schematic options for decommissioning wells and boreholes



a) Environment Agency strategic monitoring boreholes.

The Agency has a duty to monitor groundwater quality and water table elevation, and a network of Agency and privately owned boreholes and wells is used for this purpose. New monitoring points are often required to improve coverage or to replace boreholes which have been taken out of use.

FIGURE 3
The drawdown of the water table around a pumping borehole to form a cone of depression



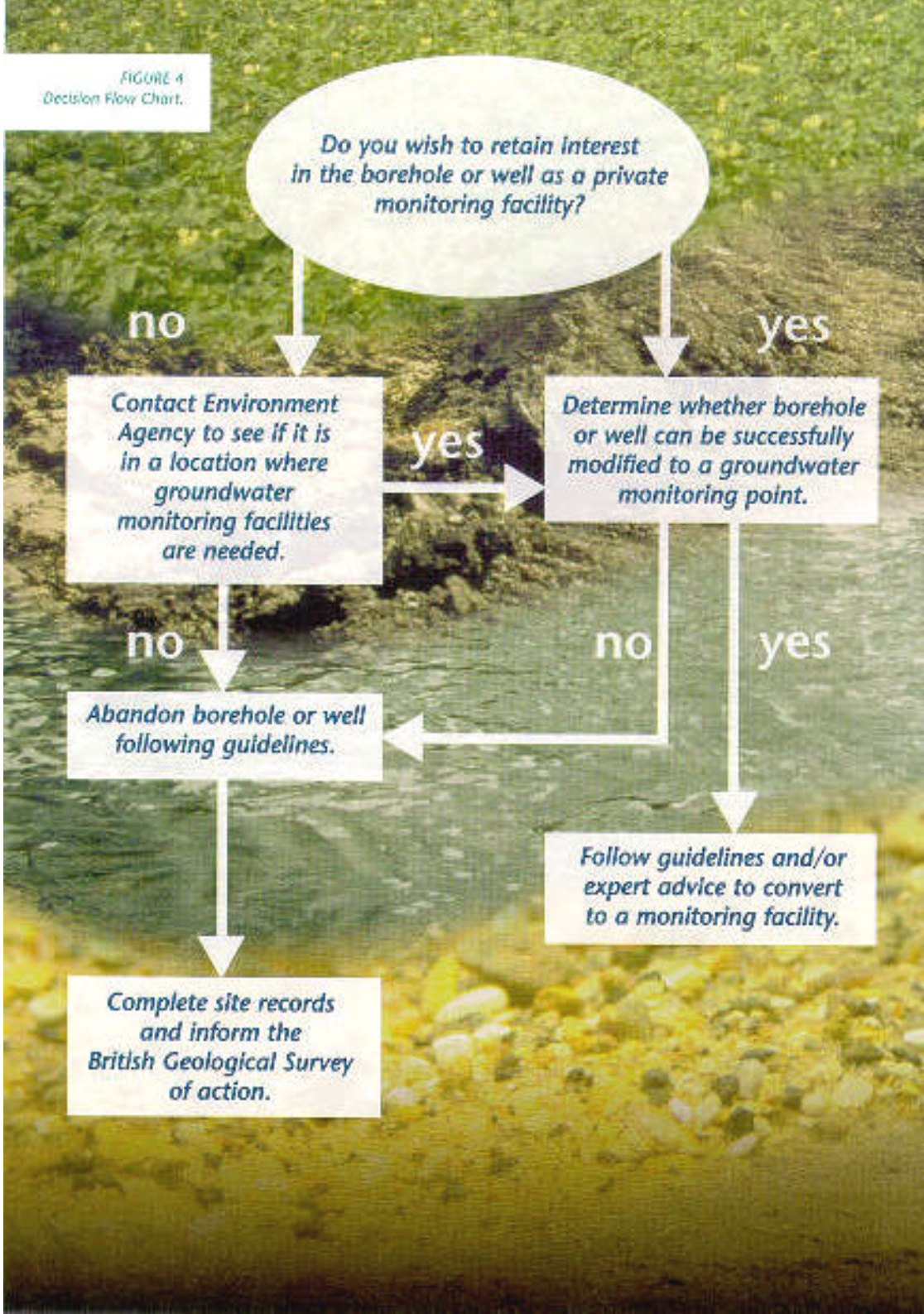
When a borehole is constructed such that it allows a representative sample of groundwater to be collected or water levels to be measured, and is located in an area where additional monitoring points are required, consideration should be give to converting it to an Agency monitoring borehole. The Agency may be prepared to pay for the costs of the conversion, but in return will require access to the borehole and/or its long-term lease.

b) Contaminated land/landfill monitoring point

Site investigation boreholes which have been installed as part of ground engineering investigation, land contamination study or scientific investigation may lend themselves to adaptation to longer-term groundwater monitoring facilities.

The design of boreholes on or adjacent to sites which may be contaminated is particularly important because they will act as potential conduits for the vertical migration of contaminants within the soil or fill layers if incorrectly designed. Such boreholes should be cased through the unsaturated zone and the casing sealed with an impermeable cement or bentonite grout to prevent any movement of potentially contaminated water around the outside of the casing. The top of the borehole must also be suitably protected and fitted with a robust lockable cap to prevent the unauthorised entry of objects into the borehole. Where the top of the borehole casing is below ground level it must be surrounded by a suitably constructed, watertight housing.

Boreholes close to contaminated land, landfill sites or other sources of soil gas may also require a venting facility to prevent the build up of noxious gases within the borehole.



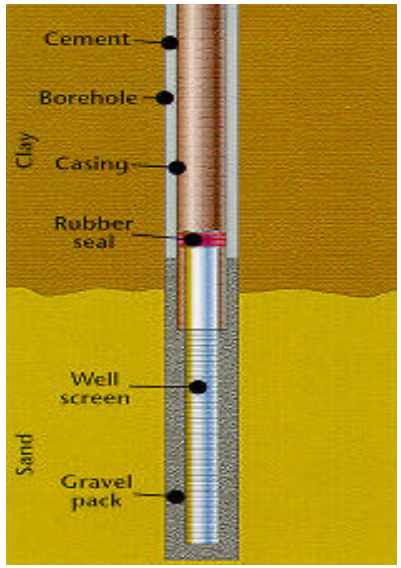


FIGURE 5
Section of a borehole showing a well screen and gravel pack (or filter) in unconsolidated sands.

c) Private monitoring boreholes.

A site owner may wish to convert a redundant abstraction borehole to a groundwater monitoring facility, particularly where the borehole is on or adjacent to contaminated land, or land where potentially polluting activities are being undertaken.

There are many good reasons for so doing including:

- To validate the success of any remedial works being undertaken on the site
- To demonstrate that activities are not causing pollution, hence prove regulatory compliance.
- As part of the " requisite surveillance" required under the Groundwater Regulations, 1998 or the Waste Management Licensing Regulations, 1994.
- To monitor water levels in an urban area where rising groundwater levels may threaten buried structures (tunnels, basements etc.).

6.Decommissioning redundant boreholes and wells

If conversion to a groundwater monitoring point is not possible or necessary, the following borehole abandonment procedures are recommended. However, every borehole and well is different and may require variation from the detail of the approach. For the best results, the employment of a proficient well contractor with a good knowledge of the local geology and well abandonment procedures is recommended.

a) Defining the objectives

Each site has its own particular characteristics that must be considered when planning how to decommission a borehole or well.

The following objectives may apply, although additional objectives may also be applicable;

- Remove the hazard of an open hole (safety issues).
- Prevent the borehole acting as a conduit for contamination to enter groundwater.
- Prevent the mixing of contaminated and uncontaminated groundwater from different aquifers.
- Prevent the flow of groundwater from one geological horizon to another.
- Prevent the wastage of groundwater from overflow to artesian boreholes.

The method of decommissioning should be capable of achieving each of the objectives that are applicable to a site.

b) Removing headworks and casing

Ensure that the borehole or well is free from all obstructions that may interfere with the sealing of the hole. In particular, the pump and pipework should be removed together with any other infrastructure (dip tubes etc.). The condition of any borehole casing and grout must be examined to ascertain whether its retention in the hole would prejudice any of the objectives of the abandonment. For many holes, examination of the casing from the ground surface will be adequate, however, deep boreholes may require the use of a down-hole Closed Circuit Television (CCTV) to examine the casing at depth.

Where casing has corroded or broken, or the grouting has failed, it may be necessary to remove those materials in order to prevent flow of groundwater around the outside of the borehole. Care should be taken, however, to ensure that removal of the well casing does not result in the collapse of the borehole walls (particularly in unconsolidated materials) and possible subsidence at the ground surface. The advice of a specialist well contractor should be sought over these issues. If it is decided that the well casing needs to be removed, various techniques are

available to do this and the well contractor can advise on the most appropriate technique for a given site.

c) Backfilling the hole

For most purposes the ground should be restored as closely as possible to its pre-drilled condition. The borehole or well should be backfilled with clean (washed), uncontaminated, excavated materials such that the permeability of the selected materials are similar to the properties of the geological strata against which they are placed. The backfilled borehole will then mimic the surrounding natural strata and groundwater flow and quality will be protected.

Restoration will require a variety of materials to be used so that permeable aggregates (e.g. pea gravel, sand) are positioned adjacent to aquifer horizons, whilst low permeability materials (e.g. clay, bentonite or cement grout, concrete) are positioned adjacent to low permeability horizons ***(see Figure 2(B))***. Alternatively, the entire borehole or well can be backfilled with low permeability materials that will prevent significant vertical or horizontal movement of groundwater through or along the borehole ***(see Figure 2(C)).***

The materials used to backfill a borehole or well must be clean, inert and non-polluting. Suitable materials include pea-gravel, sand, shingle, concrete, bentonite or cement grout and uncontaminated rock. **UNDER NO CIRCUMSTANCES SHOULD POTENTIALLY POLLUTING MATERIALS BE USED AS INFILL.** Consideration should also be given to the geochemical environment into which these materials will be placed, as under different environmental conditions the behaviour of materials may change (e.g. phenol contamination may prevent bentonite grouts curing).

Aggregates (pea-gravel, shingle, sand etc.) should be selected such that they have a grain size that allows easy delivery into the borehole and should be introduced in a controlled manner to ensure that accidental "bridging" does not occur within the borehole. Concrete and grouts that are introduced in a liquid form should be introduced through an appropriate delivery pipe (e.g. tremmie pipe), to ensure that voids do not form. Boreholes that penetrate highly fissured aquifers, such as the Chalk and some limestones, present additional problems. Liquid grouts (particularly those injected under pressure), or fine-grained aggregates (e.g. fine sand) may be transported out of the borehole into the body of the aquifer through fissures. Careful monitoring of the process is required if these techniques are used, and in these cases it may be more appropriate to use coarser aggregate (e.g. gravel) as a backfill against fissured aquifers.

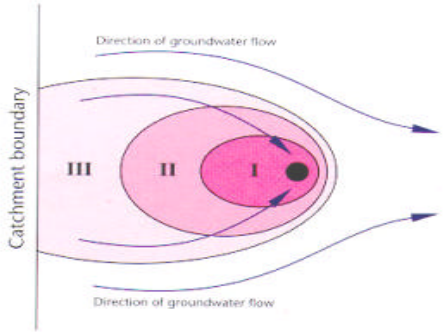


FIGURE 6
Source Protection Zones around a borehole.

I - Inner Zone
II - Outer Zone
III - Total Catchment

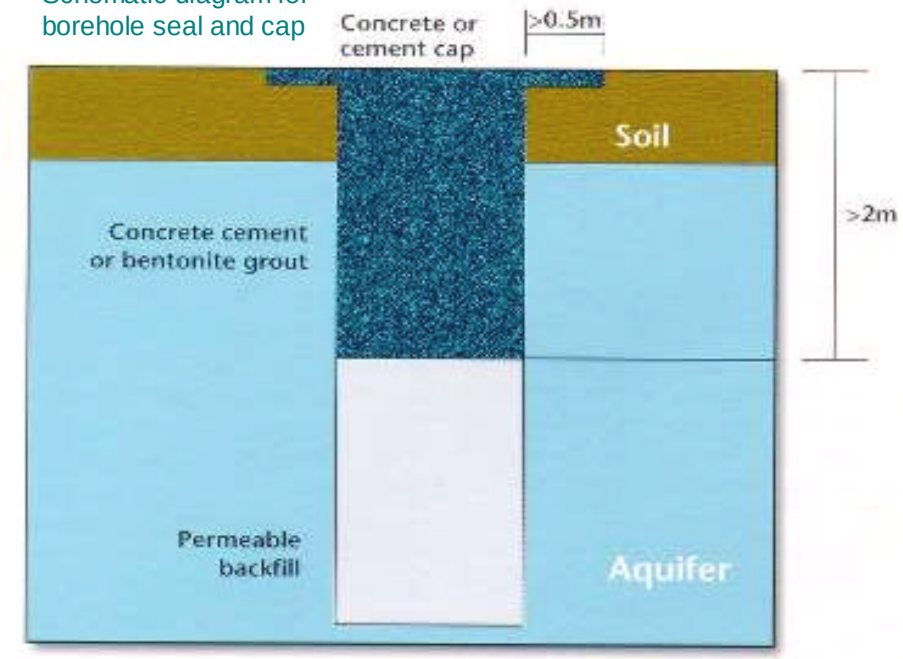
Where the site is in a very sensitive location (e.g. Inner Source Protection Zone (SPZI) **(*see figure 6*)** as defined in the Agency's Groundwater Protection Policy, or within 50 metres of a potable abstraction) consideration should be given to disinfecting the materials prior to its use as infill. Care must be taken, however, to ensure that the disinfectant does not, in itself, present a groundwater pollution risk. Agency and disinfectant manufacturers advice should be sought in such instances.

d) Deep and wide boreholes/wells.

In the case of very deep boreholes and wells with wide diameters, the volume of material needed to backfill the hole may be very large. In such circumstances it may be appropriate to adopt an alternative strategy, as long as this will not prejudice any of the original objectives.

Provided that the long term structural stability of the borehole can be demonstrated, it is acceptable to place a permanent bridging seal, or plug, within the borehole and then to infill above this level using the approach given in Section 6c) **(*page 9*) (*see Figure 2(D)*).** The bridging seal should ideally be positioned below the lowest aquifer horizon. However, where this is not possible, it is important that the open borehole beneath the bridging seal penetrates no more than a single aquifer unit thereby preventing the flow of groundwater between different aquifers.

FIGURE 7
Schematic diagram for borehole seal and cap



The material commonly used as a bridging seal is cement, although a combination of a mechanical plug and cement is acceptable. Cement seals must be allowed to set (cure) in place before backfilling is continued and completed. The advice of a specialist well contractor should be sought for the most appropriate technique.

e) Sealing the top of the borehole.

In order to prevent potentially contaminated surface run-off or other liquids entering the backfilled borehole, it is necessary to complete the backfilling of all boreholes with an impermeable plug and cap. The final 2 metres (from ground level down) should be filled with cement, concrete or bentonite grout and a concrete or cement cap of suitable strength should then be installed over the top of the borehole and surrounding ground, such that its diameter is at least one metre greater than the diameter of the backfilled borehole ***(see Figure 7)***.

f) Artesian boreholes.

For artesian boreholes, the de-commissioning process should aim to confine the groundwater to the aquifer from which it came in order to prevent loss of confining pressure, and the loss of water resources to the surface or other formations.

The first step is to control the artesian flow.

There are a number of ways to accomplish this depending, in part, on the water pressure in the confined aquifer and the depth to which the water level must be lowered, for instance;

- Pumping the borehole to produce the necessary drawdown.
- Pumping nearby boreholes.
- Extending the casing above ground level beyond the potentiometric surface.
- Introduce dense, non-polluting, fluids into the borehole.
- Introduce a pre-cast plug at an appropriate level within the hole.
- Using an inflatable packer, pressure grout the void space below the packer.

Decommissioning of artesian boreholes is likely to be easiest in late summer, when groundwater levels and artesian flows are at their lowest. Decommissioning artesian boreholes is a specialist job and requires expert advice.

g) Recording details on site plan

Complete and accurate records should be kept of the abandonment procedures for possible future reference.

These records should include the following;

- The reasons for abandonment (e.g. water quality problems).
- Measurement of groundwater level prior to backfilling.
- The depth and position of each layer of backfilling and sealing materials.
- The type and quantity of backfilling and sealing materials used.
- Any changes made to the borehole/well during the abandonment (e.g. casing removal).
- Any problems encountered during the abandonment procedure.

Abandoned borehole and well locations should be marked on site records and, if possible, on the ground. Details of any decommissioning or modifications to borehole construction should also be forwarded to the British Geological Survey.

7. Conversion to soakaways

Redundant wells and boreholes have historically been used for the disposal of surface water, foul effluent and other waste liquids. In many instances this practice has resulted in groundwater pollution. It is not considered acceptable practice to use redundant abstraction boreholes and wells for the disposal of surface or foul drainage, or any other potentially polluting matter.

It is a criminal offence under Section 85 of the Water Resources Act, 1991 to "cause or knowingly permit any poisonous, noxious or polluting matter or any solid waste matter to enter any controlled waters". The definition of "controlled waters" includes all groundwater.

Where the on-site disposal of surface of foul drainage into land or groundwater is necessary then the effluent should normally be treated before its discharge into a shallow soakaway. An authorisation from the Environment Agency is normally required and a discharge may be illegal without one, regardless of whether pollution occurs.

In determining an application for an authorisation the Agency will assess the particular risks of pollution by taking into account the potential for attenuation of contaminants before they reach the water table.

8. Specialist Advice

It is recommended that the advice of a specialist well contractor and local Environment Agency staff should always be sought, and the site-specific characteristics of a site given full consideration when determining the best borehole abandonment solution. Details of specialist drilling contractors can be obtained from The British Drilling Association. Further advice can be obtained from the local Environment Agency office, or from the Agency's National Groundwater & Contaminated Land Centre.

9. Further Guidance and References

American Society for Test and Materials (ASTM) D5299-92, 1993. **Standard Guide for Decommissioning Ground Water Wells, Vadose Zones Monitoring Devices, Boreholes, and Other Devices for Environmental Activities.**

Driscoll, F.G., 1986. **Groundwater and Wells.** Second Edition, Johnson Division.

Environment Agency, 1998. **Policy and Practice for the Protection of Groundwater.**

State Co-ordinating Committee on Groundwater, 1996. **State of Ohio Technical guidance for Sealing Unused Wells.**

The American Water Works Association, 1984. **AWWA Standards for Water Wells.** AWWA A100-84.

US Environmental Protection Agency, 1975. **Manual of Water Well Construction Practices.** EPA – 570/9-75-001.

British Geological Survey,
National Geosciences Information Centre (NGIC),
Keyworth,
Nottingham,
NG2 5ED.
Tel: (0115) 9363100.

British Drilling Association,
P.O. Box 113, Brentwood,
Essex, UK, CM15 9DS.
Tel: (01277) 373456.

National Groundwater & Contaminated Land Centre, Environment Agency,
Olton Court,
10 Warwick Road,
Olton,
Solihull,
B92 7HX.
Tel: (0121) 7115885.

MANAGEMENT AND CONTACTS

The Environment Agency delivers a service to its customers with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

Head Office is responsible for overall policy and relationships with national bodies including Government.
Rio House, Waterside Drive, Aztec WestAlmondsbury, Bristol BS32 4UD

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Standard Guide for Decommissioning of Ground Water Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities[1]

This standard is issued under the fixed designation D5299; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers procedures that are specifically related to permanent decommissioning (closure) of the following as applied to environmental activities. It is intended for use where solid or hazardous materials or wastes are found, or where conditions occur requiring the need for decommissioning. The following devices are considered in this guide:

1.1.1 A borehole used for geoenvironmental purposes (see Note 1),

1.1.2 Monitoring wells,

1.1.3 Observation wells,

1.1.4 Injection wells (see Note 2),

1.1.5 Piezometers,

1.1.6 Wells used for the extraction of contaminated ground water, the removal of floating or submerged materials other than water such as gasoline or tetrachloroethylene, or other devices used for the extraction of soil gas,

1.1.7 A borehole used to construct a monitoring well, and

1.1.8 Any other vadose zone monitoring device.

1.2 Temporary decommissioning of the above is not covered in this guide.

NOTE 1—This guide may be used to decommission boreholes where no contamination is observed at a site (see Practice D420 for details); however, the primary use of the guide is to decommission boreholes and wells where solid or hazardous waste have been identified. Methods identified in this guide can also be used in other situations such as the decommissioning of water supply wells and boreholes where water contaminated with nonhazardous pollutants (such as nitrates or sulfates) are present. This guide should be consulted in the event that a routine geotechnical investigation indicates the presence of contamination at a site.

NOTE 2—The term "well" is used in this guide to denote monitoring wells, piezometers, or other devices constructed in a manner similar to a well. Some of the devices listed such as injection and extraction wells can be decommissioned using this guide for information, but are not specifically covered in the text.

NOTE 3—Details on the decommissioning of multiple-screened wells are not provided in this guide due to the many methods used to construct these types of wells and the numerous types of commercially available multiple-screened well systems. However, in some instances, the methods presented in this guide may be used with few changes. An example of how this guide may be used is the complete removal of the multiple-screened wells by overdrilling.

1.3 Most monitoring wells and piezometers are intended primarily for water quality sampling, water level observation, or soil gas sampling, or combination thereof, to determine quality. Many wells are relatively small in diameter and are used to monitor for hazardous chemicals in ground water. Decommissioning of monitoring wells is necessary to:

1.3.1 Eliminate the possibility that the well is used for purposes other than intended,

1.3.2 Prevent migration of contaminants into an aquifer or between aquifers,

1.3.3 Prevent migration of contaminants in the vadose zone,

1.3.4 Reduce the potential for vertical or horizontal migration of fluids in the well or adjacent to the well, and

1.3.5 Remove the well from active use when the well is no longer capable of rehabilitation, or has failed structurally; no longer required for monitoring; no longer capable of providing representative samples or is providing unreliable samples; or required to be decommissioned; or to meet regulatory requirements.

NOTE 4—The determination of whether a well is providing a representative water quality sample is not defined in this guide. Examples of when a representative water quality sample may not be collected include the biological or chemical clogging of well screens, a drop in water level to below the base of the well screen, or complete silting of a tail pipe. These conditions may indicate that a well is not functioning properly.

1.4 This guide is intended to provide information for effective permanent closure of wells so that the physical structure of the well does not provide a means of hydraulic communication between aquifers or react chemically in a detrimental way with the environment.

[1] This guide is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Ground Water and Vadose Zone Investigations.

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1.5 The intent of this guide is to provide procedures that when followed result in a reasonable level of confidence in the integrity of the decommissioning activity. However, it may not be possible to verify the integrity of the decommissioning procedure. At this time, methods are not available to substantially determine the integrity of the decommissioning activity.

1.6 The values stated in inch-pound units are to be regarded as the standard. The SI units given in parentheses are for information only.

1.7 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.8 *This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word" Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.*

NOTE 5—If state and local regulations are in effect where the decommissioning is to occur, the regulations take precedence over this guide.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

C150 Specification for Portland Cement

D420 Guide to Site Characterization for Engineering Design and Construction Purposes

D4380 Test Method for Density of Bentonitic Slurries

D5088 Practice for Decontamination of Field Equipment Used at Waste Sites

D5092 Practice for Design and Installation of Ground Water Monitoring Wells

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 **abandonment**—see *decommissioning*.

3.1.2 *attapulgite clay*—a chain-lattice clay mineral. The term also applies to a group of clay minerals that are lightweight, tough, matted, and fibrous.

3.1.3 *borehole television log*—a borehole or well video record produced by lowering a television camera into the borehole or well. This record is useful in visually observing downhole conditions such as collapsed casing or a blocked screen.

3.1.4 *blowout*—a sudden or violent uncontrolled escape of fluids or gas, or both, from a borehole.

3.1.5 *caliper log*—a geophysical borehole log that shows to scale the variations with depth in the mean diameter of a cased or uncased borehole.

3.1.6 *cement, API, Class A*—a cement intended for use from the surface to a depth of 6000 ft (1828 m). This cement is similar to ASTM Type I cement.

3.1.7 *cement, API, Class B*—a cement intended for use from the surface to a depth of 6000 ft (1828 m) when conditions require moderate- to high-sulfate resistance. This cement is similar to ASTM Type II cement.

3.1.8 *cement, API, Class C*—this cement is intended for use from the surface to a depth of 6000 ft (1828 m) when conditions require high early strength. This cement is similar to ASTM Type III cement. Also available as a high sulfate resistant type.

3.1.9 *cement, API, Class G*—this cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with accelerators or retarders to cover a wide range of well depths and temperatures. No additions other than calcium sulfate or water, or both, can be interground or blended with the clinker during manufacture of the cement. Also available as several sulfate-resistant types.

3.1.10 *cement, API, Class H*—this cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with accelerators or retarders to cover a wide range of well depths and temperatures. No additions other than calcium sulfate or water, or both, can be interground or blended with the clinker during manufacture of the cement. Also available as a sulfate-resistant type.

3.1.11 *cement, API, Class J*—this cement is intended for use from depths of 12 000 to 16 000 ft (3658 to 4877 m) under conditions of extremely high temperatures and pressures. It can be used with accelerators and retarders to cover a range of well depths and temperatures. No additions of retarders other than calcium sulfate, or water, or both, can be interground or blended with the clinker during manufacture of the cement.

3.1.12 *cement bond (sonic) log*—a borehole geophysical log that can be used to determine the effectiveness of a cement seal of the annular space of a well.

3.1.13 *channeling*—the process of forming a vertical cavity resulting from a faulty cement job in the annular space.

3.1.14 *curing accelerator*—a material added to cement to decrease the time for curing. Examples are sodium chloride, calcium sulfate (gypsum), and aluminum powder.

3.1.15 *curing retarder*—a material added to cement to increase the time for curing. Sodium chloride in high concentrations is an example.

3.1.16 *decommissioning (closure)*—the engineered closure of a well, borehole, or other subsurface monitoring device sealed with plugging materials. Decommissioning also includes the planning and documenting of all associated activities. A synonym is abandonment.

3.1.17 *decontamination*—the process of removing undesirable physical or chemical constituents, or both, from equipment to reduce the potential for cross-contamination.

3.1.18 *fallback*—shrinkage, settlement, or loss of plugging material placed in a borehole or well.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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3.1.19 *fire clay*—a silicious clay rich in hydrous aluminum silicates.

3.1.20 *flow log*—a borehole geophysical log used to record vertical movement of ground water and movement of water into or out of a well or borehole and between formations within a well.

3.1.21 *geophysical borehole log*—a log obtained by lowering an instrument into a borehole and continuously recording a physical property of native or backfill material and contained fluids. Examples include resistivity, induction, caliper, sonic, and natural gamma logs.

3.1.22 *grout*—material consisting of bentonite, cement, or a cement-bentonite mixture.

3.1.23 *grout pipe*—a pipe or tube that is used to transport cement, bentonite, or other plugging materials from the ground surface to a specified depth in a well or borehole. The material may be allowed to flow freely or it may be injected under pressure. The term tremie pipe is frequently used interchangeably.

3.1.24 *hydraulic communication*—the migration of fluids from one zone to another, with reference to this guide; especially along a casing, grout plug, or through backfill materials.

3.1.25 *multiple-screened wells*—two or more monitoring wells situated in the same borehole. These devices can be either individual casing strings and screen set at a specific depth, a well with screens in more than one zone, or can consist of devices with screens with tubing or other collecting devices attached that can collect a discrete sample.

3.1.26 *native material*—in place geologic (or soil) materials encountered at a site.

3.1.27 *overdrilling*—the process of drilling out a well casing and any material placed in the annular space.

3.1.28 *perforation*—a slot or hole made in well casing to allow for communication of fluids between the well and the annular space.

3.1.29 *permanent plugging*—a seal that has a hydraulic conductivity that is equivalent or less than the hydraulic conductivity of the geologic formation. This term is often used with uncased boreholes.

3.1.30 *plow layer*—the depth typically reached by a plow or other commonly used earth turning device used in agriculture. This depth is commonly one to two feet (.3 m to .61 m) below land surface.

3.1.31 *plugging material*—a material that has a hydraulic conductivity equal to or less than that of the geologic formation(s) to be sealed. Typical materials include portland cement and bentonite.

3.1.32 *pre-conditioning*—an activity conducted prior to placing plugging material into a borehole in order to stabilize the hole.

3.1.33 *temporary decommissioning*—the engineered closure of a well intended to be returned to service at some later date (generally no more than six months). Temporary plugging should not damage the structural integrity of the well. Plugging materials consist of sand, bentonite, or other easily removed materials.

4. Summary of Guide

4.1 Information is provided on the significance of properly decommissioning boreholes and wells at sites containing or formerly containing solid or hazardous waste or hazardous materials or their byproducts, or that may be affected by solid or hazardous waste materials or their byproducts in the future. This guide may be used in situations where water quality in one aquifer may be detrimental to another aquifer either above or below the aquifer. The primary purpose of decommissioning activities is to permanently decommission the borehole or monitoring device so that the natural migration of ground water or soil vapor is not significantly influenced. Decommissioned boreholes and wells should have no adverse influence on the local environment than the original geologic setting.

4.2 It is important to have a good understanding of the geology, hydrogeology, well construction, historic and future land use, chemicals encountered, and the regulatory environment for successful decommissioning to occur.

4.3 Various materials suitable for decommissioning boreholes and wells are discussed, including their positive and negative attributes for decommissioning. A generalized procedure is provided that discusses the process from planning through implementation and documentation. Examples of typical practices are provided in the appendix.

5. Significance and Use

5.1 Decommissioning of boreholes and monitoring wells, and other devices requires that the specific characteristics of each site be considered. The wide variety of geological, biological, and physical conditions, construction practices, and chemical composition of the surrounding soil, rock, waste, and ground water precludes the use of a single decommissioning practice. The procedures discussed in this guide are intended to aid the geologist or engineer in selecting the tasks required to plan, choose materials for, and carry out an effective permanent decommissioning operation. Each individual situation should be evaluated separately and the appropriate technology applied to best meet site conditions. Considerations for selection of appropriate procedures are presented in this guide, but other considerations based on site specific conditions should also be taken into account.

NOTE 6—Ideally, decommissioning should be considered as an integral part of the design of the monitoring well. Planning at this early stage can make the decommissioning activity easier to accomplish. See Practice D5092 for details on monitoring well construction.

5.2 This guide is intended to provide technical information and is not intended to supplant statutes or regulations. Approval of the appropriate regulatory authorities should be an important consideration during the decommissioning process.

6. Materials

6.1 The materials used for construction of a monitoring well or other monitoring device to be decommissioned in part determines how it is decommissioned. Various materials are available for use in plugging boreholes and monitoring wells. This section provides information on these materials.

6.2 *Casing and Screen Materials*:

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6.2.1 Various materials are used for well casing and screen. The most common materials used are: PVC, PTFE, fiberglass, carbon steel, stainless steel, and aluminum. Typically, the same material is used for casing and screen in a well, however, in some instances different materials may be used in a well to achieve a particular purpose such as corrosion protection, reduction of material costs, or improving the integrity of ground water or soil vapor samples. This guide does not specifically address the use of more than one type of casing or screen material used in a well, however, the same decommissioning methods can frequently be used when more than one material is used (for example, PVC and PTFE, or stainless steel and carbon steel) in a well.

6.2.2 In selecting a well decommissioning method, PVC, PTFE, and fiberglass wells can be decommissioned using similar methods as all three types of materials tend to be low in tensile strength and easy to drill out or perforate. Appendix X1 provides a discussion on various procedures that can be used for the decommissioning of PVC wells and by reference PTFE and fiberglass wells.

6.2.3 Wells constructed of carbon steel, stainless steel, and heavy walled aluminum can be decommissioned using similar methods as these materials tend to have a higher tensile strength that allows for the casing to be removed. Appendix X1 provides a discussion on various procedures that can be used for the decommissioning of steel wells and by reference stainless steel and aluminum wells.

6.3 *Plugging Materials*:

6.3.1 Plugging materials should be carefully chosen for well closure to be permanent. Basic material characteristics are listed as follows:

6.3.1.1 Plugging materials should not react with contaminants or adversely react with ground water or geologic materials.

6.3.1.2 Plugging materials used in decommissioning wells, borings, etc. should have hydraulic conductivity (saturated condition) that is comparable to or lower than that of the lowest hydraulic conductivity of the geologic material being sealed.

6.3.1.3 Plugging materials must have sufficient structural strength to withstand pressures expected from native conditions.

6.3.1.4 Plugging materials must maintain sealing capabilities and not degrade due to chemical interaction, corrosion, dehydration, or other physical or chemical processes. Materials should maintain their design characteristics for the length of time contamination is present at the site.

6.3.1.5 Plugging materials should not be readily susceptible to cracking or shrinkage, or both.

6.3.1.6 Plugging materials must be capable of being placed at the position in the well or borehole in which they are needed and must have properties that reduce their unintended movement vertically and horizontally.

6.3.1.7 Plugging materials must be capable of forming a tight bond and seal with well casing and the formation.

6.3.1.8 Plugging materials must have properties that eliminate leaching or erosion of the material, under the conditions the material will be subjected. These include vertical or horizontal movement, or both, or contact with ground water or other existing conditions.

NOTE 7—The grain size of plugging material used in decommissioning operations conducted in areas where thick vadose zones occur should be coarser than materials used in areas where thin vadose zones or shallow saturated conditions occur. This is necessary as water is not transported effectively in coarse-grained materials under negative pore pressures. Coarse-grained materials should not be used where saturated conditions are likely to exist during the period of time that hazardous materials can be expected to occur at the site. It is important to determine the lithology and grain size distribution of materials adjacent to the borehole or well prior to selection of plugging materials.

NOTE 8—If coarse-grained materials are used to decommission the borehole or well, a layer of fine-grained material (such as cement or bentonite, or both) 1 or 2 ft (.3 or .61 m) thick should be placed at 10 ft (3 m) intervals in the borehole in the saturated zone. This layer should extend 2 to 3 ft (.61 to .91 m) above the highest expected level saturation is expected based on historical information on the water table for unconfined aquifers. A similar thickness of these materials should be used for confined aquifers. A similar 5-ft (1.5-m) seal of a low-permeability material should be placed near the ground surface to reduce the potential for entrance of fluids at the ground surface.

6.4 *Commonly Used Materials*—Subsections 6.2 and 6.3 introduced the general criteria that must be evaluated during the process of selecting the appropriate procedure and material for plugging a specific well. Because well construction and local geological conditions are site specific, a wide variety of materials and procedures may be used to complete the closure.

6.4.1 Section 6.4 presents a review of the plugging materials most commonly used to decommission monitoring wells. Table 1 summarizes these materials and lists the most important considerations (positive and negative) for their use. A detailed discussion of each material is presented in the following subsections.

6.4.2 *Portland Cement*—Portland cement may be used in any of its various forms to meet placement, strength, and durability criteria listed in 6.1. The amount of shrinkage or settling of neat cement is dependent on the amount of water used. Higher water to cement ratios tend to increase shrinkage (**1**).[3]

6.5 *Specification* C150:

6.5.1 *Type I*—Type 1 cement, a general-purpose material, is the most commonly used cement. This material has a tendency to develop a relatively high heat of hydration when used in confined situations and has relatively low-sulfate resistance.

6.5.2 *Type II*—Somewhat slower strength development than Type I; however, Type II cement has moderate heat of hydration and moderate sulfate resistance.

6.5.3 *Type III*—Type III cement is used when high early strength is desired. This material is not commonly used in decommissioning activities because of its ability to quickly set. Care must be used in working with this material.

6.5.4 *Type IV*—Type IV cement is used where a low heat of hydration is desired. It is not commonly used in decommissioning activities.

[3] The boldface numbers in parentheses refer to a list of references at the end of the text.

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6.5.5 *Type V*—Type V cement has high resistance to sulfate, and brine solutions. This material has ultimate strength development somewhat less than either Types I or II.

6.5.6 Type K cement is expansive and can be used to compensate for shrinkage. This cement is essentially Type I or more commonly Type II Portland Cement with additives to produce expansion. It can be of use in plugging situations where water-tightness is important. Type K cement contains calcium sulfoaluminate. When mixed with water, the hydration causes an expansion ranging from approximately 0.05 to 0.20 % (**2**).

6.6 *API Cements* (**3**):

6.6.1 *Class A*—Class A cement corresponds closely to ASTM Type 1. This cement is intended to be used from the surface to a depth of 6000 ft (1828 m).

6.6.2 *Class B*—Class B cement corresponds closely to ASTM Type II. It is intended for use from the surface to a depth of 6000 ft (1828 m) and is also available as a high-sulfate resistant variety.

6.6.3 *Class C*—Class C cement corresponds closely to ASTM Type III. It is intended for use from the surface to a depth of 6000 ft (1828 m). It is also available as a high-sulfate resistant variety.

6.6.4 *Class G*—Class G cement is intended for use from the surface to a depth of 8000 ft (2438 m) and can be used with accelerators or retarders to cover a wide range of depths and temperatures. The cement is also available as a high-sulfate resistant variety.

TABLE 1 Properties of Common Plugging Materials

Plugging Material	Description	Positive Attributes	Negative Attributes
ASTM C-50 Portland Cement			
Type I	Most commonly used type of cement for plugging	Forms a good seal when used with bentonite in 3 to 5 % concentration. Commonly available and can be purchased premixed on-site.	High heats of hydration may be a problem in PVC-cased wells. Can shrink and crack; low-sulfate resistance. Should not be used in the presence of strong acids or in low-pH environments.
Type II	Similar to Type I, but with a moderate heat of hydration.	Moderate heat of hydration. Moderate resistance to sulfate.	Somewhat slower strength development than Type I; expensive. Can shrink and crack. Can be difficult to use. Should not be used in the presence of strong acids or in low-pH environments.
Type III	High early strength.	May prove useful in situations where high early strength is needed, such as borehole walls that have a tendency to collapse.	Not a common cement. Can set very quickly before decommissioning is completed. Should not be used in the presence of strong acids or in low-pH environments.
Type IV	Low heat of hydration.	May prove useful in situations where a low heat of hydration is required	Not a common cement. Should not be used in the presence of strong acids or in low-pH environments.
Type V	Similar to Type I, with high resistance to sulfate and brine.	High resistance to sulfate and brine. Low heat of hydration.	Ultimate strength is less than Types I and III. Expensive; should not be used in the presence of strong acids or in low-pH environments. Can be difficult to use. Can shrink or crack.
K	Expansive cement.	Basically Type I or Type II Portland Cement with additions (tricalcium sulfo aluminate for example) to provide for expansion. Expansion is generally in the range from 0.05 to 0.20 % Good resistance to sulfate attack.	
API 10			
Class A	Similar to ASTM Type I.	Can be used to a depth of 6000 ft (1828 m). Forms a good seal when used with bentonite in 3 to 5 % concentration. Commonly available and can be purchased premixed on-site.	High heats of hydration may be a problem in PVC-cased wells. Can shrink and crack; low-sulfate resistance. Should not be used in the presence of strong acids or in low-pH environments.
Class B	Similar to ASTM Type II.	Can be used to depth of 6000 ft (1828 m). Moderate heat of hydration. Moderate resistance to sulfate. Available as a high-sulfate resistant variety.	Somewhat slower strength development than Type I; expensive. Can shrink and crack. Can be difficult to use. Should not be used in the presence of strong acids or in low-pH environments.
Class C	Similar to ASTM Type III.	Can be used to a depth of 6000 ft (1828 m).	Can set very quickly before decommissioning is completed. Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class G	Useful in a wide range of temperatures and depths through the use of accelerators or retarders.	Can be used to a depth of 8000 ft (2438 m). Available as a sulfate-resistant variety.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class H	Useful in a wide range of depths and temperatures through the use of accelerators or retarders.	Can be used to a depth of 8000 ft (2438 m). Available only as a moderate sulfate type.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Class J	Intended for use from a depth 12 000 to 16 000 ft (3658 to 4877 m).	Has use where extremely high temperatures and pressures occur.	Should not be used in the presence of strong acids or in low-pH environments. Can shrink and crack.
Pozzolanic cement	Addition of silicious materials to ASTM Type V or API Class A cement.	Good resistance to corrosive conditions and in reducing the permeability of cement.	Many types of materials can be used that can result in variable results.

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TABLE 1 *Continued*

Plugging Material	Description	Positive Attributes	Negative Attributes
Epoxy cements	Vinyl ester resins.	Good chemical resistance to acids and bases. Can use available equipment to place cement.	Very expensive. Poor chemical resistance to chlorinated hydrocarbons and acetic aid. Should be used only by experienced personnel. Water accelerates curing, must use diesel oil to precondition hole (diesel may increase contamination of site if hydrocarbons are a concern).
Bentonite			
Pellets	Granular bentonite compressed into a tablet	Uniform in size. Easy to use. Produces a low permeability seal.	Must be hydrated after placement. Shrinkage may occur when desiccated or when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline. Expensive.
Chips	Raw mined montmorillonite in the form of chunks ¼ to ¾ in. (.64 to 1.91 m) in size.	Inexpensive. No mixing equipment required. Forms a low-permeability seal.	Difficult to place. Must be hydrated after placement. Less swelling than beneficiated bentonite. Shrinkage may occur when desiccated when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline.
Granular	Raw mined montmorillonite crushed and seared to an 8 to 20-mesh size.	Can be placed at depth in dry holes. Forms a low- permeability seal.	Difficult to place in holes containing water as it quickly hydrates. Can bridge in hole. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage.
Powdered	Pulverized and seared bentonite that passes a 200-mesh screen. Used as drilling mud or as an additive to cement.	Used with cement to compensate for shrinkage (under saturated conditions). Other additives can be used to inhibit swelling, etc. Retards cement set; lowers heat of hydration.	May not be a desirable plugging material in deep vadose zones due to the drying out of the material, resulting in cracking. Difficult to place in holes containing water, as it quickly hydrates. Can bridge in hole. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage.
High solids clay grout	Powdered bentonite (200 mesh) mixed with fresh water to form a slurry with a minimum of 20 % solids and a density of 9.4 lb/gal (1126 Kg/m^3 g/L).	Does not shrink during curing. Low density reduces formation losses. Forms a low-permeability seal that stays flexible as long as it is hydrated.	May not be a desirable plugging material in deep vadose zones due to the drying out of the material, resulting in cracking. May desiccate when in contact with high concentrations of organic compounds (greater than 2 %) or materials that are strongly acidic or alkaline causing shrinkage. A low-strength material subject to expansion under low-pressure differentials such as artesian conditions.

6.6.5 *Class H*—Class H cement is intended for use from the surface to a depth of 8000 ft (2438 m). It can be used with a wide variety of accelerators and retarders to cover a wide range of depths and temperatures. It is available only as a moderate-sulfate resistant type.

6.6.6 *Class J*—This cement is intended for use from a depth of 12 000 to 16 000 ft (3658 to 4877 m) where extremely high temperatures and pressures can be expected to occur.

6.6.7 *Other Cements*—Other cements have been developed that may have applicability in decommissioning activities. These include the following:

6.6.7.1 Ultralight cements with a slurry density that can be as low as 6 lb/gal (719 cm Kg/L). This material can be made by foaming the cement with nitrogen or through the addition of hollow glass microspheres between 60 and 315 µm in diameter. The latter forms a slurry of between 9 and 12 lb/gal (1078 and 1438 Kg/L). Ultralight cements and microspheres have been reported (**4**) for cement unconsolidated sands and for plugging cavernous formations and lost circulation zones. Reference (**5**) provided similar information on microspheres. Microspheres can also be used in high-pressure applications when it may be desirable to limit density increases. Another advantage is the low water/cement ratio due to the low water absorbency and low density (**5**).

6.6.7.2 *Pozzolanic-Portland Cements*—These cements consist of silicious materials that develop into a cement in the presence of lime and water. Both natural materials of volcanic origin such as perlites (volcanic ashes), heat-treated clays, shales, tuffs, opaline cherts, diatomaceous earth and artificial materials consisting of byproducts from glass factories, furnace slag, and fly ash have been used (**2, 4, 6**). The large variety of materials that can be used as a source for pozzolans may result in variable results.

6.6.7.3 Pozzolans act to extend cement and decrease density. The specific gravity of fly ash ranges from 2.3 to 2.7 (depending upon the source) while portland cement is 3.1 to 3.2 (**2**). These materials can also provide improved resistance to corrosive fluids. Table 2 provides a comparison of sulfate resistance between ASTM Type V cement with and without pozzolans.

6.6.7.4 The improved resistance to corrosive materials is accomplished in part as many pozzolans contain zeolites which have the ability for ion exchange between the corrosive material and the alkaline component in the cement (**7**). Secondly, the use of pozzolans also decreases cement permeability over time. This occurs as a result of the increased percentage in hydrated cement containing materials resulting from the release of calcium hydroxide and the silica combining with lime from the cement to form a stable material (**8**).

6.6.7.5 Pozzolans are added to portland cement by adding 74 lb (33.6 Kg) (as fly ash) per sack of cement. If perlites are

TABLE 2 Comparison of ASTM Type V Cement With and Without Pozzolan Materials[A]

Cement Type	Relative Degree of Sulfate Attack	Percentage of Water Soluble Sulfate (as SO_4) in Soil, ppm	Sulfate (as SO_4) in Water Samples, ppm
V	Severe	0.20 to 2.00	1 500 to 10 000
V (plus pozzolan)	Very severe	2.00 or more	10 000 or more

[A] See Ref (**4**).

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used, 2 to 6 % of bentonite by weight is needed to keep the perlite from floating (**9**).

6.6.8 Gypsum cements can be used for high early strength development and their ability to set rapidly. These cements expand approximately 0.3 %. This cement may have use in plugging highly permeable formations. Care should be taken in using gypsum cements due to the solubility of gypsum.

6.6.9 *Epoxy Resin Cements*—Epoxy (vinyl ester resins) cements may have applicability in decommissioning wells and boreholes where corrosive materials may be present (**5**).

6.6.9.1 Epoxy cement consists of an epoxy base, hardener, accelerator, and inert filler. Resin viscosity is reduced by the addition of a nonreactive liquid diluent that also controls exothermic heat during polymerization. An inert solid filler such as very fine silica or barite is added to further reduce reaction heat and increase strength (**10**).

6.6.9.2 There are several advantages of using epoxy cements. Reference (**11**) reports that a stronger bond occurred between the casing and the formation. Cole also reported resistance to various chemicals (see Table 3). The cement is highly resistant to high concentrations of hydrochloric and sulfuric acid, but is not suitable for use in environments where acetic acid, chlorinated hydrocarbons, or toluene are present.

6.6.9.3 This cement is expensive and requires removal of water (that reduces settling time) through the use of gelled and weighted diesel oil to precondition the hole. The use of this material may increase contamination at the site, if diesel oil (hydrocarbons) are a concern at the site.

6.6.10 *Cement Additives*—A number of materials can be added to cement to modify properties to meet a specific need. Cement additives can be used to extend, accelerate, retard, increase density, control fluid losses, control circulation losses, or reduce friction (**4**). Several of these materials have more than one use; for example, sodium chloride can be used to accelerate or retard cement. The most common cement additives are discussed in the following subsections. Fig. 1 lists these additives and presents the relative impact of their use on selected performance criteria.

6.7 *Extenders*:

6.7.1 Bentonite is the most commonly used material in modifying cement properties. It can be added to most ASTM and API cements. In decommissioning activities, the percentage of bentonite added is generally no more than 4 %. It has the following effects when added to cement (**4**):

6.7.1.1 Lowers the hydraulic conductivity of the cement;

6.7.1.2 Increases slurry viscosity;

6.7.1.3 Reduces fluid loss to the formation;

6.7.1.4 Provides for a longer pumpability at normal pressures as a result of delaying strength development;

TABLE 3 List of Chemicals Reported Not to Affect Epoxy Cement[A]

Chemical	Concentration, %
Hydrochloric acid	30
Sulfuric acid	25
Chromic acid	up to 10
Nitric acid	5
Hydroxide	up to 20
Hypochlorite	up to 6

[A]See Ref **(11)**.

6.7.1.5 Reduces compressive strength; and

6.7.1.6 Lowers resistance to chemical attack.

6.7.2 Bentonite increases shrinkage as it ties up large volumes of water that would normally be in the cement. A second common extender are pozzolans which have already been addressed in 6.6.7.2.

6.8 *Accelerators*:

6.8.1 Accelerators hasten the settling of cement and are useful when voids occur, or when cement plugs are to be used in the first pour. Two common materials are used; calcium chloride and sodium chloride.

6.8.2 Calcium chloride is available as a powder or flake. Flakes are the most commonly used form, as it is easy to store and can absorb some moisture without becoming lumpy (**2**). Two to four % of calcium chloride by weight is used to achieve maximum acceleration. The use of calcium chloride should be considered when a rapid set, a decrease in viscosity, and early strength are desired.

6.8.3 Sodium chloride can be added between 1.5 to 5 % by weight of cement to reduce setting time. Maximum acceleration occurs at a concentration of 2 to 2.5 % except when higher water ratios are used (**2**).

6.9 *Retarders*:

6.9.1 Sodium chloride can be used to retard the settling of cement as well as accelerate the setting of cement. Fifteen to seventeen % salt (14 to 16 lb (6.35 to 7.26 Kg) of salt per sack) by weight is added to retard cement (**2**).

6.9.2 Other chemicals (cellulose, lignosulfates) have been used as retarders, but are not appropriate for decommissioning activities without additional information on their compatibility with waste and their effect on water quality. Reference (**12**) indicates that sugar-derived retarders such as cellulose lignosulfates are destructive to cement strength and should not be used where strength is important. Organic retarders should not be used for decommissioning activities.

6.10 *Density Improvers*—The density of cement can be improved to increase hydrostatic pressure. Sand can be used to increase density without affecting the cement chemically although additional water is required. Barite has been used, but may interact with waste and should not be used.

6.11 *Fluid Loss Controllers*:

6.11.1 Various organic materials such as cellulose can be used to produce a constant water to solids ratio that may have applicability when a grout is placed under pressure and water loss can occur. However, these materials may not be suitable for decommissioning activities, as they may contribute to contamination.

6.11.2 These organic materials (fibrous materials, cellophane flakes) act to block the movement of the grout into the formation. It is not desirable to use these materials in decommissioning activities due to their organic content that may adversely affect water quality and also may not result in a good plug.

6.12 *Friction Reducers (Dispersants)*:

6.12.1 These materials reduce friction to improve flow and can be effective when the water cement ratio is reduced. Reduction of the water cement ratio is a method to decrease cement friction. (It is possible to reduce the amount of water

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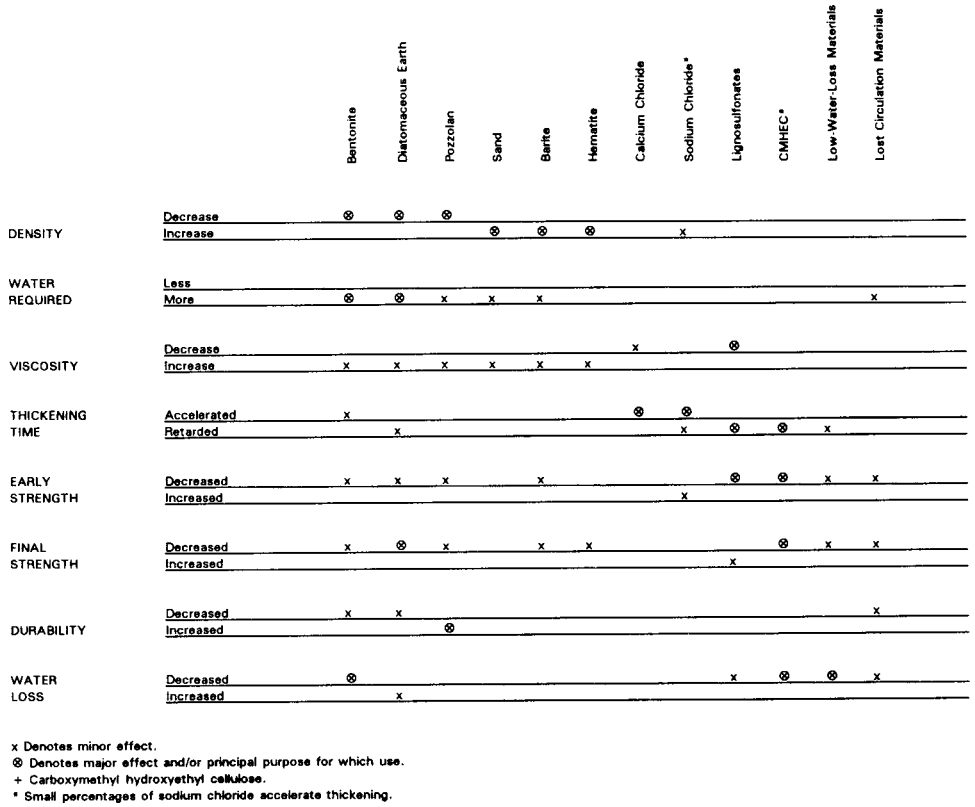

NOTE 1—See Ref (**3**).

FIG. 1 Effects of Some Additives on the Physical Properties of Cement

added by using a dispersant (**5**). These materials (sodium chloride, polymers, and calcium lignosulfonate) also help to reduce the energy required to pump the grout. Polymers and calcium lignosulfonate may not be appropriate materials for decommissioning activity as they may affect water quality.

6.13 *Bentonite*—Bentonite is predominantly composed of the clay mineral sodium montmorillonite. It has the ability to absorb large quantities of water and swell to many times its original size when hydrated, and the material remains flexible. Bentonite clay may be used in any of its various forms to meet placement, strength, and sealing criteria listed in 6.3. The amount of shrinkage or settling of a bentonite seal is dependent on the percent solids of bentonite, composition of surrounding formation and its soil moisture. Higher water to bentonite ratios increase the likelihood of dehydration.

6.13.1 The permeability of bentonite is very low; hydraulic conductivities of 1×10^{-6} cm/s or less can be achieved. However, bentonite may desiccate in the presence of high concentrations of some organic chemicals, strong acids or bases, saline ground water, or when allowed to dry, thereby increasing its hydraulic conductivity. Bentonite is commercially available in the following forms:

6.13.1.1 *Pellets*—Pellets are made from granular powdered bentonite that has been compressed into tablets, commonly ¼ to ¾ in. (.64 cm to 1.91 cm) in diameter. Pellets have a low-moisture content, high density, and uniform size. Pellets should be composed of additive-free, high-swelling granular sodium bentonite. Properly placed in a well or borehole, pellets hydrate and expand creating a low permeability (1×10^{-6} cm/s) plug. Pellets can be used in the saturated zone provided the length of the water column is short. The rate of pour into the hole should not be more than 50 lb (22.7 Kg) of bentonite in 5 min (**1**).

6.13.1.2 *Preformed Donuts*—Commercial preformed donuts consist of compressed bentonite and may have use in decommissioning activities.

6.13.2 *Chips*—Raw mined sodium montmorillonite in the form of chunks that are ¼ to ¾ in. (6.4 to 1.91 cm) in diameter. Their angular shape can make it difficult to place chips to the desired depth in a small-diameter well or borehole without bridging.

6.13.2.1 Fine-grained material resulting from the mechanical breakdown during shipping may cause a problem in the placement of chips due to clumping. Fines should be screened through a ¼-in. (6.4-mm) mesh screen before use.

6.13.2.2 The lower affinity for water that chips have allow them to fall through a water column without rapid hydration.

6.13.2.3 Chips have applicability in large-diameter boreholes and when carefully dropped into the hole to reduce bridging.

6.13.3 *Granular*—Raw-mined sodium montmorillonite without any additives that has been crushed and seared to an 8 to 20-mesh size. This material can be placed at depth in dry holes but hydrates quickly when placed into water. It often sticks to wet borehole walls and bridges when placed through

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water. Granular material is best suited for use in the unsaturated zone with enough water added to provide adequate hydration.

6.13.3.1 Fines can clump when in contact with water (**1**). Fines result from mechanical breakdown of the material during shipping. Granular bentonite should be poured slowly to reduce the potential for bridging. In some situations, a pour rate not exceeding 50 lb (227 Kg) in 5 min has been used successfully (**1**).

6.13.4 *Powdered*—Untreated, seared, and ground bentonite that passes through a 200-mesh screen. It is designed to be used in drilling fluids (muds) and as an additive to other plugging materials such as cement. Bentonite powder slurry can become an effective grout material when combined with density-increasing additives and swelling inhibitors. Powdered bentonite should not be placed in dry form through water as it can bridge and stick to the borehole walls.

6.13.5 *High Solids Clay Grout*—This material is a blend of powdered polymer-free bentonite clays mixed with fresh water that forms a slurry with a minimum 20 % solids by weight and a density of 9.4 lb/gal (1126m^3 Kg/L). The slurry sets to a low-permeable plastic grout that generates no heat of hydration and does not shrink during curing in the presence of moisture. High solids clay grouts are commonly used for borehole plugging.

6.14 *Other Materials*:

6.14.1 A number of other materials have been used for plugging:

6.14.1.1 Attapulgite clay (may have applicability when used with a salt cement grout),[4]

6.14.1.2 Fire clay,

6.14.1.3 Commercial packing materials, and

6.14.1.4 Packers.

6.14.2 These materials are either inappropriate for use in decommissioning wells or boreholes where hazardous waste are encountered, or are not well studied for decommissioning wells in hazardous waste situations. Therefore, they are not discussed in this guide.

6.14.3 Other materials have been used in the past for plugging wells and boreholes. Such materials as wooden or lead plugs should not be used because wood plugs may decay and lead is a potentially hazardous material. Mechanical packers composed of steel, plastic, or other materials can be used to assist in plugging.

7. Procedure

7.1 The primary purpose of most boreholes and monitoring wells is to monitor chemical compounds in the soil and ground water; however, there are other uses for subsurface monitoring including the measurement of temperature, soil gas sampling, or measurement of geophysical parameters. Use significant care in planning and implementing the decommissioning activity. It is important to obtain any required approvals from regulatory agencies, land owners, responsible parties, and other parties involved with the site. The following subsections present a recommended list of tasks in order that the decommissioning activity is successfully completed. Several of the steps outlined below do not pertain to boreholes and may be omitted.

7.2 *Planning*:

7.2.1 *Records Review*—Carefully review all available records and information relating to use of the monitoring well, borehole, etc. This review may include the following information:

7.2.1.1 Review applicable Federal, state, and local regulations relating to decommissioning activities. This may include contacting the applicable state or local agency having jurisdiction over drilling activities and preparation of the necessary documentation to drill (start card),

7.2.1.2 Collection of drillers' logs, geophysical logs, well construction, or geologic logs, including stratigraphy, structural geology, subsurface information, construction materials, screened interval, depth, hydraulic gradients (if water levels are available from other wells for its determination), legal location, date of installation, and photographs of the well,

7.2.1.3 Review of analytical chemical data for soil and ground water over the life of the well, and variations in water levels over time,

7.2.1.4 Review of records of the repairs, modifications, or other changes made to the well during the lifetime of the well,

7.2.1.5 Evaluation of historic, current, and planned land use,

7.2.1.6 Interviews with local workers and collection of other pertinent data such as discussing site conditions with local drillers, and

7.2.1.7 While not directly part of the decommissioning activity, proper disposal of displaced fluids and other materials (such as pulled or drilled out casing and cement seals) should be considered. Some of these materials may be classified as a hazardous waste under Federal, state, or local regulations. Conduct a review of these regulations and appropriate analytical documentation prior to classifying a material as a hazardous waste.

NOTE 9—This information may be summarized in a work plan. A work plan would also include a description of the site geology and hydrogeology and the decommissioning method to be used.

7.2.2 *Verification of Field Data*—The variety and quality of field practices and reporting require that the well be inspected to verify the actual field situation prior to decommissioning the well. The following list of procedures is recommended so that the actual condition of the well is known. Some of the borehole geophysical logs may not be applicable or may not be available for small diameter (2 in. (5.08 cm) or less) holes or wells.

7.2.2.1 Inspection of well head installation for integrity,

7.2.2.2 Current depth measurement of the casing and well. (The original depth of the borehole may be different than the well.),

7.2.2.3 *Water Quality Sampling and Analysis*—A final water quality sample taken from the well may be required for regulatory purposes;

7.2.2.4 *Downhole Inspections*—Including caliper logs to measure inside diameter; television logs to determine in-well conditions such as casing breaks, screen size, etc.; gamma logs to verify geologic information, if not already available; cement bond logs (sonic) to determine if the casing is firmly attached

[4] Sutton, Fred, Personal Communication, 1990.

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to grout (presently available for holes 2½ in. (6.35 cm) or larger in diameter); flow logs (flow meter or spinners) to determine if vertical flow occurs within the casing; and hydraulic integrity test to determine if the well casing is intact.

NOTE 10—Care should be taken in running any of these tools in a well with a collapsed or broken casing, or in boreholes that may collapse on the tool. Tools with active radioactive sources should not be used under these circumstances. Conduct downhole inspections only after obstructions are removed from the well casing or borehole.

7.2.2.5 Contact local owner, resident operator/observer to verify operations at the site.

7.2.2.6 Verification of field data is an ongoing responsibility. Use verified information to modify plans in order that the decommissioning activity is correctly conducted. Continue this activity during the field phase and change specifications as needed.

7.2.3 *Review of Decommissioning Options*—After the records have been thoroughly reviewed and verified in the field, select an appropriate decommissioning procedure. Evaluate each possible option to determine the most appropriate method for the selection. The following list of evaluation criteria is recommended:

7.2.3.1 The potential for fluid movement from one aquifer into another by means of the borehole or well should be eliminated.

7.2.3.2 Materials to be used in plugging must be compatible with well casing and screen (if left in place), and with subsurface formation and ground water, etc. over the period of time hazardous materials are found at these sites.

7.2.3.3 Future land use (as is known at the time of decommissioning) should be compatible with decommissioning plans.

7.2.3.4 Closure options should be compatible with applicable federal, state, and local requirements.

7.3 *Implementation*:

7.3.1 *Field Procedure*:

7.3.1.1 Satisfactory completion of decommissioning is the primary purpose of this guide. All work performed on the borehole or well should be completed by competently trained drillers, equipped with appropriate tools, under the direction of a geological or engineering professional who is qualified to certify that the decommissioning is completed according to the planned procedures and is consistent with applicable regulations.

7.3.1.2 Approve any modifications to the proposed work plan and record in writing by the on-site geologist or engineer (or their representatives) prior to implementation.

7.3.1.3 The geologist or engineer should be on-site during the field activities to verify that the activities are completed as planned. Decommissioning operations can be successfully accomplished by careful planning and documentation (see 7.5). Maintain documentation of decommissioning activities for the post-closure period or period required by regulations (if specified). While regulations may require documentation for a period of 30 years, it is advisable to continue this activity for a period lasting as long as hazardous materials occur at the site.

7.3.1.4 Remove casing from the ground by either pulling or overdrilling (see 7.3.7). Depending upon construction, it may be necessary to leave the casing in place and produce suitable perforations in the screen and blank casing to allow for the plugging material to penetrate the annular space and formation (see 7.3.7). If grout in the annular space can be verified to be in good condition, the well can be decommissioned by cutting the blank casing and filling the screened interval with grout. Verifying the integrity of grout may be difficult to impossible. If a filter pack is present, it may be necessary to remove the filter pack after perforating the casing by washing or overdrilling. Several of the methods identified in this subsection are briefly discussed in the Appendix X1.

7.3.1.5 If well construction conditions are not adequately known and the well site contains hazardous materials, it may not be appropriate to remove the casing and screen, as this may increase the mobility of hazardous materials.

7.3.1.6 The borehole or well, or both, may require preconditioning for decommissioning to be successful. Preconditioning can reduce the potential for sloughing of the borehole wall if for example, a sodium montmorillonite clay occurs naturally in the formation and cement is used as the plugging material. The calcium contained in Portland cement exchanges with the sodium cation in bentonite clay decreasing the water contained in the clay and inducing sloughing. This problem can be significant in sediments or rocks that are under considerable pressure, causing a loss in part of the hole, thereby not completely plugging the borehole and possibly causing loss of all downhole equipment. These conditions are usually known by local drilling and well servicing contractors who should be contacted prior to the start of field operations.

7.3.1.7 Preconditioning consists of removing mud from borehole walls (when mud is used for drilling the borehole), or stabilizing a borehole prior to placement of the plugging material. If a drilling mud has been used to drill a borehole, preconditioning can involve the circulation of a high-quality, low-solids drilling fluid to remove gelled mud from the borehole and borehole walls prior to plugging. For the above situation, a high-quality bentonite or drilling fluid can be used. If a drilling mud is used as the plugging material, prepare fresh mud. The mud used in drilling contains cuttings and may also not have suitable properties (**13**). The selection and use of material(s) should meet the requirements specified in Section 6.

7.3.2 *Volume of Plugging Material Required*:

7.3.2.1 The geologist or engineer should calculate the volume of plugging material required for the borehole or well after first taking into consideration applicable loss of material to the formation, voids intersecting the borehole, changes in borehole diameter, washout zones, and swelling or shrinkage of material. An approximation of the volume of material that may be required can frequently be provided by contacting local drillers or professionals.

7.3.2.2 Loss of plugging material into the formation may occur rapidly (within minutes) or after several hours or days. The volume of plugging material required to be on-site should be at a minimum, enough to fill one borehole volume, however, it is advisable to have available a minimum of 25 to 50 % in excess of the calculated borehole volume (**1, 2**). Additional plugging material should be readily available to site personnel

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under short notice, especially if it is common to lose plugging material into the formation or the material is required for clearing a hole (see 7.3.8.2).

7.3.2.3 A caliper log is helpful in boreholes or overdrilled holes to define hole diameter. If this information is not available, use an estimate of borehole diameter from the available well construction specifications. Calculate the volume of the borehole using the following:

$$v = \pi r^2 L \quad (1)$$

where:
v = volume,
L = length of borehole or well to be plugged, and
r = radius of hole.

7.3.2.4 Manuals listing the volume of a hole per linear foot (metre) such as Ref (**3**) can also be used. These manuals are available through major deep well cementing service companies. Assume in the calculations or table used that the derived volume is the minimum required for actual conditions due to possible loss of plugging material into the formation. Verify grout emplaced through estimating the volume of material leaving the hole for holes filled with mud or water. For all boreholes, measure the volume of material emplaced and check for the appearance of the material at the top of the interval grouted or land's surface, whichever is applicable.

7.3.2.5 Location of the grout at depth can be difficult because the top of the grout may not be able to be distinguished from water or other fluids in the borehole. One field procedure that has been applied to measure the level of the grout is to use a wooden sounding block with a weight attached to the block. The weight should be slightly denser than the grout.

NOTE 11—Location of the depth of plugging material in a borehole or well does not confirm that the plug has performed its intended purpose. Plugging materials may not have adhered to the walls of the borehole or well or may have been bypassed from the target zone. Therefore, placement of plugging materials is highly dependent upon proper preparation of the hole.

7.3.2.6 In areas where coarse materials are encountered, or considerable fracturing or solution openings occur, two or three times the calculated volume of material may be required to fill the hole. In extreme cases such as in some karst terrains where large conduits may exist, it may be difficult to plug a well or borehole. In these situations, packers can be used to isolate critical intervals for filling with plugged materials above or below the karstic formations. Packers may also be used to isolate critical intervals within a well or borehole throughout the entire depth.

7.3.3 *Quality of Water Used for Grout*—Grout must be carefully mixed using water of a known chemical quality. The quality of the water must be compatible with the grouting material and not introduce contamination into the subsurface. For cement, water used should be free of silt, organic matter, alkali compounds, and have a total solids content of 500 mg/L or less (**14**). The grout should be weighed using a mud balance.

NOTE 12—Thicker grout mixtures may have greater effectiveness in plugging highly permeable materials or materials with large voids, but may be very difficult to pump through a grout pipe. Less viscous mixtures are easy to pump, but may be too mobile, have greater shrinkage, and take longer to set if additives to compensate these problems are not added.

7.3.4 *Mixing of Cement and Bentonite On-Site*—Both cement and bentonite can be mixed on site. Cement can also be purchased from a contractor and delivered premixed on site, provided the water used is of known and acceptable quality.

7.3.5 *Use of Curing Accelerators*—Curing accelerators can be used to hasten the initial set time for cement from 6 to 8 h to perhaps 2 or 3 h, provided the accelerator (typically calcium chloride, sodium chloride, aluminum powder, or gypsum) does not degrade the cement or react with the environment. The use of these materials may also require approval by regulatory authorities.

7.3.6 *Decommissioning of Boreholes*:

7.3.6.1 To achieve an effective seal, the borehole should be free of debris and foreign matter that may restrict the adhesion of the plugging materials to the borehole wall. Clear boreholes of excessive mud filtercake, or gelled mud (if used) and any bridges resulting from the removal of temporary casing, or when noncohesive materials (such as sand and gravel) are encountered that can lead to a collapsed borehole during decommissioning activities.

7.3.6.2 One method commonly used for effective removal of these materials is to advance a small grout pipe to the bottom of the borehole by use of water or a high-quality bentonite slurry and flush the hole. Flushing is continued until the blockage is removed, or noncohesive formations are stabilized. Use at least two borehole volume of materials. If the flushing fluid returning to the surface contains potentially hazardous materials, it may be necessary to place this material into containers for proper disposal.

7.3.6.3 As soon as the borehole is prepared, pump plugging material slowly through a grout pipe to displace the flushing fluid. Inject grout starting from the bottom of the hole, forcing other fluids upward. Complete grouting slowly to prevent channeling of the grout around any undesirable material remaining in the hole. Complete this operation in one continuous operation. Raise the grout pipe when pumping pressure increases significantly, or when undiluted grout reaches the surface. Regularly sample and evaluate overflowing grout for weight, presence of foreign material, or other changes. When the overflowing grout is similar to that being pumped down the hole, the plugging is considered complete.

7.3.6.4 Grout pipes should be the largest diameter that is practical for field operations to reduce the required pumping pressure. Cut the lower end of the pipe at an angle to allow for the side discharge of the grout. Side discharge reduces the potential for erosion of the borehole wall. Typically, heavy-walled PVC (Schedule 40 or greater) or thin-walled steel pipe is used for grouting purposes. Use caution while grouting deeper holes in order that downhole pressure does not exceed the rupture strength of the grout pipe.

7.3.6.5 Grouting of shallow auger holes or other boreholes where grout pumping equipment is not readily available may be accomplished by placing grout through a side discharge grout pipe that has a funnel attached to the top. As the grouting progresses, slowly raise the pipe. Take care when using this procedure, as the low placement pressure may not completely fill or flush undesirable materials from the borehole. This

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procedure is only recommended when the entire borehole depth is 10 to 15 ft (3 to 4.6 m) or less.

7.3.6.6 Small diameter (<2-in. (5.08 cm-mm)) holes are difficult to plug. A small diameter (¾-in. (1.9 cm-mm)) grout pipe can be used, however, high-pumping pressures may be required or less viscous plugging materials may be necessary.

NOTE 13—It is important to avoid hydrofracturing or blowout in shallow holes in unconsolidated materials when pressure grouting. A general rule to avoid hydrofracturing is to restrict pumping pressure to about 0.6 lb/in.^{2}(0.42 Kg/cm^2) of hydraulic pressure for each foot (metre) of overburden. In some instances, the pressure used must be reduced further.

7.3.6.7 A conservative method (**15**) of calculating maximum pressure is as follows:

$$Pm = (0.733 - 0.433\ Sg)d \quad (2)$$

where:

Pm = pressure of fluid injected at wellhead, lb/in.^{2}(Kg/cm^2),

Sg = density (specific gravity) of the plugging material (grout) (unitless), and

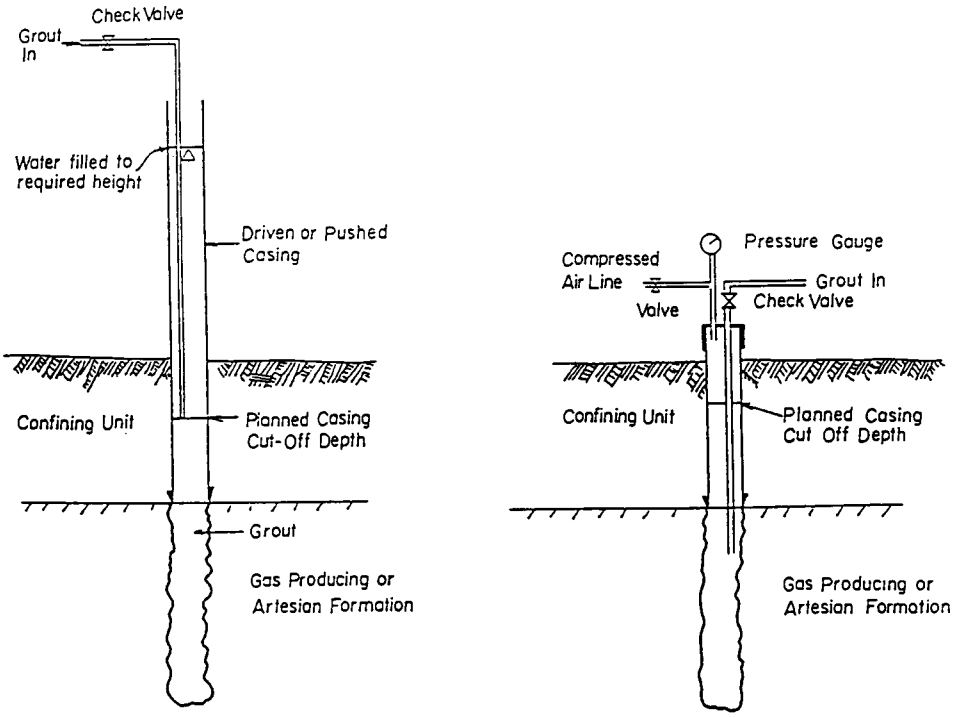
d = depth measured for the surface to the opening of the grout pipe (metres) feet.

Hydrofracturing typically occurs during start-up or restart of grouting.

7.3.6.8 Inject grout at the bottom of the hole, displacing grout, loose formation materials, and borehole fluids upward. Slowly pump grout to avoid channeling. Do this in one continuous operation. Raise the grout pipe when grout can no longer be easily forced from the pipe into the hole or when undiluted grout reaches the top of the hole and flows out. Sample and weigh this material. The weight of the grout returning to the surface should be the same as the grout pumped into the hole.

7.3.7 *Control of Elevated Formation Pressures*—Occasionally, a borehole or well may penetrate a formation that is under confined conditions (artesian head), or from which a gas is being released, under pressure. (Gas bubbling upward through the grout may result in open channels, or increase the permeability of the grout.) When this condition is encountered, sealing of the borehole requires that the grout pressure be maintained greater than the formation pressure until initial grout set occurs. The "shut-in-pressure" of the formation can usually be determined by use of pressure gages attached to a casing that has been pushed or driven into the confining unit. This casing must be tightly sealed to prevent leakage around its annulus. (Separate packers or casing grout, or both, may be required to prevent leakage around the casing.)

7.3.7.1 Several procedures may be used to balance the formation pressure until the initial set of the grout has occurred. (See Fig. 2.) The procedure most often used to contain the pressure is to use a sufficient column of grout. If additional head pressure is required, increase the unit weight of the grout by the addition of sand, densifying additives (barite, or hematite) or decreasing the water cement ratio. Another alternative commonly used is to pump the grout through a check valve into the casing until the top of grout reaches the desired elevation. Maintain pressure above the grout by use of



Stand Pipe To Contain Excess Formation Pressure

Compressed Air To Contain Excess Formation Pressure

FIG. 2 Two Procedures That Can Be Used to Overcome Elevated Formation Pressure

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compressed air, or by use of a simple standpipe filled with water. If the standpipe procedure is used, pump grout through a tremie pipe extending through the water to prevent dilution.

7.3.7.2 After the initial grout set has occurred (minimum 24 h), the sustaining pressure (above atmospheric pressure) may be released. However, record the air pressure (or fluid level) in the air filled casing above the grout frequently for several days to verify that no leakage is occurring. If gas (of any variety) is present in the formation, analyze a sample of the air from the casing above the grout. Care should be taken under these conditions, as explosive or hazardous conditions may be present. Methane, the most commonly produced gas, is odorless, colorless, toxic, and extremely flammable. Safety precautions are advised.

7.3.7.3 Only after testing results confirm that the seal is effective, is it advisable to complete the permanent closure or removal of the near (or above) surface casing.

7.3.7.4 Measure any fallback or settlement of the grout surface (whether by gravity or under pressure) that occurs after grout emplacement to the nearest foot and record. Correct any fallback with native or imported materials to grade, or to a specified depth below grade, such as below the plow layer. The depth is based on existing and proposed land use and regulatory requirements.

7.3.8 *Decommissioning of Wells and Other Monitoring Devices*:

7.3.8.1 This discussion has applicability in decommissioning ground water monitoring and injection wells and soil gas monitoring wells, neutron probe access tubes, lysimeter and tensiometer and installations, and similar devices. Appendix X1 should be consulted for additional information.

7.3.8.2 It is desirable to remove all existing well construction materials such as screen, casing, filter pack, seal, and grout from the hole to reduce the potential for the formation of a vertical conduit to occur at the contact between casing and annular seal; reduce the potential of these materials interfering with the decommissioning operation; decrease the potential of a reaction between the materials used; or to minimize the reaction with the native materials or ground water. In situations where well materials are removed and borehole collapse occurs, redrill the borehole following the guidance provided in 7.3.6.

7.3.8.3 Steel casing may be removed using jacks to free casing from the hole followed by lifting the casing out by using a drill rig, backhoe, cranes, etc. of sufficient capacity. If the annular space has been cemented over a long distance, this method may not be readily used unless a poor contact occurs between the casing and borehole. Small lengths of cement (typically less than 10 ft (3 m)) can be removed along with the casing if the drill rig has sufficient lifting capacity. When the casing cannot be removed, perforate the casing and screen using a suitable tool. This is necessary as encrustation or corrosion of the screen can block or completely close openings. A wide variety of commercial equipment is available for perforating casings and screens. Due to the diversity of application, consult an experienced contractor prior to selection of the technique. A minimum of four rows of perforations several inches (millimetres) long and a minimum of five perforations per linear foot (metre) of casing or screen is recommended.

7.3.8.4 Remove steel casing by overdrilling (overreaming) the casing. Overreaming can be done using an overreaming tool (see Fig. 3). Select a pilot bit that is nearly the same size as the inside diameter of the casing. The reaming bit should be slightly larger than the borehole diameter to remove all well construction materials and a small amount of native material. As drilling proceeds, the casing, grout, bentonite seal, filter pack, and other well materials are destroyed and returned to the surface. In situations when the grout in the annular space can be verified to be in good condition, it may be very difficult to remove casing and grout and grout can be left in place by pressure grouting the screened interval and casing. Verifying the integrity of the grout can be difficult.

7.3.8.5 PVC and other low tensile strength materials generally cannot be removed by pulling if they have been properly cemented into place. Overdrilling is necessary to remove these casing and screen materials.

7.3.8.6 A hollow stem auger equipped with outward facing carbide cutting teeth with a diameter 2 to 4 in. (50.8 to 1016 cm) larger than the casing may be used for overdrilling. Place the lead auger over the casing and rotate downward (see Fig. 4). The casing guides the cutting head and remains inside the auger. When the full diameter and length of the well has been penetrated, the casing and screen can be retrieved from the center of the auger. It is important to use outward facing cutting

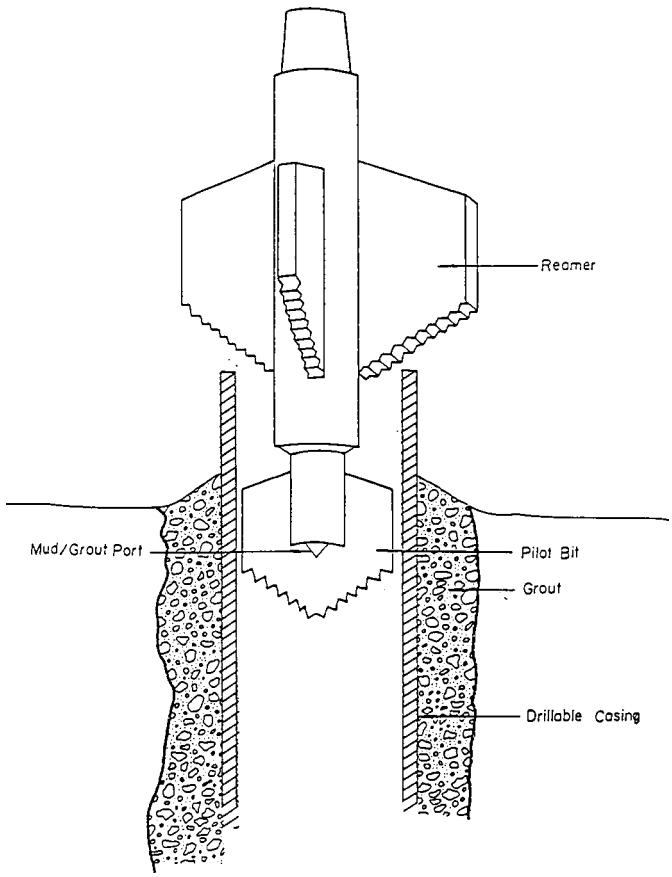

FIG. 3 Over Drilling by Mud Rotary Procedure

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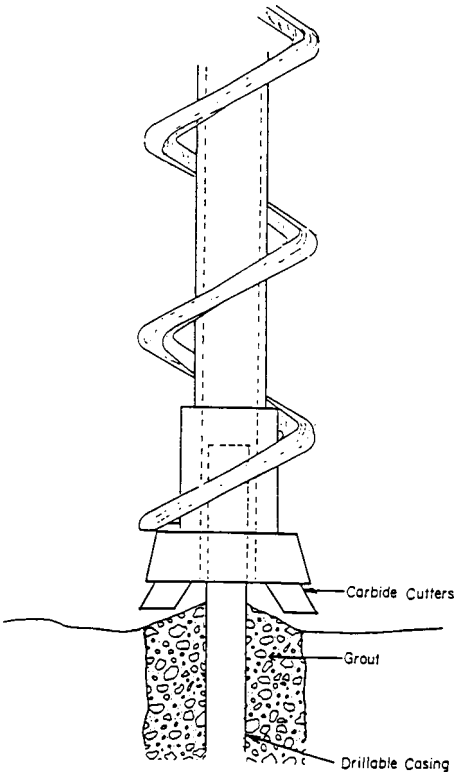

FIG. 4 Over Drilling by Hollow Stem Auger Procedure

teeth in order that the cutting tool does not sever the casing and drift off center. An alternative is to install a steel guide pipe inside the well casing so that the augers can be centered.[5] Firmly attach this temporary working pipe to the inside of the casing by use of a packer, or other type of expansion or friction device. When the auger reaches full depth and the well materials have been removed, pump plugging materials through the hollow stem as the augers are withdrawn.

NOTE 14—Local regulations may allow leaving the PVC casing in place, if a good annular seal exists, or just removing blank casing if the integrity of the annular seal can be documented. It is generally difficult to document a good annular seal (tight fit, no fractures or channels) without the use of a cement bond log or similar method. A cement bond log cannot be run in small diameter wells (less than 2.5 in. (6.35 cm) in diameter) because a small diameter tool is not currently available. Also, this method is not reliable for PVC casings.

7.3.8.7 After removal of the casing, decommissioning can be completed in accordance with 7.3.6.

NOTE 15—Wells with a maximum depth of 10 to 15 ft (3 to 4.6 m) can be removed by overdrilling, or when possible by pulling the casing out of the ground. The open hole is then filled with grout or other suitable plugging materials. A tamping rod can be used to tamp the material into place.

7.4 *Decontamination of Downhole Equipment*:

7.4.1 If hazardous waste or other contaminants occur at the site, decontaminate all tools placed into the borehole or well prior to entry (see Practice D5088). Follow state and local regulations, if applicable. A hot water pressure wash or steam cleaning are examples of two typical decontamination methods. Other methods such as the use of solvents followed by rinsing with clean tap water and allowing equipment to air dry may also be acceptable. Also contain water and other materials used for decontamination for chemical analysis to determine proper disposal methods.

7.4.2 Do not flush grout pipes out with water while in or above the hole. Conduct all cleaning operations aboveground and manage appropriately as a hazardous or nonhazardous situation depending upon chemical analytical data on the site.

7.5 *Documentation*:

7.5.1 *Inspection Records*—The primary purpose of records of field work is to provide that appropriate measures have been taken so that the borehole or monitoring well is permanently decommissioned in a manner that minimizes it from being a conduit for fluid, water, or vapor migration. Properly decommissioned boreholes and wells should have no adverse influence on the local environment than the original geological setting.

7.5.2 *Narrative Report*—Maintain the narrative report of activities as a permanent record of the decommissioning activities and include the full set of field activities including:

7.5.2.1 Decommissioning date,

7.5.2.2 Personnel (with listing of company representation, including phone number and address),

7.5.2.3 Source of decommissioning method,

7.5.2.4 Step-by-step procedures used in the field,

7.5.2.5 Record of all measurements made, depths encountered, types and volume of fluids pumped and photographs before and after, and

7.5.2.6 All other pertinent information that is required based on site conditions or regulatory requirements. Any problems encountered should also be documented in detail.

8. Report

8.1 At the completion of field work, present a formal report to document the entire procedure used in the decommissioning process for the borehole or well. Additional information or requirements may be specified in government regulations and should also be included in this report. Report in detail the following items as a minimum:

8.1.1 *Background Information*:

8.1.1.1 Location of the borehole/well,

8.1.1.2 Purpose of the borehole/well,

8.1.1.3 History of the borehole/well,

8.1.1.4 Chemical parameters and concentrations present during the active life of the well and at the time of plugging; and

8.1.1.5 Information collected prior to the inspection record.

8.1.2 *Testing Prior to Decommissioning*:

8.1.2.1 Site characterization (if applicable),

8.1.2.2 Physical testing (depth, structural condition, etc.),

8.1.2.3 Chemical testing results (last chemical analysis for record), and

8.1.2.4 Geophysical logging results (if any).

8.1.3 *Decommissioning Design Procedure*:

8.1.3.1 Rationale for selection of method used, and

8.1.3.2 Presentation of a decommissioning plan.

8.1.4 *Field Implementation*:

[5] Baker, Robert, Personal Communication, Layne Environmental, 1990.

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8.1.4.1 Description of activities,
8.1.4.2 Variance from plan, and
8.1.4.3 Result of testing and measurements.
8.1.5 *Confirmation*—Statement of regulatory compliance.

9. Keywords

9.1 abandonment; decommissioning; ground water monitoring wells; hazardous waste; plugging

APPENDIX

(Nonmandatory Information)

X1. EXAMPLES OF SUCCESSFUL MONITORING WELL DECOMMISSIONING PRACTICES

X1.1 This appendix covers a general discussion of field procedures that have been used to decommission monitoring wells. These procedures are presented to provide technical guidance to assist in the development of decommissioning wells or boreholes. Local regulations may not allow implementation of some procedures. Two subsets of procedures are outlined, one for rigid steel casing and the second for lower tensile strength casing materials (plastic).

X1.2 *Steel Casing:*

X1.2.1 *Condition*—Properly grouted steel casing and screen, difficult to pull casing:

X1.2.1.1 *Suggestion*—Pressure pump plugging materials into well to above aquifer, place 3-ft (.91-mm) plug of plastic material (bentonite plug) above rigid plug then complete with rigid plugging material to surface. Place a PVC or neoprene plug or packer, located at the base of the rigid (cement) material to reduce the co-mingling of fluids due to different specific gravities. Complete decommissioning at surface according to local regulations.

X1.2.1.2 *Alternative*—Perforate steel casing and screen to allow plugging material to come into contact with the annular space and formation.

X1.2.1.3 *Advantage*—If (when) casing material corrodes, the continually plastic bentonite plug will continue to provide a suitable sealing zone.

X1.2.2 *Condition*—Steel well materials, that are removable:

X1.2.2.1 *Suggestion*—Pull screen and casing, then redrill borehole to original depth using slightly larger diameter drill bit than the borehole. Complete closure by pressure sealing the borehole by grout pipe from bottom to top.

X1.2.2.2 *Advantage*—Casing and annular materials are completely removed and replaced with sealing material of equal or lower permeability (saturated zone) than the native geologic materials.

X1.2.3 *Condition*—Shallow screened well completed into permeable sand or gravel aquifer:

X1.2.3.1 *Suggestion*—Pull the casing and screen (grout also, if possible) then redrill the borehole to original depth. Completion should be by pressure sealing to the surface.

X1.2.3.2 *Advantage*—The possibility of hydraulic connections with the surface is greatly reduced.

X1.2.4 *Condition*—Steel casing and screen set into highly permeable formation (such as fractured limestone) that results in lost fluid circulation during drilling or decommissioning procedures:

X1.2.4.1 *Suggestion*—Fill highly permeable section with quick setting cement grout (addition of calcium chloride), or coarse gravel to base of casing, or hang "cement basket" at base of casing. Complete decommissioning with plugging materials pumped into place, including at least one section of permanent plastic seal.

X1.2.4.2 *Advantage*—Extremely permeable or highly cavernous materials may not be able to be filled sufficiently to allow closure similar to other cases. In such situations, prevention of vertical migration of fluids to or from that zone is the primary purpose of decommissioning.

X1.3 *Low-Tensile Strength Materials (that is, PVC, ABS, PTFE):*

X1.3.1 *Condition*—Properly constructed well that has a sealed annulus from the surface to the top of screen:

X1.3.1.1 *Suggestions*—Pressure grout in place after perforating the entire casing so that the screen and gravel pack are filled with grout; or over-ream the well using a drill bit diameter that is a minimum or slightly larger than the diameter of the annular space.

X1.3.2 *Condition*—Annulus is not permanently sealed and casing/screen cannot be pulled:

X1.3.2.1 *Suggestion*—Overdrill casing, screen and filter pack with a hollow stemmed auger or other suitable drilling method. Remove casing from bottom to top as augers are removed.

X1.3.2.2 *Advantage*—Complete well structure is removed. Grouting materials provide no avenue of fluid or gas migration after decommissioning.

X1.3.3 *Condition*—Annulus seal questionable; casing screen cannot be pulled:

X1.3.3.1 *Suggestion*—Use rotary tools equipped with pilot bit. Large portion of bit must be equal to or larger than diameter of original borehole. Drill out casing, annular material, to depth of well. Pressure seal after tools are removed.

X1.3.3.2 *Advantage*—Complete well structure is removed. Grouting materials do not provide pathways for fluid or gas migration after decommissioning.

X1.3.4 *Condition*—Annulus seal questionable, casing and screen may be pulled from firm clay soils:

X1.3.4.1 *Suggestion*—Use pulling rig equipped with down hole casing latch tool. Anchor tool at bottom of well and lift casing and screen. Pressure grout open hole from bottom to top. (This method may have applicability for shallow wells.)

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X1.3.4.2 *Advantage*—This method is often possible in firm clay soils. Requires less expensive equipment than other procedures.

X1.3.5 *Condition*—Vadose zone monitoring devices such as lysimeters, tensiometers, neutron access holes, and similar devices installed vertically:

X1.3.5.1 *Suggestion*—Drill out the device and backfill as suggested in 7.3.8.5 and 7.3.8.6. (See also Note 15 in the text.)

X1.3.5.2 *Advantage*—The device and materials used to construct the device are removed reducing the potential for fluid movement from the surface to underlying materials and ground water.

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Appendix C Decommissioning Programme & Detailed Methodology

Decommissioning Programme & Detailed Methodology
Former Kodak Site, Kirkby

Acorn Developments Ltd

October 2010

WSP

QM

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft			
Date				
Prepared by	John Morton			
Signature				
Checked by	Neil Shaw			
Signature				
Authorised by	Dave Rix			
Signature				
Project number	13010908			
File reference	13010908.Decom .Oct10			

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Contents

1	Introduction	3
2	Well Decommissioning	4
3	Reinstatement Works Zone 4	7
4	Reinstatement Works Zone 2	9

1 Introduction

1.1 FOREWORD

The following document has been prepared to detail the decommissioning works required at the former Kodak Chemicals Site in Knowsley Industrial Park, Kirkby. WSP has undertaken voluntary remediation works on behalf of Acorn Developments and has been present on site since October 2007. Remediation on site has now concluded and the infrastructure installed by WSP requires decommissioning.

This document contains the detailed specifications, methodologies and risk assessments for the works that are required.

1.2 TASKS

1) Decommissioning all wells installed by WSP in all site Zones;
2) Decommission Zone 4 remediation well chambers;
3) Breaking out and removal of chamber lids in Zone 4 and reinstating the tarmac surface;
4) Preparing Zone 2 air sparge area for concrete capping;
5) Decommission remediation systems in Zone 2 and Zone 3;
6) General housekeeping and site clearance of WSP infrastructure.

1.3 STAFF

- Project Director – Dave Rix
- Project Manager – John Morton
- Project Engineer – Thomas Miles
- Site Engineer – Nigel Bullock
- Site Engineer – Michael Hindle

1.4 PROGRAMME

Programme is included in Appendix C

2 Well Decommissioning

2.1 OVERVIEW

Since 2007 WSP (Environmental and Remediation) has installed a total of 146 wells. All of which require decommissioning with the exception of those which are expressly requested to be retained by third parties. Any wells retained will be the sole liability of the party which made the request. Wells will be decommissioned in line with the Environment Agency guidance document "Decommissioning Redundant Boreholes and Wells" and the Standard Guide for Decommissioning of Groundwater Wells, Vadose Monitoring Devices and Other Devices for Environmental Activities published by ASTM international (reference D5299-99 (Re-approved 2005)).

2.2 LEGAL FRAMEWORK

Under the Groundwater Regulations, 1998 and in accordance with the EC Groundwater Directive (80/68/EEC) discharge into the groundwater of substances in List I of the Directive is prohibited and discharges of substances in List II must be minimised so as to prevent pollution.

Due to the number of monitoring wells on site and due to the current usage of the site the likelihood of contaminants entering the groundwater via monitoring well installations is high. As such, all monitoring and remediation well installations completed by WSP will be fully decommissioned to prevent the wells acting as a pathway for surface contaminants to impact groundwater.

2.3 MONITORING WELLS

Since WSP December 2007 146 wells have been installed by WSP throughout the eight zones on site (See Figure 1 in Appendix A). Table 1 shows how many wells, installed by WSP, exist in each Zone.

Zone	No. of Wells	Well Id's
1	0	
2	36	WSPR-D59, WSPR-D60, WSPR-D1, WSPR-D12, WSPR-D42, WSPR-D18, WSPR-D7, WSPR-D19, WSPR-D4, WSPRD65, WSPRD14, WSPRD20, BH11R, WSPR-D30, WSPR-D62, WSPR-D64, WSPR-D62, WSPR-D11, WSPR-D21, WSPR-D23, WSPR-D37, WSPR-D45, WSPR-D63, WSPR-D53, WSPR-D24, BHX50, WSPR-D31, WSPR-D35, WSPR-D47, WSPR-D52A, WSPR-D50, WSPR-R3, WSPR-R4, WSPX32, WSPX37, WSPX47
3	25	WSPR-A5, WSPR-A8, WSPR-A24, WSPRA9, WSPR-A2, WSPR-A12, WSPR-A13, WSPR-A11, WSPR-A22, WSPR-A10, WSPR-A7, WSPR-A23, WSPR-A1, WSPR-A21, WSPR-A19, WSPR-A18, WSPR-A6, WSPR-A17, WSPR-A16, WSPR-A15, WSPR-A4, WSPR-R1, WSPX5, WSPX8, WSPX59
4	31	RWZ4/1, RWZ4/2, RWZ4/3, RWZ4/4, RWZ4/5, RWZ4/6, RWZ4/7, RWZ4/8, RWZ4/9, RWZ4/10, RWZ4/11, RWZ4/12, RWZ4/13, RWZ4/14, RWZ4/15, RWZ4/16, RWZ4/17, RWZ4/18, RWZ4/19, WSP-B3, WSPB4, WSPR-E1, WSPX10, WSPX12, WSPX13, WSPX14, WSPX16, WSPX19, WSPX20, WSPX21, WSPX54
5	15	WSPR-R5, WSPR-C1, WSPR-C2, WSPR-B2, WSPR-B4, WSPR-B6, WSPR-B11, WSPR-B13, WSPR-B14, WSPR-B15, WSP-B1, WSPX23, WSPRX28, WSPRX46, WSPR-52A,
6	3	WSPR-R2, WSPX40, WSPX40B
7	1	WSPR-R8
8	1	WSPR-R7
Other	1	WSPR-R6

2.4 GROUTING EQUIPMENT

Plant & Equipment

- 1 x Grout mixer/pump and ancillary equipment;
- 1 x 5m Telehandler;
- 1 x IBC
- 120 x 25kg bags of 3:1 bentonite/cement powder
- 20 x 25kg bags of Portland cement;

2.5 GROUTING METHODOLOGY

1) Locate the well to decommission;
2) Measure the borehole depth;
3) Work out the volume of well;
4) Site the grout pump adjacent to the well;
5) Use Telehandler to tow the grout pump and to transport the cement/bentonite powder and IBC of clean water;
6) Mix the correct volume of grout using the following guidelines in Table 2 (information provided by Stuart Well Services Ltd.);

Table 2 – Mixing ratios for grout

Mass of Cement/Bentonite Powder (Number of bags in brackets)	Volume of Water in Mix (Litres)*	Final Volume of Grout (Litres)
25kgs (1)	100-120	110-130
50kgs (2)	200-240	220-260
75kgs (3)	300-360	330-390
100kgs (4)	400-480	440-520
125kgs (5)	500-600	550-650
250kgs (10)	1000-1100	1100-1200

* Water content is for guidance only and users must determine the best mix to suit their purposes. High shear mixing produces the best grouts which are smooth and creamy at the recommended mix volumes. Lower water content gives thicker slurry but stronger plugs.

7) Insert the grout hose into the well as far as it will go;
8) Begin to inject the grout at a steady rate ensuring that the mixture does not bridge in the well. Use an up/down motion on the hose to distribute the grout as evenly as possible;
9) Fill the well to the top. Check the installation 24 hours after injecting to check for settling.
10) Remove all covers and fill scar with cement and finish flush with the surrounding surface.

2.6 ZONE 4 GROUTING METHODOLOGY

Wells which were installed in chambers in Zone 4 are to be grouted using the following methodology;

1) Contact Roy Brunt (07817421448) of FIS and Tony Field of Acorn Developments (07739302661) and inform them of the works to be undertaken and where WSP will be working in advance;
2) Obtain a permit to work form FIS if the chambers are located in the FIS compound;
3) Barrier off the well to be grouted;
4) Remove chamber lid to gain access to the well;

5) Follow the grouting procedure outlined in section 2.5.

2.7 PPE REQUIREMENT

All personnel engaged in well grouting must comply with the following, minimum, PPE requirement;

- Disposable coveralls;
- Nitrile gloves;
- Hardhat;
- Safety boots;
- Safety glasses

3 Reinstatement Works Zone 4

3.1 OVERVIEW

The remediation wells in Zone 4 (RWZ4/1, RWZ4/2, RWZ4/3, RWZ4/4, RWZ4/5, RWZ4/6, RWZ4/7, RWZ4/8, RWZ4/9, RWZ4/10, RWZ4/11, RWZ4/12, RWZ4/13, RWZ4/14, RWZ4/15, RWZ4/16, RWZ4/17, RWZ4/18, RWZ4/19) were all installed in 900mmx500mm concrete chambers and fitted with chemical resistant sealed lids. Upon completing the grouting of the wells the chambers will be filled with concrete and the road resurfaced with Tarmac.

3.2 PLANT AND EQUIPMENT

- 8 tonne tracked excavator;
- 5m Telehandler;
- Concrete wagons;

3.3 CHAMBER FILLING PROGRAMME

It is intended that the majority of Zone 4 chambers will be filled directly from the concrete wagon. As such, due to the full load capacity of the wagon (6m³) several chambers can be filled from one load. The chambers in the road next to the FIS loading areas will be filled in 3 phases

- Phase 1 – Fill the following wells in sequence; RWZ4/1, RWZ4/2, RWZ4/3, RWZ4/4, RWZ4/5, RWZ4/6, RWZ4/11, RWZ4/13, RWZ4/14 and RWZ4/15. These wells are installed along the length of road which forms the southern boundary of FIS leased area. All of these wells can be accessed directly by a concrete wagon from the road side. There are also four chambers which serve as junction points for the former remediation infrastructure which will also be filled during Phase 1. It is estimated that to Phase 1 will be completed in two stages due to the capacity of the concrete delivery wagons (see methodology section 3.3);
- Phase 2 – Fill the following wells in sequence; RWZ4/16, RWZ4/17, RWZ4/16, RWZ4/19 and RWZ4/12. These wells are installed to the east of the FIS compound. Direct access to these wells is limited and, for some of the wells, the concrete will have to be dropped at a different location and manually transported to the chambers. The concrete will be poured on a Visqueen sheet in a suitable location (see methodology section 3.3);
- Phase 3 – Fill the following wellsRWZ4/10, RWZ4/9, RWZ4/8, and RWZ4/7. Direct access to all of these wells is not available therefore all of these chambers will be filled manually (see methodology section 3.3).

3.4 METHODOLOGY

1) Contact Roy Brunt (07817421448) of FIS and Tony Field of Acorn Developments (07739302661) and inform them of the works to be undertaken and where WSP will be working in advance;
2) Obtain a permit to work form FIS if the chambers are located in the FIS compound;
3) Select the chambers to be filled and erect traffic barriers around each one and erect signage to inform site vehicles of the works being undertaken;
4) Remove the lid of the first chamber to be filled;
5) Direct concrete wagon to park along side the chamber close enough for the chute to reach over;
6) Fill the chamber and ensure that all voids are filled using a power tamper;
7) Once filled re-place the lid to allow the concrete to cure.

For wells where direct access is not available the following methodology should be enacted

1) Repeat stages 1 and 2 of the previous list;
2) Barrier off the chambers which require filling;
3) Clear a safe walkway from the chamber to the area where the concrete will be stockpiled and inform other site personnel working in the same area of the works to be undertaken;
4) The concrete will be delivered to site and poured in a stockpile in a suitable area on site;

5) Concrete will be taken from the stockpile and barrowed to the chambers where access is limited;

6) Once filled the chamber lids will be re-placed to allow the concrete to cure.

3.5 TARMAC REINSTATEMENT

Once the concrete has been allowed to cure the chamber lids can be removed and the scar reinstated with cold lay Roadmaster SMA Tarmac. The Tarmac reinstatement will be completed using the following methodology.

1) Follow stage 1 to 3 of the methodology outlined in section 3.3;

2) Remove the lid of the first chamber and ensure that the concrete has cured sufficiently;

3) Use a pneumatic breaker to break out the chamber lid and retain lid for re-use. Break out a clean, square section to allow for a neat reinstatement;

4) Sweep the area clean of debris;

5) Prepare the scar with a bitumen based preparatory spray;

6) Fill the scar with cold lay Tarmac. The volume required for each scar will be determined on site;

7) Use 1200mm ride on roller to compact the Tarmac in place to the desired finish.

Chambers which are in the FIS compound will be concreted to surface apart from car park areas.

3.6 HEALTH & SAFETY CONSIDERATIONS

Zone 4 is in a heavily tracked area of the site and several wells are located in loading areas for bulk tankers. The proximity to the tankers and the hazardous materials they transport is discussed in Risk Assessment 1 in Appendix B.

3.7 PPE REQUIREMENT

All personnel engaged in well grouting must comply with the following, minimum, PPE requirement;

- Disposable coveralls;
- Nitrile gloves;
- Hardhat;
- Safety boots;
- Safety glasses;

4 Reinstatement Works Zone 2

4.1 OVERVIEW

Once the Zone 2 wells have been grouted the area used for the Zone 2 air sparge system is to be capped with a 150mm concrete slab.

4.2 PLANT & EQUIPMENT

- 8 tonne excavator;
- 6 tonne dumper;
- 1200mm ride on roller;
- Power screed;
- Power float;
- Hand tools.

4.3 METHODOLOGY

1) Remove Nicotarp liner and dispose of in 8 yard skip;
2) Level the area to be concreted with 8 tonne excavator. Excess material is to be stockpiled and tested for classification before relocation to Zone 5;
3) The remaining material is to be rolled and compacted to provide an adequate sub base for the concrete slab;
4) The curbs are to be retained and will be used as shuttering for the slab. A section of curbs will be removed on the southern edge of the pad to provide an access ramp for cars;
5) Install shuttering across the centre of the prepared area;
6) Pour concrete into first shuttered section (northern half to be completed first);
7) Use power screed to tamp concrete and ensure an even pour filling all voids;
8) Finish the surface with power float until desired finish is achieved;
9) Once the concrete has cured remove the shuttering and install spacing boards to allow for a central expansion join;
10) Pour southern section of pad following the same methodology as northern section.

Appendix D Laboratory Data

ALcontrol Laboratories

WSP Remediation Ltd
Fairway House
Paramount Business Park
St Mellons
Cardiff
Wales
CF3 0LW

Certificate of Analysis

Job Number 10-18673

Report Date	26 November 2010
Project Number	12199398 084
Customer	WSP REM
Site Address	Former Kodak Chemicals, Acornfield Road, L33 7CF
Date of Sampling	03/11/2010
Date of Analysis	04 November 2010 - 26 November 2010
Order Ref	13010908-001

Dear John

Please find attached your results for the above project.
This report includes the samples we received at ALcontrol Laboratories on 04 November 2010.

Results authorised by

Andrew Clissold
Sample Preparation Manager

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

UKAS TESTING
0206

Chemical Analysis is undertaken in accordance with in-house technical procedures and is subject to quality control procedures. Results are expressed on a dry weight basis (dried at below 30˚C) for all soil analyses. Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.

Solid Samples

Job No. 10-18673
Site: Former Kodak Chemicals, Acornfield Road, L33 7CF
Report Date: 26/11/2010

			Lab No.	205429
			Sample Date	03/11/2010
			Sample Id	Z2-Stockpile
			Other ID	
			Depth (m)	0
Determination	**LOD**	**Units**	**Method**	
Solid Description			101	Clay with Stones
Moisture	0.1	%	101	9.6
Naphthalene	0.1	mg/kg	408 M*	< 0.1
Acenaphthylene	0.1	mg/kg	408*	< 0.1
Acenaphthene	0.1	mg/kg	408 M*	< 0.1
Fluorene	0.1	mg/kg	408 M*	< 0.1
Phenanthrene	0.1	mg/kg	408 M*	0.2
Anthracene	0.1	mg/kg	408 M*	< 0.1
Fluoranthene	0.1	mg/kg	408 M*	0.3
Pyrene	0.1	mg/kg	408 M*	0.3
Benzo(a)anthracene	0.1	mg/kg	408 M*	0.1
Chrysene	0.1	mg/kg	408 M*	0.2
Benzo(k)fluoranthene	0.1	mg/kg	408 M*	< 0.1
Benzo(b)fluoranthene	0.1	mg/kg	408 M*	0.1
Benzo(a)pyrene	0.1	mg/kg	408 M*	0.1
Indeno(1,2,3-c,d)pyrene	0.1	mg/kg	408 M*	< 0.1
Dibenzo(a,h)anthracene	0.1	mg/kg	408 M*	< 0.1
Benzo(g,h,i)perylene	0.1	mg/kg	408 M*	< 0.1
PAH Total (EPA 16)	1	mg/kg	408*	1.3
PCB Congener 28	1	µg/kg	217	< 1.0
PCB Congener 52	1	µg/kg	217	< 1.0
PCB Congener 101	1	µg/kg	217	< 1.0
PCB Congener 118	1	µg/kg	217	< 1.0
PCB Congener 138	1	µg/kg	217	< 1.0
PCB Congener 153	1	µg/kg	217	< 1.0
PCB Congener 180	1	µg/kg	217	< 1.0

Solid Samples

Job No. 10-18673
Site: Former Kodak Chemicals, Acornfield Road, L33 7CF
Report Date: 26/11/2010

			Lab No.	205429
			Sample Date	03/11/2010
			Sample Id	Z2-Stockpile
			Other ID	
			Depth (m)	0
Determination	**LOD**	**Units**	**Method**	
Total PCB Congeners (EPA 7)	7	µg/kg	217	< 7.0
Benzene	0.01	mg/kg	401	< 0.01
Ethylbenzene	0.01	mg/kg	401	< 0.01
o-Xylene	0.01	mg/kg	401	< 0.01
MTBE	0.01	mg/kg	401	< 0.01
m+p-Xylene	0.01	mg/kg	401	< 0.01
TAME	0.01	mg/kg	401	< 0.01
Toluene	0.01	mg/kg	401	< 0.01
PRO (>C5-C6)	10	mg/kg	401	< 10.0
PRO (>C6-C8)	10	mg/kg	401	< 10.0
PRO (>C8-C10)	10	mg/kg	401	< 10.0
PRO (>C5-C10)	30	mg/kg	401	< 30
PRO (>C6-C10)	20	mg/kg	401	< 20
Aliphatic (>C5-C6)	0.2	mg/kg	401	< 0.2
Aliphatic (>C6-C8)	0.2	mg/kg	401	< 0.2
Aliphatic (>C8-C10)	0.2	mg/kg	401	< 0.2
Aliphatic (>C10-C12)	2	mg/kg	419	< 2.0
Aliphatic (>C12-C16)	2	mg/kg	419	16
Aliphatic (>C16-C21)	5	mg/kg	419	24
Aliphatic (>C21-C35)	5	mg/kg	419	63
Aliphatic (>C35-C40)	2	mg/kg	419	8.6
Aliphatic (>C40-C44)	2	mg/kg	419	3.5
Total Aliphatics (>C6-C44)	20	mg/kg	419	120
Aromatic (>C6-C7)	0.01	mg/kg	401	< 0.01
Aromatic (>C7-C8)	0.01	mg/kg	401	< 0.01
Aromatic (>C8-C10)	0.01	mg/kg	401	< 0.01

Solid Samples

Job No. 10-18673
Site: Former Kodak Chemicals, Acornfield Road, L33 7CF
Report Date: 26/11/2010

			Lab No.	205429
			Sample Date	03/11/2010
			Sample Id	Z2-Stockpile
			Other ID	
			Depth (m)	0
Determination	**LOD**	**Units**	**Method**	
Aromatic (>C10-C12)	2	mg/kg	419	< 2.0
Aromatic (>C12-C16)	2	mg/kg	419	5.9
Aromatic (>C16-C21)	5	mg/kg	419	36
Aromatic (>C21-C35)	5	mg/kg	419	75
Aromatic (>C35-C40)	2	mg/kg	419	25
Aromatic (>C40-C44)	2	mg/kg	419	12
Total Aromatics (>C6-C44)	20	mg/kg	419	150
Total TPH (>C6-C44)	40	mg/kg	419	270
Dichlorodifluoromethane	0.01	mg/kg	421 M*	< 0.01
Chloromethane	0.01	mg/kg	421 M*	< 0.01
Chloroethane	0.01	mg/kg	421 M*	< 0.01
Bromomethane	0.01	mg/kg	421 M*	< 0.01
Trichlorofluoromethane	0.01	mg/kg	421	< 0.01
1,1-Dichloroethene	0.01	mg/kg	421 M*	< 0.01
MTBE	0.01	mg/kg	421 M*	< 0.01
Trans-1,2-Dichloroethene	0.01	mg/kg	421 M*	< 0.01
1,1-Dichloroethane	0.01	mg/kg	421 M*	< 0.01
Cis-1,2-Dichloroethene	0.01	mg/kg	421 M*	< 0.01
2,2-Dichloropropane	0.01	mg/kg	421 M*	< 0.01
Chloroform	0.01	mg/kg	421 M*	< 0.01
Bromochloromethane	0.01	mg/kg	421 M*	< 0.01
1,1,1-Trichloroethane	0.01	mg/kg	421 M*	< 0.01
1,1-Dichloropropene	0.01	mg/kg	421 M*	< 0.01
1,2-Dichloroethane	0.01	mg/kg	421 M*	< 0.01
Benzene	0.01	mg/kg	421 M*	< 0.01
1,2-Dichloropropane	0.01	mg/kg	421 M*	< 0.01

Solid Samples

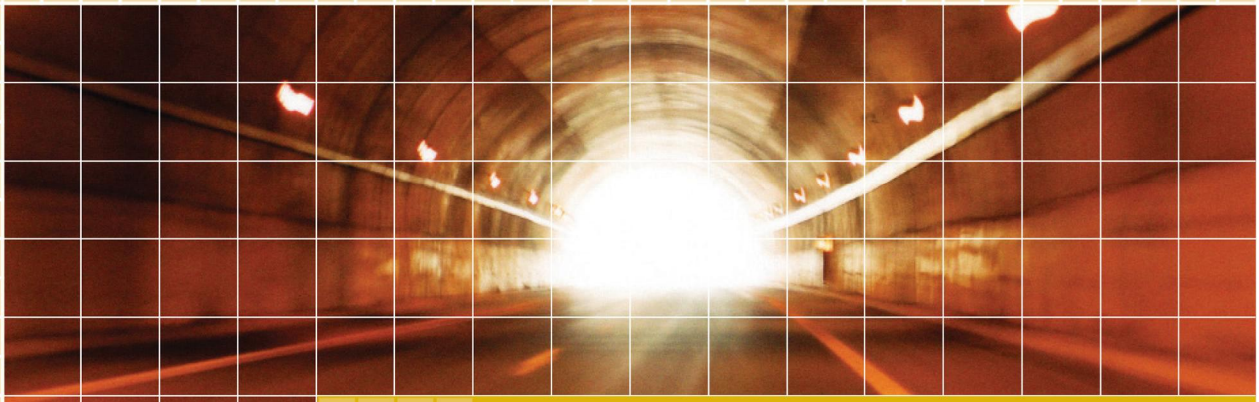
Job No. 10-18673
Site: Former Kodak Chemicals, Acornfield Road, L33 7CF
Report Date: 26/11/2010

			Lab No.	205429
			Sample Date	03/11/2010
			Sample Id	Z2-Stockpile
			Other ID	
			Depth (m)	0
Determination	**LOD**	**Units**	**Method**	
Trichloroethene	0.01	mg/kg	421 M*	< 0.01
Bromodichloromethane	0.01	mg/kg	421 M*	< 0.01
Dibromomethane	0.01	mg/kg	421 M*	< 0.01
TAME	0.01	mg/kg	421 M*	< 0.01
Cis-1,3-Dichloropropene	0.01	mg/kg	421 M*	< 0.01
Toluene	0.01	mg/kg	421 M*	< 0.01
Trans-1,3-Dichloropropene	0.01	mg/kg	421 M*	< 0.01
1,1,2-Trichloroethane	0.01	mg/kg	421 M*	< 0.01
Carbon Tetrachloride	0.01	mg/kg	421 M*	< 0.01
Vinyl Chloride	0.01	mg/kg	421 M*	< 0.01
1,3-Dichloropropane	0.01	mg/kg	421 M*	< 0.01
Tetrachloroethene	0.01	mg/kg	421 M*	< 0.01
Dibromochloromethane	0.01	mg/kg	421 M*	< 0.01
1,2-Dibromoethane	0.01	mg/kg	421 M*	< 0.01
Chlorobenzene	0.01	mg/kg	421 M*	< 0.01
1,1,1,2-Tetrachloroethane	0.01	mg/kg	421	< 0.01
Ethylbenzene	0.01	mg/kg	421 M*	< 0.01
m,p-Xylene	0.01	mg/kg	421 M*	< 0.01
o-Xylene	0.01	mg/kg	421 M*	< 0.01
Styrene	0.01	mg/kg	421 M*	< 0.01
Bromoform	0.01	mg/kg	421 M*	< 0.01
Isopropylbenzene	0.01	mg/kg	421 M*	< 0.01
1,1,2,2-Tetrachloroethane	0.01	mg/kg	421 M*	< 0.01
1,2,3-Trichloropropane	0.01	mg/kg	421 M*	< 0.01
n-Propylbenzene	0.01	mg/kg	421 M*	< 0.01
Bromobenzene	0.01	mg/kg	421 M*	< 0.01

Solid Samples

Job No. 10-18673
Site: Former Kodak Chemicals, Acornfield Road, L33 7CF
Report Date: 26/11/2010

			Lab No.	205429
			Sample Date	03/11/2010
			Sample Id	Z2-Stockpile
			Other ID	
			Depth (m)	0
Determination	**LOD**	**Units**	**Method**	
2-Chlorotoluene	0.01	mg/kg	421 M*	< 0.01
1,3,5-Trimethylbenzene	0.01	mg/kg	421*	< 0.01
4-Chlorotoluene	0.01	mg/kg	421 M*	< 0.01
Tert-Butylbenzene	0.01	mg/kg	421*	< 0.01
1,2,4-Trimethylbenzene	0.01	mg/kg	421 M*	< 0.01
sec-Butylbenzene	0.01	mg/kg	421*	< 0.01
p-Isopropyltoluene	0.01	mg/kg	421*	< 0.01
1,3-Dichlorobenzene	0.01	mg/kg	421*	< 0.01
1,4-Dichlorobenzene	0.01	mg/kg	421 M*	< 0.01
n-Butylbenzene	0.01	mg/kg	421*	< 0.01
1,2-Dichlorobenzene	0.01	mg/kg	421 M*	< 0.01
1,2-Dibromo-3-Chloropropane	0.01	mg/kg	421 M*	< 0.01
1,2,4-Trichlorobenzene	0.01	mg/kg	421	< 0.01
Hexachlorobutadiene	0.01	mg/kg	421	< 0.01
Naphthalene	0.01	mg/kg	421	< 0.01
1,2,3-Trichlorobenzene	0.01	mg/kg	421	< 0.01
Dichloromethane	0.04	mg/kg	421	< 0.04



Environmental Management Plan
Image Business Park, Knowsley

Acorn Properties (Kirkby) Ltd

December 2010

QM

Issue/revision	Issue 1	Revision 1	Revision 2
Remarks	Draft	MRM Audit included	2010 Update
Date	April 2009	September 2009	December 2010
Prepared by	R Lawless	R Lawless	R Lawless
Signature			
Checked by	I Meyer	I Meyer	A Moore
Signature			
Authorised by	R Clayton	R Clayton	A Moore
Signature			
Project number	12121392/007	12121392/007	12121392/007
File reference	8948(1)	8948(1)	8948(2)

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Contents

1	Introduction	1
2	Image Business Park	2
3	Conceptual Site Model	5
4	Environmental Risk Management	7
5	Summary & Recommendations	9
Appendix A	Eastman Chemicals Audit	10
Appendix B	Ames Goldsmith Audit	11
Appendix C	Future Industrial Services Audit	12
Appendix D	Minerals Resource Management Audit	13
Appendix E	Corrective Action Plan	14

1 Introduction

1.1 BACKGROUND TO THE REPORT

This report relates to Image Business Park, located off Acornfield Road within the Knowsley Industrial Park, Kirkby, Merseyside. Acorn Properties (Kirkby) Limited (Acorn) purchased the buildings and equipment and secured a long-term leasehold interest to the property from Kodak Chemicals UK Limited (Kodak) in 2007.

Following the purchase, Acorn has commenced a programme of refurbishment, plant sales, letting of buildings, and there exists the possibility of limited redevelopment. It is understood that the principal site infrastructure such as roads, services and the majority of buildings will remain.

WSP Ltd (WSP) has been retained by Acorn to undertake voluntary remediation works that were identified during the due diligence process in order to manage / mitigate environmental liabilities relating to soil and groundwater contamination.

1.2 REPORT OBJECTIVES

The purpose of this report is to provide an overview of current site uses, a summary of the environmental setting of the study area and an assessment of potential risks to identified environmental receptors.

The objectives of this report are as follows:

- To summarise the current uses of the subject property and identify potential sources of contamination.
- To identify environmental receptors within the vicinity of the study area and summarise the site conceptual model.
- To identify potential environmental risks and provide recommendations to manage the risks where appropriate.
- To provide a framework for assessing the likely environmental risks relating to new tenants on the site.

1.3 AMMENDMENTS TO THIS PLAN

This is a live document that may require amendment during the course of the works. Amendments are recorded through revisions to the document or through corrective actions recorded as Appendix E.

2 Image Business Park

2.1 SITE DESCRIPTION

The Site occupies approximately 15.0Ha on the eastern edge of Knowsley Industrial Park. Until 2007, the site was occupied by Kodak and utilised as a photochemicals production facility. Production ceased at the end of 2006 and the majority of the facility has been decommissioned. Three companies currently reside and utilise a small proportion of the property. Ames Goldsmith Ltd operates a silver nitrate production facility in the southwest, Future Industrial Services (FIS) undertakes effluent treatment and disposal in three separate areas of the site and Eastman Chemicals Ltd occupies a building in the northwest for research purposes. Minerals Resource Management Ltd (MRM) is in the process of occupying the southern part of Building 82 for the purpose of producing plasterboard from recycled gypsum.

The current layout comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways and areas of landscaping. All roadways and loading areas are surfaced with concrete hardstanding. The north-eastern corner of the site was until recently utilised as a sports pitch (grassed).

The Site is bounded to the west by Acornfield Road, beyond which are a number of industrial premises. An industrial site also bounds the north. Perimeter Road forms the eastern boundary, beyond which lies agricultural land. This includes a former municipal landfill (now restored and used for grazing) to the southeast. The southern boundary is adjacent to woodland.

2.2 HISTORICAL OPERATIONS

2.2.1 Kirkby Munitions Factory

Until WWII the study area was situated within a rural, agricultural setting. In late 1939 construction of the Kirkby Munitions Factory commenced, with completion in early 1941 (although manufacturing started in 1940). Portions of the site were used as a filling factory, whereby explosives were loaded into various types of ammunition cases. The Munitions Factory covered 743 acres, with the majority located off-site, to the west of Acornfield Road and only covered a small part of the Kodak site (mainly the south-western corner). Within the subject site a number of small buildings were constructed within the south-western corner, together with a rectangular feature close to the north-eastern boundary, which was used as a fresh water reservoir. The buildings on site were reportedly used as explosive test bays. The presence of earth bunds around some of the buildings suggests that explosives may have been stored on site.

2.2.2 Kodak

The munitions factory was closed in 1946 and Kodak purchased a long-term lease on the property in 1949. It appears that initially operations were small-scale with 9 employees occupying the former Ministry of Defence buildings, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's additional facility in Harrow, London. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

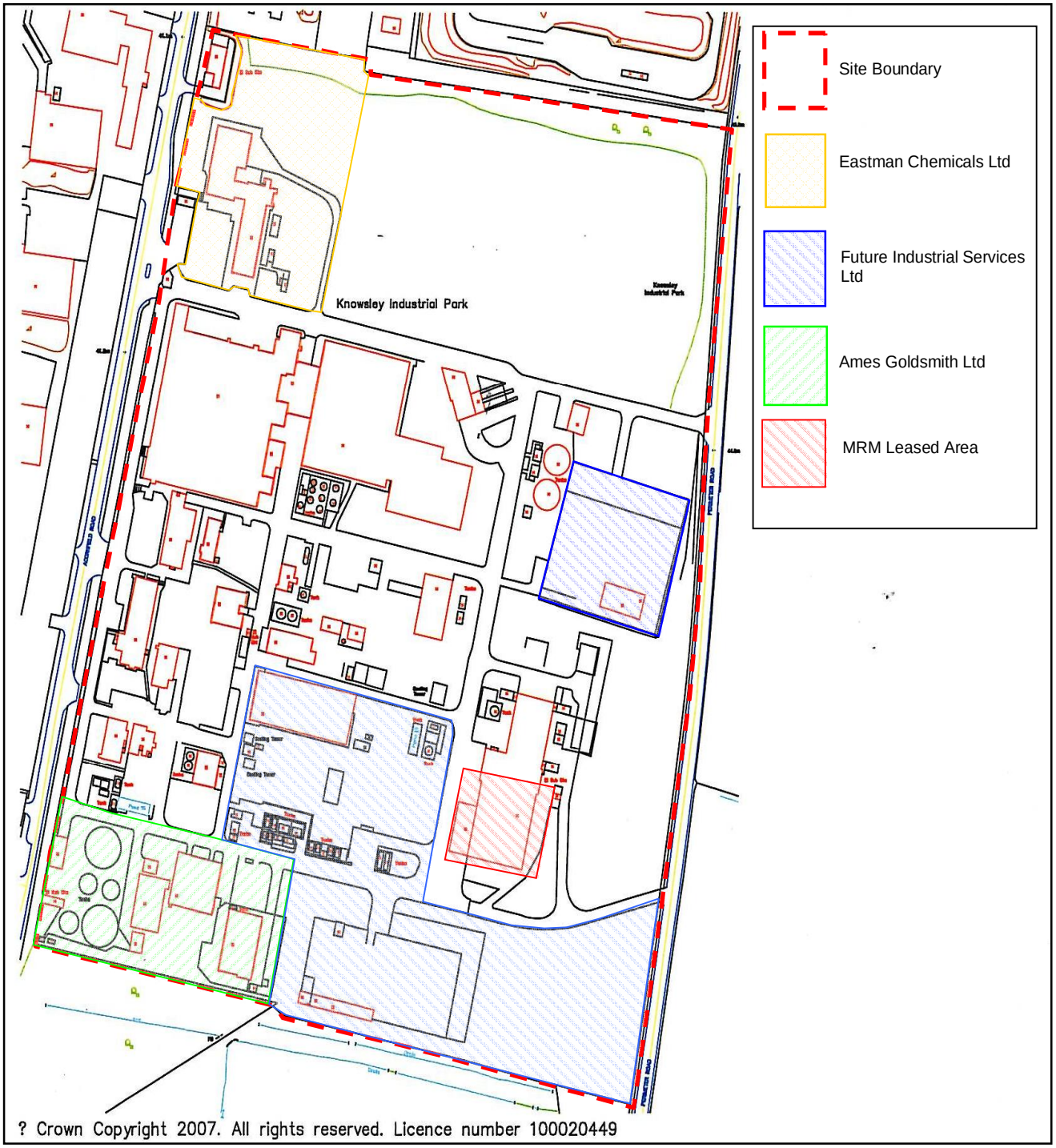
Between 1969 and 1974 production on site diversified to produce chemicals not specifically for the photochemicals industry, including production of hydroquinone, tecmangam (manganese ammonium sulphate) and benzoquinone.

The synthetic chemicals manufacturing buildings were demolished and replaced (in a different location on site) in the late 1970s. The Powders & Solutions Department was closed in 2001 and photochemical production ceased at the end of 2006.

Anecdotal information suggests that landfilling activities occurred during the 1950s / 1960s in two parts of the site; the north-eastern corner (currently a grassed area used until recently as a sports pitch) and the south-eastern corner (currently an area of soft landscaping and a drum storage compound).

2.3 CURRENT & ANTICIPATED OPERATIONS

Acorn is in the process of transforming the site into a multi-occupancy business park. This will be achieved by limited demolition of dilapidated / unsuitable structures, refurbishment for letting and development of parts of the property that are currently undeveloped. The extent of current leases and tenants is outlined on the site plan below:



The operations of the current tenants are summarised as follows:

2.3.1 Eastman Chemicals Ltd (Eastman)

Eastman has been located in this part of the site since the building's construction in the 1960s. The Eastman property comprises a large laboratory / office building. The ground floor contains small-scale plastics processing laboratories and offices.

The first floor contains analytical and research laboratories, formulation laboratories for paint coatings, stores and offices. The second floor contains paint formulation laboratories and spray booths. An exterior high pressure laboratory that is now disused, is located to the rear of the main building. In addition, a chemical store, a 'clean' solvent and a waste solvent building are located immediately to the east of the main building.

This tenant has been the subject of an environmental audit undertaken by WSPE in January 2008 and subsequently in October 2010. The findings of the most recent audit are presented in Appendix A.

2.3.2 Ames Goldsmith (Ames)

Ames took over the operation of silver nitrate production in early 2007 and it is understood that the location and nature of this process has not altered since Kodak managed the plant. The process reacts silver bullion with nitric acid to form silver nitrate.

This tenant has been the subject of an environmental audit undertaken by WSPE in January 2008 and subsequently December 2010. The findings of the most recent audit are presented in Appendix B.

2.3.3 Future Industrial Services Ltd (FIS)

FIS commenced operations on site during 2008, beginning with the treatment, disposal and transfer of a range of industrial effluents and waste liquids. The operations are still expanding and in the near future are anticipated to include solvent recycling and the recycling of pulverised fuel ash (PFA).

This tenant has been the subject of three environmental audits by WSPE, firstly in January 2008, then in May 2009 and finally in November 2010. The purpose of the November 2010 audit was to follow up on a number of recommendations and review a range of environmental improvements being implemented by FIS. The findings of the November 2010 audit are presented in Appendix C.

2.3.4 Minerals Resource Management Ltd (MRM)

MRM commenced operations on site during 2009, which relate to the recycling of waste plasterboard. MRM has occupied the southern part of Building 82 located within Zone 3. MRM has been audited by WSPE initially in August 2009 and subsequently in October 2010.

The most recent WSPE audit is presented in Appendix D.

3 Conceptual Site Model

3.1 GEOLOGY

Published geological mapping indicates the study area to be underlain by Shirdley Hill Sand, and then subsequently by Glacial Till and Sherwood Sandstone.

Site investigations have recorded Made Ground across the whole site generally between 1 and 2m thick, although a maximum of 7m was recorded in the south-eastern corner (in an area of historical landfilling).

Shirdley Hill Sand is present as a thin horizon (generally less than 1m thick) across the majority of the site although is absent from some areas including beneath parts of the former playing fields and the original Synthetic Chemicals (Synchem) Area. It has also been removed to facilitate construction of the reservoir in the north-eastern corner.

Glacial Till was found to be present beneath the entire study area (with a single exception) and is observed to thin from the northwest to the southeast. The Glacial Till is generally described as a sandy, occasionally gravelly clay. Discrete sandy horizons have also been recorded within the Till, although these are laterally discontinuous.

The depth to the top of the Sherwood Sandstone varies from in excess of 14m in the northwest to less than 2m in the extreme south of the site and closely corresponds with the Glacial Till thickness.

3.2 HYDROGEOLOGY

Two distinct groundwater bodies are present beneath the site; a perched groundwater within the Made Ground / Shirdley Hill Sand, resting on the Glacial Till and the main groundwater body within the underlying Sherwood Sandstone.

The perched groundwater is nearly continuous across the study area, and is only locally absent beneath some of the larger existent structures; monitoring indicates a flow direction to the west / southwest. Data for the Sherwood Sandstone indicates a flow direction to the northwest.

The hydraulic gradient of the perched groundwater is steeper than the Sherwood Sandstone. Given the groundwater flow directions, the two bodies appear to be operating independently. However, it has been surmised that limited downward migration through the Glacial Till may be possible locally, which may be due to its relatively high sand / gravel content. Furthermore, there are several locations where recharge to the Sherwood Sandstone may be occurring from the shallower body, namely:

- The fire water pit, which is at least 4.7m deep, with adjacent Glacial Till thickness 4.9m.
- The southern part of the site (adjacent to the drum compound) where the borehole log does not clearly identify Glacial Till.
- The former effluent treatment plant in the southwest of the site, where recent works suggest a possible linkage between the perched groundwater and the underlying aquifer are the chemical drainage sumps/chambers which extend to depths ranging from 2 to 3.7m below ground.
- Former foundations of the original Synchem buildings, which appear to have been piled, possibly into the top of the Sherwood Sandstone.

It is possible that two underground storage tanks (USTs - the only two recorded on site) and the “graded” pit all located in the centre of the site were installed close to the top of the Sherwood Sandstone at circa 3.1m in this area. The construction details of the USTs and pit are unknown, although they could extend to approximately 3m depth, thus providing a pathway through the Glacial Till to allow recharge.

Possible evidence of this interaction is demonstrated by monitoring data with the perched groundwater apparently migrating towards the fire water pit and effluent treatment plant.

3.3 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 10m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area.

Work undertaken by CRA concluded that the water level within the nearby drainage ditch is higher than perched groundwater levels; consequently migration of groundwater to this receptor from site was considered unlikely.

3.4 POLLUTANT LINKAGE ASSESSMENT

During assessment of the site, the following pathways have been considered:

- Mobilisation of contaminants in soils on-site to shallow perched groundwater in the Shirdley Hill Sand.
- Migration of impacted perched groundwater across and off-site beneath 3rd party property to the west.
- Migration of perched groundwater to the drainage ditch to the south of site.
- Migration of perched groundwater via drainage systems both on-site and off-site into 3rd party drainage network, or to groundwater via leaks.
- Interconnection between perched groundwater and the deeper major aquifer, particularly in the south-western part of the study area where the Glacial Till may have been 'punctured' by foundations / tanks.
- Dermal contact, ingestion and inhalation of contaminants.
- Migration and inhalation of volatile vapours.
- Direct contact with buildings and building services.

3.5 SUMMARY OF CONCEPTUAL SITE MODEL

Notwithstanding pathways associated with human receptors (which will be governed by the activities and health & safety measures of individual tenants), the principal environmental receptor is considered to be the Sherwood Sandstone. Potential pathways to the Sherwood Sandstone have been identified in the south-western corner of the site. The Environment Agency undertakes a great deal of monitoring and regulatory activities to protect this water resource and this receptor poses the highest risk of regulatory intervention. All industrial activities on the site should be managed in such a way as to minimise the risk of contaminants entering groundwater.

The majority of potential contamination sources on site are the responsibility of individual tenants, primarily the storage and use of hazardous chemicals, or in the case of FIS, the management and treatment of effluents. However, the wider site outside tenanted areas remains the responsibility of Acorn. Of particular relevance is the condition of the drainage network across the site. The condition of any drainage runs in current use should be confirmed by survey (if not done so already), and the drainage infrastructure proposed to be used by any new tenants should be assesses prior to use.

4 Environmental Risk Management

4.1 ENVIRONMENTAL RISK MANAGEMENT AND ASSESSMENT APPROACH

All project environmental issues (aspects and impacts) are evaluated for significance using the following criteria:

- Legal requirements (automatically SIGNIFICANT and must be controlled) *e.g. waste disposal or oil storage*
- Landlords /Tenants requirements *e.g. Site waste management plan.*
- Public perception / disruption *e.g. noise to local residents*.
- Sensitive receptors *e.g. pollution to controlled waters*.

Where controls are not required for legal (or other) reasons, significance of environmental issues will be determined using a risk based approach:

- Significance (or 'risk rating') = Likelihood of impact x Severity of Outcome

Note: Severity of outcome will consider the potential environmental harm (e.g. oil pollution), in addition to the various receptors which may be affected e.g. on site ground pollution and off site water pollution. Any significant / residual risks will be recorded in the HSE Plan and managed through suitable control measures.

4.2 ENVIRONMENTAL PERMIT & OTHER AUTHORISATIONS

A number of tenants on site carry out their day to day operations under the authorisation of an Environmental Permit. The Environmental Permits includes a number of obligations for control of site activities including a variety of environmental, such as:

- Suitability of process equipment and control
- Dust, odour and other nuisance impacts
- Control of spillages and leaks
- Control of waste
- Ensuring competence of staff
- Record keeping and validation

4.3 RESPONSE TO INCIDENTS

In the event of a significant accident, incident, including environmental incident or near miss (i.e. injury, illness due to contaminant exposure, damage to underground services) occurring on site, the following additional procedures will be followed:

- If minor injury remove the casualty (if applicable) to a safe area and treat with first aid, or remove to local A&E Department
- If major injury or incident call the emergency services
- Turn off all operating machinery and evacuate the area
- Inform local site manager of problem and record incident in local accident book (if available)
- Notify the company management team by the quickest possible means, who will identify if there is a need to notify the landlord, the HSE or other parties (i.e. client, sub-contractor organisation).

In other circumstances incidents, accidents or near misses, will be reported in the first instance to site manager.

5 Summary & Recommendations

5.1 SUMMARY

Image Business Park comprises a number of tenanted and vacant buildings (undergoing refurbishment / marketing) with associated infrastructure and services. Currently there are four tenants on site undertaking a range of commercial and industrial operations.

The environmental sensitivity of the site is relatively high and primarily relates to the underlying Sherwood Sandstone major aquifer, which is particularly shallow and vulnerable in the south-western corner of the site.

5.2 RECOMMENDATIONS

In order to assess potential environmental risks associated with each individual tenant's activities, it is recommended that a detailed audit be conducted for each company. This would comprise a site inspection and interviews with relevant staff, review of environmental permitting / licensing information and review of published environmental datasets.

The output from each audit would include recommendations where considered necessary to minimise risk of contamination. As the audit is completed for the landlord and not the tenants directly, it would be up to Acorn to discuss the implementation of any recommendations with the tenants.

The process of auditing existing tenants has already commenced and the reports are appended to this document, as follows:

- Eastman Chemicals – Appendix A (audited October 2010).
- Ames Goldsmith – Appendix B (audited December 2010).
- FIS – Appendix C (audited November 2010).
- MRM – Appendix D (audited October 2010).

It is recommended that further tenant audits are undertaken upon commencement of any new lease, or when there are significant changes to existing tenants' operations.

The site's drainage network represents a potential source of contamination and it is understood this is the responsibility of Acorn. Where necessary, the condition of the drainage infrastructure should be surveyed and maintained to minimise the risk of losses to ground. In particular, relevant sections of drainage should be assessed prior to use by new tenants.

WSP Group PLC

Appendix A Eastman Chemicals Audit

UNITED BY OUR DIFFERENCE

WSP

Baseline Environmental Audit

Eastman Chemicals Ltd

Kirkby AT LLC

October 2010

QUALITY MANAGEMENT

Issue/revision	Issue 1
Remarks	Final
Date	October 10
Prepared by	A Skinner
Signature	
Checked by	R Lawless
Signature	
Authorised by	A Moore
Signature	
Project number	12121392/002
File reference	9358(1)

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CONTENTS

1	Introduction	3
2	Site Description	4
3	Site Setting	5
4	Assessment of Pre Existing Contamination	7
5	Operational Findings and Observations	8
6	Conclusions and Recommendations	10

Figure 1 Site Location Plans
Figure 2 Photographic Records

1 Introduction

1.1 BACKGROUND

WSP Environment & Energy (WSPE&E) was commissioned by Kirkby AT LLC to carry out a Baseline Environmental Audit of Eastman Chemicals Ltd (Eastman), Arconfield Road, Knowsley Industrial Estate, Kirkby, Liverpool, L33 7UF. The area leased by Eastman ("the site") forms part of the larger former Kodak facility, which has been acquired by International Process Plants (IPP) and divided into a business park and leased to industrial operators.

The purpose of the audit is to update the previous Baseline Environmental Report undertaken by WSPE&E in January 2008 (Ref: 12024512), to review current and proposed activities with regards to potential environmental impact.

This report will form part of the EMP for the entire former Kodak site which will be subject to annual review to assess its suitability, and updated based on remediation and demolition works undertaken and ongoing tenanted activities.

1.2 STRUCTURE OF ASSESSMENT

1.2.1 Site Visit

A site visit was undertaken by a WSPE&E representative on the 23 September 2010, which included a brief on current and future site activities and guided site walkover by Amanda Tinsley (HSE and Site Coordinator).

1.2.2 Documentation Reviewed

Information reviewed as part of this assessment includes:

- Drainage plan of the wider former Kodak site (CAD drawing);
- Drainage assessment of the wider former Kodak site;
- Ground Contamination Review and Remediation Action Plan of the Former Kodak Chemicals Ltd Site, Kirkby (12121392/001);
- Baseline Environmental Audit, Eastman Chemical Ltd (12024512/001)

2 Site Description

2.1 BACKGROUND

The subject site is located towards the north-western corner of the larger former Kodak chemical processing facility and was constructed in the 1960's. This site occupies an area of approximately 1.05 hectares (Ha) and is situated on the eastern side of Knowsley Industrial Park, approximately 2 kilometres (km) to the east of Kirkby and 12.5 km northeast of Liverpool City Centre.

2.2 SITE DESCRIPTION & USE

The subject site comprises an approximately rectangular shaped plot, upon which an irregular shaped building is situated. The building is of a brick construction and is arranged over ground and three upper floors plus roof top plant level, which houses the majority of the building services.

Eastman Chemicals Limited (Eastman) is a subsidiary of Kodak and has operated on-site since the 1960's.

Operations at the site include a small scale plastic processing laboratory, offices (ground floor); analytical and research laboratories for Eastman Products, formulation laboratories for paint coatings, stores and offices (first floor); paint formulation laboratories and spray booths (second floor).

Internal areas of the building comprise six laboratories, a plastics processing laboratory, a number of general offices and associated staff welfare areas. The site is supplied with mains electricity, gas and water.

The laboratories present within the building support a number of air extraction fume cupboards and refrigeration equipment. External areas of the site comprise peripheral landscaping (approximately 60% of the total area) situated predominantly along the western and northern sections of the site. No signs of vegetative distress were observed.

Three outbuildings are located externally adjacent to the eastern building elevation and comprise a 'clean' solvent store, paint store and a waste storage area, comprising a small concreted area with a shelter and drip tray for waste solvent.

3 Site Setting

3.1 INTRODUCTION

Information on the site setting has been obtained from WSPE&E records, primarily the 2007 WSPE&E Ground Contamination Review and Remediation Action Plan report, and on-site observations.

3.2 SITE SETTING

3.2.1 General

The subject site is located on the eastern boundary of the Kirkby Industrial Park.

The surrounding site area to the north comprises a strip of vacant land, beyond which other commercial/industrial premises forming part of Knowsley Industrial Estate are present. The site is bordered immediately to the east by an area of undeveloped land, beyond which Perimeter Road is located and then further by open land, reportedly known as Kirkby Moss. Immediately to the south of the site the former main Kodak facility buildings are present. The site is bound to the west by Acornfield Road, with further industrial units located beyond.

3.2.2 Sensitive Land Uses

No formally designated ecological receptors (such as Sites of Special Scientific Interest or Sites of Biological Interest) or residential properties have been identified within 500m of the site.

3.3 GEOLOGY

British Geological Survey (BGS) geological map, Sheet 84, Wigan, Solid & Drift Edition, 1:50,000 scale indicates the following geological progression:

- Shirdley Hill Sand – Secondary A Aquifer
- Glacial Deposits – Unclassified Perceived low permeability deposits
- Sherwood Sandstone – Principal Aquifer

Following the completion of ground investigation works undertaken by WSPE the ground conditions beneath the site comprise Made Ground of generally between 1.0 – 3.0m depth (maximum 7.0m in an area of historical landfilling), underlain by the Shirdley Hill Sand (a thin laterally discontinuous sand horizon up to 1m thick), and in turn by Glacial Deposits (a restricted-permeability clay horizon) and the Sherwood Sandstone at depths of between 2.5m and 14m. The Sherwood Sandstone is classified as a Principal Aquifer by the Environment Agency and is considered to be the principal environmental receptor when considering whether remediation is required.

Two separate groundwater bodies have been identified, a perched water table (above the Glacial Deposits) within the Made Ground & Shirdley Hill Sand and the deeper water within the Sherwood Sandstone.

3.4 HYDROGEOLOGY

The Environment Agency (EA) Groundwater Vulnerability Map, which make up part of the published Policy and Practice for the Protection of Groundwater, divide the underlying strata in England and Wales into Principal, Secondary A and B and Non Aquifers dependent upon their potential for potable water supply. Refer to Appendix F for EA aquifer classification system.

Groundwater from the Sherwood Sandstone is abstracted in the region for commercial and drinking water purposes. Kodak held (and currently Ames Goldsmith now holds) a license for groundwater abstraction for industrial use (cooling purposes). The borehole is located at a distance of 260m from the subject site and is understood to be 106m deep and drilled in 1986 to supply the silver nitrate plant close to the southern boundary. The license is for 90, 920m 3 per year.

Data from the Environment Agency indicates that the closest abstraction for drinking water is the Knowsley Pumping Station approximately 1.5km to the south. This well is not down gradient of the site, and is currently not operational.

A second drinking water abstraction (Randle's Bridge pumping station) is located approximately 3.5km southwest of the Site. This well is also not down gradient of the site. The Former Kodak facility is not currently located within a Source Protection Zone for a potable abstraction (as defined by the Environment Agency).

Given the highly sensitive nature of the groundwater beneath the study area, the Environment Agency manages a network of groundwater monitoring wells within the wider area. The closest well to the subject site is located approximately 50m to the south of the Kodak boundary within Charley Wood.

3.5 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 110m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area.

3.6 COAL MINING

The site is not located within an area affected by coal mining or brine extraction activities.

3.7 RADON

The site is located within an area where less than 1% of homes are above the Action Level for radon gas. Therefore, no radon protection measures are considered necessary.

4 Assessment of Pre Existing Contamination

4.1 POTENTIAL HISTORICAL CONTAMINATION SOURCES

The history of development on the site and in the surrounding area was investigated with reference to historical Ordnance Survey (OS) mapping and previous ground investigation reports.

4.1.1 Historical On-site Sources

A review of the available historical mapping information relating to the site indicates the subject site comprised undeveloped agricultural land from at least 1850, until the site is identified to fall within the boundary of the larger Kirkby Industrial Estate from circa 1958. The current site layout comprising an approximately 'L' shaped building and small outhouse are identified on-site from pre 1971, and fall within the boundary of the larger Kodak facility described below.

4.1.2 Historical Off-site Sources

The surrounding area has supported several potentially contaminated land uses including the former Kirkby Munitions factory (c.1941), with associated process buildings and reservoir, located from adjacent. The land immediately to the south of the site was later (c.1949) taken over by Kodak who began predominately manufacturing photochemicals, at the site, until the site ceased operation in 2006. The majority of the associated infrastructure however still remains at the site.

Several other potentially contaminated uses have also been identified within close proximity to the site, including landfilling activities, and the development of various industrial processes associated with the development of Kirkby Industrial estate to the west.

4.2 CURRENT CONTAMINATION STATUS

Information obtained from a combined Phase I/Phase II report produced by Conestoga-Rovers & Associates (Europe) Limited, and dated 4th January 2007, undertaken only on the subject site indicates the following:

- The report was undertaken to assess the shallow soil and groundwater conditions around the subject site and identify the lateral and vertical extent of any contamination. Sampling was reportedly targeted around potential areas of contamination specifically around the high pressure laboratory and the solvent store.
- The investigation comprised the completion of three rotary boreholes (maximum depth of 5.0m below ground level (bgl)), and fifteen window sample boreholes (maximum depth of 3.0m bgl).
- The ground conditions observed across the investigation area are reported to have consisted of either topsoil or hardstanding at the surface. The topsoil was observed to be 0.08m to 0.3m, below which Made Ground deposits were observed at all borehole locations and was generally described as dense or medium dense, dark brown, rounded, medium grained, gravely sand. The gravels were fine to coarse and consisted of sandstone, brick, flint and concrete fragments. Underlying the Made Ground at all locations were natural deposits of clay or silt described as stiff, light brown and sandy.
- No visual or olfactory evidence of contamination was reported in the logs.
- Thirty six soil samples and four groundwater samples were reportedly submitted for analysis of metals, total petroleum hydrocarbon (TPH), Benzene, Toluene, ethylbenzene, xylene (BTEX), volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs) and other inorganics.
- Exceedances of selected soil criteria were reportedly recorded for lead. Shallow samples collected from BHE-16 (0.8-1.0m) and BHE-17 (0.8 – 1.1m) located along the eastern building elevation recorded lead concentrations of 2,279mg/kg and 2,156mg/kg respectively. Both of these are exceedances of the CLEA (Contaminated Land Exposure Model) Soil Guideline Value (SGV) for lead (750mg/kg) for a commercial/industrial end use. No other exceedances were recorded for soils.

No exceedances of selected groundwater assessment criteria were reportedly recorded.

5 Operational Findings and Observations

5.1 ENVIRONMENTAL PERMITS

No environmental permits are currently required for the operations conducted on the subject site.

5.2 HAZARDOUS MATERIALS STORAGE

5.2.1 Underground Storage Tanks (USTs)

No USTs for the bulk storage of hazardous materials/chemicals are reportedly present on-site, and no evidence of such facilities associated with Eastman's activities were noted during the walkover.

5.2.2 Above Ground Storage Tanks (ASTs)

No ASTs are reportedly present on site and none were observed during the site inspection.

5.2.3 Other Hazardous Material Storage

Hazardous substances currently used at the subject site include a range of solvents including chlorinated and phenol, sprits, xylene, ethanol, plasticisers, methanol, acids, stabilizers, isocyanate, peroxide, alcohol, and various types of additives. Please also refer to Appendix B for a complete list of chemicals stored on-site.

Chemicals and solvents are stored in three exterior stores located along the eastern building elevation. These comprise a waste storage area, a clean solvent store and chemicals store.

The majority of the chemicals are stored in containers of less than 50 litres, which are decanted into smaller containers for use in the laboratories within the main building.

A storage room containing substances in powdered form is also present on the second floor within the main building.

A number of gas cylinders are stored externally within a locked metal cage, located adjacent to the eastern building elevation. The cylinders contain oxygen and propane gas for use within the laboratory areas of the site.

Conclusion / Recommendation(s): Current storage arrangements are considered to be adequate to contain any leakage from the primary containers. Regular visual inspections of the storage areas should be undertaken in the event of leakage.

5.3 WATER SUPPLY AND USE

The site benefits from mains water supply, and is used predominantly in the laboratory areas of the site as part of the analytical processes undertaken in these areas.

5.4 WATERWATER

5.4.1 Drainage

The drainage across the site according to a drainage plan, dated July 2004, entitled G.A of Chemical, Foul and Surface Water Drainage System, indicates that the drainage layout across the subject site comprises the following:

Chemical Effluent

Effluent generated from inside the laboratory areas of the site, drains into a neutralising pit, located in the south-eastern section of the site. Effluent collected here appears to discharge into a foul sewage drain located beneath North Street along the southern boundary of the site, through North Gate and then discharges into the mains foul water system located beneath Acornfield Road and moves off-site to an unknown discharge point to the north.

Foul Sewage

Foul water generated within the site is identified to drain directly into the foul drain located beneath North Street, and discharged into the public drainage system as described above.

Surface Water

Surface water generated at the site consists of runoff from the site buildings and roof down pipes, and surfaced areas of the site. Rainwater falling on the un-surfaced areas of the site infiltrates into the ground and moves offsite via base flow. (Also refer to Hydrogeology section above).

5.4.2 Drainage Appraisal

WSP Development and Transportation conducted a drainage appraisal on the chemical drainage system across the wider former Kodak site, dated 27 February 2008. The scope of the works included an assessment of the feasibility of re-using the existing chemical drainage infrastructure at the subject site.

The report states that where pipes are identified as having structural defects there is the potential for leaching of chemicals into the subsoil and potential infiltration into the underlying groundwater. Therefore although limited contamination was identified to potentially impacting the site it was recommended that the drainage infrastructure is replaced or repaired to prevent significant contamination.

The damaged drainage which was revealed after the camera inspection was repaired/ replaced in July 2007. This was undertaken to improve the integrity of the drainage network and prevent leaching into the surrounding sub-soils.

5.4.3 Regulations, Monitoring and Compliance

Site management stated that the chemical effluent discharged into the neutralising pit comprises small amounts of waste chemicals from washing processing undertaken within the laboratory areas. A 'Consent to the Discharge of Trade Effluent' (reference is 693T04233LPN1) has been obtained by the site for the effluent discharge.

5.5 WASTE MANAGEMENT

5.5.1 Hazardous Waste

A small amount of solvent waste and other miscellaneous liquid waste is produced in the laboratories at the site. This is decanted into small containers and stored externally in four 205 litre drums. The drums are stored on a drip tray, with an overhead protected canopy to protect the drums from weather damage. The site representative stated that these are collected by ESS a suitable licensed hazardous waste contractor (License number AHN198).

5.5.2 Non Hazardous Waste

The site produces general office waste, which is reportedly segregated and recycled where possible. Dedicated drums are in place to contain metals, plastics and paper wastes. These were observed to be stored externally along the eastern building elevation.

Conclusion / Recommendation(s): It is recommended that the non hazardous storage drums are placed under cover to prevent rusting, and damage to the containers.

5.6 POLYCHLORINATED BIPHENYL'S (PCBS)

No fixed plant representing potential sources of PCBs was identified on the site.

5.7 RADIOACTIVE SUBSTANCES

Information obtained from a previous Phase I report undertaken by Conestoga Rovers & Associates (Europe) Limited, dated January 2007 indicates that a thickness gauge and associated radiation source are located within the plastics laboratory. However information obtained by WSPE during the site inspection and correspondence with site management as part of this assessment has identified that the site no longer has a radiation source or the associated thickness gauge.

5.8 ENVIRONMENTAL MANAGEMENT

No Environmental Management plan is reportedly currently in place at the subject site, however overall environmental awareness and performance was perceived to be good.

.

6 Conclusions and Recommendations

6.1 CONCLUSIONS

The site is currently occupied by Eastman Chemicals primarily for plastics processing and analytical research. The site is located in the north-western section of the former Kodak chemical manufacturing facility, although the subject site has been utilised as a research facility since it was constructed in the 1960's.

WSPE carried out an environmental baseline audit of the sites current processes to determine the potential for current activities to cause ground contamination. The following conclusions were made with respect to this:

- No significant sources of ground contamination were identified from the current and on-going practises carried out at the subject site.
- The results of a third party site investigation have not identified significant sources of historical ground contamination, and a significant pollutant linkage has not been identified, which is considered to warrant remediation.

Figure 1

SITE LOCATION PLAN

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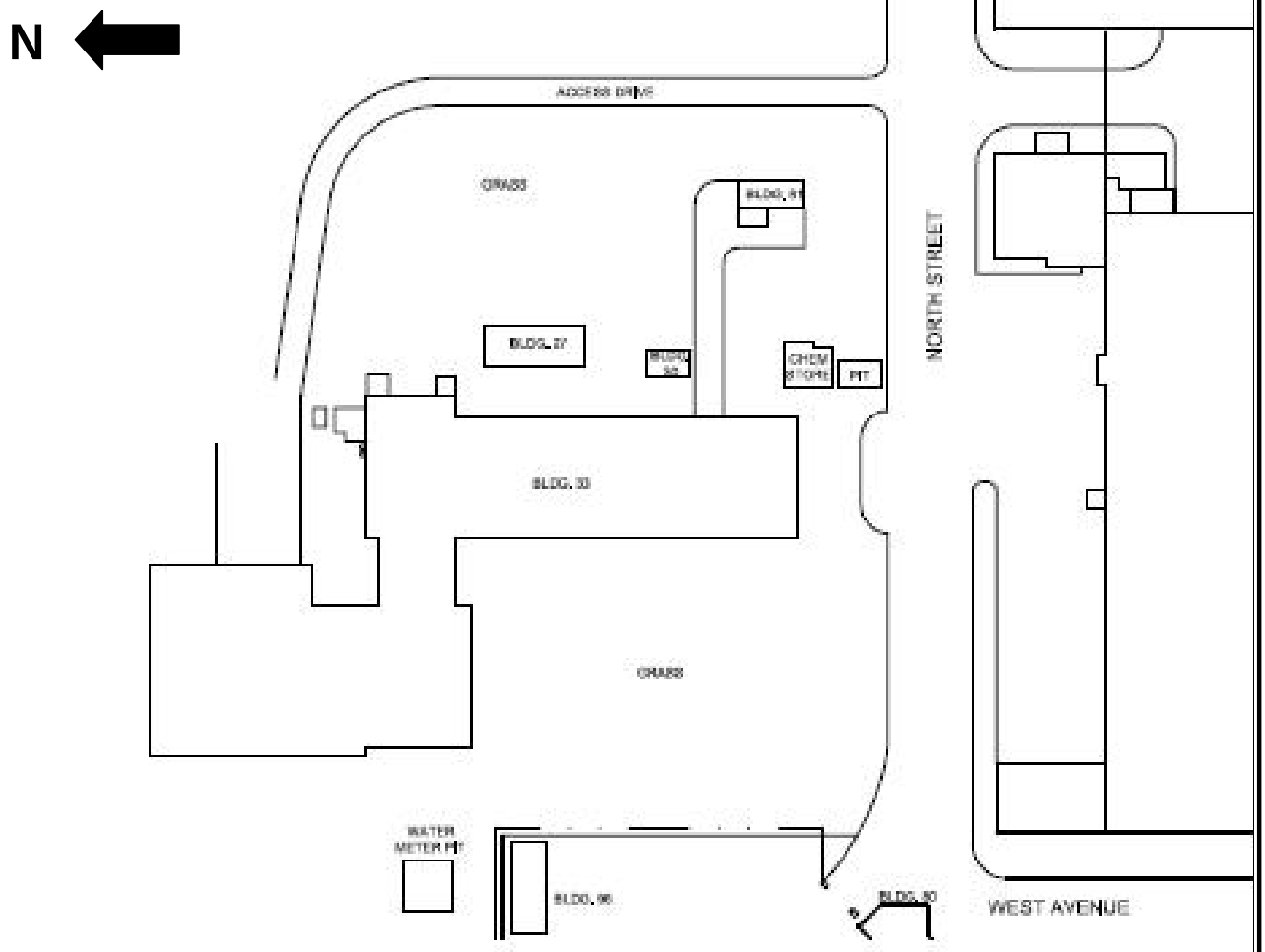
PROJECT NAME

Eastman Chemicals Limited

TITLE

Site Location/Boundary Plans



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PROJECT NAME

Eastman Chemicals Limited

TITLE

Site Boundary Plans

Figure 2

SITE PHOTOGRAPHS

Photo 1: Laboratory chemical storage and waste collection area.

Photo 2: Chemical storage area, located in an outbuilding.

Photo 3: Bunded waste storage area

Photo 4: Additional non-hazardous waste storage drums

Photo 5: Neutralising pit, associated with chemical drainage system.

Photo 6: Locked gas storage unit.

Appendix A

General

WSP Environmental Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from WSP Environmental Limited; a charge may be levied against such approval.

WSP Environmental Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) this document to any third party with whom an agreement has not been executed.

Phase I Environmental Audits

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Geo-environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to site remediation these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values

Appendix B Ames Goldsmith Audit

WSP Environment & Energy

Open Document Details Menu to Change

Baseline Environmental Audit

Ames Goldsmith

Kirkby AT LLC

December 2010

QUALITY MANAGEMENT

Issue/revision	Issue 1
Remarks	Final
Date	December 2010
Prepared by	A Skinner
Signature	
Checked by	R Lawless
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Authorised by	A Moore
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CONTENTS

1	Introduction	3
2	Site Description	4
3	Site Setting	5
4	Assessment of Pre Existing Contamination	7
5	Operational Findings and Observations	9
6	Conclusions and Recommendations	13
Appendix A	Site Location & Boundary Plans	
Appendix B	Photographic Record	
Appendix C	Site Specific Documentation	
Appendix D	Annual Review Inventory	
Appendix E	Methodology & Limitations	
Appendix F	Report References	

1 Introduction

1.1 BACKGROUND

WSP Environment & Energy (WSPE&E) was commissioned by Kirkby AT LLC to carry out a Baseline Environmental Audit of Ames Goldsmith (Ames), Acornfield Road, Knowsley Industrial Estate, Kirkby, Liverpool, L33 7UF. The area leased by Ames ("the site") forms part of the larger former Kodak facility, which has been acquired by International Process Plants (IPP) and divided into a business park and leased to industrial operators.

The purpose of the audit is to update the previous Baseline Environmental Report undertaken by WSPE&E in January 2008 (Ref: 12024512/002), with current and proposed activities with regards to potential environmental impact.

This report will form part of the EMP for the entire former Kodak site which will be subject to review to assess its suitability, and updated based on ongoing tenanted activities.

1.2 STRUCTURE OF ASSESSMENT

1.2.1 Site Visit

Currently no site visit has been undertaken by a WSPE&E representative; however a conference call between Rob Garrett (Plant Manager) of Ames and WSPE&E was undertaken on the 30/11/2010 to discuss current operations and any significant changes since the previous audit was completed.

1.2.2 Documentation Reviewed

Information reviewed as part of this assessment includes:

- Drainage plan of the wider former Kodak site (CAD drawing);
- Drainage assessment of the wider former Kodak site;
- Ground Contamination Review and Remediation Action Plan of the Former Kodak Chemicals Ltd Site, Kirkby (12121392/001);
- Baseline Environmental Audit, Ames Goldsmith (12024512/002)

2 Site Description

2.1 BACKGROUND

The subject site is located towards the south-western corner of the larger former Kodak chemical processing facility and was constructed in the 1960's. The site occupies an area of approximately 0.90 hectares (Ha) and is situated on the eastern side of the Knowsley Industrial Park, approximately 2 kilometres (km) to the east of Kirkby and 12.5 km northeast of Liverpool City centre.

2.2 SITE DESCRIPTION & USE

The subject site comprises an approximately rectangular shaped plot located in the south-eastern corner of the larger former Kodak chemical Manufacturing facility. The site comprises three process buildings of a dated brick construction under a corrugated sheet roof.

Internal areas of the site comprise the main manufacturing process areas, with additional small ancillary office areas and staff welfare areas.

At the time of reporting infrastructure for an additional manufacturing area was being undertaken, located in the eastern site building, along with a small scale laundry area.

The site is supplied with its own separate supply of mains gas and is reportedly connected to the rest of the site for water and electricity which is distributed centrally and is purchased by the site. In addition, the site has an operational groundwater abstraction borehole located in the central area of the site.

The plant uses two above ground storage tanks (ASTs) for storage of 60% nitric acid, one tank is located externally near the southeast corner of the plant building (17,000 litres) and the other inside the plant building at the southern end (7,000 litres). Both tanks are of a steel construction with concrete bunds and appeared to be in good condition,

The effluent produced from the operations is treated on-site using an effluent treatment plant. This comprises two galvanised steel ASTs for temporary storage of wastewater this is used to recover any waste silver produced from the manufacturing process, before the sludge is removed and the remainder of the process water released into the mains drainage system.

The site currently holds a groundwater abstraction license from the Environment Agency (EA) (License number 25 69 031 089) for the abstraction of groundwater from the underlying Principal Aquifer. The borehole is located in the north-eastern section of the subject site and was issued to the site on 12th February 2007 (date of original issue 1st July 1988), and effective from 10th November 2006 inline with a number of conditions (Please refer to Appendix C). Including a maximum abstraction not exceeding 90,920 cubic meters per year.

3 Site Setting

3.1 INTRODUCTION

Information on the site setting has been obtained from WSPE&E records, primarily the 2007 WSPE&E Ground Contamination Review and Remediation Action Plan report, and on-site observations.

3.2 SITE SETTING

3.2.1 General

The site is situated on the eastern side of the Knowsley Industrial Park, approximately 2km to the east of Kirkby and 12.5km northeast of Liverpool City centre. The site comprises a total area of approximately 0.898 hectares.

Surrounding the site area to the north is the land occupied by the former Kodak manufacturing facility and beyond other commercial/industrial premises on the Knowsley Industrial Estate. The site is bordered to the east by Perimeter Road and further by open land known locally as Kirkby Moss. Bordering the site to the south is undeveloped woodland/overgrown land and to the west a further area of undeveloped land which was historically a wastewater treatment plant for the Kodak chemical manufacturing facility.

3.3 GEOLOGY

British Geological Survey (BGS) geological map, Sheet 84, Wigan, Solid & Drift Edition, 1:50,000 scale indicates the following geological progression:

- Shirdley Hill Sand – Secondary A Aquifer
- Glacial Deposits – Unclassified Perceived low permeability deposits
- Sherwood Sandstone – Principal Aquifer

Following the completion of ground investigation works undertaken by WSPE the ground conditions beneath the site comprise Made Ground of generally between 1.0 – 3.0m depth (maximum 7.0m in an area of historical landfilling), underlain by the Shirdley Hill Sand (a thin laterally discontinuous sand horizon up to 1m thick), and in turn by Glacial Deposits (a restricted-permeability clay horizon) and the Sherwood Sandstone at depths of between 2.5m and 14m. The Sherwood Sandstone is classified as a Principal Aquifer by the Environment Agency and is considered to be the principal environmental receptor when considering whether remediation is required.

Two separate groundwater bodies have been identified, a perched water table (above the Glacial Deposits) within the Made Ground & Shirdley Hill Sand and the deeper water within the Sherwood Sandstone.

3.4 HYDROGEOLOGY

The Environment Agency (EA) Groundwater Vulnerability Map, which make up part of the published Policy and Practice for the Protection of Groundwater, divide the underlying strata in England and Wales into Principal, Secondary A & B and Non Aquifers dependent upon their potential for potable water supply.

Groundwater from the Sherwood Sandstone is abstracted in the region for commercial and drinking water purposes. Kodak held (and currently Ames Goldsmith now holds) a license for groundwater abstraction for industrial use (cooling purposes). The borehole is located in the north-eastern section of the subject site and is understood to be 106m deep and drilled in 1986 to supply the silver nitrate plant close to the southern boundary. The license is for 90, 920m^3 per year.

Data from the Environment Agency indicates that the closest abstraction for drinking water is the Knowsley Pumping Station approximately 1.2km to the south. This well is not down gradient of the site, although this abstraction well is currently not operational.

A second drinking water abstraction (Randle's Bridge pumping station) is located approximately 3.2km southwest of the Site. This well is also not down gradient of the site. The Former Kodak facility is not currently located within a Source Protection Zone for a potable abstraction (as defined by the Environment Agency).

Given the highly sensitive nature of the groundwater beneath the study area, the Environment Agency manages a network of groundwater monitoring wells within the wider area. The closest well to the subject site is located approximately 50m to the south of the Kodak boundary within Charley Wood.

3.5 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 50m to the south of the Site. No other significant surface water features have been identified within a 500m radius of the study area

3.6 COAL MINING

The site is not located within an area affected by coal mining or brine extraction activities.

3.7 RADON

The site is located within an area where less than 1% of homes are above the Action Level for radon gas. Therefore, no radon protection measures are considered necessary.

3.8 SENSITIVE RECEPTORS

Sensitive surrounding land uses in the immediate vicinity of the subject site are as follows:

- Undeveloped land and agricultural land with a number of field drains is located approximately 300m east of the subject site.
- The nearest residential property is Top House Farm, which is located approximately 800m east of the site.
- Charley Wood with associated surface water drains is located approximately 300m south of the subject site.

3.9 OVERALL SENSITIVITY

Overall, the site is considered to be of moderate environmental sensitivity for the following reasons:

- The presence of an underlying Principal Aquifer;
- The presence of an on-site groundwater abstraction; and
- The predominately industrial land uses within the surrounding area.

4 Assessment of Pre Existing Contamination

4.1 POTENTIAL HISTORICAL CONTAMINATION SOURCES

The history of development on the site and in the surrounding area was investigated with reference to historical Ordnance Survey (OS) mapping and anecdotal information provided by site personnel.

4.1.1 Historical On-site Sources

Historical mapping information for the site indicates that the site comprised undeveloped open land from at least 1850, until a number of small unspecified buildings were identified on the site and an area of disturbed ground, circa 1956, marked as Kirkby Industrial Estate. By the early 1960's the site is identified to comprise an unspecified works with various process buildings and what are perceived to be above ground storage tanks. This appears to be largely consistent with the current site configuration

4.1.2 Historical Off-site Sources

The surrounding area has supported several potentially contaminated land uses including the former Kirkby Munitions factory (c.1941), with associated process buildings and reservoir, located from adjacent. The land immediately to the north of the site was later (c.1949) taken over by Kodak who began predominately manufacturing photochemical's, at the site, until the site ceased operation in 2006. The majority of the associated infrastructure however still remains at the site.

Several other potentially contaminated uses have also been identified within close proximity to the site, including landfilling activities, and the development of various industrial processes associated with the development of Kirkby Industrial estate to the west

4.2 CURRENT CONTAMINATION STATUS

Information obtained from a Phase II Environmental Site Assessment, undertaken by Conestoga-Rovers Associates (Europe) Limited, dated June 2006 indicates the following;

- The report was produced in order to assess the current conditions of the shallow soil and groundwater surrounding the Silver Nitrate/ Silver Oxide Plant.
- The report provides details of a previous ground investigation undertaken by Aspinwall & Co. Limited in 1993. The scope of work for the area surrounding the silver nitrate plant included the excavation of one trail pit, located on the grassy area to the left of the silver nitrate plant and installation of one groundwater-monitoring well for the collection of groundwater samples. The ground conditions encountered during the excavation of the trail pit were recorded as 1.0m of made ground, over 0.1m of clay and 2.1m of sandstone. The geology identified during the installation of the borehole consisted of 0.2m of Made Ground over 0.6m of sand, 1.3m of clay and 2.1m of sandstone.
- A targeted Phase II was carried out across the entire Kodak facility by Conestoga-Rovers in June 2003. The intrusive investigation which was carried out in the vicinity of the silver nitrate plant included three shallow window sampler boreholes. The recorded geology encountered in these locations generally consisted of dark brown sandy topsoil overlying Made Ground consisting of brown sandy clay with brick fragments and brown sand with fine to medium gravels and clay, encountered between 0.8m bgl (below ground level) and 1.5m bgl.
- Photo Ionisation Detector (PID) result of 262ppm was identified in one of the window sample holes which is considered to be moderately elevated at a depth of 0.7-1.7m bgl.
- The current investigation was carried out between 10th and 12th May 2006 and on 22nd May 2006. The aim of the investigation was to assess the shallow soil and groundwater conditions above the clay deposits in the areas surrounding the silver nitrate plant. The investigation comprised the completion of twenty boreholes above the clay deposits in the area surrounding the silver nitrate plant, and comprised the following;
  - Twenty window sample boreholes were advanced to a maximum depth 2.0m bgl;
  - Installation of shallow groundwater monitoring installations in 6 of the 20 boreholes;

- Collection of and submittal of 32 soil samples and 6 groundwater samples for laboratory analysis to include the following suite of chemicals heavy metals (arsenic, boron, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc), Total Petroleum Hydrocarbon (TPH) benzene, toluene, ethylebenzene, and xylenes (BTEX), volatile organic and semi-volatile organic compounds plus tentatively identified compounds, polycyclic aromatic hydrocarbons (PAHs), total and free cyanide and sulphate.

- The ground conditions observed across the investigation area consisted of either topsoil or hardstanding at the surface. The topsoil encountered was observed as medium dense to loose, moist, brown to dark brown and sandy with many rootlets ranging from 0.1m to 0.5m thick. Beneath the surface of all the boreholes made ground deposits were encountered. The made ground generally comprised dense or medium dense, dark brown, rounded, medium grained, gravely sand. The gravels were described as being fine to coarse gained and consisted of sandstone, brick, flint and concrete fragments. The underlying made ground at all locations was described as stiff, light brown and sandy.
- Two boreholes located in the north-eastern area of the site were identified to have a sulphurous odour with yellow staining identified at one of the boreholes (BH116), situated on the bunded concrete service area. The highest PID reading recorded during the investigation was 3.2ppm at BH118 located in the north-western section of the site.
- The analytical results when compared to WSPE assessment criteria have identified that all soil contaminants tested for are below the respective concentrations for an industrial end use.
- Groundwater testing results were identified to exceed the UK Drinking Water Quality Standard (DWQS) for benzene, however given that the site is not located within a groundwater Source Protection Zone, and that this was only encountered in one sample location, it is considered unlikely to represent a significant concern.

5 Operational Findings and Observations

5.1 ENVIRONMENTAL PERMITS

The site operates a Pollution Prevention and Control (PPC) permit which historically formed part of an Integrated Pollution Prevention and Control (IPPC) permit, which regulated a number of activities across the larger former Kodak facility.

Permitted activities include:

- The manufacture of silver nitrate from the receipt of raw materials to despatch of finished product.
- The manufacture of silver oxide, from the receipt of raw materials to despatch of finished product.
- Steam and heat generation, from the single steam-raising boilers;
- Waste management, for the storage and handling of process wastes.

Under the permit Ames Goldsmith are tasked with implementing and maintaining a management system sufficient to achieve compliance with the permit. This includes the completion of an Improvement Programme which incorporates three Improvement Provisions ('IPs'). Ames Goldsmith is required to perform these improvements and provide written notification of the dates of the completion to the EA. A summary of the IPs and Ames Goldsmiths response is provided as follows:

Ref	Description	Implication / Recommendation
1	The operator shall review the adequacy and suitability of existing bund provision, with reference to section 2.2.5 of the Agency Guidance Note IPPC S4.03. (Date for completion 06/10/2007)	WSPE recommend that the existing bund integrity is maintained and any damage repaired to damaged areas, in the event of any leaks/spills in these areas, which could potentially cause contamination to the underlying ground, and or the surface water drainage system.
2	The operator informs us that TUV (UKAS accredited company) certification has been reviewed for the methods used to sample and analyse samples taken to fulfil the conditions of the permit. A report was submitted to the Environment Agency detailing the timetable for achieving this standard.	No material issues identified.
3	The operator shall monitor process discharges for silver to sewer. A report regarding the released of silver and effects to the environment was issued to the Environment Agency before the 31/03/2008.	No material issues identified. However, WSPE recommend that the EA's written acceptance of the implemented monitoring procedure should be obtained and kept on file.

Conclusion / Recommendation(s): A number of improvements have been made under the current permit, which according to site personnel at the time of the site inspection are currently being dealt with.

These represent issues of management best practice and do not represent material costs. However, all correspondence with the EA should be formally documented and retained on record for inspection purposes

5.2 HAZARDOUS MATERIALS STORAGE

5.2.1 Underground Storage Tanks (USTs)

No USTs were reportedly present onsite, with the exception of a wastewater pit located in the western area of the site, and no evidence (vent pipes, fill points) of such tanks was noted during the site inspection.

5.2.2 Above Ground Storage Tanks

The following ASTs are located on the subject site:

- The plant uses two above ground storage tanks (ASTs) for storage of 60% nitric acid, one tank is located externally near the southeast corner of the plant building (17, 000 litres) and the other inside the plant building at the southern end (7, 000 litres). Both tanks are of a steel construction with concrete bunds and appeared to be in good condition,
- The effluent produced from the operations is treated on-site using an effluent treatment plant. This comprises two galvanised steel ASTs for temporary storage of wastewater this is used to recover any waste silver produced from the manufacturing process, before the sludge is removed and the remainder of the process water released into the mains drainage system.

Conclusion / Recommendation(s): No material issues were identified, however regular visual inspections of the tank and associated pipework and bund should be undertaken to detect any signs of leakage or damage.

5.2.3 Other Hazardous Materials Storage

- Bulk storage of oxygen is located near the southeast corner of the plant building, externally. No areas of potential environmental concern were identified.
- A number of various sized containers of general maintenance materials including lubricants and oils for maintenance of the on-site plant equipment were present within small quantities within the on-site buildings.

Conclusion / Recommendation(s): General storage arrangements and awareness of environmental producers appeared to be good. Continual visual inspections of the on-site tanks should be undertaken to ensure tank integrity and detect any signs of damage or leakage.

5.3 WATER SUPPLY AND USE

The subject site holds a groundwater abstraction licenses for one borehole located in the central section of the site for cooling purposes. Environment Agency License number 25 69 031 089 and application reference number C2742-S1.

The abstracted water is reportedly monitored for quality and evidence of contamination. However no results of this monitoring were not made available to WSPE during the site inspection.

Conclusion / Recommendation(s): No significant concerns were identified with the abstraction of groundwater from the on-site borehole, however continued monitoring and operation within the provisions of the permit should be continued.

5.4 WATERWATER

5.4.1 Drainage

The drainage across the site according to a drainage plan, dated July 2004, entitled *G.A of Chemical, Foul and Surface Water Drainage System,* indicates that the drainage layout across the subject site comprises the following:

Chemical Effluent

Information provided by the site representative in relation to proposed alterations to the chemical drainage system at the subject site indicates the following;

- The drains will have to cope with dilute nitric acid (5%) or sodium hydroxide (5%) in the worst case. In addition the documentation reports that there is likely to be some salt (sodium chloride) in the drains and there some dilute silver nitrate (5%) and hydrochloric acid (5%).
- The information indicates that alterations will need to be made to the following drainage pipes;
  - Acid bund drain: modify manhole C131 (invert levels of 97.65 at ground level and 96.51 at the bottom of the manhole) in order to block off the current route (to C132) and to send it to C101 (invert level or C156).
  - Repair surface water manhole SW 107
  - Block outlet from valved manhole in compound 19.
  - Seal drains at manhole C153 in central avenue
  - Seal off line to pit at manhole C117

– K67 Drain: Block off inlet from C113

– pH pits – modify manhole C118 (invert levels – ground 96.6, bottom of drain 94.84). There should be no inlet from gully's or outlet to pits. The outlet should go to the feed sump (no invert level available for the feed sump, put manhole C125 on the other side of it has a ground level of 96.75). The current inlet to the feed sump needs to be blocked off. The concrete of the waste water plant will be removed when this work is done. But the roadway will need to be improved.

– The outfall pit at Manhole C123, the inlet needs to be blocked.

Information obtained from the drainage plan indicates that the chemical drainage discharges off-site to the west and towards a chemical effluent pit present to the south west within the former Kodak sites boundary.

Surface Water

Surface water generated at the site consists of runoff from the site buildings and roof down pipes, and surfaced areas of the site. Rainwater falling on the un-surfaced areas of the site infiltrates into the ground and moves offsite via baseflow. (Also refer to Hydrogeology section above).e site

Foul water

The site has an on-site water treatment plant which collects waste water from the process inside the building

The effluent produced from the operations is treated on-site using an effluent treatment plant. This comprises two galvanised steel ASTs for temporary storage of wastewater this is used to recover any waste silver produced from the manufacturing process, before the sludge is removed and the remainder of the process water released into the mains drainage system.

Trade Effluent

The site holds a Trade Effluent Consent from North West Water, and dated August 1998 for the release of chemical and photochemical effluent into the mains sewer, in line with the conditions of the consent. Please refer to Appendix C for detailed information relating to the imposed conditions.

5.4.2 Drainage appraisal

WSP Development and Transportation conducted a drainage appraisal on the chemical drainage system across the wider former Kodak site, dated 27th February 2008, file reference 11190862/IF1. The scope of the works included an assessment of the feasibility of re-using the existing chemical drainage infrastructure at the subject site. The following information pertaining to the subject sites drainage system includes the following:

– Large sections of the drainage network at the subject site were not assessed for integrity or condition, due to absence restrictions,

– However in two sections of the subject sites chemical drainage system, structural defects were detected such as cracks, fractures, holes, pipe collapse and displaced joints.

It was recommend in the previous audit in January 2008 that the drainage infrastructure is replaced or repaired preventing any significant concentration of contamination accumulating over time and potentially impacting the underlying soils and groundwater.

We have been informed by the Plant manager at Ames Goldsmith that this work was undertaken to replace of the drainage that was seen to be a potential risk pathway to the underlying soils and groundwater. The work was undertaken in March 2008, however, Ames do not hold any photographic records of the works.

Conclusion / Recommendation(s): No significant concerns have been identified as the recommended works to the drainage systems has been undertaken.

5.5 WASTE MANAGEMENT

5.5.1 Hazardous Waste

Waste sludge from the chemical drainage pit is collected from in 50litre drums and sent off site by JBR as waste and Ames parent company Ames Goldsmith Corp as a by-product to use in other processes. No areas of potential environmental concern were identified with the storage of this waste material.

5.5.2 Non Hazardous Waste

The site produces general office waste, which is reportedly segregated and recycled where possible. Dedicated drums are in place to contain metals, plastics and paper wastes. These were observed to be stored externally along the eastern building elevation.

5.6 POLYCHLORINATED BIPHENYLS (PCBS)

To date no sources of PCBs have been identified on the site

Conclusion / Recommendation(s): No material issues identified.

5.7 RADIOACTIVE SUBSTANCES

No radioactive substances are used by Ames Goldsmith.

Conclusion / Recommendation(s): No material issues identified.

5.8 ENVIRONMENTAL MANAGEMENT

No Environmental Management plan is reportedly currently in place at the subject site, however overall environmental awareness and performance was perceived to be good.

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6 Conclusions and Recommendations

6.1 CONCLUSIONS

The site is currently occupied by Ames Goldsmith primarily for the production of Silver Nitrate and Silver Oxide. The site is located in the south-western section of the former Kodak chemical manufacturing facility.

WSPE carried out an environmental baseline audit of the sites current processes to determine the potential for current activities to cause ground contamination. The following conclusions were made with respect to this:

- No significant sources of ground contamination were identified from the current and on-going practises carried out at the subject site.
- The results of a third party site investigation have not identified significant sources of historical ground contamination, and a significant pollutant linkage has not been identified, which is considered to warrant remediation;

6.2 BEST PRACTICE IMPROVEMENTS

A number of best practice improvements have been identified throughout this report and these are listed as follows:

- General storage arrangements and awareness of environmental procedures appeared to be good. Continual visual inspections of the on-site tanks and associated pipework should be undertaken to ensure tank integrity and to detect any signs of damage or leakage.
- In line with the sites Pollution Prevention and Control (PPC) permit improvements to the sites infrastructure and practices should be adhered to and completed within the designated time period stated within the permit document.

Appendix A

SITE LOCATION PLAN

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PROJECT NAME

Ames Goldsmith, Kikby

TITLE

Site Location Plan

Appendix B

PLATE 1: Chemical drainage precipitation pit

PLATE 2: External bunded storage area

PLATE 3: Effluent treatment tanks, located along the southern building elevation

PLATE 4: Above ground nitric acid storage tank, placed within a dedicated construction bund.

Appendix C

Appendix D

Appendix E

General

WSP Environmental Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from WSP Environmental Limited; a charge may be levied against such approval.

WSP Environmental Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) this document to any third party with whom an agreement has not been executed.

Phase I Environmental Audits

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Geo-environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to site remediation these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values

Environment Agency Aquifer Classifications

The Environment Agency (EA) Groundwater Vulnerability Map and Regional Appendices, which make up part of the published Policy and Practice for the Protection of Groundwater, divide the underlying strata in England and Wales into major, minor and non aquifers dependent upon their potential for potable water supply. The following table is derived from the main policy document. The division of the rock formations into major, minor and non aquifer reflects the Regional importance and vulnerability of the formation.

Major Aquifer

Highly permeable formations usually with the known or probable Presence of significant fracturing. Highly productive strata of Regional importance. Often used for large potable abstractions. E.g. Upper Chalk, Permo-Triassic Sandstones

Minor Aquifer

Fractured or potentially fractured but without high intergranular permeability. Generally only support locally important abstractions E.g. Coal Measures

Variable porosity and permeability but without significant fracturing. Generally only support locally important abstractions. E.g. River Terrace Gravels

Non Aquifer

Formations with negligible permeability. Only support very minor abstractions if any. E.g. Mercia Mudstones, igneous rocks

Regulatory Information Sources

Reference has been made to the Landmark Information Group data provision service. This includes information and data collated from several organisations, including the Environment Agency (EA), Department for Environment, Food & Rural Affairs (DEFRA), Health & Safety Executive (HSE), the Health Protection Agency (HPA), and the Coal Authority

Appendix C Future Industrial Services Audit

UNITED BY OUR DIFFERENCE

WSP

Environmental Audit Follow-Up,

Future Industrial Services Ltd, Acornfield Road, Kirkby

Kirkby AT LLC

November 2010

Issue/revision	Issue 1
Remarks	Final
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Contents

EXECUTIVE SUMMARY		1
1	Introduction	1
2	Site Description	2
3	Environmental Setting	5
4	Site Observations	8
5	Environmental Risk Assessment	11

Figure 1 Site Layout
Figure 2 Drainage Diagram
Figure 3 Surface Conditions
Appendix A Site Photographs

Executive Summary

WSP Environment & Energy Limited (WSPE&E) was commissioned by Kirkby AT LLC to carry out a follow-up to a previous Environmental Audit of Future Industrial Services Limited (Future), Image Business Park, Acornfield Road, Kirkby, Liverpool, L33 7UF. The Future facility (the site) forms part of the larger Image Business Park, which has been acquired by International Process Plants & Equipment Ltd (IPPE), divided into a business park and leased in part to industrial operations. The previous audit report was prepared in May 2009 (Ref: 12025063/001).

The purpose of this follow-up was to review actions carried out by Future to address the issues identified in the previous Environmental Audit and any changes to processes / layout in the intervening period.

Future occupies three separate areas of the business park and operates a waste management and disposal facility. WSPE&E has identified a number of potential environmental concerns, predominantly associated with ground contamination and makes the following recommendations:

- Appropriate secondary containment should be provided for the two tanker off-loading areas, as current measures appear inadequate to deal with any significant loss to ground.
- Operation of the eastern off-loading area appears to be resulting in loss to ground via the adjacent gravel area. Consideration should be given to provision of hardstanding to replace the gravel, or relocating the off-loading area to a more suitable location.
- Integrity of all below ground infrastructure should be conducted and repeated as required on a regular basis. Specifically this should cover all surface water drains in the Futures area, all gullies, chemical drains and sumps / interceptors in use.
- Integrity testing should be undertaken on the two underground storage tanks within Zone 4, including all associated below-ground pipework.
- Several surface water drains appear to be at risk of receiving effluent via surface runoff. Specifically SW23, SW94 and SW95 have been identified at risk, although a review of all surface water drains within the vicinity of the Future operations is recommended. All such identified drains should be sealed and replaced as appropriate.
- Integrity of the concrete hardstanding within the Zone 3 storage area should be assessed to prevent storage of potentially contaminative materials where the condition is poor.
- All gullies used to collect surface run-off of effluent should be regularly maintained / cleaned to prevent blockages. This was observed to be particularly necessary in the Containerised Pad.

WSP Environment & Energy Ltd

1 Introduction

WSP Environment & Energy Limited (WSPE&E) was commissioned by Kirkby AT LLC to carry out a follow-up to a previous Environmental Audit of Future Industrial Services Limited (Future), Image Business Park, Acornfield Road, Kirkby, Liverpool, L33 7UF. The Future facility (the site) forms part of the larger Image Business Park, which has been acquired by International Process Plants & Equipment Ltd (IPPE), divided into a business park and leased in part to industrial operations. The previous audit report was prepared in May 2009 (Ref: 12025063/001).

The purpose of this follow-up was to review actions carried out by Future to address the issues identified in the previous Environmental Audit and any changes to processes / layout in the intervening period.

The findings of this follow-up report and the previous reports undertaken will form part of the Environmental Management Plan (EMP) for the entire Image Business Park site which will be subject to annual review to assess its suitability, and updated based on remediation and demolition works undertaken and on-going tenanted activities.

Information on the environmental setting of the site and summary of the pre-existing contamination conditions (i.e. predating Futures occupation of the site) is presented in the Environmental Audit prepared in January 2009 (Ref: 12024959).

As part of this assessment a site visit was undertaken on 14 and 15 June 2010 by a WSP engineer, which included a guided site walkover and discussions with Roy Brunt (General Manager, Futures) and Andrew Kelleher (Compliance Manager, Future). No documentation was reviewed as part of this assessment.

2 Site Description

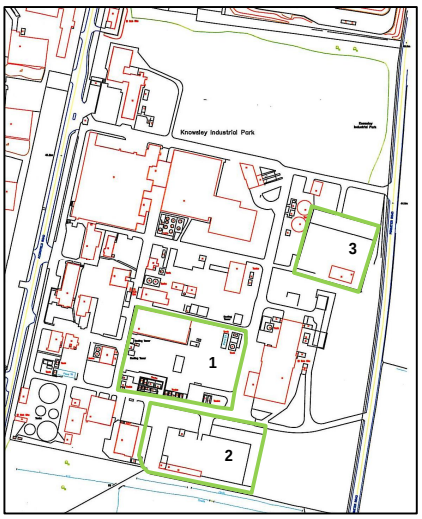
2.1 BACKGROUND

The subject site is located in the south-eastern corner of the larger former Kodak chemical processing facility which is situated in the eastern side of Knowsley Industrial Park, approximately 2 kilometres (km) to the east of Kirby and 12.5km northeast of Liverpool City Centre. A former Kodak facility is understood to date from 1960's. An assessment of the contamination conditions on the subject site prior to the commencement of Future's operations is presented in the Environmental Audit prepared in January 2009 (Ref: 12024959).

2.2 SITE DESCRIPTION

The subject site comprises three separate areas as follows:

1. The main process area contains the offices and process plant including storage tanks. This is located within Zone 4 of the business park.
2. A containerised waste storage pad is located to the south of South Street and is utilised for waste transfer, mixing and bulking up operations. This is located within Zones 6 and 7 of the business park.
3. A disused concrete sunken reservoir is utilised for plant and vehicle storage and is located in the northeast of the site. This is located within Zone 3 of the business park.



The main part of the site includes areas of un-surfaced and gravel surfaced ground around the process plant. The waste storage pad is constructed of good quality concrete. A site layout plan is shown in Figure 1.

2.3 PROCESS DESCRIPTION

2.3.1 Disposal of Aqueous Wastes

Aqueous wastes, generally comprising landfill leachate, are accepted via bulk tanker (See Figure 2) and held in tanks prior to discharge to foul sewer.

Landfill leachate is accepted from numerous landfills across the northwest of England. Site management report that leachate is not accepted from hazardous waste landfills, although mixed waste landfill leachate (including waste deposited before current legislative controls were in place) is accepted.

Site management report that since the previous audit of the site limited chemical analysis of leachate has been introduced, particularly for leachates from landfills that have not been previously accepted. Full details of the analysis carried out have not been provided.

The facility contains an electronic process control system, including an automatic pH dosing, with addition of flocculating agents to facilitate clarification. This is used to

enhance the operation of the pH adjustment plant and the quality of the final discharge effluent.

Site management report that leachate may be passed through a granular activated carbon (GAC) column to remove red list organic contaminants, which are not permitted under the terms of the site's Discharge Consent. It is unclear how the requirement for GAC treatment is determined.

2.3.2 Treatment of Oil/ Water Mixtures

The site accepts oil/water mixes by bulk tankers, which are pumped into holding tanks in the same aqueous wastes. Light non-aqueous phase liquids are separated and the aqueous fraction discharged to foul sewer.

2.3.3 Containerised Hazardous Waste Transfer

Containers (generally comprising IBCs and drums) of mixed wastes are accepted and stored on the containerised waste pad prior to offsite disposal. Containers may be opened and wastes 'bulked-up' into larger loads (included bulk tankers prior to shipping). There is a maximum storage capacity of 660 tonnes of waste.

2.3.4 Solvent Mixing and Recovery

The site's Environmental Permit (EP) permits the blending of solvent wastes in bulk tanks, and it is understood that some physical treatment of solvent wastes has been introduced since the initial audit. It is assumed that this treatment is carried out in bulk tanks.

Solvent distillation plant is present on the site and site management indicates that this is planned to be used in around two to three years to recycle sediments on site. Use of the plant will require a variation to the site's EP.

2.3.5 Ancillary Operation – Tank Washing

A tanker washing operation has been established on the containerised waste pad since the initial audit of the site. This process involves tankers being hosed out into an above ground tank; the effluent weirs through subsequent above ground tanks and is treated in the aqueous effluent treatment process on the site. Solids settling within the tanks are removed for off-site disposal.

2.4 ENVIRONMENTAL PERMITS

The site operates under a Pollution Prevention and Control Permit (PPC) (now an Environmental Permit (EP)) from the Environment Agency (EA) (Ref: VP3936UG, determined 19/09/08).

The site is permitted to carry out a number of waste management operations under subsections of section 5.3A (1) of Schedule 1 of the PPC Regulations including:

- Storage of specified hazardous wastes;
- Repackaging of specified hazardous wastes;
- Blending or mixing of solvents;
- Blending or mixing of hazardous aqueous wastes;
- Physico-chemical treatment of hazardous and non-hazardous aqueous wastes using GAC column;

- Physico-chemical treatment of hazardous and non-hazardous wastes by pH adjustment;
- Storage, blending and waste separation of waste oils; and
- Recycling/reclamation of inorganic materials consisting of washing, dewatering, neutralisation and filtration of wastes to produce synthetic gypsum.

The site is also permitted to carry out the following directly associated activities:

- Washing of waste containers and size reduction by crushing and shredding;
- Storage of non-hazardous waste residues prior to on-site treatment for disposal; and
- Washing residues from tankers after delivery of wastes.

A comprehensive assessment of the site's compliance with the EP lies outside the scope of this assessment. The following permit conditions are considered pertinent to potential soil and groundwater contamination:

- The only permitted emission to water or land is a discharge of effluent from the pH adjustment plant and uncontaminated surface water to the foul sewer;
- Fugitive emissions of substances shall not cause pollution; and
- All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment or other appropriate measures to prevent leakage.

The permit also requires that the following conditions are satisfied at least one month prior to the start of operations on the site:

- The operator shall submit a written report to the EA demonstrating that all bulk liquid storage tanks, pipelines and secondary containment have been leak-tested;
- The operator shall submit a process and instrumentation diagram (P&ID) for systems containing potentially polluting substances.

The PPC Application Site Report (prepared by Enviros Consulting Limited (August 2007)) was made available to WSPE&E for review. The report was prepared prior to the commencement of operations on the site and states that Future would integrity test all bulk tanks and bunds prior to commencement of operations.

The report indicates that a drainage survey had recently (March 2007) been carried out by Future and all drains to be used by the site were in 'a general good condition and for purpose'. The report indicates that daily/weekly inspections of tank and bund conditions, housekeeping etc will be carried out and recorded. The report concludes that no activities have been identified with a reasonable possibility of future pollution occurring and there will be no requirement for collection of reference data as part of the Site protection and Monitoring Programme (SPMP).

The SPMP prepared by Future (dated November 2008) gives details of the Infrastructure Monitoring Programme to be carried out. This does not currently include a requirement for groundwater monitoring, although may be required soon as part of proposed changes to the permit by Futures.

3 Environmental Setting

3.1 INTRODUCTION

Information on the site setting has been obtained from WSPE records, primarily the 2007 WSPE Ground Contamination Review and Remediation Action Plan report, and on-site observations.

3.2 ENVIRONMENTAL SETTING

3.2.1 Location

The Future site is located in the south eastern area of the former Kodak facility, which itself is located on the eastern periphery of the Knowsley Industrial Park.

Other tenants on the former Kodak site include:

- Ames Goldsmith (operating a silver nitrate process to the west of Future);
- Minerals Resource Management Ltd (recycling of waste plasterboard); and,
- Eastman Chemicals (analytical and formulation laboratories to the north of the Future site).

Land to the south of the containerised waste storage pad is a mature wood (Charley Wood). To the east of the waste storage pad is a grassed embankment that also formed part of the Kodak site. The Eastern boundary of the site is formed by Perimeter Road, beyond which is a grassed area formerly used as a landfill during the 1950s to 1970s. The waste types deposited are unknown, although it was reportedly operated by the local authority in the 1970s for domestic refuse disposal.

3.2.2 Sensitive Land Uses

No formally designated ecological receptors (such as Sites of Special Scientific Interest or Sites of Biological Interest) or residential properties have been identified within 500m of the site.

3.3 GEOLOGY

British Geological Survey (BGS) geological map, Sheet 84, Wigan, Solid & Drift Edition, 1:50,000 scale indicates the following geological progression:

Geology	**Aquifer Status**
Shirdley Hill Sand	■ Secondary A
Glacial Deposits	■ Unclassified – perceived low
Sherwood Sandstone	■ Principle Aquifer

Previous investigation works identified that the ground conditions beneath the site generally comprised the following sequence:

- Made Ground of generally less than 1.0m depth (although locally deeper);
- A thin, laterally discontinuous peat layer identified in some locations (maximum approximately 0.6m in thickness);
- Shirdley Hill Sand (a thin sand horizon generally less than 1m thick);
- Glacial Deposits, comprising sandy clay; on the Futures site, the clay horizon varied in thickness thinning towards the southwest:

- On the main Futures site, a maximum of thickness of 4m was recorded (in the northwest corner of the site (under the current office building), thinning to 1.5-2.2m in the locations of the ASTs;
- On the containerised waste storage pad, the thickness ranged from approximately 0.9-2.0m, although in one location just beyond the eastern edge of the pad, the Glacial Deposits were absent.

- Weathered Sherwood Sandstone was encountered underlying Glacial Deposits at depths of between 1.5m bgl (containerised waste storage pad) and 6m bgl (main Future site).

3.4 HYDROGEOLOGY

3.4.1 Shallow Aquifer

Previous investigations have identified a shallow aquifer within made ground and sand deposits perched on the underlying low permeability Glacial Deposits. Contour data indicates that the shallow groundwater body flows towards the west; shallow groundwater levels on the subject site range from approximately 43.8m AOD (eastern area of waste storage pad) to 41.0m AOD (western area of main site).

Reportedly, the shallow aquifer was locally absent under part of the waste storage pad (and was also absent under some large structures on the former Kodak site).

3.4.2 Deep Aquifer

Groundwater from the Sherwood Sandstone is abstracted in the region for commercial and drinking water purposes. Ames Goldsmith hold a license for groundwater abstraction for industrial use (cooling purposes) on their site, adjacent to the west. Their borehole is understood to be 106m deep and drilled in 1986 to supply the silver nitrate plant close to the southern boundary.

Data from the Environment Agency indicates that the closest abstraction for drinking water is the Knowsley Pumping Station approximately 1.5km to the south. A second drinking water abstraction (Randle's Bridge pumping station) is located approximately 3.5km southwest of the Site. However, the Futures site is not currently located within a Source Protection Zone for a potable abstraction (as defined by the Environment Agency).

The Environment Agency manages a network of groundwater monitoring wells within the wider area. The closest well to the subject site is understood to be located approximately 50m to the south of the Future site boundary within Charley Wood.

Previous investigations have identified the groundwater level in the deep aquifer underlying the Future site at approximately 36-37m AOD, with a flow direction towards the northwest. Previous investigation data reportedly indicated that the deep aquifer is fully saturated across part of the study area and confined by the overlying Glacial Deposits.

3.5 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) 10m to the south of the Future site. Previous investigations indicated that the surface watercourse is up the hydraulic gradient from the subject site.

No other significant surface water features have been identified within a 500m radius of the site.

3.6 COAL MINING

The site is not located within an area affected by coal mining or brine extraction activities.

3.7 RADON

The site is located within an area where less than 1% of homes are above the Action Level for radon gas. Therefore, no radon protection measures are considered necessary.

4 Site Observations

4.1 GENERAL SITE CONDITIONS

4.1.1 Zone 3/ Storage Area

Zone 3 which is currently used as a storage area for the Futures site is situated on the east of the of the former Kodak facility as seen in Surface Coverage Figure 3. This area in sunken, with walls constructed from reinforced concrete acting as a concrete bund with an approximate depth of 3m.

During the recent site visit and walk over numerous equipment is now stored within this area. These can be seen on Plates 1 and 2, Appendix A and include the following:

- Large HGV containers, used to transport chemicals and wastes;
- Various industrial plant equipment;
- A number of skips containing wastes;
- Stockpiled materials; and
- General small scale equipment used at the Futures site.

The ground conditions comprise reinforced concrete which id generally in good condition except for occasional wear and tear (Plate 3, Appendix A). However, within the north, east and south-western corners there are areas of generally disturbed ground and increase in vegetation growth. This suggests a potential pathway to the underlying ground if any sources of contamination are stored on damaged surfacing.

4.1.2 Zone 4/ Tanks, Bunds and Plant.

The main operations within Zone 4 are described in Section 2.3. Activities include:

- Aqueous effluent unloading area;
- Aqueous effluent waste holding tanks;
- Concrete effluent holding/ pH adjustment tanks;
- Oil water separation plant;
- Solvent blending plant; and
- Drainage interceptor pit.

Aqueous effluent unloading and holding tanks area

This area is situated on the eastern boundary of Zone 4 and includes the access road that leads towards South Street (Plate 5, Appendix A). The area is used for the unloading of effluent from HGV containers to holding tanks via an effluent unloading tank to remove any sediments (See Figure 2). The process is a manual operation involving connecting the tanker to the pump. Surrounding the main unloading bays are two gullies to collect any spillages. These gullies are understood to feed into the chemical drainage system. A number of chemical and foul drains are also located within this area.

As seen in Plates 6 and 7 (Appendix A), the general surface conditions are generally in good condition with no evidence of surface damage. However, there are a number of visual signs of contamination / surface spillages on the road surface and within the shallow gullies used to collect any surface run-off (Figure 2).

Beyond the loading bay and fence to the west, the ground surface comprises gravelled hardcore with signs of vegetation growth (Plate 8, Appendix A). Some areas (particularly behind the interceptor) the gravels appear to be new and only recently been placed (anecdotal information suggests that the gravel in this area was previously heavily stained due to spillages during tanker off-loading).

4.1.3 Above Tanks Storage Areas

The main Above Ground Storage Tanks (AST) are situated adjacent to South Street and include the oil water separation plant and solvent separation and the new alkaline powder process facility (Plate 9, Appendix A). Along the front of the ASTs are drains and shallow gullies have also been placed around these areas to collect any surface spillages (connected to the chemical drainage system).

As seen in the Plate 10 (Appendix A), surface staining is evident locally around these ASTs and within the surface drainage. These areas are reportedly regularly cleaned and the resultant water is collected in the chemical drainage system as seen in Plates 11 and 12 (Appendix A).

A schedule of ASTs and details of integrity testing (as required by the site's EP) has not been made available to WSPE at the time of reporting.

4.1.4 Drainage Interceptor Pits

This area is located on the western edge of Zone 4, Plate 14 (Appendix A). All chemical drainage from the Futures area (within Zone 4) collects within an interceptor pit before discharging into the foul water system. The general ground conditions surrounding the interceptor comprise a mixture of hardstanding, gravelled and soft landscaping.

4.1.5 Containerised Chemical Pad

This area is located on the southern boundary of the site in Zones 6 and 7. Containerised wastes are stored in individual bays on the waste storage pad according to the hazardous properties of the wastes (Plate 15, Appendix A). The wastes are transferred into vacuum tankers within this area.

The ground conditions comprise hardstanding, concrete; surrounding the area is soft landscaping which includes, grassed and gravelled areas.

4.2 DRAINAGE

4.2.1 Onsite

Effluent from the interceptor pit in Zone 4 is discharged to the chemical drainage system via a proportional sampler. The drainage plan of the site indicates that Future's chemical drain discharges to the wider chemical drainage system on the former Kodak site, although site management indicate that the drain actually now passes to a foul water drain under Central Avenue adjacent to the west. At the time of the site visit, the foul drain was reportedly at a higher level than the chemical drain and effluent flows only under the head of pressure in the drain, meaning the drain is permanently flooded with effluent around the connection. The drainage plans provided do not include invert levels for the chemical drainage system so it is not possible to confirm this.

Surface water from the Future Zone 4 area also drains into the chemical drainage system in the following areas:

- Gulley drains around tanker unloading areas;
- Gulley drains to the front of bulk storage tank bunds; and
- The drainage plan also appears to show that bunds are drained to the chemical drainage system.

Surface water from these areas drains to the interceptor pit on the Zone 4 Futures site before discharging to the foul water system on the wider former Kodak site.

It should also be noted that plans indicate that chemical drains from outside the Futures area drain into the chemical drains system on the site. It is not known whether the connections from off-site are still in place.

Roof drainage from the buildings on site and foul drainage from the office building pass to the surface and foul water drains on Central Avenue. In addition, a number of surface water drains are shown on plans as passing over the main Future site. These drains did not form part of the CCTV condition survey so their integrity is not known and the accuracy of the plan is not known.

A number of surface water drainage grids were identified to be potentially at risk from effluent run-off from operations at the Futures site in Zone 4. The grids in question are highlighted in Figure 2 and include SW23, SW94 and SW95.

4.2.2 Containerised Pad

The chemical pad has a central drainage channel which drains to a four stage interceptor prior to entering to the chemical drainage system. Drainage from the pad can be controlled by a valve before the drainage enters the interceptor.

Each of the covered chemical storage bays on the pad is also independently drained to a gulley, which discharges into a blind sump. Each of the sumps is fitted with a float switch with a visible alarm to indicate the presence of liquid in the sump. Site management reported that a number of sumps accumulate water within them, which is emptied frequently. Site management report that the water is removed from the chambers regularly.

The vehicular entrance to the drainage pad is drained to the chemical drainage system via a gully drain. All chemical drainage from the containerised pad passes through the interceptor located in Zone 4 and is ultimately discharged via Futures Consented discharge point on Acornfield Road.

5 Environmental Risk Assessment

5.1 INTRODUCTION

This section of the report provides a summary of the potential contamination sources, pathways and receptors identified during the recent environmental audit of the Futures site. The information is based on observations and current operations that take place on site. This section will identify the potential sources linked to the operations that are undertaken, identified environmental receptors, consideration of the contamination pathways and a final assessment of potential pollutant linkages.

5.2 SOURCES

Based on the current Futures site audit and its operational activities on the site the following sources of contamination have been identified and presented below:

Potential On-going Sources

- Zone 3 / Storage area: Visual areas of chemical staining and leachate from stockpiled materials. Material stockpiled is unknown; the integrity of the underlying concrete appears to be locally impaired.
- Zone 4: Visual areas of chemical staining around the effluent unloading area, waste holding tanks and separation plant. As previously mentioned the majority of the staining is located around the surface gullies, used to collect any spillages. They are also used to collect any surface run-off from precipitation and cleaning of tanks and equipment. The integrity of the various gullies collecting spillages is not known.
- Zone 4: evidence of recent gravel staining behind one of the tanker off-loading areas indicates potential on-going loss of effluent to ground in small quantities.
- Surface Water Drainage: As noted above visual staining has been recorded on Zone 4. Due to the location of a number of surface water drainage grids, it is possible that spillages may enter the surface water drainage network, which is not treated / attenuated prior to leaving site. The manhole covers potentially at risk are highlighted on Figure 2.
- Interceptor Pit: Used to collect all the discharge from the chemical drains, located at the western boundary of zone 4. Integrity of this feature and interconnecting drains not known.
- Waste Holding Tanks: Two historical underground holding tanks are situated below the ASTs and will be used in an emergency. No current information was provided regarding the integrity of these tanks and if any residue wastes remain within the tanks.

Potential one-off events

- Tanker Unloading and Loading Areas: Any major release of effluents from these areas could be either; collected within the surface water drainage system and impact the off-site drainage, impact the soft landscaped and gravelled areas or pool across the site.
- Waste Holding Tanks: Any failure of the tanks could release effluent to the surface water drainage and / or soft landscaped / gravelled areas.
- Spillage during Bulking up of Containerised Wastes. Any release should be contained within this area and taken away via the surface gullies. However, current

observation suggests these are regularly blocked and may not accommodate a significant release.

5.3 RECEPTORS

Based on the ongoing commercial/ industrial usage of the Futures site and the current environmental audit the following receptors are considered relevant to the subject site:

- Site drainage – specifically the surface water drainage network which ultimately discharges untreated to an off-site surface watercourse;
- Perched groundwater within the Made Ground / Shirdley Hill Sand;
- The underlying Sherwood Sandstone; and,
- Current and future users of the site.

Within the context of the subject site, the most significant controlled water receptor is considered to be the Sherwood Sandstone major aquifer. This groundwater body is regionally important for providing potable drinking water and is closely regulated by the Environment Agency.

5.4 PATHWAYS

- Damaged Concrete: Damaged concrete has been recorded in certain areas across the site; shown in Figure 3. These areas could potentially provide a migration pathway to the underlying aquifer and/ or the drainage system.
- Damaged Drains: Any un-surveyed drains / gullies across the site could be a potential pathway to underlying groundwater if damaged.
- Soft Landscaping/ Gravelled Areas: The current audit has identified areas of soft landscaping and gravelled surfaces. These could potentially act as a pathway to underlying groundwater. A gravelled area in Zone 4 behind one of the tanker off-loading bays appears to have been impacted by Futures operations.
- Surface Water Drains: The site's chemical drainage network is designed to collect all the chemical spills etc within the chemical drainage system, therefore not impacting the surface water or foul drains. However, as already noted there is potential for a number of surface water drains to be impacted by any over-ground spillages, therefore bypassing any containment measures.

5.5 SUMMARY OF POTENTIAL POLLUTANT LINKAGES

Human Health

Risks to human health are considered primarily associated with short-term (acute) exposure to contaminants during operations. These risks can be managed by recourse to health & safety risk assessments for operatives and use of suitable personal protective equipment.

Appropriate health and safety assessments and management plans should be developed for any workers and / or contractors who are likely to come into contact with impacted soils. If any future re-developments are undertaken then further risk assessments will be needed.

Controlled Waters

A number of potential risks to Controlled Waters have been identified associated with the current Future operations. Potential for infiltration of effluent to ground has been identified in several areas as discussed above and could enter perched groundwater and / or surface water drains. Subsequent migration downwards migration into the Sherwood Sandstone is less likely given the presence of overlying Glacial Till, but is possible in the southern part of the site, given this overlying stratum's limited thickness and potential for below ground structures to penetrate the Principal Aquifer.

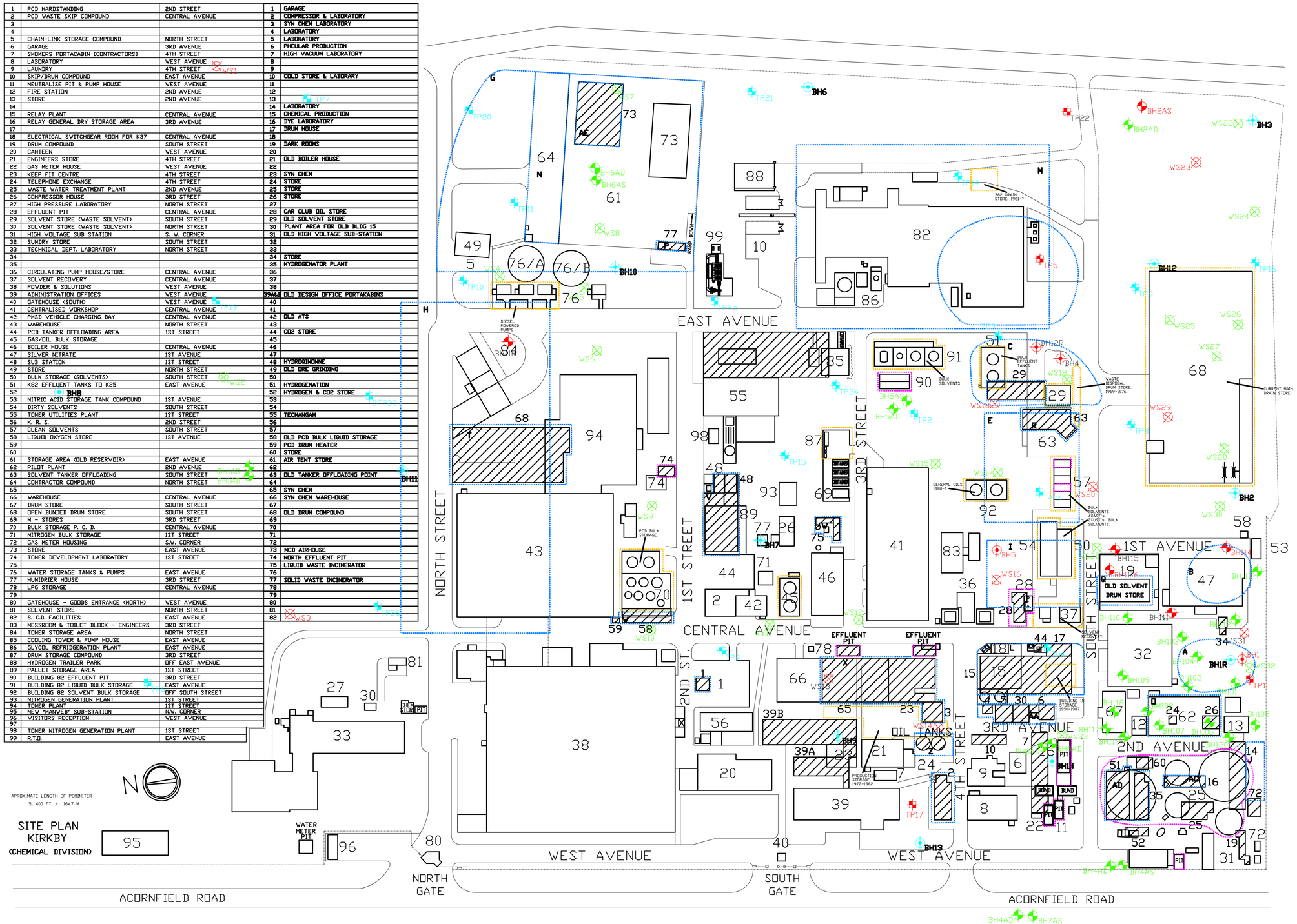
5.6 RECOMMENDATIONS

A number of recommendations are provided below, based on WSPE observations of the current Future operations – it is possible that some of these recommendations may have already been implemented since the site inspection. The recommendations are primarily to mitigate potential risks to Controlled Waters.

- Appropriate secondary containment should be provided for the two tanker off-loading areas, as current measures appear inadequate to deal with any significant loss to ground.
- Operation of the eastern off-loading area appears to be resulting in loss to ground via the adjacent gravel area. Consideration should be given to provision of hardstanding to replace the gravel, or relocating the off-loading area to a more suitable location.
- Integrity of all below ground infrastructure should be conducted and repeated as required on a regular basis. Specifically this should cover all surface water drains in the Futures area, all gullies, chemical drains and sumps / interceptors in use.
- Integrity testing should be undertaken on the two underground storage tanks within Zone 4, including all associated below-ground pipework.
- Several surface water drains appear to be at risk of receiving effluent via surface runoff. Specifically SW23, SW94 and SW95 have been identified at risk, although a review of all surface water drains within the vicinity of the Future operations is recommended. All such identified drains should be sealed and replaced as appropriate.
- Integrity of the concrete hardstanding within the Zone 3 storage area should be assessed to prevent storage of potentially contaminative materials where the condition is poor.
- All gullies used to collect surface run-off of effluent should be regularly maintained / cleaned to prevent blockages. This was observed to be particularly necessary in the Containerised Pad.

Figure 1 Site Layout

1	PCD HARDSTANDING	2ND STREET	1	GARAGE
2	PCD WASTE SKIP COMPOUND	CENTRAL AVENUE	2	COMPRESSOR & LABORATORY
3			3	SYN CHEM LABORATORY
4			4	LABORATORY
5	CHAIN-LINK STORAGE COMPOUND	NORTH STREET	5	LABORATORY
6	GARAGE	3RD AVENUE	6	PHEULAR PRODUCTION
7	SMOKERS PORTACABIN (CONTRACTORS)	4TH STREET	7	HIGH VACUUM LABORATORY
8	LABORATORY	WEST AVENUE	8	
9	LAUNDRY	4TH STREET	9	
10	SKIP/DRUM COMPOUND	EAST AVENUE	10	COLD STORE & LABORARY
11	NEUTRALISE PIT & PUMP HOUSE	WEST AVENUE	11	
12	FIRE STATION	2ND AVENUE	12	
13	STORE	2ND AVENUE	13	
14			14	LABORATORY
15	RELAY PLANT	CENTRAL AVENUE	15	CHEMICAL PRODUCTION
16	RELAY GENERAL DRY STORAGE AREA	3RD AVENUE	16	DYE LABORATORY
17			17	DRUM HOUSE
18	ELECTRICAL SWITCHGEAR ROOM FOR K37	CENTRAL AVENUE	18	
19	DRUM COMPOUND	SOUTH STREET	19	DARK ROOMS
20	CANTEEN	WEST AVENUE	20	
21	ENGINEERS STORE	4TH STREET	21	OLD BOILER HOUSE
22	GAS METER HOUSE	WEST AVENUE	22	
23	KEEP FIT CENTRE	4TH STREET	23	SYN CHEM
24	TELEPHONE EXCHANGE	4TH STREET	24	STORE
25	WASTE WATER TREATMENT PLANT	2ND AVENUE	25	STORE
26	COMPRESSOR HOUSE	3RD STREET	26	STORE
27	HIGH PRESSURE LABORATORY	NORTH STREET	27	
28	EFFLUENT PIT	CENTRAL AVENUE	28	CAR CLUB OIL STORE
29	SOLVENT STORE (WASTE SOLVENT)	SOUTH STREET	29	OLD SOLVENT STORE
30	SOLVENT STORE (WASTE SOLVENT)	NORTH STREET	30	PLANT AREA FOR OLD BLDG 15
31	HIGH VOLTAGE SUB STATION	S. W. CORNER	31	OLD HIGH VOLTAGE SUB-STATION
32	SUNDRY STORE	SOUTH STREET	32	
33	TECHNICAL DEPT. LABORATORY	NORTH STREET	33	
34			34	STORE
35			35	HYDROGENATOR PLANT
36	CIRCULATING PUMP HOUSE/STORE	CENTRAL AVENUE	36	
37	SOLVENT RECOVERY	CENTRAL AVENUE	37	
38	POWDER & SOLUTIONS	WEST AVENUE	38	
39	ADMINISTRATION OFFICES	WEST AVENUE	39A&B	OLD DESIGN OFFICE PORTAKABINS
40	GATEHOUSE (SOUTH)	WEST AVENUE	40	
41	CENTRALISED WORKSHOP	CENTRAL AVENUE	41	
42	PMSD VEHICLE CHARGING BAY	CENTRAL AVENUE	42	OLD ATS
43	WAREHOUSE	NORTH STREET	43	
44	PCD TANKER OFFLOADING AREA	1ST STREET	44	CO2 STORE
45	GAS/OIL BULK STORAGE		45	
46	BOILER HOUSE	CENTRAL AVENUE	46	
47	SILVER NITRATE	1ST AVENUE	47	
48	SUB STATION	1ST STREET	48	HYDRODINONNE
49	STORE	NORTH STREET	49	OLD DRE GRINDING
50	BULK STORAGE (SOLVENTS)	SOUTH STREET	50	
51	K82 EFFLUENT TANKS TO K25	EAST AVENUE	51	HYDROGENATION
52	BH8		52	HYDROGEN & CO2 STORE
53	NITRIC ACID STORAGE TANK COMPOUND	1ST AVENUE	53	
54	DIRTY SOLVENTS	SOUTH STREET	54	
55	TONER UTILITIES PLANT	1ST STREET	55	TECMANGAM
56	K. R. S.	2ND STREET	56	
57	CLEAN SOLVENTS	SOUTH STREET	57	
58	LIQUID OXYGEN STORE	1ST AVENUE	58	OLD PCD BULK LIQUID STORAGE
59			59	PCD DRUM HEATER
60			60	STORE
61	STORAGE AREA (OLD RESERVOIR)	EAST AVENUE	61	AIR TENT STORE
62	PILOT PLANT	2ND AVENUE	62	
63	SOLVENT TANKER OFFLOADING	SOUTH STREET	63	OLD TANKER OFFLOADING POINT
64	CONTRACTOR COMPOUND	NORTH STREET	64	
65			65	SYN CHEM
66	WAREHOUSE	CENTRAL AVENUE	66	SYN CHEM WAREHOUSE
67	DRUM STORE	SOUTH STREET	67	
68	OPEN BUNDED DRUM STORE	SOUTH STREET	68	OLD DRUM COMPOUND
69	M - STORES	3RD STREET	69	
70	BULK STORAGE P. C. D.	CENTRAL AVENUE	70	
71	NITROGEN BULK STORAGE	1ST STREET	71	
72	GAS METER HOUSING	S.W. CORNER	72	
73	STORE	EAST AVENUE	73	MCD AIRHOUSE
74	TONER DEVELOPMENT LABORATORY	1ST STREET	74	NORTH EFFLUENT PIT
75			75	LIQUID WASTE INCINERATOR
76	WATER STORAGE TANKS & PUMPS	EAST AVENUE	76	
77	HUMIDRIER HOUSE	3RD STREET	77	SOLID WASTE INCINERATOR
78	LPG STORAGE	CENTRAL AVENUE	78	
79			79	
80	GATEHOUSE - GOODS ENTRANCE (NORTH)	WEST AVENUE	80	
81	SOLVENT STORE	NORTH STREET	81	
82	S. C.D. FACILITIES	EAST AVENUE	82	
83	MESSROOM & TOILET BLOCK - ENGINEERS	3RD STREET		
84	TONER STORAGE AREA	NORTH STREET		
85	COOLING TOWER & PUMP HOUSE	EAST AVENUE		
86	GLYCOL REFRIDGERATION PLANT	EAST AVENUE		
87	DRUM STORAGE COMPOUND	3RD STREET		
88	HYDROGEN TRAILER PARK	OFF EAST AVENUE		
89	PALLET STORAGE AREA	1ST STREET		
90	BUILDING 82 EFFLUENT PIT	3RD STREET		
91	BUILDING 82 LIQUID BULK STORAGE	EAST AVENUE		
92	BUILDING 82 SOLVENT BULK STORAGE	OFF SOUTH STREET		
93	NITROGEN GENERATION PLANT	1ST STREET		
94	TONER PLANT	1ST STREET		
95	NEW "MANWEB" SUB-STATION	N.W. CORNER		
96	VISITORS RECEPTION	WEST AVENUE		
97				
98	TONER NITROGEN GENERATION PLANT	1ST STREET		
99	R.T.O.	EAST AVENUE		



DO NOT SCALE

KEY

- CRA BOREHOLES, NO ELEVATED RESULTS DETECTED
- CRA BOREHOLES, ELEVATED RESULTS DETECTED
- CRA WINDOW SAMPLES, NO ELEVATED RESULTS DETECTED
- CRA WINDOW SAMPLES, ELEVATED RESULTS DETECTED
- ASPINWALL BOREHOLES, NO ELEVATED RESULTS DETECTED
- ASPINWALL BOREHOLES, ELEVATED RESULTS DETECTED
- ASPINWALL TRIAL PITS, NO ELEVATED RESULTS DETECTED
- ASPINWALL TRIAL PITS, ELEVATED RESULTS DETECTED
- BULK STORAGE.
- HISTORICAL ISSUES
- POTENTIAL FOR PENETRATION OF GLACIAL TILL

REV	DATE	BY	DESCRIPTION	CHK	APD
A	11/04/06	XXX	FIRST ISSUE	@	@

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Future's Audit

TITLE:

Figure 1 Site Plan

SCALE @ A1:	CHECKED:	APPROVED:
CAD FILE: SITE PLAN	DESIGN-DRAWN:	DATE: February 2007
PROJECT No:	DRAWING No:	REV: A

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Figure 2 Drainage Layout

DO NOT SCALE

Covered Storage

SOIL / AGGREGATE TREATMENT & TRANSFER AREA

Covered Storage

SW1

RAMP DOWN

Surface Water Drainage Grids at Risk

Interceptor Tank & New Graveled Surace

Tanker Unloading Area

EQUIPMENT STORAGE

TANKER PARK

TRANSFER STATION

TANKER PARK

EAST AVENUE

NORTH STREET

1ST STREET

CENTRAL AVENUE

2ND STREET

3RD AVENUE

1ST AVENUE

CARPARK

OFFICE

STORE

LAB

LAB STORE

INSTRU-MENTS

STORE

LAB OFFICE

WORKSHOP

STORE

SPARE OFFICE

CANTEEN

SHOWER

PUMP HOUSE

Compressor House

MCC ROOM

OLD LAB

CONTAINER

CONTAINER

CONTAINER

Non Hazardous

Non Hazardous

Corrosive Acid Inorganic

Corrosive Acid Organic

Corrosive Acid Inorganic

Corrosive Caustic

Corrosive Caustic

Toxic

Reception

Non Hazardous

Organic Oxidisers

Inorganic Oxidisers

Acidic Oxidisers

Flammable

Container plant including sprinkler

Quarantine

REV	DATE	BY	DESCRIPTION	CHK	APD
A	23/07/06	TS	FIRST ISSUE	SD	SD

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PROJECT: Future Aufit

TITLE: Drainage Network and Assoicated Risks

SCALE @ A1:	CHECKED:	APPROVED:
1:500	SD	SD
CAD FILE: FIGURE 1_VAR	DESIGN-DRAWN: TS	DATE: July 2009
PROJECT No:	DRAWING No: FIGURE 1_VAR	REV: A

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C:\DOCUMENTS AND SETTINGS\UKTXS025\DESKTOP\SEJAL DIXON\FIGURE 1_VAR.DWG 23/07/2009 11:46:35 Smith, Toby

Figure 3 Surface Conditions

1. New gravel (black staining)
2. Tanker Offload point
3. Chemical Staining
4. Containers
5. Drain (semi filled with Sludge & Silts)
6. Patches of Staining
7. Visual Drain Blockage
8. New Gravel Area
9. Truck Parking Area
10. New Concrete Slope (arrows denote direction)
11. Acid Transfer and Cleaning Area
12. Acid Leakage (arrow denotes direction)
13. Dip in Road
14. New drain (semi blocked)
15. Sludge/oil
16. Containers – Unknown Content
17. Metal waste
18. White Leachate from Container
19. Oily Sheen
20. Damaged Concrete
21. Metal Silo
22. Drain
23. Water Piping
24. Tankers
25. Skips Containing Wastes and Chemicals

Key

- Hard Standing
- Gravelled Areas
- Soft Standing
- Chemical Staining

REV	DATE	BY	DESCRIPTION	CHK	APD

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TITLE: Surface Conditions

SCALE @ SIZE:	CHECKED:	APPROVED:
CAD FILE: 1002008im	DESIGN/DRAWN:	DATE:

PROJECT No:	DRAWING No:	REV:
13010908	2	A

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DWG_INFO

Appendix A Photographs

Site Photographs, Futures Audit 2010.

Plate 1: Zone 3, Storage Area

Plate 2: Zone 3 – Within the Containerised Pad

Site Photographs, Futures Audit 2010.

Plate 3: Zone 3 – Surface Conditions

Plate 4: Zone 3 – Surface Conditions

Site Photographs, Futures Audit 2010.

Plate 5: Zone 4 – Eastern tanker off-loading area showing holding tanks (gravel behind).

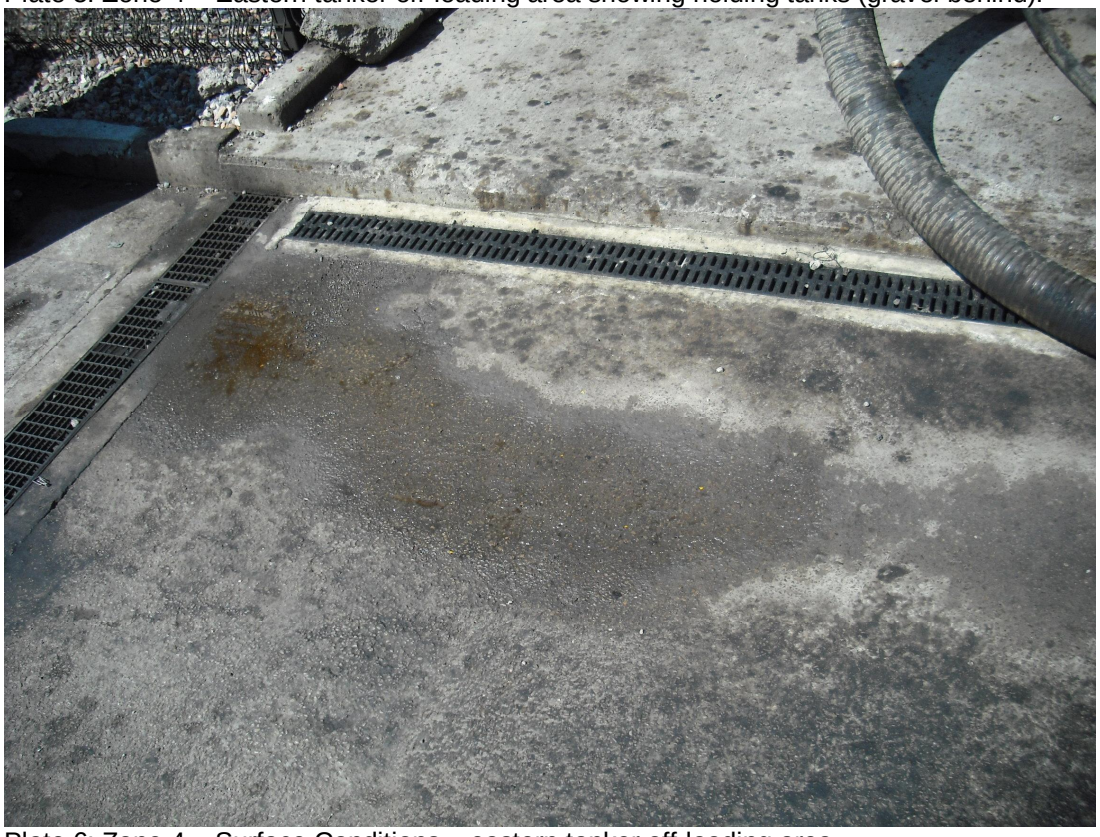

Plate 6: Zone 4 – Surface Conditions – eastern tanker off-loading area

Site Photographs, Futures Audit 2010.

Plate 7: Zone 4 – Surface Conditions – eastern tanker off-loading area

Plate 8: Zone 4 – Gravelled area adjacent to eastern tanker off-loading – gravel recently placed.

Site Photographs, Futures Audit 2010.

Plate 9: South Street – Above Ground Storage Tanks

Plate 10: South Street

Site Photographs, Futures Audit 2010.

Plate 11: South Street – Cleaning Process

Plate 12: South Street

Site Photographs, Futures Audit 2010.

Plate 13: Opposite South Street

Plate 14: Zone 4 – Interceptor Pit

Site Photographs, Futures Audit 2010.

Plate 15: Containerised Pad

Appendix D Minerals Resource Management Audit

UNITED BY OUR DIFFERENCE

WSP

Baseline Environmental Audit

Minerals Resource Management Ltd

Kirkby AT LLC

October 2010

QUALITY MANAGEMENT

Issue/revision	Issue 1
Remarks	Final
Date	October 2010
Prepared by	A Skinner
Signature	
Checked by	R Lawless
Signature	
Authorised by	A Moore
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Project number	12121392/
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CONTENTS

1	Introduction	3
2	Site Description	4
3	Site Setting	6
4	Assessment of Pre Existing Contamination	8
5	Operational Findings and Observations	10
6	Conclusions and Recommendations	13

Appendix A Site Plans
Appendix B Photographic Records
Appendix C Drainage Survey
Appendix D Limitations

1 Introduction

1.1 BACKGROUND

WSP Environment & Energy (WSPE&E) was commissioned by Kirkby AT LLC to carry out a Baseline Environmental Audit of Minerals Resource Management (MRM) Ltd, Arconfield Road, Knowsley Industrial Estate, Kirkby, Liverpool, L33 7UF. The area leased by MRM ("the site") forms part of the larger former Kodak facility, which has been acquired by International Process Plants (IPP) and divided into a business park and leased to industrial operators.

The purpose of the audit is to update the previous Baseline Environmental Report undertaken by WSPE&E in August 2009 (Ref: 12025165), with current and proposed activities with regards to potential environmental impact.

This report will form part of the EMP for the entire former Kodak site which will be subject to annual review to assess its suitability, and updated based on remediation and demolition works undertaken and ongoing tenanted activities.

1.2 STRUCTURE OF ASSESSMENT

1.2.1 Site Visit

A site visit was undertaken by a WSPE&E representative on the 23 September 2010, which included a brief on current and future site activities and guided site walkover by Jonathan Sowerby (Operations Manager, MRM).

1.2.2 Documentation Reviewed

Information reviewed as part of this assessment includes:

- Drainage plan of the wider former Kodak site (CAD drawing);
- Drainage assessment of the wider former Kodak site;
- Ground Contamination Review and Remediation Action Plan of the Former Kodak Chemicals Ltd Site, Kirkby (12121392/001);
- Baseline Environmental Audit, Mineral Resource Management Ltd (12055165/001)

2 Site Description

2.1 BACKGROUND

The subject site is located in the south-eastern area of the larger former Kodak chemical processing facility which is situated on the eastern side of Knowsley Industrial Park approximately 2 kilometres (km) to the east of Kirkby and 12.5km northeast of Liverpool City Centre. A site location plan is included as Appendix A.

The former Kodak facility is understood to date from the 1960's. An assessment of contamination conditions on the subject site prior to the commencement of MRMs operations is presented in Section 4.

2.2 SITE DESCRIPTION

The subject site is located on the eastern side of East Avenue and comprises a generally square plot of land which supports an L-shaped warehouse unit and a small adjacent single storey office building. The warehouse building forms part of a larger building extending off-site to the north, referred to as Building 82, which formerly comprised the southern section of the Synchem Building of the former Kodak facility. Access to the warehouse unit is via an access road (the eastern extent of South Street) located adjacent to the southern building elevation, which joins with East Avenue adjacent to the southwest corner of the site.

A site layout plan is included in Appendix A.

2.3 PROCESS DESCRIPTION

Operation undertaken during the current WSPE&E visit:

- The site is currently occupied by MRM for the operation of a non-hazardous waste treatment facility for the recycling of waste plasterboard. The site operates under an Environmental Permit (Ref. EPR/CP3690LE), issued by the Environment Agency on 9 April 2009;
- MRM was established in 2007 by Castle Cement Ltd and Solvent Resource Management Ltd; both companies are owned by Hanson UK, owned by the Heidelburg Cement Group;
- Site operations were generally outlined to include the following:
  - Waste plasterboard, mainly from customers in the waste management industry, is delivered to the site in skips by third party haulage companies. The majority of the waste delivered to the site comprises materials which have been bulked at waste transfer stations rather than being sourced directly from building demolition/refurbishment sites. Wastes are tipped inside the warehouse and stockpiled prior to processing;
  - The site currently has a procedure for checking the components of the waste when it arrives on-site and some hand segregation is undertaken. The site utilises a 'material assessment questionnaire', which has to be completed by customers prior to the waste arriving on-site. The form is designed to identify whether there are any hazardous components including asbestos, pre 1980s plasterboard, toxic compounds and radioactive materials within the load, which would not be accepted by the site;
  - Following stockpiling within the warehouse, the material will be passed through a jaw crusher before being passed through a portable trommel which separates out the component materials of the plasterboard: gypsum and paper. The resulting granules are then passed through a vibrating magnetic screen to remove any wood, metal and plastic components ('peripheral contamination') from the gypsum product. The peripheral contamination is stored internally within large container skips;
  - The gypsum is stockpiled within the warehouse for bulk distribution and reuse within the cement industry. Disposal options are currently being considered for the paper fraction of the segregated waste, which retains an approximately 14% concentration of gypsum following processing. Part of the commissioning process ongoing at the site is trying to achieve the lowest percentage of gypsum residue on the paper fraction of the waste.
- The processing plant utilised within the warehouse is fuelled by diesel, which is stored in an above ground storage tank adjacent to the eastern building elevation. Diesel is dispensed from the tank into a mobile bowser, which is manoeuvred internally for hand delivery to the process plant.

- The site representative stated that waste processing operations are undertaken with the roller shutter doors to the building shut in order to control dust emissions from the process. In addition, a dust suppression system operates within the warehouse, which sprays the stockpiles with a fine water mist when required. The mist is absorbed into the atmosphere and gypsum and does not create a water run-off.

3 Site Setting

3.1 INTRODUCTION

Information on the site setting has been obtained from WSPE&E records, primarily the 2007 WSPE&E Ground Contamination Review and Remediation Action Plan report, and on-site observations.

3.2 SITE SETTING

3.2.1 Location

The MRM site is located in the southeastern area of the former Kodak facility, which itself is located on the eastern periphery of the Knowsley Industrial Park.

Other tenants on the former Kodak site include:

- Future Industrial Services Ltd (treatment and disposal of liquid wastes, including hazardous wastes, located adjacent to the west and southwest of the MRM facility;
- Ames Goldsmith (operating a silver nitrate process to the southwest of the MRM site, beyond the premises of Future Industrial Services Ltd); and,
- Eastman Chemicals (analytical and formulation laboratories located in the northwest corner of the former Kodak site).

The site is located in a generally industrial area. Building 82, part of the former Kodak facility, is located adjacent to the north of the site and East Avenue forms the site's western boundary, beyond which are the premises of Future Industrial Services. External areas to the south and east of the MRM unit comprise small areas of grass landscaping, tarmac/concrete hardstanding and hardcore, beyond which to the south/southwest is a containerised waste storage pad associated with Future Industrial Services, and to the east is Perimeter Road. Charley Wood (with associated drainage ditch) is located beyond the waste storage pad to the south/southwest, and an area of open grassed land is located beyond Perimeter Road to the east. It is understood that the open grassed area to the east beyond Perimeter Road was formerly used as a landfill during the 1950s to1970s. The waste types deposited are unknown, although it was reportedly operated by the Local Authority in the 1970s for domestic refuse disposal.

3.2.2 Sensitive Land Uses

No formally designated ecological receptors (such as Sites of Special Scientific Interest or Sites of Biological Interest) or residential properties have been identified within 500m of the site.

3.3 GEOLOGY

British Geological Survey (BGS) geological map, Sheet 84, Wigan, Solid & Drift Edition, 1:50,000 scale indicates the following geological progression:

- Shirdley Hill Sand – Minor Aquifer
- Glacial Deposits – Unclassified Perceived low permeability deposits
- Sherwood Sandstone – Major Aquifer

Previous investigation works (see Section 4.2) identified that the ground conditions beneath the Kodak site generally comprised the following sequence:

- Made Ground of generally less than 1.0m depth (although locally deeper);
- A thin, laterally discontinuous peat layer identified in some locations (maximum approximately 0.6m in thickness);
- Shirdley Hill Sand (a thin sand horizon generally less than 1m thick);
- Glacial Deposits, comprising sandy clay; in the area of the MRM site, the clay horizon varied in thickness from approximately 0.4m in the south-eastern area of the site, increasing up to approximately 1.8m to the northwest; and

- Weathered Sherwood Sandstone was encountered underlying Glacial Deposits at depths of approximately 5m bgl in the area of the MRM facility

3.4 HYDROGEOLOGY

3.4.1 Shallow Aquifer

Previous investigations have identified a shallow aquifer within made ground and sand deposits perched on the underlying low permeability Glacial Deposits. Contour data provided in the 2007 WSPE report indicates that the shallow groundwater body flows towards the west; shallow groundwater levels in the area of the subject site range from approximately 43.9m AOD (in the northern area of Building 82) to 42.92m AOD (adjacent to East Avenue). Reportedly, the shallow aquifer was locally absent in some areas of the former Kodak site, including under part of the Future Industrial Services waste storage pad adjacent to the southwest of the MRM unit, and in the northwest area of the site to the south of the Eastman Chemicals facility.

3.4.2 Deep Aquifer

Groundwater from the Sherwood Sandstone is abstracted in the region for commercial and drinking water purposes. Ames Goldsmith hold a license for groundwater abstraction for industrial use (cooling purposes) on their site, approximately 120m to the southwest. Their borehole is understood to be 106m deep and drilled in 1986 to supply the silver nitrate plant close to the southern boundary of the wider Kodak site.

Data from the Environment Agency indicates that the closest abstraction for drinking water is the Knowsley Pumping Station approximately 1.5km to the south. A second drinking water abstraction (Randle's Bridge pumping station) is located approximately 3.5km southwest of the site. However, the MRM site is not currently located within a Source Protection Zone (SPZ) for a potable abstraction (as defined by the Environment Agency).

The Environment Agency manages a network of groundwater monitoring wells within the wider area. The closest well to the subject site is understood to be located approximately 90m to the south of the MRM site boundary within Charley Wood.

Previous investigations have identified the groundwater level in the deep aquifer underlying the MRM site at approximately 36-37m AOD, with a flow direction towards the northwest. Previous investigation data reportedly indicated that the deep aquifer is fully saturated and confined by the overlying Glacial Deposits.

3.5 HYDROLOGY

The nearest surface watercourse is a small drainage ditch situated on the edge of woodland (Charley Wood) approximately 90m to the south of the MRM site. Previous investigations indicated that this surface watercourse is up the hydraulic gradient from the subject site.

No other significant surface water features have been identified within a 500m radius of the site.

3.6 COAL MINING

The site is not located within an area affected by coal mining or brine extraction activities.

3.7 RADON

The site is located within an area where less than 1% of homes are above the Action Level for radon gas. Therefore, no radon protection measures are considered necessary.

4 Assessment of Pre Existing Contamination

4.1 POTENTIAL HISTORICAL CONTAMINATION SOURCES

4.1.1 Background

Information on the site setting has been obtained from WSPE&E records, primarily the Ground Contamination Review and Remediation Action Plan report. WSPE&E had access to historical maps, site photographs, and historical site records from Kodak archives and anecdotal information during the production of the earlier report.

The site and surrounding area comprised undeveloped land until the development of the Kirkby Munitions Factory, commencing 1939, on land to the west (beyond Acornfield Road) but encroaching towards the subject site. The Munitions Factory covered 743 acres (now largely the site of the Knowsley Industrial Park) and was used as a filling factory for loading explosives into munitions cases.

The munitions factory was closed in 1946 and Kodak occupied the property in 1949 for small scale manufacturing of sensitising dyes, emulsion addenda and film couplers. The factory went on to produce silver nitrate (commencing 1968) and then non-photographic chemicals including hydroquinone, tecmangam (manganese ammonium sulphate) and benzoquinone (commencing 1969). Production ceased in 2006.

4.1.2 Potentially Contaminative Former Operations

The area of the former Kodak site which now comprises the unit occupied by MRM was formerly the southern section of Kodak's Synchem Building (Building 82), which was utilised for the manufacture of synthetic chemicals from the 1980s. The MRM unit it located within WSPE&E Zone 3, which also supported a former fire-water reservoir which Kodak utilised as a drum store located adjacent to the north of the Synchem Building and sprinkler water tanks with associated pump houses.

The main products manufactured within Building 82 were mainly photographic couplers and stabilisers which utilised large volumes of petroleum-based solvents in the manufacturing process including methanol, heptane, methyl ethyl ketone (MEK), ethyl acetate, toluene and acetone. Chemicals were stored in 205 litre drums in this area in purpose built concrete storage areas, although some storage was reported to have been undertaken on open ground adjacent to the east of the building. Process wastes were directed into the chemical drainage system and generally contained acid, caustic soda, diluted methanol and triethylamine.

Historical issues specifically relating to the MRM site boundary identify that this area of the former Kodak facility was utilised for the disposal of Polycrystalline Diamond [PCD] Powders, solvents and acid chlorides between 1960 and 1971 and in the wider area, subsurface solvent and acid contamination was discovered on the surface of the water table adjacent to a ditch drain in 1987.

4.2 CONTAMINATION STATUS PRIOR TO MRM'S OPERATION

4.2.1 Contamination Conditions Prior to Remediation

WSPE&E's 2007 Ground Contamination Review and Remediation Action Plan report has been reviewed and pertinent information relating to the MRM site summarised below:

- The report is based on information from three phases of investigation on the site:
  - 1993/1994: Aspinwall carried out investigations (with subsequent monitoring) for Kodak.
  - 2003: Conestoga Rovers & Associates (Europe) Ltd (CRA) investigated the site on behalf of Kodak as part of a project to assess environmental liabilities. The investigation was generally restricted to non-operational areas.
  - 2007: Further investigation of the site was carried out by CRA, latterly with the scope being amended and agreed by WSPE&E as a result of IPP's interest in the site.
- The investigations comprised the excavation of numerous trial pits and boreholes within external and internal areas of the former Synchem Building and across the wider area of WSPE&E Zone 3. Several boreholes were progressed within the current MRM site boundary (inside the warehouse building).

- The following contamination issues were identified (commentary is restricted to results obtained from sampling within Building 82 (of which the MRM unit currently forms part) and in the area immediately surrounding the building):
  - Visual/Olfactory Evidence of Contamination:
    - Evidence of the disposal of waste materials was reported in the external areas adjacent to the east of Building 82, extending up to the Kodak boundary with Perimeter Road;
    - Evidence of chemical/solvent odour was identified in the northern section of Building 82;
    - Visual and olfactory evidence of hydrocarbons was recorded in the southern area of Building 82 (currently the MRM unit).
  - Soils:
    - No elevated contaminants were noted in soils in WSPE&E Zone 3.
  - Shallow Groundwater:
    - Elevated chloroethane (74ug/l), dichloroethane (25ug/l) and xylene (250ug/l) were identified in a sample from WSPE&EX56, located in the northern area of Building 82.
  - Deep Groundwater:
    - No contamination was identified in samples abstracted from the single well in this area of the site.
- The report acknowledges that shallow and deep groundwater bodies appear to be acting independently, and that there are no locally known conditions within WSPE&E Zone 3 where a potential pathway (such as deep excavations) to deeper groundwater is thought likely to exist.
- The report acknowledges that there was not (at the time of the report) a risk to human health and no direct linkage to deep groundwater was identified, however a proven pollutant linkage to shallow groundwater was identified.
- Given the pollution linkages proven to be evident across the wider Kodak site, WSPE&E proposed a remediation scheme with different elements for the different areas of the site. No remediation was proposed on area of the site currently occupied by MRM, however the following remediation proposals were identified for the northern section of the former Synchem Building (Building 82, of which the subject site forms part):
  - Installation of shallow soil treatment infrastructure integral to the building; operation of a dual phase vacuum extraction system to address water and shallow soil impacts.

5 Operational Findings and Observations

5.1 ENVIRONMENTAL PERMITS

The site operates under an Environmental Permit (EP) issued by the Environment Agency (reference EPR/CP3690LE, determined 09/04/09). A comprehensive assessment of the site's compliance with the EP lies outside the scope of this assessment; however the following pertinent information is contained within the Permit:

- The site is permitted to carry out the following operations:
  - R13 – Storage of specified wastes pending operations;
  - R3 – Recycling or reclamation of organic substances; and
  - R4 – Recycling/reclamation of metals and metal compounds.
- The limits of site activities are detailed as follows:
  - Treatment of waste consists only of manual sorting, separation, screening, rushing, grinding, pulverisation and blending of wastes into different components for recovery.
  - All waste must be received and treated within a building provided with an impermeable surface and sealed drainage.
- There are to be no point source emissions, to air, water or land.
- There are no emission limits or associated monitoring requirements.
- Fugitive emissions of substances shall not cause pollution; and
- All liquids, whose emission to water or land could cause pollution, shall be provided with secondary containment or other appropriate measures to prevent leakage.
- There are no improvement conditions attached to the site's Environmental Permit.

5.2 HAZARDOUS MATERIALS STORAGE

5.2.1 Underground Storage Tanks (USTs)

No USTs for the bulk storage of hazardous materials/chemicals are reportedly present on-site, and no evidence of such facilities associated with MRM's activities were noted during the walkover.

5.2.2 Above Ground Storage Tanks (ASTs)

An AST is located adjacent to the eastern building elevation. The tank is of an approximate 18,000 litre capacity and is reportedly double skinned. The tank is utilised to store diesel fuel for the process equipment and is located on a good quality concrete pad surrounded by gravel. A drum is manually filled with fuel from the tank, and then dispensed into the process equipment within the warehouse. There is no pipework associated with this facility, and no evidence of hydrocarbon staining was noted surrounding the tank or dispense point.

5.2.3 Other Hazardous Material Storage

No significant quantities of other potentially hazardous materials are reportedly stored/ utilised in on-site processes, and no such materials were noted during the walkover.

5.3 WATER SUPPLY AND USE

Water utilised on site serves general welfare purposes and also serves the site's dust suppression system. All water utilised on-site is understood to be from the mains supply.

5.4 WASTEWATER

Information on the drainage system on the site has been provided by WSP Remediation (drainage plan of the former Kodak site) and an assessment of the chemical drainage system by WSP Development and Transportation (WSP DT). The drains on the MRM site form part of the wider drainage network on the former Kodak site, which are understood to

date from the original construction of the Kodak site in the 1950s. The drainage system on the MRM site and wider former Kodak site comprises three systems:

- chemical drains;
- foul drains; and
- surface water drains.

An extract of the WSP DT drainage assessment report, showing the condition of the chemical drainage system on and around the MRM site is included as Appendix C. The WSP DT report does not include information on all chemical drains on the site and does not include drainage gullies. All of the chemical drains surveyed on the wider former Kodak site are reported to be of ceramic construction.

5.4.1 On-Site Drainage

The CCTV condition survey identified that the chemical drain serving the current office building at the MRM site showed a service defect, although it is understood that chemical drains in this area of the site have now been decommissioned

Roof drainage from the buildings on site and foul drainage from the office building pass to the surface and foul water drains beneath East Avenue and South Street. These drains did not form part of the CCTV condition survey so their integrity is not known.

A box gulley surface water drain was observed inside the MRM building in the area dividing the main process building from the storage area.

It was recommended in the previous report that the internal open surface water drain within the unit is sealed to prevent any waste materials entering the drainage system. This has been done and both ends of the drain sealed to prevent any blockages.

Conclusions/Recommendations: The on-site surface water drainage has been sealed. No other changes have occurred on-site since the previous audit.

5.4.2 Off-Site Drainage

Drainage plans indicate that chemical drains on the wider former Kodak site discharge to central pits, and presumably was historically subject to on-site treatment. Site management have indicated that the chemical drainage system on the site is now routed to the foul system on the wider Kodak site.

It is assumed that responsibility for maintaining drains outside MRM site boundary lies with the landlord or potentially the tenant in the case of tenanted areas.

5.4.3 Regulation Monitoring & Compliance

The site's EP states that there are no emission limits or associated monitoring requirements associated with MRM's operations. Furthermore, there are no improvement conditions attached to the site's Environmental Permit.

5.5 WASTE MANAGEMENT

5.5.1 Waste Acceptance Procedures

Site management reported that a procedure is in place for visual checking the components of the waste materials when they arrive on-site. Some hand segregation is undertaken prior to processing the wastes, however, largely, the onus is placed on the 'material assessment questionnaires' which are completed by the producer of the waste prior to consignment to the site.

The site's EP states that wastes shall only be accepted at the site if:

- It is of a type and quantity listed in Schedule 3 of the site's EP (List of Wastes); and
- It conforms to the description in the documentation supplied by the producer and the holder.

Conclusions/Recommendations: Compliance with using the written procedures for waste acceptance is still being maintained at the site.

5.5.2 Waste Disposal

Quantities of waste materials hand segregated from the waste materials are stored internally within drums; site management report that such wastes are disposed of at appropriately authorised facilities. During the audit these were not named and no documentary evidence (waste transfer notes etc) were inspected.

5.6 EXTERNAL AREAS

External areas surrounding the operational building generally comprise small areas of grass landscaping, tarmac/concrete hardstanding and hardcore. No waste reception or unloading is undertaken externally and generally hardstanding is in acceptable condition.

5.7 POLYCHLORINATED BIPHENYLS (PCBS)

No fixed plant representing potential sources of PCBs was identified on the site.

5.8 ASBESTOS CONTAINING MATERIAL (ACM)

No asbestos containing material was identified during the recent site audit.

5.9 RADIOACTIVE SUBSTANCES

No radioactive substances or radioactive containing waste materials have been identified on the site.

5.10 ENVIRONMENTAL MANAGEMENT

The Operations manager at MRM is largely responsible for environmental issues at the site. Solvent Resource Management Limited (of which MRM are a subsidiary) operate an ISO14001(Ref.52629)certified environmental management system (EMS), which was last issued in April 2010 and is due to expire on 3 m ay 2013.

6 Conclusions and Recommendations

6.1 CONCLUSIONS

6.1.1 Assessment of Soil and Groundwater Contamination Potential

The activities undertaken on the MRM site are generally not considered to have a significant potential to cause soil and groundwater contamination.

Potential pathways by which waste and effluent could impact soil and groundwater quality on the site, together with existing control measures, are shown in the table below.

Potential Contamination Pathways	Control Measures in Place	Comment/ Recommendations
Leakage of diesel fuel from external AST	The diesel tank is provided with integral secondary containment which is likely to contain any leakage from the tank.	The tank should be regularly inspected and maintained in order to ensure ongoing integrity of the facility. (ONGOING ACTION)
Spillage of diesel fuel during hand dispensing and movement of fuel inside the warehouse	The mobile drum is located within secondary containment (similar to a mobile bowser) which should contain any spillages during movement of fuel. Spillages during dispensing are a possibility and given the hard core/soft ground in this area, there could be some impact to the underlying ground if appropriate control measures are not in place.	Drip trays and spill kits should be available for use and staff responsible for dispensing fuel from the AST should be appropriately trained in how to dispense fuel appropriately and manage spillages. Ideally, any area utilised for fuel storage/dispensing should be provided with impermeable hardstanding in order to prevent any spillages from entering the underlying soils. (ONGOING ACTION)
Discharge of effluent (potential future wheel wash effluent) to site drainage system	Some effluent drains both on and off the MRM site are of unknown integrity so there is the potential for leakage from the drainage system	MRM have undertaken an assessment of the drains and gullies on the site, including work on the water drainage system. This should be maintained to ensure no future blockages. (ONGOING ACTION).

Appendix A

WSP

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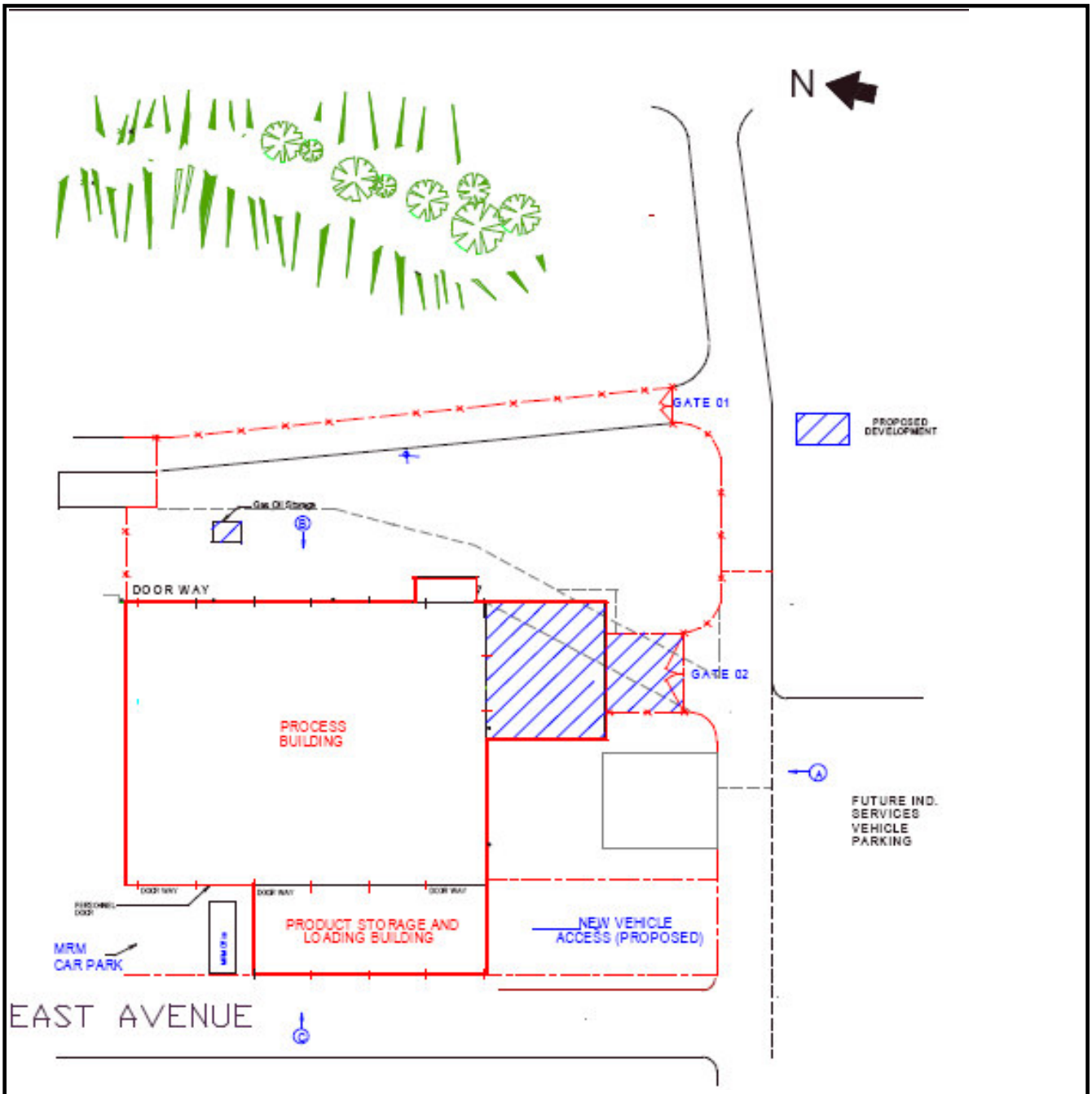
PROJECT NAME

MRM

TITLE

Site Location Plan

SITE BOUNDARY PLAN



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MRM

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Site Boundary Plan

Appendix B

Site Photographs, MRM Audit 2010.

Plate 1: External View

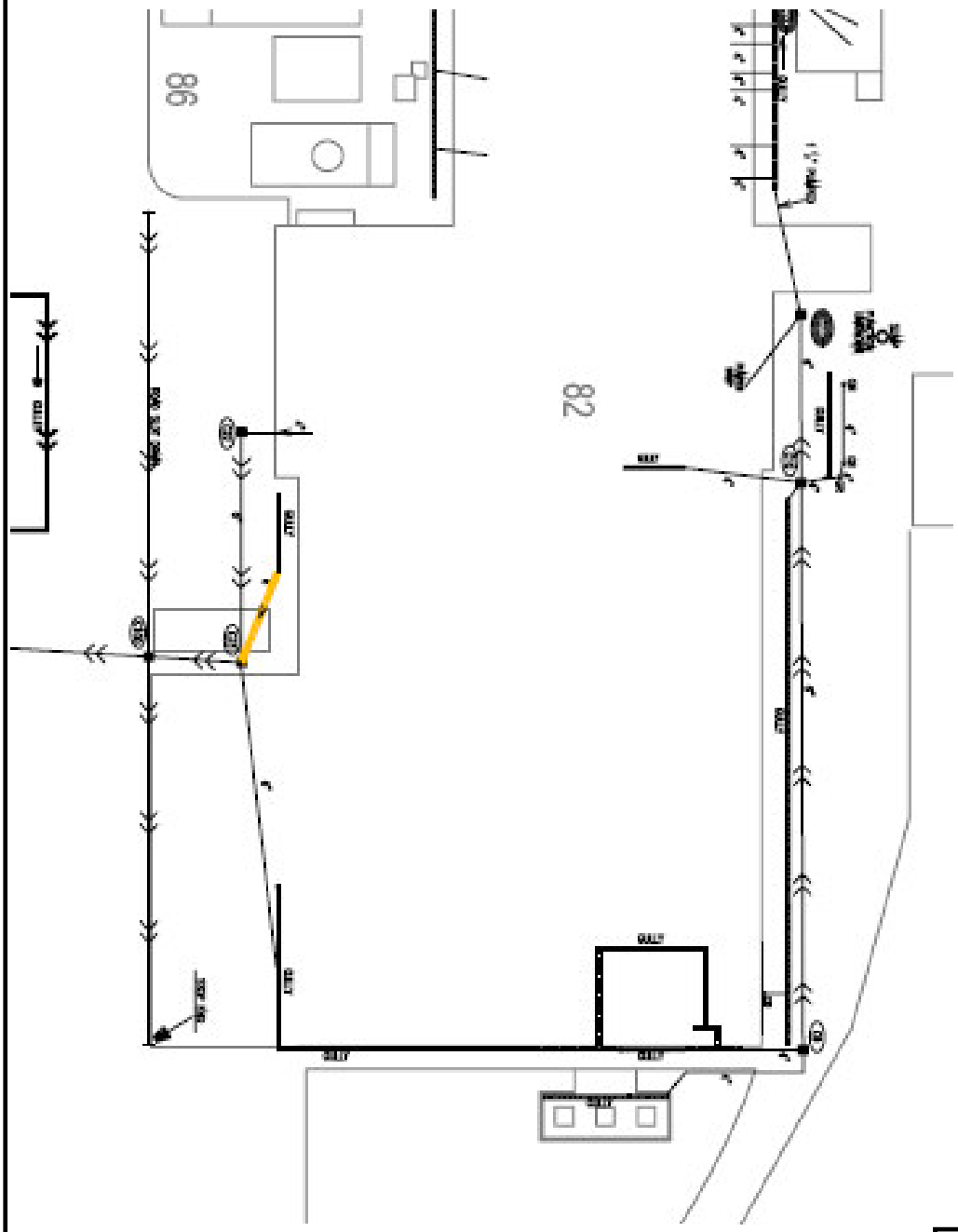
Plate 2: Internal View

Site Photographs, MRM Audit 2010.

Plate 3: Internal View

Plate 4: Above Ground Storage Tank

Appendix C



KEY

PIPES THAT APPEAR TO HAVE NO STRUCTURAL OR SERVICE DEFECTS

PIPES THAT HAVE SERVICE DEFECTS

PIPES THAT HAVE STRUCTURAL DEFECTS

AND

PIPES NOT CONTAINED IN THE DRAINAGE SURVEY INFORMATION

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PROJECT NAME

MRM

TITLE

Chemical Drains Survey

Appendix D

General

WSP Environmental Limited has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from WSP Environmental Limited; a charge may be levied against such approval.

WSP Environmental Limited accepts no responsibility or liability for:

a) the consequences of this document being used for any purpose or project other than for which it was commissioned, and

b) this document to any third party with whom an agreement has not been executed.

Phase I Environmental Audits

The work undertaken to provide the basis of this report comprised a study of available documented information from a variety of sources (including the Client), together with (where appropriate) a brief walk over inspection of the site and meetings and discussions with relevant authorities and other interested parties. The opinions given in this report have been dictated by the finite data on which they are based and are relevant only to the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, WSP Environmental Limited reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed; actual risks can only be assessed following a physical investigation of the site.

Phase II Environmental Audits

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. The objectives of the investigation have been limited to establishing the risks associated with potential human targets, building materials, the environment (including adjacent land), and to surface and groundwater.

The amount of exploratory work and chemical testing undertaken has necessarily been restricted by the short timescale available, and the locations of exploratory holes have been restricted to the areas unoccupied by the building(s) on the site and by buried services. A more comprehensive investigation may be required if the site is to be redeveloped as, in addition to risk assessment, a number of important engineering and environmental issues may need to be resolved.

For these reasons if costs have been included in relation to site remediation these must be considered as tentative only and must, in any event, be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The number of sampling points and the methods of sampling and testing do not preclude the existence of localised "hotspots" of contamination where concentrations may be significantly higher than those actually encountered.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values.

Geo-environmental Investigations

The investigation of the site has been carried out to provide sufficient information concerning the type and degree of contamination, geotechnical characteristics, and ground and groundwater conditions to provide a reasonable assessment of the environmental risks together with engineering and development implications.

If costs have been included in relation to site remediation these must be confirmed by a qualified quantity surveyor.

The exploratory holes undertaken, which investigate only a small volume of the ground in relation to the size of the site can only provide a general indication of site conditions. The opinions provided and recommendations given in this report are based on the ground conditions apparent at the site of each of the exploratory holes. There may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report.

The comments made on groundwater conditions are based on observations made at the time that site work was carried out. It should be noted that groundwater levels will vary owing to seasonal, tidal and weather related effects.

The scope of the investigation was selected on the basis of the specific development proposed by the Client and may be inappropriate to another form of development or scheme.

The risk assessment and opinions provided, inter alia, take in to consideration currently available guidance values relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of any future changes or amendments to these values

Appendix E Corrective Action Plan

CORRECTIVE ACTION PLAN

SITE: **Image Business Park, Kirkby**
CONTRACT # **12121392/002**
PROJECT MANAGER: **Richard Lawless**

Date:

Item	Tenant	Issue	Responsibility	Action	Priority	Target	Completion	Comments
					Low/Med/High	date.	date.	
1	Eastman Chemicals Ltd	Non Hazardous waste is stored externally. It is recommended storage drums be placed under cover to prevent rusting and damage to the containers.	Eastman Chemicals Ltd	WSP to re-audit by Dec-09	Low	01/12/2009		Outstanding
2	Ames Goldsmith Ltd	Written report to EA required to confirm condition of bulk storage secondary containment with action plan for any upgrades required.	Ames Goldsmith Ltd	WSP to re-audit by Dec-09	Low	01/12/2009		Outstanding
3	Ames Goldsmith Ltd	Monitoring of silver within effleunt required to be followed by report identifying potential enviornmental impacts. Required by the EA as part of the PPC permit.	Ames Goldsmith Ltd	WSP to re-audit by Dec-09	Low	01/12/2009		Outstanding
4	Future Industrial Services Ltd	Structural deficincies within the drainage system within Future's lease require repair / upgrade.	Future Industrial Services Ltd	WSP to re-audit by May-09	High	01-May-09		Trade effluent drains on the Future site have been rerouted.
5	Future Industrial Services Ltd	Groundwater monitoring well / remediation wells should be sealed within Future's lease area to prevent creation of preferential migration pathways.	WSP	WSP to undertake programme of sealing covers.	High	01-May-09		All wells now decommissioned.
6	Future Industrial Services Ltd	Integrity of drainage sumps serving the containerised waste storage bays should be investigated and sealed if necessary.	Future Industrial Services Ltd	WSP to re-audit by May-09	Med	01-May-09		Future have verbally confirmed this has been carried out
7	Future Industrial Services Ltd	Survey required of wider drainage network that receives Future's drainage. Repair / upgrades need to be implemented as specified following survey.	Acorn Properties (Kirkby) Ltd	Acorn to instruct requisite surveys & follow-up work	High	01-May-09		Completed.
8	Future Industrial Services Ltd	Improved characterisation of wastes received / disposed by Futures	Future Industrial Services Ltd	WSP to re-audit May-09	High	01-May-09		Future have invested in new analytical capability. Further assessment required to determine acceptance procedures
9	Minerals Resource Management Ltd	Internal open surface water drain should be sealed to prevent waste materials	Minerals Resource Management Ltd	WSP to re-audit Dec-09	Med	01-Dec-09		Completed.
10			Future Industrial Services Ltd	Appropriate secondary containment should be provided for the two tanker off-loading areas, as current measures appear inadequate to deal with any significant loss to ground.	Med			
11			Future Industrial Services Ltd	Operation of the eastern off-loading area appears to be resulting in loss to ground via the adjacent gravel area. Consideration should be given to provision of hardstanding to replace the gravel, or relocating the off-loading area to a more suitable location.	High			
12			Future Industrial Services Ltd	Integrity of all below ground infrastructure should be conducted and repeated as required on a regular basis. Specifically this should cover all surface water drains in the Futures area, all gullies, chemical drains and sumps / interceptors in use.	Med			Requires regular inspections.
13			Future Industrial Services Ltd	Integrity testing should be undertaken on the two underground storage tanks within Zone 4, including all associated below-ground pipework.	Med			Requires regular inspections.
14			Future Industrial Services Ltd	Several surface water drains appear to be at risk of receiving effluent via surface runoff. Specifically SW23, SW94 and SW95 have been identified at risk, although a review of all surface water drains within the vicinity of the Future operations is recommended. All such identified drains should be sealed and replaced as appropriate.	High			
15			Future Industrial Services Ltd	Integrity of the concrete hardstanding within the Zone 3 storage area should be assessed to prevent storage of potentially contaminative materials where the condition is poor.	Med			Requires regular inspections.
16			Future Industrial Services Ltd	All gullies used to collect surface run-off of effluent should be regularly maintained / cleaned to prevent blockages. This was observed to be particularly necessary in the Containerised Pad.	Med			Requires regular inspections.

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Asbestos Refurbishment / Demolition Survey Report

Building K38

IPP (Europe) Ltd

Acornfield Road

Kirkby

L33 7UF

Job No. TSL/3727/24/05/2016

IPP (Europe) Ltd
Image Business Park
Acornfield Road
Kirkby
L33 7UF

Inspector (s): Jagdeep Sahajpal
Varinder Khaira

Date of Survey: 7th – 8th July 2016

Checked and Authorised by: _____

Varinder Singh Khaira (Manager)

Registered in England and Wales
Company No. 5985210
VAT Registration No. - 898337754

CONTENTS

1.0	**Executive Summary**		**1**
2.0	**Inspection Information**		**8**
3.0	**Aim and Purpose of the Refurbishment/Demolition Survey**		**10**
4.0	**Sampling Strategy**		**11**
	4.1	Presumption or identification of ACMs	12
5.0	**Inspection Details**		**13**
6.0	**Risk Assessment**		**15**
	6.1	Explanation of Material Assessment	15
	6.2	Material Assessment Algorithm	16
	6.3	Table of suspected ACMs and their locations	17
	6.4	Material Assessment Records	31
7.0	**Summary**		**152**

APPENDICES **153**

Appendix 1: Asbestos Bulk Analysis Certificate No. ATH/16/07/0080 & 16-24710

Appendix 2: Asbestos Location Site Plans

Appendix 3: Risk Assessment

1.0 Executive Summary

On the 24th May 2016, Trident Surveying Limited was instructed by Mr Tony Field of IPP (Europe) Ltd to undertake an Asbestos Refurbishment/Demolition Survey of Building K38, IPP (Europe) Ltd, Acornfield Road, Kirkby, L33 7UF.

The purpose was to locate, as far as is reasonably practicable, the presence and extent of any suspect Asbestos Containing Materials (ACMs) in the premises.

Presented in this report are the findings of our site observations and sample analysis results. Due to the building being demolished we would recommend removal of all ACM's identified in this report.

Tabled below is a summary of the types and locations of ACMs identified on the Second floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
BK38/003	Second / 72 / Laboratory	Asbestos flange gaskets	3 & 4	3
BK38/004	Second / Throughout	Asbestos cement panels forming the ceiling	5 & 6	3
As BK38/004	Second / 79 / Platform	Asbestos cement debris	7 & 8	3
BK38/005	Second / 72 / Laboratory	Asbestos spray coating to cement ceiling panel	9	3
As BK38/005	Second / 72 / Laboratory	Asbestos spray coating debris on top of shelving unit	10	3
BK38/006	Second / 78 / Misc Section	Asbestos insulation debris on floor	11 & 12	3
As BK38/006	Second / 80 / Dark Room	Asbestos insulation debris on floor	13	3
As BK38/006	Second – Ground / 21 / Service Riser	Asbestos insulation debris, (whole riser is contaminated)	14 - 17	1 - 3
BK38/007	Second / 78 / Misc Section	Asbestos insulating board closer to reinforced steel joist stanchion	18	3
As BK38/007	Second / 37 / Main Stairwell	Asbestos insulating board closer to reinforced steel joist stanchion	19	3
As BK38/007	Second / 80 / Dark room	Asbestos insulating board closer to reinforced steel joist stanchion	-	3
BK38/008	Second / 78 / Misc Section	Asbestos spray coating residue to cement ceiling panels, beams, top of cable trays and ducting	20 & 21	3
BK38/009	Second / 78 / Misc Section	Asbestos spray coating residue and debris to cement ceiling	22 & 23	3

Tabled below is a summary of the types and locations of ACMs identified on the Second floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
BK38/010	Second / 78 / Misc Section	Asbestos flange gaskets to pipework	24	3
BK38/011	Second / 81 / Main Corridor	Asbestos insulation residue to pipework (behind fibreglass insulation)	25	3
BK38/012	Second / 81 / Main Corridor	Asbestos textile flash pads within switch gear	26 & 27	3
As BK38/012	Second / 86 / Fire Exit Stairwell Crawl Space	Asbestos textile flash pads within switch gear	28	3
BK38/013	Second / 72 / Lab	Asbestos spray coating residue/debris to cement ceiling panels and beams	29	3
BK38/014	Second / 81 / Main Corridor	Asbestos spray coating to cement ceiling panels	30	3
As BK38/014	Second - Ground / 28 / Fire Exit Stairwell	Asbestos spray coating to cement ceiling panels and debris to floor, ledges and stairwell	31 - 33	1 - 3
As BK38/014	Second / 89 / Corridor to Fire Exit Stairwell	Asbestos spray coating debris to floor	34	3
As BK38/014	Second / 86 / Fire Exit Stairwell Crawl Space	Asbestos spray coating to ceiling and debris	35 & 36	3
As BK38/014	Second / 83 / Dark Room	Asbestos spray coating to cement ceiling and panels	37	3
BK38/015	Second / 81 / Main Corridor	Asbestos spray coating residue and debris to cement ceiling panels and beams	38	3
BK38/016	Second / 72 / Lab	Asbestos mastic to metal ducting flanges	39	3
BK38/017	Second / 88 / Raw Material Store	Asbestos spray coating residue and debris to cement ceiling panels and beams	40	3
As BK38/017	Second / 85 / Solution Hosing Room	Asbestos spray coating residue and debris to cement ceiling panels and beams	41	3
As BK38/017	Second / 82 / Pre Weight Area and Dark Room	Asbestos spray coating residue and debris to cement ceiling panels and beams	42	3
As BK38/017	Second / 68-77, 80, 82, 84, 89 / Various	Asbestos spray coating residue and debris to cement ceiling panels and beams	-	3

Tabled below is a summary of the types and locations of ACMs identified on the First Floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
As BK38/012	First / 47 / Corridor	Asbestos textile flash pads within electrical boxes	45	2
As BK38/012	First / 54 / Corridor	Asbestos textile flash pads within electrical boxes	46	2
As BK38/012	First / 54 / Corridor (adjacent to Air Ducts)	Asbestos textile flash pads within electrical boxes	47	2
BK38/019	First / 60 / Solution Filtration	Asbestos insulation within discarded MMMF insulation and debris throughout	48 & 49	2
BK38/020	First / 39 / Store	Asbestos cement ceiling panels	50	2
As BK38/020	First / 38 & 40 / Stairwell & Corridor	Asbestos cement ceiling panels	51	2
As BK38/020	First / 41 / Conference Room	Asbestos cement ceiling panels	-	2
As BK38/020	First / 42 / Kitchen	Asbestos cement ceiling panels	-	2
BK38/025	First / 51 / Office	Asbestos paper lining to fibreboard panels above glazing	56	2
BK38/026	First / 51 / Office	Asbestos vinyl floor tiles with bitumen adhesive	57	2
BK38/027	First / 65 / Plant Room	Asbestos flange gasket to low level pipework	58	2
BK38/028	First / 66 / Plant Room Stairwell	Asbestos flange gasket to pipework	59	2
BK38/031	First / 54 / Corridor (adjacent to Air Duct)	Asbestos bitumen gaskets to metal ducting	62	2
BK38/033	First / 43 / Canteen	Asbestos insulating board forming the external walls	63 & 64	2
As BK38/033	First / 43 / Canteen	Asbestos insulating board forming part of the ceiling	65	2
BK38/037	First / 43 / Canteen	Asbestos insulating board along top of wall	66 & 67	2

Tabled below is a summary of the types and locations of ACMs identified on the Ground Floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
As BK38/012	Ground / 26 / Switch Room	Asbestos textile flash pads within electrical boxes	68 & 69	1
As BK38/012	Ground / 09 / Warehouse	Asbestos textile flash pads within electrical boxes	70	1
BK38/032	Ground / 09 / Warehouse	Asbestos cement ceiling panels	71	4
As BK38/032	First / 43 / Canteen	Asbestos cement ceiling panels	-	2
As BK38/032	Ground / 07 / Office	Asbestos cement ceiling panels	72	1
As BK38/032	Ground / 06a / Store	Asbestos cement ceiling panels	-	1
As BK38/032	Ground / 02 / Office Annex	Asbestos cement ceiling panels	-	1
BK38/033	Ground / 09a / Plant Duct Area (beneath canteen)	Asbestos insulating board soffit to underside of canteen	73	1
As BK38/033	Ground / 23 / Female Changing and Toilets	Asbestos insulating board forming the ceiling	74	1
BK38/034	Ground / 09a / Plant Duct Area (beneath canteen)	Asbestos insulating board cladding to beam	75	1
As BK38/034	Ground / 22 / Corridor to Male Changing	Asbestos insulating board cladding to beam	76	1
As BK38/034	Ground / 25 / Male Changing Room and Toilet	Asbestos insulating board cladding to beam behind plasterboard	77	1
BK38/035	Ground / 23 / Female Changing and Toilets	Asbestos insulating board cladding to beam	78	1
As BK38/035	Ground / 24 / Under Stairs Cupboard	Asbestos insulating board forming the ceiling and wall	79	1
BK38/036	Ground / 09 / Warehouse	Asbestos rope seal to north facing skylights	80	5
BK38/038	Ground / 09 / Warehouse	Asbestos insulating board end panels / upstands to sky lights	81 & 82	4

Tabled below is a summary of the types and locations of ACMs identified on the Ground Floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
As BK38/038	Ground / 18 / Calorifier Room	Asbestos wall panels at height	83	1
BK38/41	Ground / 09 / Warehouse	Asbestos flange gaskets to high level pipework with metal casing	87	1
BK38/044	Ground / 34 / Department Managers Office	Asbestos insulation debris to floor	90	1
As BK38/044	Ground / 35 / Secretary's Office	Asbestos insulation debris to floor	91	1
As BK38/044	Ground / 32 / Corridor to offices	Asbestos insulation debris to floor	92	1
As BK38/044	Ground / 34 / Department Managers Office	Asbestos insulation to high level pipework	93 & 94	1
BK38/045	Ground / 03 / Circulation Area	Asbestos cement fascia panel along top of wall	95	1
As BK38/045	Ground / 04 / Ladies Toilet	Asbestos cement fascia panel along top of wall	-	1
BK38/46	Ground / 08 / Label Board Area	Asbestos insulating board above and below window	96 & 97	1
As BK38/046	Ground / 01 / Lobby	Asbestos insulating board above entrance door above suspended ceiling	98	1
As BK38/046	Ground / 01 / Lobby	Asbestos insulating board above suspended ceiling	99	1
As BK38/046	Ground / 02 / Reception	Asbestos insulating board above windows	100 & 101	1
As BK38/046	Ground / 07 / Office	Asbestos insulating board above windows	102	1
As BK38/046	Ground / 06 / Library	Asbestos insulating board above and below window	103	1
BK38/047	Ground / 18 / Calorifier Room	Asbestos residue to pipework from large hot water tank	104	1
BK38/048	Ground / 18 / Calorifier Room	Asbestos residue to large hot water tank	105	1

Tabled below is a summary of the types and locations of ACMs identified on the Ground Floor.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
BK38/050	Ground / 18 / Calorifier Room	Asbestos residue to pipework (steam)	108	1
BK38/P1	Throughout Building	Presumed asbestos packing to downpipe joists	109	-
BK38/P2	Ground – Second / 20 / Lift	No access within lift shaft (presume asbestos material within)	110	-
BK38/P3	Ground / 09 / Warehouse	Asbestos insulating board panelling around ducting	111	1
As BK38/032	Ground / 10 / Workshop	Asbestos cement ceiling panels to bay window	-	1
As BK38/032	Ground / 33 / Fire exit	Asbestos cement ceiling panels	-	1
As BK38/012	Ground / 18 / Calorifier Room	Asbestos textile flash pads within electrical boxes	121	1

It must be noted that there is potential for trace asbestos contamination in the main stairwell (Survey Room No. 36) due to the high level of asbestos insulation contamination on the upper floors and the high probability of transit transfer of this debris due to people traffic. Also the PPE located adjacent to the main doors must be removed as contaminated waste.

Tabled below is a summary of the types and locations of ACMs identified on the Roof.

Sample Ref.	Area containing ACMs (Floor / Survey Room No. / Description)	Description of ACM	Photo No.	Diagram No.
BK38/052	Roof / 67 / Roof level	Asbestos cement end panels to skylights	113	4
As BK38/052	Roof / 92 / Roof level	Asbestos cement panels covering large skylight	114	4
As BK38/004	Roof / 67 / Roof level	Asbestos cement roofing panels to skylights	115 & 116	4
As BK38/004	Roof / 93 / Lift machinery room	Asbestos cement ceiling panels	117	4
As BK38/004	Roof / 21 / Service riser	Asbestos cement ceiling panels	118	4
As BK38/004	Roof / 64 / Air duct	Asbestos cement ceiling panels	119	4
As BK38/004	Roof / 67 / Roof level	Asbestos cement pipe and cowl	120	4

Whilst the Refurbishment/Demolition Survey is invasive by nature, our experience of buildings leads us to conclude that ACM's are frequently concealed within the fabric of the building.

During this Refurbishment/Demolition Survey, all efforts were made to identify all ACM's and investigate every void. However it is not reasonably practicable to state that the ACM's identified in this report are the only ACM's within the building, without demolishing the complete structure.

The extents of the ACMs identified are approximations only and we would advise a site visit to ascertain the exact extent of each ACM identified in this report.

On commencement of asbestos removal and refurbishment / demolition works, it is recommend that arrangements are made between the client, the asbestos consultant, the principal contractor, the demolition contractor and the licensed asbestos removal contractor (all relevant interested parties) to allow inspections into the areas subject to access limitations.

2.0 Inspection Information

Job No.:	TSL/3727/24/05/2016
Asbestos Bulk Analysis Certificate No.:	ATH/16/07/0080
Inspection Date:	7th & 8th July 2016
Completion Date of Report:	19th July 2016
Inspectors:	Jagdeep Sahajpal and Varinder Khaira
Type of Inspection:	Asbestos Refurbishment/Demolition Survey
Premises Inspected:	Building K38 IPP (Europe) Ltd Acornfield Road Kirkby L33 7UF
Client Details:	IPP (Europe) Ltd Image Business Park Acornfield Road Kirkby L33 7UF

Variation or deviations from 'Asbestos: The Survey Guide':
No variations or deviations from the inspection method.
Where buildings remain under occupation, such as in project specific refurbishment or demolition surveys in occupied properties, it will have been necessary to reduce sampling frequency and levels of intrusion significantly or to adopt discreet sampling regimes more sensitive to the occupant's needs, health and demeanour. It is Trident Surveying Ltd policy not to sample or carry out destructive intrusion in occupied rooms, therefore when areas are not vacated by their occupants or where the occupants were unwilling or unable to leave the surveyors alone to carry out sampling or intrusion this will not be carried out.

Agreed excluded areas:
All areas outside the scope of the project works as specified by the client were excluded from the remit of this survey.
Any imposed limitations are critical in influencing the extent and type of intrusive investigation available to the surveyors and hence the accuracy of the report. This would be highlighted and agreed as far as possible with the client either ahead of work commencing or where this did not prove possible, on site and to be documented within this report.
Trident Surveying cannot accept responsibility for the failure to detect the presence of asbestos in voids other than those identified as being in the specified scope and extent of the survey and able to be opened up during the survey with agreed means of access on the day, or any area which was not evident due to insufficient information being provided by the client regarding the structure at the time of the survey.

Inaccessible / Limited Areas (presume to contain Asbestiforms):

- Whilst the surveyors made every effort, Trident cannot guarantee that all asbestos containing materials have been identified, or that survey results are definitive. There is a possibility that ACM's may remain unidentified in sealed locations, it is strongly suggested that future soft strip and demolition activities are designed to allow for this potential.
- No access within lift shaft.
- Limited access within fire exit stairwell and service riser.
- No access within any concrete floor voids or underground service ducts.
- No access above or behind any sampled or presumed samples as this would violate CAR 2012, Regulation 16 (Duty to prevent or reduce the spread of asbestos).
- No access within sealed boilers, plant machinery or pipe-work.
- Access to any live electrical installations by our surveyors is prohibited under the Electricity at Work Regulations. Our duty of care requires us to presume that installations are live. If access is required to electrical switchgear, our surveyors will need suitably qualified and competent electrical engineers as part of a full permit to work system to enable access for inspection of components. Therefore we must presume that these electrical installations contain asbestos materials such as textile or cement flash guards.
- See Appendix 3 for more information.

Scenarios leading to intrusion restriction may [by way of example] include (but are not limited to) security integrity of the building envelope, significant damage to decorative finishes, risk to the structural integrity of the building (e.g. roofs), occupation within adjacent areas. Investigations undertaken in such situations may, through circumstantial restrictions, be incomplete. Further investigation works may be required once unrestricted access can be offered and before the commencement of any works to be undertaken by the client.

Until the inspection has been conducted, it is our strong recommendation that no refurbishment or repair works be undertaken within limited or inaccessible areas. It is the client's responsibility to arrange access to such areas and Trident Surveying Ltd accepts no liability for asbestos materials subsequently uncovered in areas that are not inspected.

Fire doors may contain an inner sandwich layer or strips of asbestos, which can often only be viewed when the door is completely disassembled or cored. Further investigations will be required of the fire doors that are in good condition and have not been previously been identified as undertaking any intrusive inspection on these would damage their integrity.

Where samples of floor coverings were collected, samples of the bitumen adhesive were also sampled. Where analysis of these samples has shown there to be an asbestos containing adhesive beneath the vinyl tiles, it can be presumed that beneath all floor coverings there is a consistent asbestos adhesive containing Chrysotile (White) asbestos.

Asbestos flange gaskets or CAF (compressed asbestos fibre) gaskets are not usually visible until the pipework is dismantled. All gaskets are usually presumed to contain asbestos unless stated not to and to be disposed of as a Special Waste when replaced during the course of any refurbishment / demolition works.

Due to the sealed nature of the buildings on site and there being no up to date plans available, there is a possibility that some unknown or sealed areas were not accessed during the survey and ongoing works should be designed to allow for this risk.

Prior to demolition, refurbishment or any other works that might disturb the asbestos materials identified, they should be removed. It is strongly suggested that a site specific method statement be produced in order to facilitate the removal of the asbestos. It is advised that a duty holder be appointed to coordinate and oversee the management of asbestos at the site.

3.0 Aim and Purpose of the Refurbishment/Demolition Survey

A **refurbishment and demolition** survey is needed before any refurbishment or demolition work is carried out. This type of survey is used to locate and describe, as far as reasonably practicable, all ACMs in the area where the refurbishment work will take place or in the whole building if demolition is planned. The survey will be fully intrusive and involve destructive inspection, as necessary, to gain access to all areas, including those that may be difficult to reach. A refurbishment and demolition survey may also be required in other circumstances, e.g. when more intrusive maintenance and repair work will be carried out or for plant removal or dismantling.

The inspection is designed to be used as a primary basis for tendering the removal of ACMs from the building prior to demolition or a major refurbishment so the inspection does not have to assess the condition of the asbestos, other than to note areas of damage or where additional asbestos debris may be expected to be present. **Some areas may be inaccessible due to risk of damaging structural integrity of premises; in such circumstances it must be presumed that ACMs could be present.**

There is a specific requirement in CAR 2012 (regulation 7) for all ACMs to be removed as far as reasonably practicable before major refurbishment or final demolition. Removing ACMs is also appropriate in other smaller refurbishment situations which involve structural or layout changes to buildings (e.g. removal of partitions, walls, units etc). Under CDM, the survey information should be used to help in the tendering process for removal of ACMs from the building before work starts. The survey report should be supplied by the client to designers and contractors who may be bidding for the work, so that the asbestos risks can be addressed. However, where the asbestos removal may not take place for some time, the ACMs' condition will need to be assessed and the materials managed.

Refurbishment and demolition surveys are intended to locate all the asbestos in the building (or the relevant part), as far as reasonably practicable. It is a disruptive and fully intrusive survey which may need to penetrate all parts of the building structure. Aggressive inspection techniques will be needed to lift carpets and tiles, break through walls, ceilings, cladding and partitions, and open up floors. In these situations, controls should be put in place to prevent the spread of debris, which may include asbestos. Refurbishment and demolition surveys should only be conducted in unoccupied areas to minimise risks to the public or employees on the premises. Ideally, the building should not be in service and all furnishings removed.
For minor refurbishment, this would only apply to the room involved or even part of the room where the work is small and the room large. In these situations, there should be effective isolation of the survey area (e.g. full floor to ceiling partition), and furnishings should be removed as far as possible or protected using sheeting. The 'surveyed' area must be shown to be fit for reoccupation before people move back in. This will require a thorough visual inspection and, if appropriate (e.g. where there has been significant destruction), reassurance air sampling with disturbance. Under no circumstances should staff remain in rooms or areas of buildings when intrusive sampling is performed.

There may be some circumstances where the building is still 'occupied' (i.e. in use) at the time a demolition' survey is carried out. For example in the educational sector, care homes etc, refurbishment/demolition surveys may be conducted in schools or colleges during one closure period (e.g. holidays) and the work not undertaken until the next holiday period. Also, a demolition survey maybe conducted to establish the economic future or viability of a building(s). The survey results would determine the outcome. In such situations, the 'survey' will need extremely careful managing with personnel and equipment/furnishings being decanted and protected (as necessary), while the survey progresses through the building. Again, there should be effective isolation of the survey areas and the 'surveyed' area must be shown to be fit for reoccupation before personnel reoccupy.

4.0 Sampling Strategy

After a visual examination to assess any apparent areas of different material, samples of about 3-5 cm^2 area and through the entire depth of the ACM should normally be taken with the aim of collecting one or more samples which are representative of the whole material. Sampling should not be carried out where there is an electrical hazard or if it will damage the critical integrity of a roof, gutter, pipe etc.

The sampling strategy will be based on the types of ACMs present. In general, for homogeneous manufactured products containing asbestos, it can be assumed that the asbestos is uniformly distributed throughout the material, and one or two samples will suffice for example boards, sheets, cement pipes and textiles. Insulation materials are generally less homogeneous as they were applied on site and their composition depended on the availability of supply.

Subsequent repairs and patching may add to this variability and increases the number of samples required. In addition, substantial over spray contamination and debris may have been produced. Samples of materials found to contain asbestos, other similar homogenous materials used in the same way in the building presumed or strongly presumed to contain asbestos can be cross referenced in this report.
However, for non-homogeneous materials for example textured coatings, and for some presumed non-asbestos materials, sufficient sampling may often be needed for the surveyor to make an assessment of whether asbestos is present or not and to reduce the possibility of false negatives, which may lead to uncontrolled exposures.

It must be noted that sampling of ACM's may cause some minor damage to the fabric of the building and although sampling locations will be made safe, redecoration will not be carried out. All sample locations will be photographed and all sample photographs will be included in the report.

The areas to be sampled inside buildings should be as far as possible be unoccupied. Sampling should not be undertaken in normally occupied areas, but if in constant use, periods of minimal occupation should be chosen. The nature of the area, the likely release of dust and the proximity and nature of future work will dictate the precautions required to prevent the spread of asbestos. Entry of other people to any sampling area should be restricted or suitable warnings posted.

Inspectors will follow the guidance on bulk sampling in 'Asbestos: The Survey Guide' when deciding on the sampling strategy. All samples will be analysed by a UKAS Accredited Laboratory (ISO 017025) using methods based on HSG 248 (see Appendix 1 for a copy of the test certificate).

4.1 Presumption or identification of ACMs

The duty to manage requirement in 'CAR 2012 Regulation 4' allows materials to be 'presumed' to contain asbestos. Therefore in the asbestos survey, materials can be presumed to contain asbestos. There are two levels of 'presumption':

Strong presumption: in this case the material looks as if it is an ACM, or that it might contain asbestos. This conclusion can be reached through visual inspection alone by an experienced, well-trained surveyor, familiar with the range of asbestos products. Examples of 'strong presumption' would be:

- Where laboratory analysis has confirmed the presence of asbestos in a similar construction material;
- Materials in which asbestos is known to have been commonly used in the manufactured product at the time of installation (e.g. corrugated cement roof and wall sheeting, cement gutters and drainpipes, cement water tanks, ceiling tiles, insulating boards);
- Materials which have the appearance of asbestos but a sample has not been taken, e.g. thermal insulation on a pipe where fibres are clearly visible.

Presumed: where a material/product is presumed to contain asbestos due to insufficient evidence (e.g. no analysis) to confirm that it is asbestos free or where the dutyholder/surveyor decides that it is easier under the planned management arrangements to presume certain materials contain asbestos. Many non-asbestos materials will also be presumed to contain asbestos using this system. There is a further default situation where materials must be presumed to contain asbestos. This applies to areas which cannot be accessed or inspected. In this situation **any area not accessed or inspected must be presumed to contain asbestos, unless there is strong evidence to support that it does not.**

Materials where no asbestos fibres are visible but asbestos is known to have been commonly used in the manufactured product at the time of installation (e.g. floor tiles, ceiling tiles and insulating boards) will be presumed to contain asbestos. A reasoned argument to suggest that a material does not contain asbestos would be:

- Non-asbestos substitute materials were specified in the original architect's/quantity surveyor's plans or in subsequent refurbishments;
- The product was very unlikely to contain asbestos or have asbestos added (e.g. wallpaper, plasterboard, wood, glass, metal, stone etc)
- Post-1985 construction (for amphibole asbestos-containing materials such as asbestos insulation board)
- Post 1999 construction (some Chrysotile products were prohibited in 1992 and nearly all were prohibited in 1999).

The conclusion that ACMs are not present cannot always be easily reached. The regulations require that reasonable steps are taken. It may in some circumstances not be reasonable to decide wholly on age and/or original specifications, which may have been circumvented during the construction of the building. There are also examples of sub-standard removal practice leaving asbestos-containing debris and residues, and areas where asbestos has been removed previously will need to be inspected.

5.0 Inspection Details

All areas of the premises were inspected with the exception of any areas listed in the survey information and where the act of sampling would endanger the inspector or affect the functional integrity of the item concerned.

Safety and Access Limitations

- Access will be made to all voids and risers only on completion of a risk assessment carried out by the inspector. Where no access is made due to perceived risk to our staff or those occupying the building, the inspector will make comments within the report.
- Lofts and roof voids will be accessed only if safe to do so. Loft and roof voids will only be accessed if the inspector can walk upright within and there are clear walkways or boarded out.
- Access will be limited where it is the inspector cannot proceed without disturbing any suspect asbestos materials. This will be commented within the report by the inspector.
- Access to floor voids and service ducts will be made if there is no risk of disturbing suspect materials. Where access is unavailable then this area will be presumed to contain asbestos.
- Access within plant and machinery is excluded within the inspection unless specifically requested.
- Access to lifts and hoists will are excluded if they are still in commission or are unsafe to access. Motor rooms will be inspected away from any working parts.
- Electrical gear will not be accessed unless it is isolated and confirmed by a qualified and competent person. If not accessed then the inspector will presume these electrical apparatus contain asbestos.
- Access will be made to all external areas including walls, canopies roof areas and covered walkways. Access to heights of max 3m will be made from step ladders and ladders. Access above these levels will be discussed and organised before inspection is carried out. Work on scaffolds will only be carried out once it has been passed by a qualified and competent person.
- No access will be made onto pitched and fragile roofs. Flat roofs without safe handrails or edge protection will not be accessed or will be accessed but no nearer than 1m from any edge.
- Access to underground pipe services either under structures or elsewhere on any part of the site is beyond the scope of a Refurbishment/Demolition Survey.
- Where asbestos contamination or other hazards are likely in voids or confined spaces, then access will be minimal to avoid potential contamination or personal risk. Contaminated areas will be detailed in the report including areas of limitations.
- Damage to decorative finishes will occur and Trident Surveying accepts no liability in this issue.
- During a Refurbishment/Demolition Survey, the buildings integrity may be affected. Trident Surveying Ltd accepts no liability in this issue.

Every effort has been made to identify all asbestos materials so far as was reasonably practical to do so within the scope of the inspection and the attached report. Methods used to carry out the inspection were agreed with the client prior to any works being commenced.

The Survey Room No. refers to the numbered room/areas identified on the site sketch plans. Copies of the site sketch plans are in Appendix 2 of this report.

5.0 Inspection Details cont…

Inspection techniques used involves trained and experienced inspectors using the combined approach with regard to visual examination and necessary bulk sampling. It is always possible after an inspection that asbestos based materials of one sort or another may remain in the property or area covered by that inspection, this could be due to various reasons:

- Asbestos materials existing within areas not specifically covered by this report are therefore outside the scope of the inspection.
- Materials may be hidden or obscured by other asbestos containing items i.e. paint, over boarding etc... where this is the case then its detection will be impaired.
- Asbestos may well be hidden as part of the structure to a building and not visible until the structure is dismantled at a later date.
- Debris from previous asbestos removal projects may well be present in some areas; general asbestos debris does not form part of this inspection however all good intentions are made for its discovery.
- Where an area has been previously stripped of asbestos i.e. plant rooms, ducts etc. and new coverings added, it must be pointed out that asbestos removal techniques have improved steadily over the years since its introduction. Most notably would be the Control of Asbestos at Work Regulations (1987) or other similar subsequent Regulations laying down certain enforceable guidelines. Asbestos removal prior to this regulation would not be of today's standard and therefore debris may be present below new coverings.
- This inspection will detail all areas accessed and all samples taken, where any area is not covered by this inspection it will be due to No Access for one reason or other i.e. working operatives, sensitive location or just simply no access. It may have been necessary for the limits of the inspector's authority to be confirmed prior to the inspection.
- Access for the inspection may be restricted for many reasons beyond our control such as height, inconvenience to others, immovable obstacles or confined space. Where electrical equipment is present and presumed in the way of the inspection no access will be attempted until proof of its safe state is given. Our operatives have duty of care under the Health and Safety at Work act (1974) for both themselves and others.
- In the building where asbestos has been located and it is clear that not all areas have been investigated, any materials that is found to be suspicious and not detailed as part of the inspection should be treated with caution and sampled accordingly.
- Certain materials contain asbestos to varying degrees and some may be less densely contaminated at certain locations (Textured coatings for example). Where this is the case the sample taken may not be representative of the whole product throughout.
- Where an inspection is carried out under the guidance of the owner of the property, or his representative, then the inspection will be as per his instructions and guidance at that time.
- Trident Surveying Ltd cannot accept any liability for the loss, injury, death, damage or penalty unless such claims emanate from negligent advice contained within this report.
- Trident Surveying Ltd cannot guarantee to find all asbestos within a building and the client must accept that no responsibility will be accepted by Trident Surveying Ltd in respect to any loss (cost of removal, remediation, delay, claim or any other type of loss) whatsoever regarding additional suspect asbestos being located at a later date. Trident Surveying Ltd will attend site to investigate any anomaly within a reasonable time period of its discovery, and will update records and re-issue the report accordingly if changes to the content are warranted.

6.0 Risk Assessment

No condition assessment is normally necessary for refurbishment and demolition surveys but where the period between survey and the event is significant, e.g. more than 3 months, then a material assessment has to be conducted and interim management arrangements put in place. In this report the material assessment will be included and it will be the client's decision to implement the management plan.

The method of risk assessment is based on:

- The potential of each ACM found to release airborne fibres (i.e. the Material Assessment)
- The human risk factors (i.e. the Priority Assessment)

A Management Plan is then formulated by combining the results of the Material and Priority Assessments.

6.1 Explanation of Material Assessment

The material assessment is an assessment of the condition of the ACM (or presumed ACM) and the likelihood of it releasing fibres in the event of it being disturbed in some way.

This assessment identifies the materials, which will most readily release airborne fibres if disturbed; however, there are other factors to take into account when prioritising action

'Asbestos: The Survey Guide' recommends the use of an algorithm to carry out the material assessment. The algorithm is a numerical way of taking into account the several influencing factors, where each factor is given a score, which are then totalled to give the final material assessment score.

The Material Assessment Algorithm in 'Asbestos: The Survey Guide' considers five parameters that determine the risk from an ACM, that is, its ability to release fibres if disturbed.

These five parameters used to determine the risk from an ACM are:

- Accessibility;
- Asbestos Product Type;
- Surface Treatment;
- Condition of the ACM;
- Asbestos Type.

The final Material Assessment Score is then allocated a category as follows:

- Materials with a score of 10 or more should be regarded as a **high risk** with a significant potential to release fibres if disturbed;
- Materials with a score between 7 and 9 should be regarded as a **medium risk;**
- Materials with a score between 5 and 6 should be regarded as a **low risk;**
- Materials with a score of 4 or less are regarded as a **very low risk**.

If removal works are to be carried out within the three months then the Asbestos Containing Materials in the table will be highlighted in **Red** and the final assessment score should be disregarded.

6.2 Material Algorithm

Accessibility

Score	Examples of scores
0	Usually inaccessible or usually not accessed/visited
1	Occasionally visited/accessed
2	Easily visited/accessed
3	Routinely visited/accessed

Product Type (or debris from product)

Score	Examples of scores
1	Asbestos-reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi-rigid paints or decorative finishes etc) and asbestos cement.
2	Asbestos insulating board (AIB), millboards, other low-density insulation boards, asbestos textiles, gaskets, ropes and woven textiles, asbestos paper and felt.
3	Thermal insulation (e.g. pipe and boiler lagging), sprayed asbestos, loose asbestos, asbestos mattresses and packing.

Extent of damage/deterioration

Score	Examples of scores
0	Good condition: no visible damage.
1	Low damage: a few scratches or surface marks; broken edges on boards, tiles etc.
2	Medium damage: significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres.
3	High damage or delamination of materials, sprays and thermal insulation. Visible asbestos debris.

Surface treatment

Score	Examples of scores
0	Composite materials containing asbestos: reinforced plastics, resins, vinyl tiles.
1	Enclosed sprays and lagging, AIB (with exposed face painted or encapsulated), asbestos cement sheets etc.
2	Unsealed AIB, or encapsulated lagging and sprays.
3	Unsealed lagging and sprays.

Asbestos Type

Score	Examples of scores
NADIS	No Asbestiforms Detected In Sample
1	Chrysotile.
2	Amphibole asbestos excluding Crocidolite.
3	Crocidolite.

6.3 Table of suspected ACMs and their locations on Second Floor - Office Block

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/001	Second / 72 / Laboratory	Insulating board lining to Fume cupboards	3 No.	ID	-	-	-	NADIS	-	1
BK38/002	Second / 72 / Laboratory	Bitumen pads to underside of sink	4 sinks	ID	-	-	-	NADIS	-	2
BK38/003	Second / 72 / Laboratory	Flange gaskets	>10 No.	ID	2	1	2	1	6	3 & 4
BK38/004	Second / Throughout	Cement panels forming the ceiling	1050 m^2	ID	1	2	1	1	5	5 & 6
As BK38/004	Second / 79 / Platform	Cement debris	5 m^2	SP	1	3	1	1	6	7 & 8
BK38/005	Second / 72 / Laboratory	Spray coating to cement ceiling panel	2 m^2	ID	3	3	3	2	11	9
As BK38/005	Second / 72 / Laboratory	Sprayed coating debris on top of shelving unit	<0.5 m^2	SP	3	3	2	2	9	10
BK38/006	Second / 78 / Misc Section	Insulation debris on floor	50 m^2	ID	3	3	3	2 & 1	11	11 & 12

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Second Floor – Office Block

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/006	Second / 80 / Dark Room	Insulation debris on floor	20 m^2	SP	3	3	3	2 & 1	11	13
As BK38/006	Second – Ground / 21 / Service Riser	Insulation debris, (whole riser is contaminated)	NQ	SP	3	3	3	2 & 1	11	14 - 17
BK38/007	Second / 78 / Misc Section	Insulating board closer to reinforced steel joist stanchion	3 No.	ID	2	2	2	2 & 1	8	18
As BK38/007	Second / 37 / Main Stairwell	Insulating board closer to reinforced steel joist stanchion	2 No.	SP	2	1	1	2 & 1	6	19
As BK38/007	Second / 80 / Dark room	Insulating board closer to reinforced steel joist stanchion	1 No.	SP	2	1	1	2 & 1	6	-
BK38/008	Second / 78 / Misc Section	Spray coating residue to cement ceiling panels, beams, top of cable trays and ducting	NQ	ID	3	3	3	2	11	20 & 21
BK38/009	Second / 78 / Misc Section	Spray coating residue and debris to cement ceiling	NQ	ID	3	3	3	2 & 1	11	22 & 23
BK38/010	Second / 78 / Misc Section	Flange gaskets to pipework	8 No.	ID	2	1	1	1	5	24

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
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Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/011	Second / 81 / Main Corridor	Insulation residue to pipework (behind fibreglass insulation)	50 m	ID	3	2	3	2 & 1	10	25
BK38/012	Second / 81 / Main Corridor	Textile flash pads within switch gear	NQ	ID	2	1	1	1	5	26 & 27
As BK38/012	Second / 86 / Fire Exit Stairwell Crawl Space	Textile flash pads within switch gear	NQ	SP	2	1	1	1	5	28
BK38/013	Second / 72 / Lab	Spray coating residue/debris to cement ceiling panels and beams	NQ	ID	3	1	2	2	8	29
BK38/014	Second / 81 / Main Corridor	Spray coating to cement ceiling panels	16 m^2	ID	3	1	2	2	8	30
As BK38/014	Second - Ground / 28 / Fire Exit Stairwell	Spray coating to cement ceiling panels and debris to floor, ledges and stairwell	12 m^2 per floor	ID	3	3	3	2	11	31 - 33
As BK38/014	Second / 89 / Corridor to Fire Exit Stairwell	Spray coating debris to floors	10 m^2	SP	3	3	3	2	11	34
As BK38/014	Second / 86 / Fire Exit Stairwell Crawl Space	Spray coating to ceiling and debris	8 m^2	SP	3	3	3	2	11	35 & 36

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
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6.3 Table of suspected ACMs and their locations on Second Floor – Office Block

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/014	Second / 83 / Dark Room	Spray coating to cement ceiling and panels	16 m^2	SP	3	3	3	2	11	37
BK38/015	Second / 81 / Main Corridor	Spray coating residue and debris to cement ceiling panels and beams	30 m^2	ID	3	1	2	2	8	38
BK38/016	Second / 72 / Lab	Mastics to metal ducting flanges	>30 No.	ID	1	1	0	1	3	39
BK38/017	Second / 88 / Raw Material Store	Spray coating residue and debris to cement ceiling panels and beams	NQ	ID	3	1	2	2 & 1	8	40
As BK38/017	Second / 85 / Solution Hosing Room	Spray coating residue and debris to cement ceiling panels and beams	NQ	SP	3	1	2	2 & 1	8	41
As BK38/017	Second / 82 / Pre Weight Area and Dark Room	Spray coating residue and debris to cement ceiling panels and beams	NQ	SP	3	1	2	2 & 1	8	42
As BK38/017	Second / 68-77, 80, 82, 84, 89 / Various	Spray coating residue and debris to cement ceiling panels and beams	NQ	SP	3	1	2	2 & 1	8	-
BK38/018	Second / 88 / Solution Hosing Room	Insulating board surround to sky light and closers to ceilings	20 m^2	ID	-	-	-	NADIS	-	43 & 44

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on First Floor – Office Block

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/012	First / 47 / Corridor	Textile flash pads within electrical boxes	2 No.	SP	2	1	1	1	6	45
As BK38/012	First / 54 / Corridor	Textile flash pads within electrical boxes	4 No.	SP	2	1	1	1	6	46
As BK38/012	First / 54 / Corridor (adjacent to Air Ducts)	Textile flash pads within electrical boxes	2 No.	SP	2	1	1	1	6	47
BK38/019	First / 60 / Solution Filtration	Insulation within discarded MMMF insulation and debris throughout	30 m^2	ID	3	3	3	2 & 1	11	48 & 49
BK38/020	First / 39 / Store	Cement ceiling panels	6 m^2	ID	1	1	1	1	4	50
As BK38/020	First / 38 & 40 / Stairwell & Corridor	Cement ceiling panels	12 m^2	SP	1	1	1	1	4	51
As BK38/020	First / 41 / Conference Room	Cement ceiling panels	50 m^2	SP	1	1	1	1	4	-
As BK38/020	First / 42 / Kitchen	Cement ceiling panels	8 m^2	SP	1	1	1	1	4	-

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on First Floor – Office Block

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/021	First / 47 / Corridor	Insulating board firebreak above metal partition wall within offices	30 m^2	ID	-	-	-	NADIS	-	52
BK38/022	First / 54 / Corridor (adjacent to Air Duct)	Residue to pipework beneath MMMF insulation	>30 m	ID	-	-	-	NADIS	-	53
BK38/023	First / 51 / Office	Residue to pipework beneath MMMF insulation	30 m	ID	-	-	-	NADIS	-	54
BK38/024	First / 63 / Male Toilet	Insulating board wall surround to metal duct	3 m^2	ID	-	-	-	NADIS	-	55
As BK38/024	First / 62 / Switch Room	Insulating board wall surround to metal duct	3 m^2	SP	-	-	-	NADIS	-	-
BK38/025	First / 51 / Office	Paper lining to fibreboard panels above glazing	9 m^2	ID	2	1	1	1	5	56
BK38/026	First / 51 / Office	Vinyl floor tiles with bitumen adhesive	16 m^2	ID	1	1	0	1	3	57
BK38/027	First / 65 / Plant Room	Flange gasket to low level pipework	2 No.	ID	2	1	1	1	5	58

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on First Floor – Office Block & Warehouse

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/028	First / 66 / Plant Room Stairwell	Flange gasket to pipework	NQ	ID	2	1	1	1	5	59
BK38/029	First / 66 / Plant Room Stairwell	Insulating board cladding to reinforced steel joists	30 Ln m	ID	-	-	-	NADIS	-	60
BK38/030	First / 54 / Corridor to Lift	Insulation debris on floor	20 m^2	ID	-	-	-	NADIS	-	61
BK38/031	First / 54 / Corridor (adjacent to Air Duct)	Bitumen gaskets to metal ducting	>10 No.	ID	2	1	1	1	5	62
BK38/033	First / 43 / Canteen	Insulating board forming the external walls	35 m^2	ID	2	2	1	1	5	63 & 64
As BK38/033	First / 43 / Canteen	Insulating board forming part of the ceiling	8 m^2	SP	2	1	1	1	5	65
BK38/037	First / 43 / Canteen	Insulating board along top of wall	18 m^2	ID	2	2	2	2 & 1	8	66 & 67
As BK38/012	Ground / 26 / Switch Room	Textile flash pads within electrical boxes	NQ	SP	2	1	1	1	5	68 & 69

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor - Warehouse

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/012	Ground / 09 / Warehouse	Textile flash pads within electrical boxes	2 No.	SP	2	1	1	1	5	70
BK38/032	Ground / 09 / Warehouse	Cement ceiling panels	> 4500 m^2	ID	1	1	1	1	4	71
As BK38/032	First / 43 / Canteen	Cement ceiling panels	80 m^2	SP	1	1	1	1	4	-
As BK38/032	Ground / 07 / Office	Cement ceiling panels	8 m^2	SP	1	1	1	1	4	72
As BK38/032	Ground / 06a / Store	Cement ceiling panels	3 m^2	SP	1	1	1	1	4	-
As BK38/032	Ground / 02 / Office Annex	Cement ceiling panels	9 m^2	SP	1	1	1	1	4	-
BK38/033	Ground / 09a / Plant Duct Area (beneath canteen)	Cement panel soffit to underside of canteen	9 m^2	ID	1	2	1	1	5	73
As BK38/033	Ground / 23 / Female Changing and Toilets	Cement panels forming the ceiling	55 m^2	SP	1	1	1	1	4	74

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor -Warehouse

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/034	Ground / 09a / Plant Duct Area (beneath canteen)	Insulating board cladding to beam	8 Ln m	ID	2	2	2	2 & 1	8	75
As BK38/034	Ground / 22 / Corridor to Male Changing	Insulating board cladding to beam	6 Ln m	SP	2	2	2	2 & 1	8	76
As BK38/034	Ground / 25 / Male Changing Room and Toilet	Insulating board cladding to beam behind plasterboard	4 Ln m	SP	2	0	1	2 & 1	5	77
BK38/035	Ground / 23 / Female Changing and Toilets	Insulating board cladding to beam	50 m^2	ID	2	1	1	2 & 1	6	78
As BK38/035	Ground / 24 / Under Stairs Cupboard	Insulating board forming the ceiling and end wall	3 m^2	SP	2	2	2	2 & 1	8	79
BK38/036	Ground / 09 / Warehouse	Rope seal to north facing skylights	NQ	ID	2	1	1	1	5	80
BK38/038	Ground / 09 / Warehouse	Insulating board end panels / upstands to sky lights	25 x 4 m^2	ID	2	2	2	1	7	81 & 82
As BK38/038	Ground / 18 / Calorifier Room	Wall panels at height	16 m^2	SP	2	2	1	1	6	83

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/039	Ground / 27 / Warehouse	Insulating board cladding to beam to opening leading to Room No. 09	3 Ln m	ID	-	-	-	NADIS	-	84
As BK38/039	Ground / 09 / Warehouse	Insulating board cladding to beam at height	3 m^2	SP	-	-	-	NADIS	-	85
BK38/40	External / Office block	Damp proof course	NQ	ID	-	-	-	NADIS	-	86
BK38/41	Ground / 09 / Warehouse	Flange gaskets to high level pipework with metal casing	NQ	ID	2	1	1	1	5	87
BK38/042	Ground / 09 / Warehouse	Insulation to high level pipework from 'Brooks' heaters	>100 m	ID	-	-	-	NADIS	-	88
BK38/043	Ground / 09 / Warehouse	Insulation to high level pipework with metal casing from 'Brooks' heaters	>100 m	ID	-	-	-	NADIS	-	89
BK38/044	Ground / 34 / Department Managers Office	Insulation debris to floor	12 m^2	ID	3	3	3	2 & 1	11	90
As BK38/044	Ground / 35 / Secretary's Office	Insulation debris to floor	12 m^2	SP	3	3	3	2 & 1	11	91

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/044	Ground / 32 / Corridor to offices	Insulation debris to floor	12 m^2	SP	3	3	3	2 & 1	11	92
As BK38/044	Ground / 34 / Department Managers Office	Insulation to high level pipework	2 x 10 m	ID	3	1	3	2 & 1	9	93 & 94
BK38/045	Ground / 03 / Circulation Area	Cement fascia panel along top of wall	3 Ln m	ID	1	1	1	1	4	95
As BK38/045	Ground / 04 / Ladies Toilet	Cement fascia panel along top of wall	6 Ln m	SP	1	1	1	1	4	-
BK38/46	Ground / 08 / Label Board Area	Insulating board above and below window	4 No.	ID	2	1	1	2 & 1	6	96 & 97
As BK38/046	Ground / 01 / Lobby	Insulating board above entrance door above suspended ceiling	1 m^2	SP	2	1	1	2 & 1	6	98
As BK38/046	Ground / 01 / Lobby	Insulating board above suspended ceiling	2 m^2	SP	2	3	2	2 & 1	9	99
As BK38/046	Ground / 02 / Reception	Insulating board above windows	4 No.	SP	2	1	1	2 & 1	6	100 & 101

NOTE:
ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
As BK38/046	Ground / 07 / Office	Insulating board above windows	2 No.	SP	2	1	1	2 & 1	6	102
As BK38/046	Ground / 06 / Library	Insulating board above and below window	4 No.	SP	2	1	1	2 & 1	6	103
BK38/047	Ground / 18 / Calorifier Room	Residue to pipework from large hot water tank	NQ	ID	3	3	1	2 & 1	9	104
BK38/048	Ground / 18 / Calorifier Room	Residue to large hot water tank	1 No.	ID	3	3	3	2 & 1	11	105
BK38/049	Ground / 18 / Calorifier Room	Residue to pipework (steam)	NQ	ID	-	-	-	NADIS	-	106 & 107
BK38/050	Ground / 18 / Calorifier Room	Residue to pipework (steam)	NQ	ID	3	3	3	2 & 1	11	108
BK38/P1	Throughout Building	Packing to downpipe joints	NQ	P	3	0	2	3	8	109
BK38/P2	Ground – Second / 20 / Lift	No access within lift shaft	NQ	P	2	3	1	2	8	110

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Ground Floor - Warehouse

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/P3	Ground / 09 / Warehouse	Insulating board panelling around ducting	10 m^2	ID	2	1	1	2	6	111
As BK38/032	Ground / 10 / Workshop	Cement ceiling panels to bay window	2 m^2	SP	1	1	1	1	4	-
As BK38/032	Ground / 33 / Fire exit	Cement ceiling panels	3 m^2	SP	1	1	1	1	4	-
As BK38/012	Ground / 18 / Calorifier Room	Textile flash pads within electrical boxes	NQ	SP	2	1	1	1	5	121

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.3 Table of suspected ACMs and their locations on Roof level

Sample Information					Material Assessment				Material Score	Photo No.
Sample Ref.	Area suspected of containing ACMs (Floor / Survey Room No. / Description)	Sample Description	Approx. Extent (m / m^2 / No.)	Level of Identification (ID / SP / P)	Product Type	Extent of Damage	Surface Treatment	Asbestos Type		
BK38/51	Roof / 93 / Lift machinery room	Brake shoes to lift machinery	2 No.	ID	-	-	-	NADIS	-	112
BK38/052	Roof / 67 / Roof level	Cement end panels to skylights	26 x 3 m^2	ID	1	1	1	1	4	113
As BK38/052	Roof / 92 / Roof level	Cement panels covering large skylight	16 m^2	SP	1	1	1	1	4	114
As BK38/004	Roof / 67 / Roof level	Cement roofing panels to skylights	NQ	SP	1	1	1	1	4	115 & 116
As BK38/004	Roof / 93 / Lift machinery room	Cement ceiling panels	12 m^2	SP	1	1	1	1	4	117
As BK38/004	Roof / 21 / Service riser	Cement ceiling panels	12 m^2	SP	1	1	1	1	4	118
As BK38/004	Roof / 64 / Air duct	Cement ceiling panels	20 m^2	SP	1	1	1	1	4	119
As BK38/004	Roof / 67 / Roof level	Cement pipe and cowl	1 No.	SP	1	1	1	1	4	120

NOTE:

ID = Sample taken and analysed
SP = Material Strongly Presumed as original sample taken
P = Material Presumed to contain asbestos
N/Q = Not quantifiable

Asbestos Type
NADIS = No Asbestiforms Detected In Sample
1 = Chrysotile
2 = Amphibole asbestos excluding Crocidolite
3 = Crocidolite

6.4 Material Assessment Records

Sample Ref:	BK38/001	
Area:	Second / 72 / Laboratory	
Sample Description:	Insulating board lining to Fume cupboards	
Approx. Extent:	3 No. fume cupboards	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	1

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/002	
Area:	Second / 72 / Laboratory	
Sample Description:	Bitumen pads to underside of sink	
Approx. Extent:	4 sinks	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	2

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/003	
Area:	Second / 72 / Laboratory	
Sample Description:	Flange gaskets	
Approx. Extent:	>10 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Flange Gasket	2
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

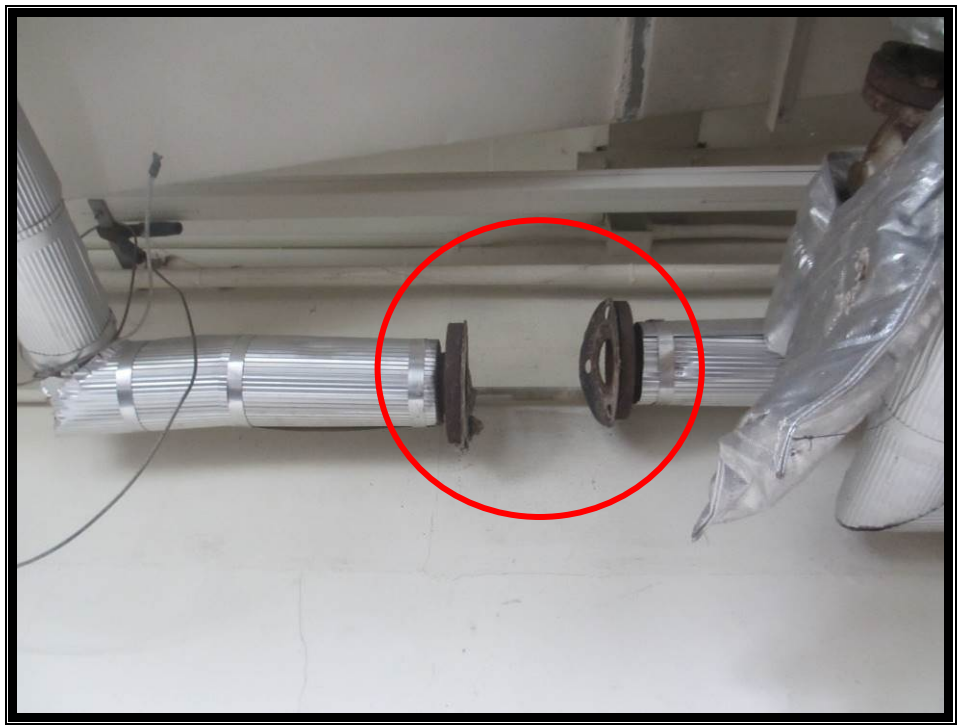


Photo No.	3

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/003	
Area:	Second / 72 / Laboratory	
Sample Description:	Flange gaskets	
Approx. Extent:	>10 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Flange Gasket	2
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	4

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/004	
Area:	Second / Throughout	
Sample Description:	Cement panels forming the ceiling	
Approx. Extent:	1050 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Medium	2
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	5

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/004	
Area:	Second / Throughout	
Sample Description:	Cement panels forming the ceiling	
Approx. Extent:	1050 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Medium	2
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

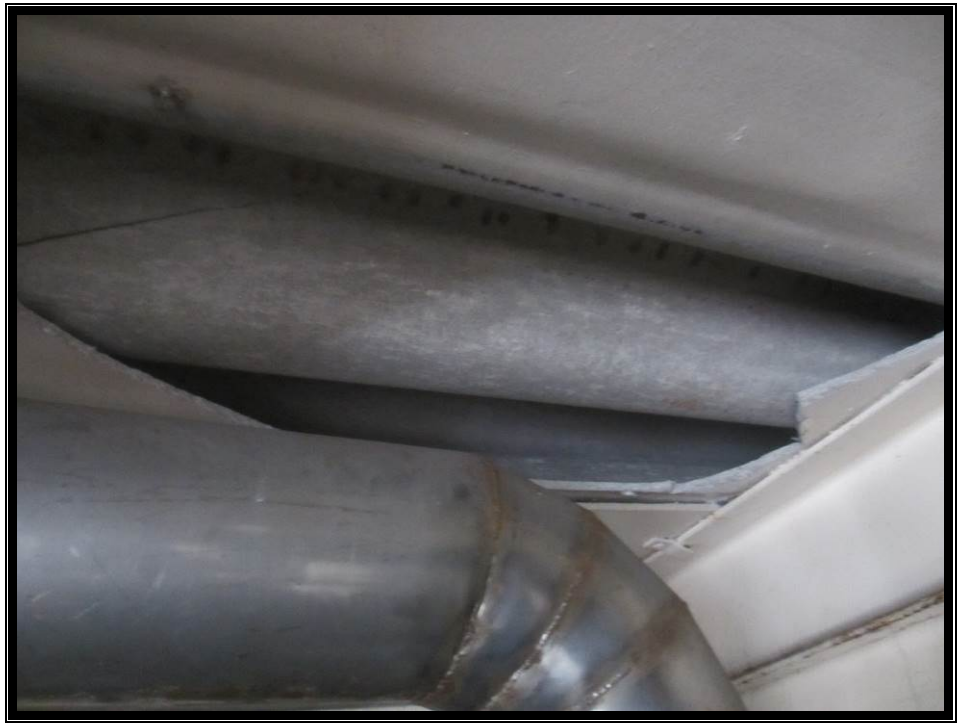


Photo No.	6

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Second / 79 / Platform	
Sample Description:	Cement debris	
Approx. Extent:	5 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	High	3
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	7

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Second / 79 / Platform	
Sample Description:	Cement debris	
Approx. Extent:	5 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	High	3
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	8

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/005	
Area:	Second / 72 / Laboratory	
Sample Description:	Spray coating to cement ceiling panel	
Approx. Extent:	2 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos spray coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	9

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/005	
Area:	Second / 72 / Laboratory	
Sample Description:	Sprayed coating debris on top of shelving unit	
Approx. Extent:	<0.5 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos sprayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	10

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/006	
Area:	Second / 78 / Misc Section	
Sample Description:	Insulation debris on floor	
Approx. Extent:	50 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	11

Comments: Due to the heavy contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/006	
Area:	Second / 78 / Misc Section	
Sample Description:	Insulation debris on floor (within void beneath Platform)	
Approx. Extent:	50 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	12

Comments: Due to the heavy contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/006	
Area:	Second / 80 / Dark Room	
Sample Description:	Insulation debris on floor	
Approx. Extent:	20 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	13

Comments: Due to the heavy contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/006	
Area:	Second – Ground / 21 / Service Riser	
Sample Description:	Insulation debris, (whole riser is contaminated)	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	14

Comments: Due to the heavy contamination of the service riser from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. WE have deemed th whole service riser as being contaminated. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/006	
Area:	Second – Ground / 21 / Service Riser	
Sample Description:	Insulation debris, (whole riser is contaminated)	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	15

Comments: Due to the heavy contamination of the service riser from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. WE have deemed th whole service riser as being contaminated. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/006	
Area:	Second – Ground / 21 / Service Riser	
Sample Description:	Remnants of insulation from pipework on wall (whole riser is contaminated)	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	16

Comments: Due to the heavy contamination of the service riser from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. WE have deemed th whole service riser as being contaminated. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/006	
Area:	Second – Ground / 21 / Service Riser	
Sample Description:	Insulation debris around pipe penetration through wall	
Approx. Extent:	3 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	17

Comments: Due to the heavy contamination of the service riser from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. WE have deemed th whole service riser as being contaminated. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/007	
Area:	Second / 78 / Misc Section	
Sample Description:	Insulating board closer to reinforced steel joist stanchion	
Approx. Extent:	2 No	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	18

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/007	
Area:	Second / 37 / Main Stairwell	
Sample Description:	Insulating board closer to reinforced steel joist stanchion	
Approx. Extent:	2 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	19

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/008	
Area:	Second / 78 / Misc Section	
Sample Description:	Spray coating residue to cement ceiling panels, beams, top of cable trays and ducting	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

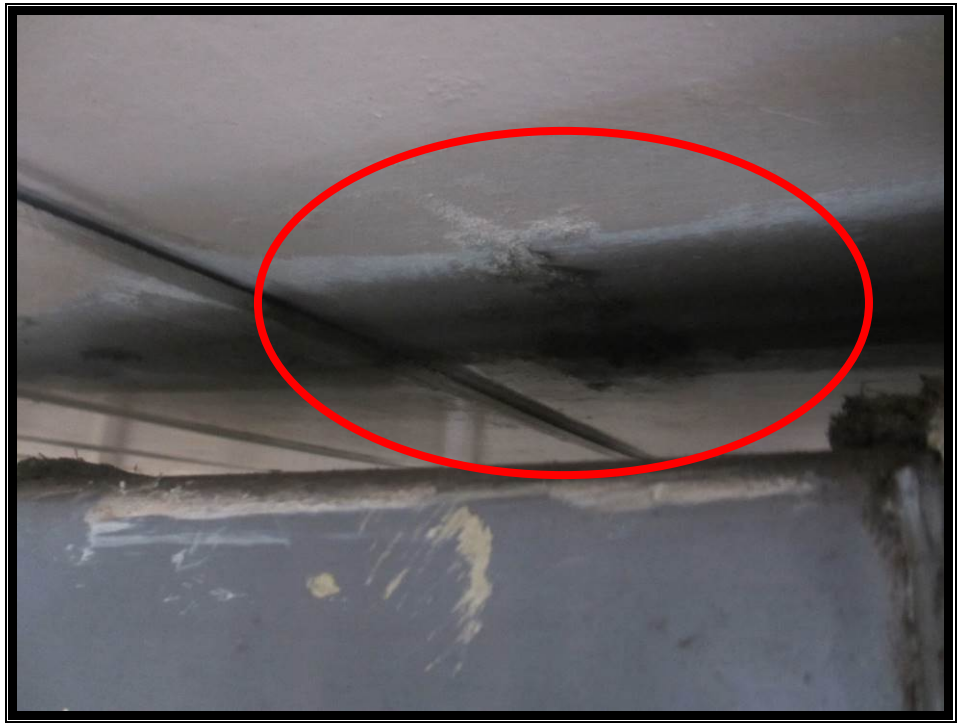


Photo No.	20

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/008	
Area:	Second / 78 / Misc Section	
Sample Description:	Spray coating residue to cement ceiling panels, beams, top of cable trays and ducting	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	21

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/009	
Area:	Second / 78 / Misc Section	
Sample Description:	Spray coating residue to cement ceiling panels, brackets and beams	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	22

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/009	
Area:	Second / 78 / Misc Section	
Sample Description:	Spray coating residue to cement ceiling panels, brackets and beams	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

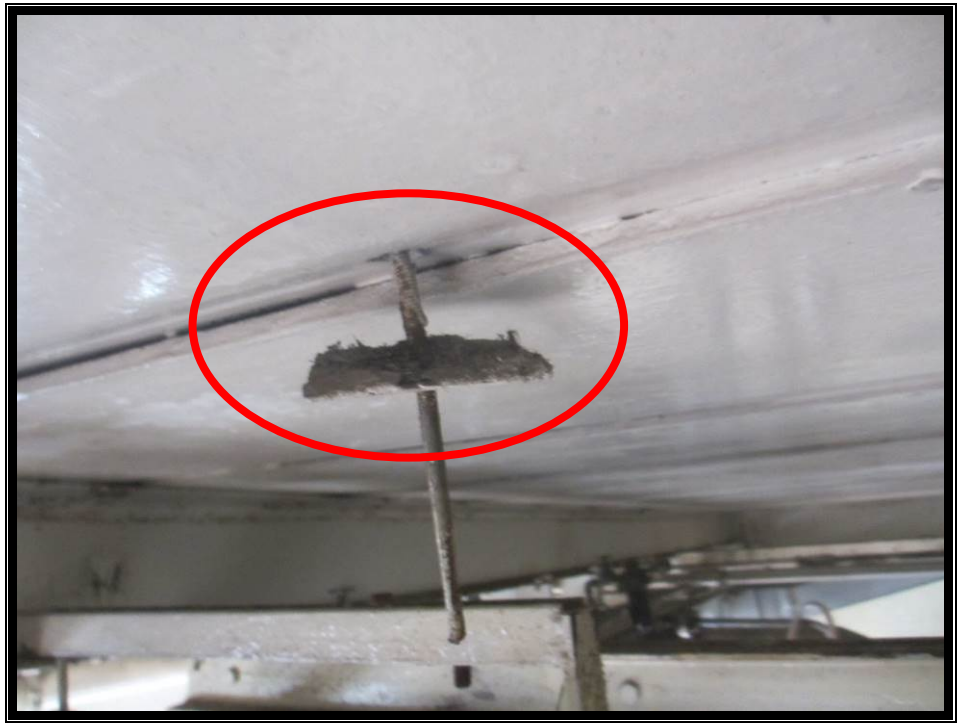


Photo No.	23

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/010	
Area:	Second / 78 / Misc Section	
Sample Description:	Flange gaskets to pipework	
Approx. Extent:	8 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Flange gasket	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	24

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/011	
Area:	Second / 81 / Main Corridor	
Sample Description:	Insulation residue to pipework (behind fibreglass insulation)	
Approx. Extent:	50 m	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	Medium	2
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

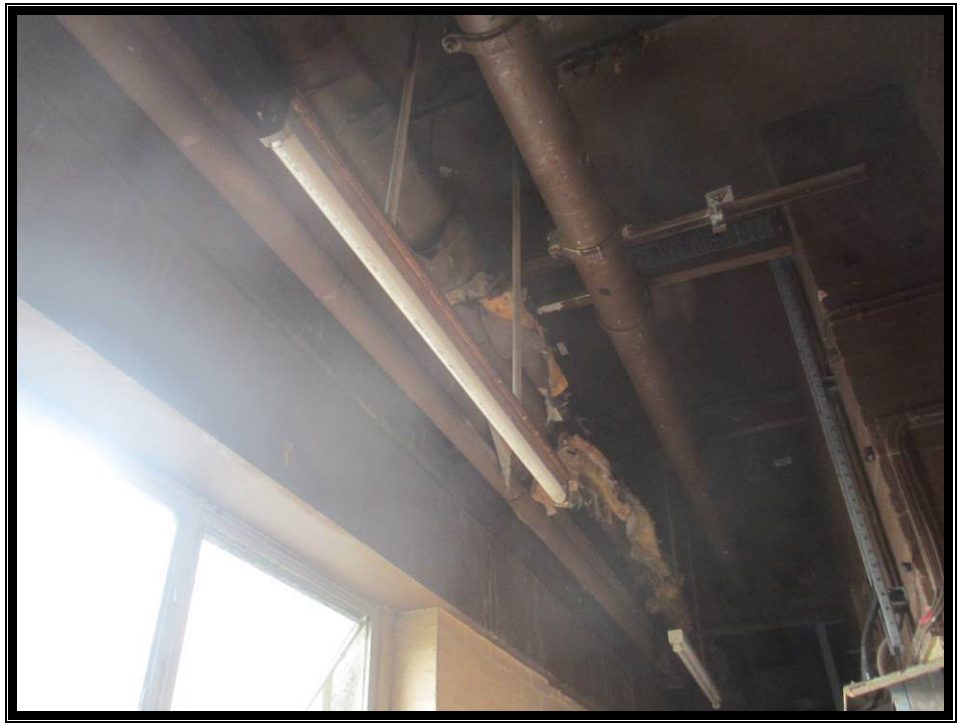


Photo No.	25

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/012	
Area:	Second / 81 / Main Corridor	
Sample Description:	Textile flash pads within switch gear	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	26

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/012	
Area:	Second / 81 / Main Corridor	
Sample Description:	Textile flash pads within switch gear	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

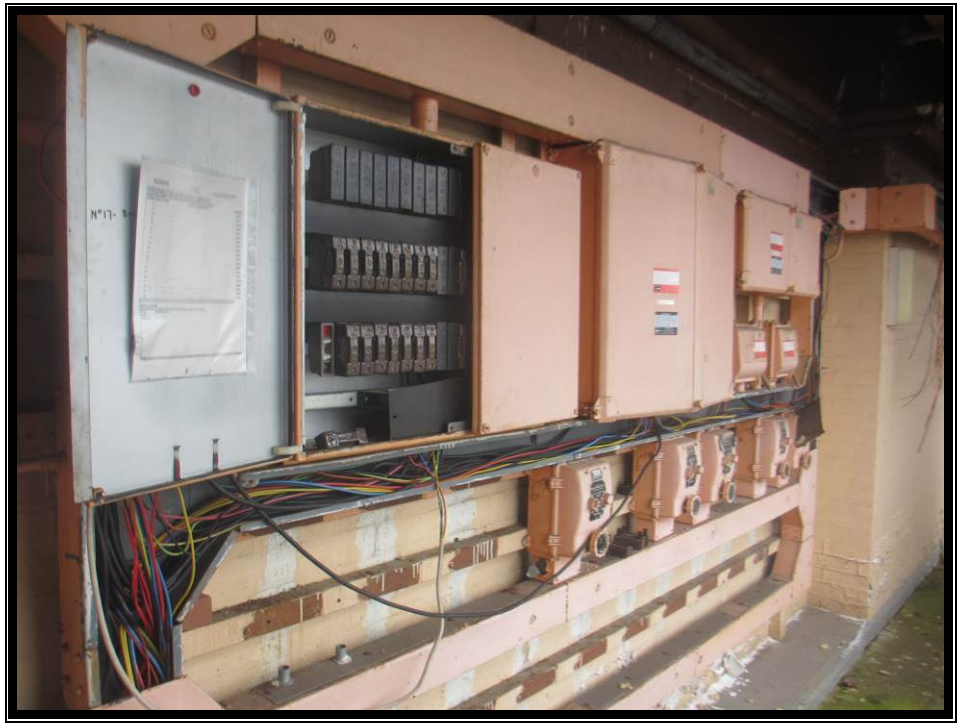


Photo No.	27

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	Second / 86 / Fire Exit Stairwell Crawl Space	
Sample Description:	Textile flash pads within switch gear	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	28

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/013	
Area:	Second / 72 / Lab	
Sample Description:	Spray coating residue and debris to cement ceiling panels and beams	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	29

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/014	
Area:	Second / 81 / Main Corridor	
Sample Description:	Spray coating to cement ceiling panels	
Approx. Extent:	16 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	30

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second - Ground / 28 / Fire Exit Stairwell	
Sample Description:	Spray coating to cement ceiling panels and debris to floor, ledges and stairwell	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	31

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second - Ground / 28 / Fire Exit Stairwell	
Sample Description:	Spray coating to cement ceiling panels and debris to floor, ledges and stairwell	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	32

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second - Ground / 28 / Fire Exit Stairwell	
Sample Description:	Spray coating to cement ceiling panels and debris to floor, ledges and stairwell	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	33

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second / 89 / Corridor to Fire Exit Stairwell	
Sample Description:	Spray coating debris to floors	
Approx. Extent:	10 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	34

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second / 86 / Fire Exit Stairwell Crawl Space	
Sample Description:	Spray coating to ceiling and debris	
Approx. Extent:	8 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	35

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second / 86 / Fire Exit Stairwell Crawl Space	
Sample Description:	Spray coating to ceiling and debris	
Approx. Extent:	8 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

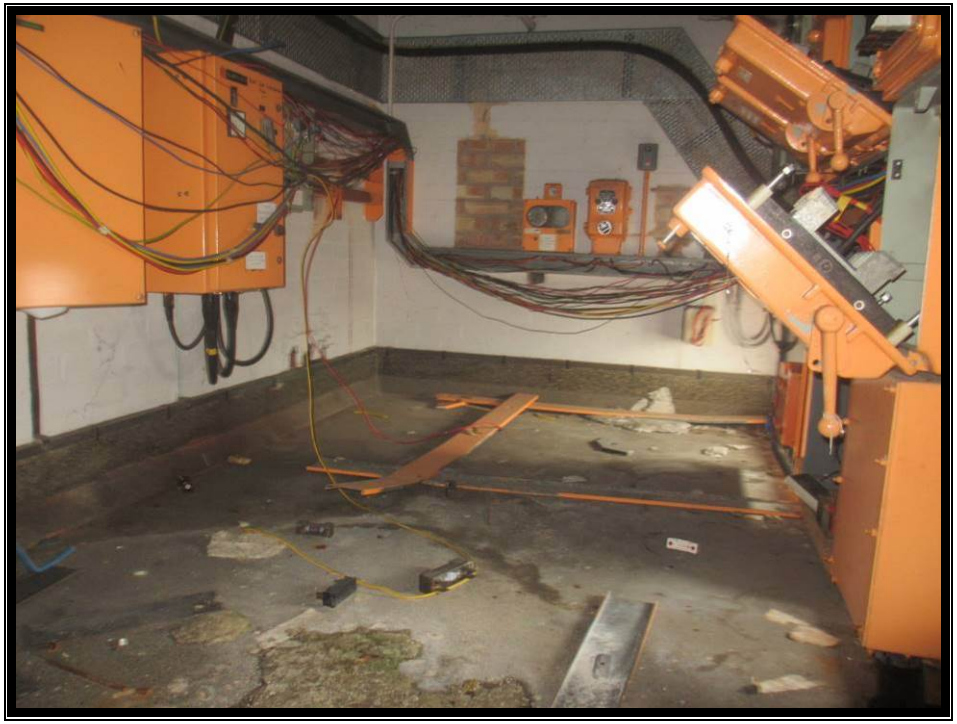


Photo No.	36

Comments: Due to the heavy contamination of the stairwell from the spray coating falling off the ceiling, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/014	
Area:	Second / 83 / Dark Room	
Sample Description:	Spray coating to cement ceiling and panels	
Approx. Extent:	16 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos spayed coating	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	37

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/015	
Area:	Second / 81 / Main Corridor	
Sample Description:	Spray coating residue and debris to cement ceiling panels and beams (painted brown)	
Approx. Extent:	30 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite	2
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	38

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/016	
Area:	Second / 72 / Lab	
Sample Description:	Mastics to metal ducting flanges	
Approx. Extent:	>30 No	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos reinforced composite	1
Extent of damage	Low	1
Surface Treatment	Composite material	0
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	39

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/017	
Area:	Second / 88 / Raw Material Store	
Sample Description:	Spray coating residue and debris to cement ceiling panels and beams	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	40

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/017	
Area:	Second / 85 / Solution Hosing Room	
Sample Description:	Spray coating residue and debris to cement ceiling panels and beams	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	41

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/017	
Area:	Second / 82 / Pre Weight Area and Dark Room	
Sample Description:	Spray coating residue and debris to cement ceiling panels and beams	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos sprayed coating	3
Extent of damage	Low	1
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	42

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/018	
Area:	Second / 88 / Solution Hosing Room	
Sample Description:	Insulating board surround to sky light	
Approx. Extent:	20 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	43

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/018	
Area:	Second / 88 / Solution Hosing Room	
Sample Description:	Insulating board closers to ceilings (found sporadically around in the area)	
Approx. Extent:	20 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	44

Comments:

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	First / 47 / Corridor	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	2 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	45

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	First / 54 / Corridor	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	4 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	46

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	First / 54 / Corridor (adjacent to Air Ducts)	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	2 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	47

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/019	
Area:	First / 60 / Solution Filtration	
Sample Description:	Insulation within discarded MMMF insulation and debris throughout	
Approx. Extent:	30 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	48

Comments: Due to the contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/019	
Area:	First / 60 / Solution Filtration	
Sample Description:	Insulation within discarded MMMF insulation and associated debris throughout	
Approx. Extent:	30 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	49

Comments: Due to the contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/020	
Area:	First / 39 / Store	
Sample Description:	Cement ceiling panels	
Approx. Extent:	6 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	50

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/020	
Area:	First / 38 & 40 / Stairwell & Corridor	
Sample Description:	Cement ceiling panels	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	51

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/021	
Area:	First / 47 / Corridor	
Sample Description:	Insulating board firebreak above metal partition wall with offices	
Approx. Extent:	30 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	52

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/022	
Area:	First / 54 / Corridor (adjacent to Air Duct)	
Sample Description:	Residue to pipework beneath MMMF insulation	
Approx. Extent:	>30 m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	53

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/023	
Area:	First / 51 / Office	
Sample Description:	Residue to pipework beneath MMMF insulation	
Approx. Extent:	30 m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	54

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/24	
Area:	First / 63 / Male Toilet	
Sample Description:	Insulating board wall surround to metal duct	
Approx. Extent:	3 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:		
Sample Certificate No.	ATH/16/07/0080	

Photo No.	55

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/025	
Area:	First / 51 / Office	
Sample Description:	Paper lining to fibreboard panels above glazing	
Approx. Extent:	9 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos paper	2
Extent of damage	Low	1
Surface Treatment	Unsealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	56

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/026	
Area:	First / 51 / Office	
Sample Description:	Vinyl floor tiles with bitumen adhesive	
Approx. Extent:	16 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos reinforced composite	1
Extent of damage	Low	1
Surface Treatment	Composite material	0
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	57

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/027	
Area:	First / 65 / Plant Room	
Sample Description:	Flange gasket to low level pipework	
Approx. Extent:	2 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos flange gasket	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	58

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/028	
Area:	First / 66 / Plant Room Stairwell	
Sample Description:	Flange gaskets to pipework	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos flange gasket	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

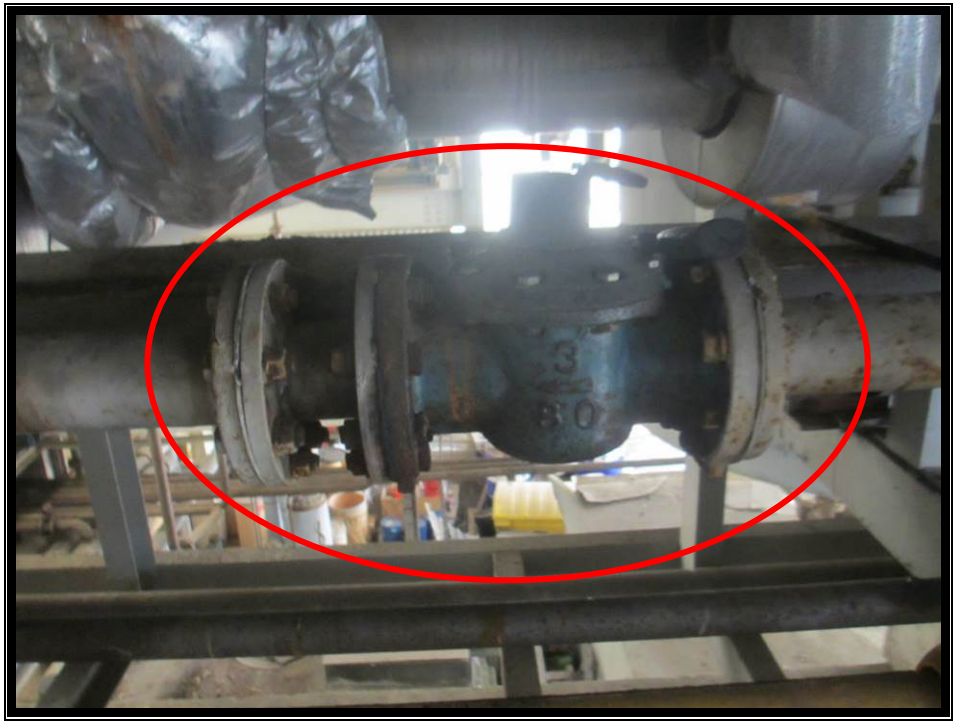


Photo No.	59

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/029	
Area:	First / 66 / Plant Room Stairwell	
Sample Description:	Insulating board cladding to reinforced steel joists	
Approx. Extent:	3 Ln m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	60

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/030	
Area:	First / 54 / Corridor to Lift	
Sample Description:	Insulation debris on floor	
Approx. Extent:	20 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	61

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/031	
Area:	First / 54 / Corridor (adjacent to Air Duct)	
Sample Description:	Bitumen gaskets to metal ducting	
Approx. Extent:	>10 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos flange gaskets	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	62

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/033	
Area:	First / 43 / Canteen	
Sample Description:	Insulating board forming the external walls	
Approx. Extent:	35 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	63

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/033	
Area:	First / 43 / Canteen	
Sample Description:	Insulating board forming the external walls	
Approx. Extent:	35 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	64

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/033	
Area:	First / 43 / Canteen	
Sample Description:	Insulating board forming part of the ceiling	
Approx. Extent:	8 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

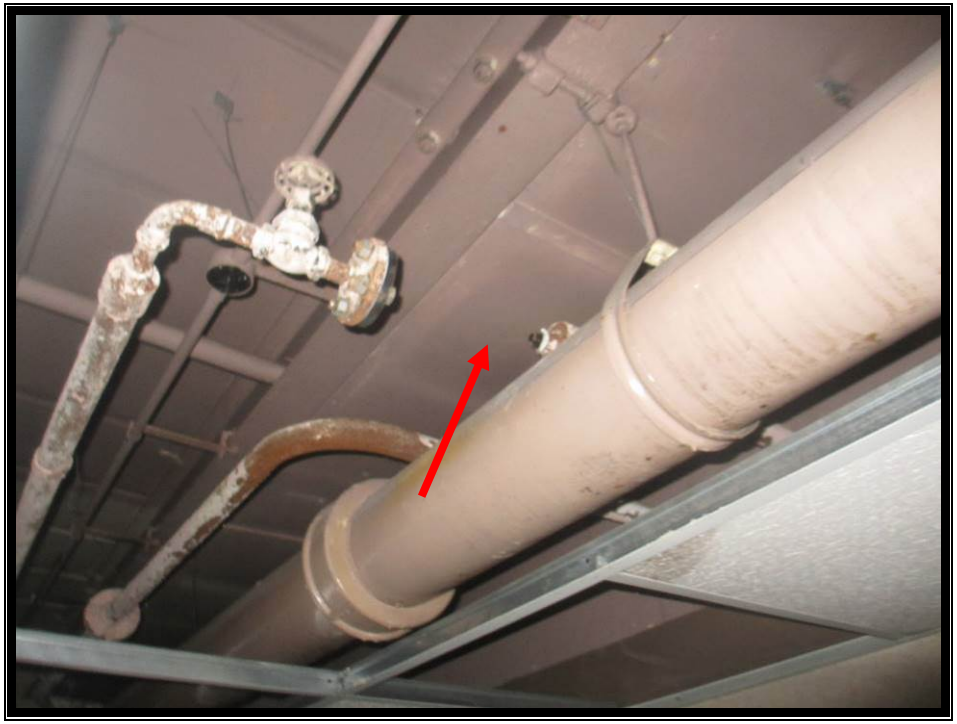


Photo No.	65

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/037	
Area:	First / 43 / Canteen	
Sample Description:	Insulating board along top of wall	
Approx. Extent:	18 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

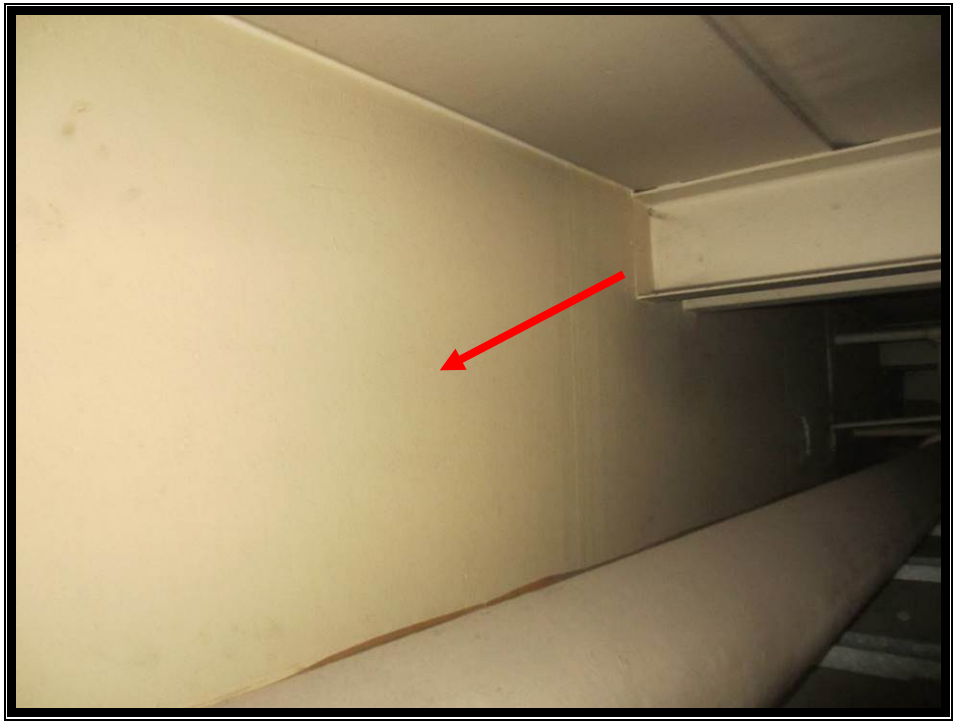


Photo No.	66

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/037	
Area:	First / 43 / Canteen	
Sample Description:	Insulating board along top of wall	
Approx. Extent:	18 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

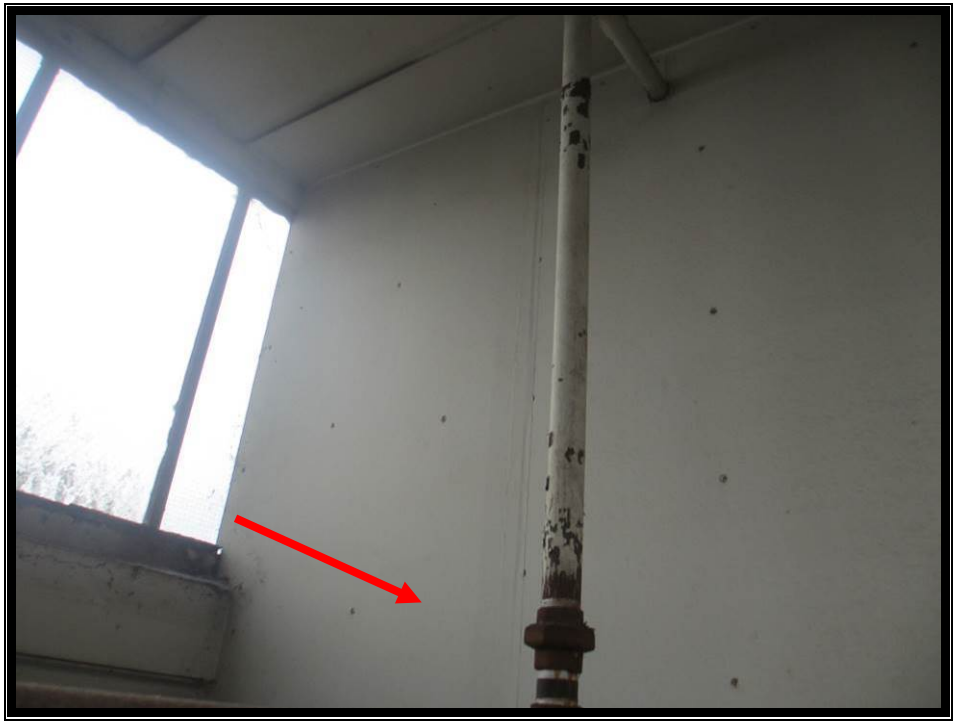


Photo No.	67

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	Ground / 26 / Switch Room	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textile	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	68

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	Ground / 26 / Switch Room	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textile	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	69

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	Ground / 09 / Warehouse	
Sample Description:	Textile flash pads within electrical boxes	
Approx. Extent:	2 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textile	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

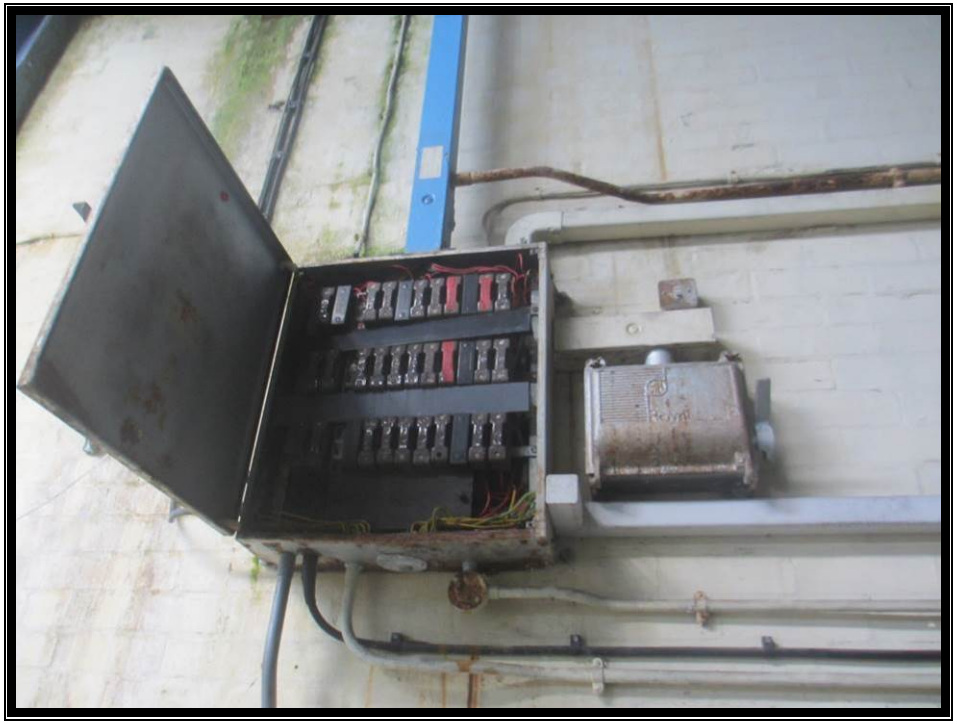


Photo No.	70

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/032	
Area:	Ground / 09 / Warehouse	
Sample Description:	Cement ceiling panels	
Approx. Extent:	> 4500 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	71

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/032	
Area:	Ground / 07 / Office	
Sample Description:	Cement ceiling panels	
Approx. Extent:	8 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	72

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/033	
Area:	Ground / 09a / Plant Duct Area (beneath canteen)	
Sample Description:	Cement panel soffit to underside of canteen	
Approx. Extent:	9 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Medium	2
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080 & 16-2470	

Photo No.	73

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.
A density check was undertaken for this material to confirm the product type.

6.4 Material Assessment Records

Sample Ref:	As BK38/033	
Area:	Ground / 23 / Female Changing and Toilets	
Sample Description:	Cement panels forming the ceiling	
Approx. Extent:	55 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080 & 16-2470	

Photo No.	74

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.
A density check was undertaken for this material to confirm the product type.

6.4 Material Assessment Records

Sample Ref:	BK38/034	
Area:	Ground / 09a / Plant Duct Area (beneath canteen)	
Sample Description:	Insulating board cladding to beam	
Approx. Extent:	8 Ln m	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	75

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/034	
Area:	Ground / 22 / Corridor to Male Changing	
Sample Description:	Insulating board cladding to beam	
Approx. Extent:	6 Ln m	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	76

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	AS/034	
Area:	Ground / 25 / Male Changing Room and Toilet	
Sample Description:	Insulating board cladding to beam behind plasterboard	
Approx. Extent:	4 Ln m	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	No visible damage	0
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	77

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/035	
Area:	Ground / 23 / Female Changing and Toilets	
Sample Description:	Insulating board cladding to beam	
Approx. Extent:	50 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

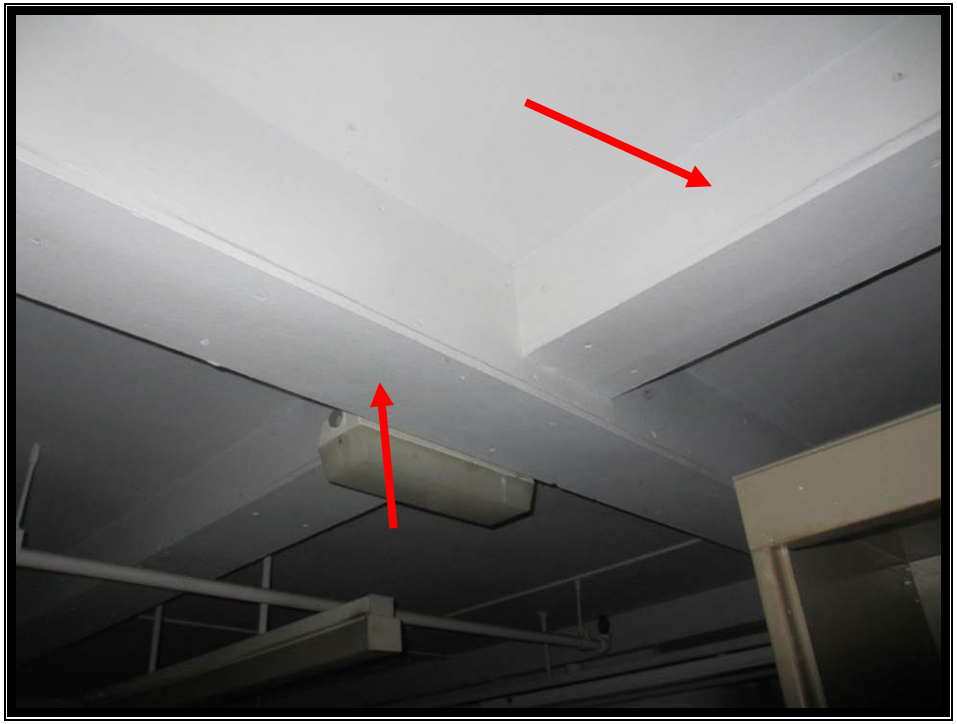


Photo No.	78

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	AS/035	
Area:	Ground / 24 / Under Stairs Cupboard	
Sample Description:	Insulating board forming the ceiling and end wall	
Approx. Extent:	3 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	79

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/036	
Area:	Ground / 09 / Warehouse	
Sample Description:	Rope seal to north facing skylights	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos rope seal	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	80

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/038	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulating board end panels / upstands to sky lights	
Approx. Extent:	25 x 4 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed where damaged	2
Asbestos Type:	Chrysotile	1
Recommendation:	A density check on these boards must be undertaken prior to removal to confirm if they are to be removed as asbestos insulating board or asbestos cement	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	81

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/038	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulating board end panels / upstands to sky lights	
Approx. Extent:	25 x 4 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Unsealed where damaged	2
Asbestos Type:	Chrysotile	1
Recommendation:	A density check on these boards must be undertaken prior to removal to confirm if they are to be removed as asbestos insulating board or asbestos cement	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	82

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/038	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Wall panels at height	
Approx. Extent:	16 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Medium	2
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	A density check on these boards must be undertaken prior to removal to confirm if they are to be removed as asbestos insulating board or asbestos cement	
Sample Certificate No.	ATH/16/07/0080	

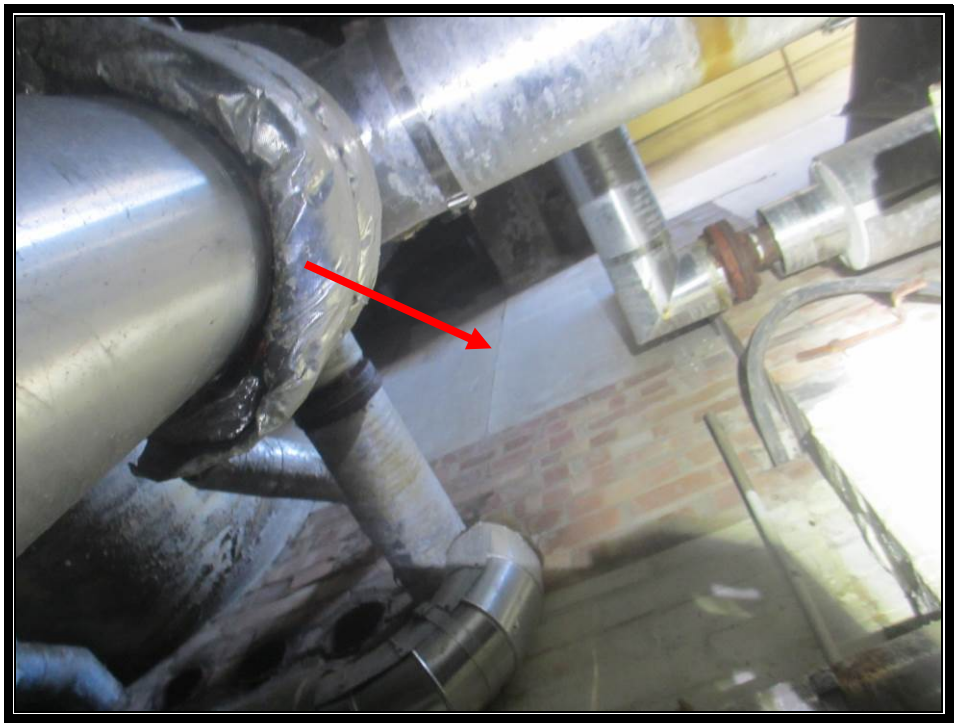


Photo No.	83

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/039	
Area:	Ground / 27 / Warehouse	
Sample Description:	Insulating board cladding to beam to opening leading to Room No. 09	
Approx. Extent:	3 Ln m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	84

Comments:

6.4 Material Assessment Records

Sample Ref:	AS/039	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulating board cladding to beam at height	
Approx. Extent:	3 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

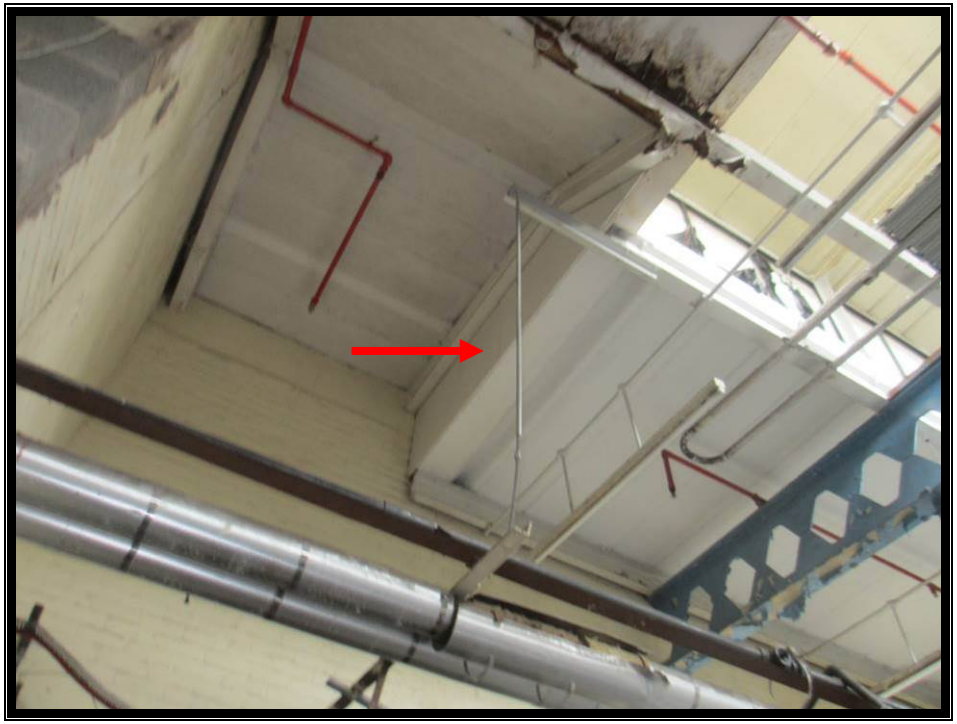


Photo No.	85

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/40	
Area:	External / Office block	
Sample Description:	Damp proof course	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	86

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/41	
Area:	Ground / 09 / Warehouse	
Sample Description:	Flange gaskets to high level pipework with metal casing	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos gaskets	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

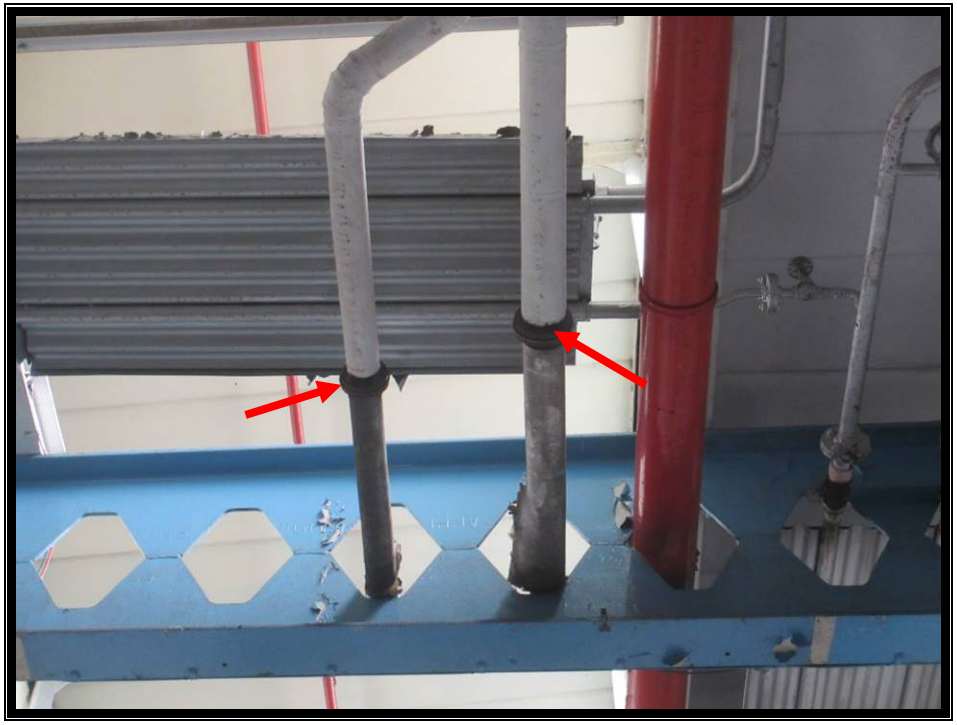


Photo No.	87

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/042	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulation to high level pipework from 'Brooks' heaters	
Approx. Extent:	>100 m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

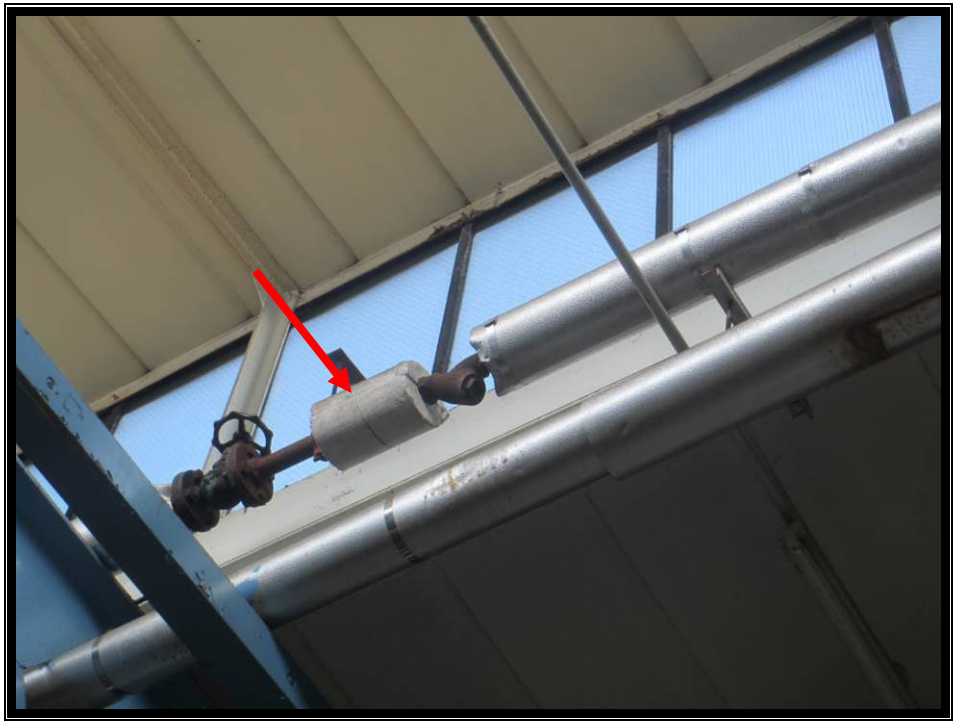


Photo No.	88

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/043	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulation to high level pipework with metal casing from 'Brooks' heaters	
Approx. Extent:	>100 m	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

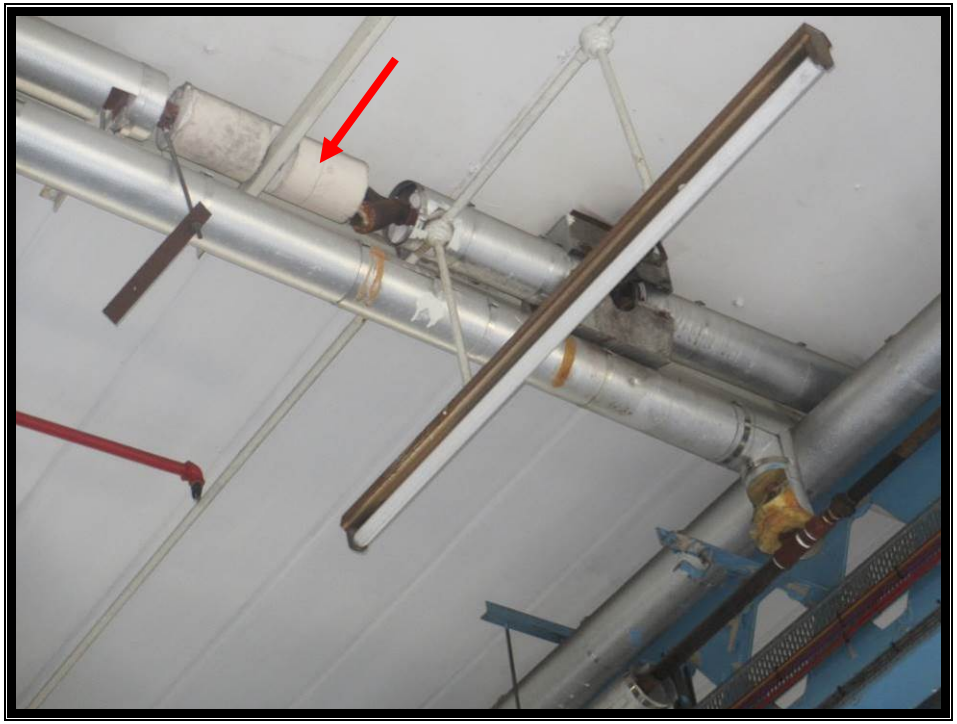


Photo No.	89

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/044	
Area:	Ground / 34 / Department Managers Office	
Sample Description:	Insulation debris to floor	
Approx. Extent:	12 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	90

Comments: Due to the contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/044	
Area:	Ground / 35 / Secretary's Office	
Sample Description:	Insulation debris to floor	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	91

Comments: Due to the contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/044	
Area:	Ground / 32 / Corridor to offices	
Sample Description:	Insulation debris to floor	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	92

Comments: Due to the contamination of the room from the loose pipe insulation, access to this area must be restricted and full PPE and RPE must be worn if access is required. The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/044	
Area:	Ground / 34 / Department Managers Office	
Sample Description:	Insulation to high level pipework	
Approx. Extent:	2 x 10 m	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos thermal insulation	3
Extent of damage	Low	1
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	93

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/044	
Area:	Ground / 34 / Department Managers Office	
Sample Description:	Insulation to high level pipework	
Approx. Extent:	2 x 10 m	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	Low	1
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	94

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/045	
Area:	Ground / 03 / Circulation Area	
Sample Description:	Cement fascia panel along top of wall	
Approx. Extent:	3 Ln m	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	95

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/46	
Area:	Ground / 08 / Label Board Area	
Sample Description:	Insulating board above and below window	
Approx. Extent:	4 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	96

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/46	
Area:	Ground / 08 / Label Board Area	
Sample Description:	Insulating board above and below window	
Approx. Extent:	4 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	97

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 01 / Lobby	
Sample Description:	Insulating board above entrance door above suspended ceiling	
Approx. Extent:	1 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	98

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 01 / Lobby	
Sample Description:	Insulating board above suspended ceiling	
Approx. Extent:	2 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	High	3
Surface Treatment	Unsealed	2
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	99

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 02 / Reception	
Sample Description:	Insulating board above windows	
Approx. Extent:	4 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	100

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 02 / Reception	
Sample Description:	Insulating board above windows	
Approx. Extent:	4 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	101

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 07 / Office	
Sample Description:	Insulating board above windows	
Approx. Extent:	2 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	102

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/046	
Area:	Ground / 06 / Library	
Sample Description:	Insulating board above and below window	
Approx. Extent:	4 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	103

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/047	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Residue to pipework from large hot water tank	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation residue	3
Extent of damage	High	3
Surface Treatment	Sealed	1
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	104

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/048	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Residue to large hot water tank	
Approx. Extent:	1 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation residue	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	105

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/049	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Residue to pipework (steam)	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	106

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/049	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Residue to pipework (steam)	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	-	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	107

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/050	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Residue to pipework (steam)	
Approx. Extent:	NQ	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos thermal insulation	3
Extent of damage	High	3
Surface Treatment	Unsealed	3
Asbestos Type:	Amosite and Chrysotile	2 & 1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	108

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/P1	
Area:	Throughout Building	
Sample Description:	Packing to downpipe joints	
Approx. Extent:	NQ	
Level of Identification:	Presumed to contain Asbestos	
Product Type:	Asbestos thermal insulation	3
Extent of damage	No visible damage	0
Surface Treatment	Unsealed	2
Asbestos Type:	Crocidolite	3
Recommendation:	Sample prior to demolition works	
Sample Certificate No.	--	

Photo No.	109

Comments: The remedial work recommended on this asbestos material must be undertaken by an HSE licensed asbestos contractor. The works will usually be subject to a 14 day notification period prior to commencement. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	BK38/P2	
Area:	Ground – Second / Lift	
Sample Description:	No access within lift shaft	
Approx. Extent:	NQ	
Level of Identification:	Presumed to contain Asbestos	
Product Type:	Asbestos insulating board	2
Extent of damage	High	3
Surface Treatment	Enclosed	1
Asbestos Type:	Amosite	2
Recommendation:	Sample prior to demolition works	
Sample Certificate No.	--	

Photo No.	110

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/P3	
Area:	Ground / 09 / Warehouse	
Sample Description:	Insulating board panelling around ducting	
Approx. Extent:	10 m^2	
Level of Identification:	Presumed to contain Asbestos	
Product Type:	Asbestos insulating board	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Amosite	2
Recommendation:	Sample prior to demolition works	
Sample Certificate No.	--	

Photo No.	111

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/51	
Area:	Roof / 93 / Lift machinery room	
Sample Description:	Brake shoes to lift machinery	
Approx. Extent:	2 No.	
Level of Identification:	Sample taken and analysed	
Product Type:	-	-
Extent of damage	-	-
Surface Treatment	-	-
Asbestos Type:	No Asbestiforms Detected In Sample	-
Recommendation:	--	
Sample Certificate No.	--	

Photo No.	112

Comments:

6.4 Material Assessment Records

Sample Ref:	BK38/52	
Area:	Roof / 67 / Roof level	
Sample Description:	Cement end panels to skylights	
Approx. Extent:	26 x 3 m^2	
Level of Identification:	Sample taken and analysed	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition works	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	113

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/052	
Area:	Roof / 92 / Roof level	
Sample Description:	Cement panels covering large skylight	
Approx. Extent:	16 m^2	
Level of Identification:	Strongly presumed as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition works	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	114

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 67 / Roof level	
Sample Description:	Cement roofing panels to skylights	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition works	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	115

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 67 / Roof level	
Sample Description:	Cement roofing panels to skylights	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition works	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	116

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 93 / Lift machinery room	
Sample Description:	Cement ceiling panels	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	117

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 21 / Service riser	
Sample Description:	Cement ceiling panels	
Approx. Extent:	12 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	118

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 64 / Air Duct	
Sample Description:	Cement ceiling panels	
Approx. Extent:	20 m^2	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	119

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/004	
Area:	Roof / 67 / Roof level	
Sample Description:	Cement pipe and cowl	
Approx. Extent:	1 No.	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos cement	1
Extent of damage	Low	1
Surface Treatment	Cement Product	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	120

Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

6.4 Material Assessment Records

Sample Ref:	As BK38/012	
Area:	Ground / 18 / Calorifier Room	
Sample Description:	Textile flash pads within switch gear	
Approx. Extent:	NQ	
Level of Identification:	Strongly presumed to be as original sample	
Product Type:	Asbestos woven textiles	2
Extent of damage	Low	1
Surface Treatment	Sealed	1
Asbestos Type:	Chrysotile	1
Recommendation:	Remove prior to demolition	
Sample Certificate No.	ATH/16/07/0080	

Photo No.	121

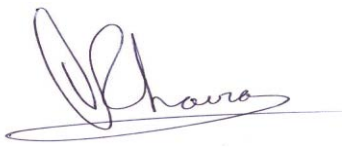
Comments: The remedial work recommended on this asbestos material should be undertaken by either an HSE licensed asbestos contractor or a competent person under current HSE regulations. All waste generated must be disposed of as hazardous.

7.0 Summary

Asbestos containing materials were found in the following forms on site:

- Asbestos flange gaskets.
- Asbestos cement panels forming the ceiling.
- Asbestos sprayed coating to cement ceiling panels and associated debris.
- Asbestos insulating board to walls, beams and ceilings.
- Asbestos sprayed coating residue to cement ceiling panels, pipework and beams.
- Asbestos textile flash pads.
- Asbestos mastic and gaskets to metal ducting.
- Asbestos insulation and associated debris.
- Asbestos paper lining to fibreboard panels.
- Asbestos bitumen backing to vinyl floor tiles.
- Asbestos cement and board end panels to skylights.
- Asbestos rope seals to Northern skylights.
- Asbestos residue to tanks and pipework.

As the building is to be demolished, Trident Surveying Limited recommends that all the asbestos containing materials be suitably removed by a licensed asbestos removal contractor and monitored by a UKAS Accredited Laboratory.

Inspector: 

Varinder Khaira

Inspector:

Jagdeep Sahajpal

APPENDICES

APPENDIX 1

ASBESTOS BULK ANALYSIS CERTIFICATE NO.

ATH/16/07/0080 & 16-24710

ATHENA ENVIRONMENTAL SOLUTIONS LTD.

UKAS TESTING
4696

CERTIFICATE OF IDENTIFICATION OF ASBESTOS FIBRES

SITE ADDRESS:	**BUILDING K38**
SITE REF NO.	**N/A**

CLIENT	TRIDENT SURVEYING LTD
ADDRESS	UNIT 5, NORTH HYLTON HOUSE NORTH HYLTON ROAD SUNDERLAND SR5 3AD
PHONE NUMBER	0191 548 3101

CERTIFICATE NUMBER	ATH/16/07/0080
DATE SAMPLED	UNKNOWN
DATE RECEIVED	12/07/16
DATE ANALYSED	12/07/16
NO. OF SAMPLES	52
PAGE NUMBER	1 OF 4
OBTAINED	DELIVERED

SAMPLE NUMBER	CLIENT NUMBER	SAMPLE LOCATION	MATERIAL TYPE	FIBRE TYPE DETECTED
1	BK38/001	INSULATING BOARD LINING TO FUME CUPBOARDS	INSULATING BOARD	NADIS
2	BK38/002	BITUMEN PADS TO UNDERSIDE OF SINK	BITUMEN	NADIS
3	BK38/003	FLANGE GASKETS	GASKET	CHRYSOTILE
4	BK38/004	CEMENT PANELS FORMING THE CEILING	CEMENT	CHRYSOTILE
5	BK38/005	SPRAY COATING TO CEMENT CEILING PANELS	INSULATION	AMOSITE
6	BK38/006	INSULATION	INSULATION	CHRYSOTILE/AMOSITE
7	BK38/007	INSULATING BOARD CLOSER TO RSJ STANCHION	INSULATING BOARD	AMOSITE/CHRYSOTILE
8	BK38/008	SPRAY COATING RESIDUE/DEBRIS TO CEMENT CEILING	INSULATION	AMOSITE
9	BK38/009	SPRAY COATING RESIDUE/DEBRIS TO CEMENT CEILING PANELS	DEBRIS	CHRYSOTILE/AMOSITE
10	BK38/010	FLANGE GASKET	GASKET	CHRYSOTILE
11	BK38/011	INSULATION RESIDUE TO PIPEWORK (BEHIND FIBREGLASS INSULATION)	INSULATION	CHRYSOTILE/AMOSITE
12	BK38/012	TEXTILE FLASH PADS	TEXTILE	CHRYSOTILE
13	BK38/013	SPRAY COATING RESIDUE/DEBRIS TO CEMENT CEILING PANELS-BEAMS	INSULATION	AMOSITE

KEY: CHRYSOTILE – WHITE ASBESTOS CROCIDOLITE – BLUE ASBESTOS AMOSITE - BROWN ASBESTOS NADIS - NO ASBESTOS DETECTED IN SAMPLE
TREMOLITE, ANTHOPHYLLITE & ACTINOLITE – LESS COMMON ASBESTOS FIBRE TYPES

Note: When a trace of asbestos fibres are reported this represents one or two fibres only.
Note: The material type reported is an opinion of the analyst only and does not form part of the ATHENA UKAS accreditation.
Note: Samples will be kept for a minimum of 6 months.
Note: This Certificate of Identification of Asbestos Fibres can only be reproduced in full unless written approval from Athena has been obtained.
Note: If the sample condition or size is deemed unacceptable or unsatisfactory by the analyst, the client will be contacted.
Note: The results relate only to the items tested.

ANALYST NAME AND SIGNATURE:	B. HOPSON	AUTHORISER NAME AND SIGNATURE:	S. HOPSON

Samples have been analysed to determine the presence of asbestos fibres using Athena Environmental Solutions "in house" method of polarised light microscopy and central stop dispersion staining based on HSG 248. The site address and sample locations are given by the client and Athena are not responsible for the accuracy or competence of these details or of the sampling.

BULK 001 VERSION 4 – 02/03/15

ATHENA ENVIRONMENTAL SOLUTIONS LTD.

UKAS TESTING
4696

CERTIFICATE OF IDENTIFICATION OF ASBESTOS FIBRES

SITE ADDRESS:	**BUILDING K38**
SITE REF NO.	**N/A**

CLIENT	TRIDENT SURVEYING LTD
ADDRESS	UNIT 5, NORTH HYLTON HOUSE NORTH HYLTON ROAD SUNDERLAND SR5 3AD
PHONE NUMBER	0191 548 3101

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DATE SAMPLED	UNKNOWN		
DATE RECEIVED	12/07/16		
DATE ANALYSED	12/07/16		
NO. OF SAMPLES	52		
PAGE NUMBER	2	OF	4
OBTAINED	DELIVERED		

SAMPLE NUMBER	CLIENT NUMBER	SAMPLE LOCATION	MATERIAL TYPE	FIBRE TYPE DETECTED
14	BK38/014	SPRAY COOATING TO CEMENT CEILING PANELS	INSULATION	AMOSITE
15	BK38/015	SPRAY COATING RESIDUE TO CEMENT CEILING PANELS	INSULATION	AMOSITE
16	BK38/016	MASTIC TO METAL DUCTING	MASTIC	CHRYSOTILE
17	BK38/017	SPRAY COATING RESIDUES/DEBRIS TO CEMENT CEILING PANELS	DEBRIS	CHRYSOTILE/AMOSITE
18	BK38/018	INSULATING BOARD SURROUND TO SKYLIGHT	INSULATING BOARD	NADIS
19	BK38/019	INSULATION WITHIN MMMF INSULATION	INSULATION	CHRYSOTILE/AMOSITE
20	BK38/020	CEMENT CEILING PANELS	CEMENT	CHRYSOTILE
21	BK38/021	INSULATING BOARD FIREBREAK ABOVE PARTITION WALL	INSULATING BOARD	NADIS
22	BK38/022	RESIDUE TO PIPEWORK BENEATH MMMF INSULATION	DEBRIS	NADIS
23	BK38/023	RESIDUE TO PIPEWORK BENEATH MMMF INSULATION	DEBRIS	NADIS
24	BK38/024	INSULATING BOARD WALL SURROUND TO DUCTWORK	INSULATING BOARD	NADIS
25	BK38/025	PAPER LINING TO FIREBOARD PANELS ABOVE INTERNAL WINDOWS	PAPER	CHRYSOTILE
26	BK38/026	VINYL FLOOR TILE WITH BITUMEN ADHESIVE	FLOOR TILE AND BITUMEN BACKING	CHRYSOTILE TO BITUMEN BACKING ONLY

KEY: CHRYSOTILE – WHITE ASBESTOS CROCIDOLITE – BLUE ASBESTOS AMOSITE - BROWN ASBESTOS NADIS - NO ASBESTOS DETECTED IN SAMPLE
TREMOLITE, ANTHOPHYLLITE & ACTINOLITE – LESS COMMON ASBESTOS FIBRE TYPES

Note: When a trace of asbestos fibres are reported this represents one or two fibres only.
Note: The material type reported is an opinion of the analyst only and does not form part of the ATHENA UKAS accreditation.
Note: Samples will be kept for a minimum of 6 months.
Note: This Certificate of Identification of Asbestos Fibres can only be reproduced in full unless written approval from Athena has been obtained.
Note: If the sample condition or size is deemed unacceptable or unsatisfactory by the analyst, the client will be contacted.
Note: The results relate only to the items tested.

ANALYST NAME AND SIGNATURE:	B. HOPSON	AUTHORISER NAME AND SIGNATURE:	S. HOPSON

Samples have been analysed to determine the presence of asbestos fibres using Athena Environmental Solutions "in house" method of polarised light microscopy and central stop dispersion staining based on HSG 248. The site address and sample locations are given by the client and Athena are not responsible for the accuracy or competence of these details or of the sampling.

BULK 001 VERSION 4 – 02/03/15

SUITE 3, SOPWITH HOUSE, HURRICANE WAY, WICKFORD, ESSEX, SS11 8YU
Tel: 01268 761 171 **Fax:** 01268 761 003 **Email:** info@athena-env.co.uk
Company Reg Number: 07376951 **Registered Address:** 3 Sandhurst Crescent, Leigh-on-sea, Essex, SS9 4AL

ATHENA
ENVIRONMENTAL SOLUTIONS LTD.

UKAS TESTING
4696

CERTIFICATE OF IDENTIFICATION OF ASBESTOS FIBRES

SITE ADDRESS:	**BUILDING K38**
SITE REF NO.	**N/A**

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PHONE NUMBER	0191 548 3101

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NO. OF SAMPLES	52		
PAGE NUMBER	3	OF	4
OBTAINED	DELIVERED		

SAMPLE NUMBER	CLIENT NUMBER	SAMPLE LOCATION	MATERIAL TYPE	FIBRE TYPE DETECTED
27	BK38/027	FLANGE GASKETS	GASKET	CHRYSOTILE
28	BK38/028	FLANGE GASKETS	GASKET	CHRYSOTILE
29	BK38/029	INSULATING BOARD TO RS3	INSULATING BOARD	NADIS
30	BK38/030	INSULATION DEBRIS TO FLOOR	INSULATION	NADIS
31	BK38/031	BITUMEN GASKET TO METAL DUCTING	GASKET	CHRYSOTILE
32	BK38/032	CEMENT CEILING PANELS	CEMENT	CHRYSOTILE
33	BK38/033	INSULATING BOARD SOFFIT AND WALL PANELS	INSULATING BOARD	CHRYSOTILE
34	BK38/034	INSULATING BOARD CLADDING TO BEAM	INSULATING BOARD	AMOSITE/CHRYSOTILE
35	BK38/035	INSULATING BOARD CLADDING TO BEAMS	INSULATING BOARD	AMOSITE/CHRYSOTILE
36	BK38/036	ROPE SEAL TO NORTH SKYLIGHTS	TEXTILE	CHRYSOTILE
37	BK38/037	INSULATING BOARD ALONG TO WALLS	INSULATING BOARD	AMOSITE/CHRYSOTILE
38	BK38/038	INSULATING BOARD END PANELS/UPSTANDS TO SKYLIGHTS	INSULATING BOARD	CHRYSOTILE
39	BK38/039	INSULATING BOARD CLADDING	INSULATING BOARD	NADIS

KEY: CHRYSOTILE – WHITE ASBESTOS CROCIDOLITE – BLUE ASBESTOS AMOSITE - BROWN ASBESTOS NADIS - NO ASBESTOS DETECTED IN SAMPLE
TREMOLITE, ANTHOPHYLLITE & ACTINOLITE – LESS COMMON ASBESTOS FIBRE TYPES

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Note: This Certificate of Identification of Asbestos Fibres can only be reproduced in full unless written approval from Athena has been obtained.
Note: If the sample condition or size is deemed unacceptable or unsatisfactory by the analyst, the client will be contacted.
Note: The results relate only to the items tested.

ANALYST NAME AND SIGNATURE:	P. Lord	AUTHORISER NAME AND SIGNATURE:	S. Hopson

Samples have been analysed to determine the presence of asbestos fibres using Athena Environmental Solutions "in house" method of polarised light microscopy and central stop dispersion staining based on HSG 248. The site address and sample locations are given by the client and Athena are not responsible for the accuracy or competence of these details or of the sampling.

BULK 001 VERSION 4 – 02/03/15

ATHENA ENVIRONMENTAL SOLUTIONS LTD.

UKAS TESTING
4696

CERTIFICATE OF IDENTIFICATION OF ASBESTOS FIBRES

SITE ADDRESS:	**BUILDING K38**
SITE REF NO.	**N/A**

CLIENT	TRIDENT SURVEYING LTD
ADDRESS	UNIT 5, NORTH HYLTON HOUSE NORTH HYLTON ROAD SUNDERLAND SR5 3AD
PHONE NUMBER	0191 548 3101

CERTIFICATE NUMBER	ATH/16/07/0080		
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DATE ANALYSED	12/07/16		
NO. OF SAMPLES	52		
PAGE NUMBER	4	OF	4
OBTAINED	DELIVERED		

SAMPLE NUMBER	CLIENT NUMBER	SAMPLE LOCATION	MATERIAL TYPE	FIBRE TYPE DETECTED
40	BK38/040	DAMP PROOF COURSE-EXTERNAL	BITUMEN	NADIS
41	BK38/041	FLANGE GASKET-TO HIGH LEVEL PIPEWORK	GASKET	CHRYSOTILE
42	BK38/042	INSULATION TO HIGH LEVEL PIPEWORK FROM BROOKS HEATER	INSULATION	NADIS
43	BK38/043	INSULATION TO HIGH LEVEL PIPEWORK FROM BROOKS HEATER	INSULATION	NADIS
44	BK38/044	INSULATION DEBRIS	INSULATION	CHRYSOTILE/AMOSITE
45	BK38/045	CEMENT PANEL	CEMENT	CHRYSOTILE
46	BK38/046	INSULATING BOARD ABOVE AND BELOW WINDOWS	INSULATING BOARD	AMOSITE/CHRYSOTILE
47	BK38/047	RESIDUE TO PIPEWORK FROM LARGE HOT WATER TANK	DEBRIS	CHRYSOTILE/AMOSITE
48	BK38/048	INSULATION RESIDUE TO LARGE HOT WATER TANK	INSULATION	AMOSITE/CHRYSOTILE
49	BK38/049	RESIDUE FROM PIPEWORK WITHIN CALORIFIER ROOM	DEBRIS	NADIS
50	BK38/050	RESIDUE FROM PIPEWORK WITHIN CALORIFIER ROOM	DEBRIS	AMOSITE/CHRYSOTILE
51	BK38/051	BRAKE SHOES	TEXTILE	NADIS
52	BK38/052	EXTERNAL CEMENT END PANELS TO SKYLIGHT	CEMENT	CHRYSOTILE

KEY: CHRYSOTILE – WHITE ASBESTOS CROCIDOLITE – BLUE ASBESTOS AMOSITE - BROWN ASBESTOS NADIS - NO ASBESTOS DETECTED IN SAMPLE
TREMOLITE, ANTHOPHYLLITE & ACTINOLITE – LESS COMMON ASBESTOS FIBRE TYPES

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Note: If the sample condition or size is deemed unacceptable or unsatisfactory by the analyst, the client will be contacted.
Note: The results relate only to the items tested.

ANALYST NAME AND SIGNATURE:	P. Lord	AUTHORISER NAME AND SIGNATURE:	S. Hopson

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SUITE 3, SOPWITH HOUSE, HURRICANE WAY, WICKFORD, ESSEX, SS11 8YU
Tel: 01268 761 171 **Fax:** 01268 761 003 **Email:** info@athena-env.co.uk
Company Reg Number: 07376951 **Registered Address:** 3 Sandhurst Crescent, Leigh-on-sea, Essex, SS9 4AL

PATTINSON SCIENTIFIC SERVICES LIMITED
Independent Analytical Laboratory & Inspection Body
Penn Street, Newcastle upon Tyne, NE4 7BG, Telephone (0191) 226 1300, Fax (0191) 226 1266
www.pattinsonscientific.com Email: enquiries@pattinsonscientific.com

Independent Asbestos Training Providers

CERTIFICATE OF ANALYSIS
16-24710

Customer	Trident Surveying, Suite 2, North Hylton House, North Hylton Road, Sunderland, SR5 3AD
Sample Received	26th July 2016
Sample Ex.	Ceiling to warehouse
Date of Report	27th July 2016
Date of Analysis	27th July 2016
Analyst	Robin Brinkhurst

Our Reference	Sample Marked/Description #	Water absorbed %
16-24710	BK38-Board	19.9

Comments
This material has a percentage water absorbed of less than 30%, therefore based on the definition in the Control of Asbestos Regulations 2012 (L143), this asbestos based material is one for which a license is not required to work on (eg 'Asbestos Cement').

N John Scown
Laboratory Manager

This sample has been examined in accordance with a documented in-house method (FIBREID) based on HSG248 The analyst's guide for sampling, analysis and clearance procedures.

Pattinson Scientific Services Limited do not accept responsibility for sampling procedures not carried out by ourselves nor for any information supplied by the customer relating to samples, or the effect such sampling/information may have on the subsequent interpretation resulting from analysis of those samples.

This certificate shall not be reproduced except in full without the written approval of the laboratory.

Samples will be retained for six months before disposal.

Analysis marked # is outside our scope of accreditation.

Any opinions or interpretations marked # expressed in this certificate are outside our scope of UKAS accreditation.

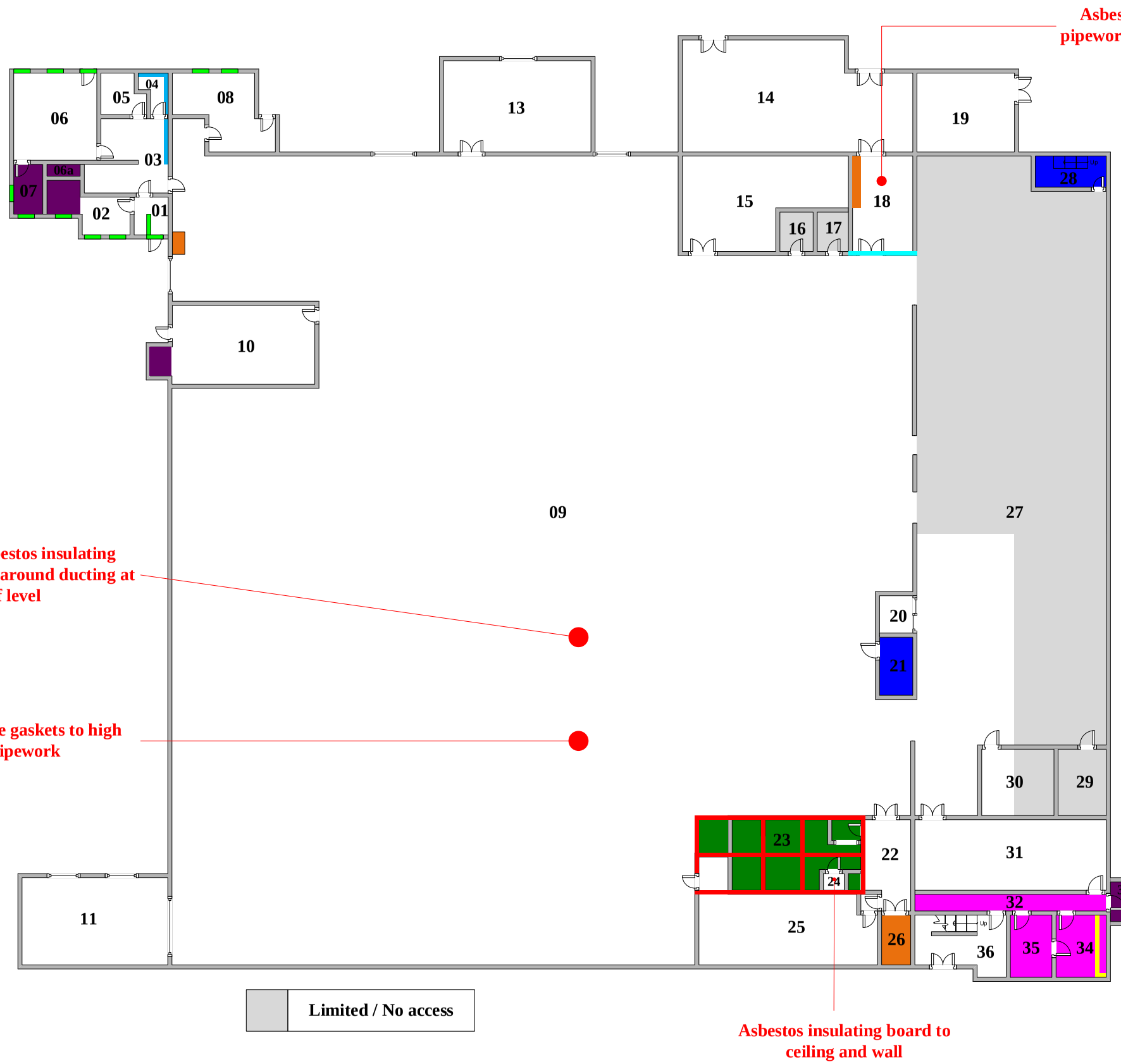
Registered in England Company No. 4555995
Directors: **Karl Reid** MSc, BSc(Hons), CChem, CSci, MRSC, AFOH, AIEMA, CCP(Asbestos), **Chris Gilliead** BSc(Hons) Tech(IOSH), AFOH, CCP(Asbestos)

APPENDIX 2

ASBESTOS LOCATION SITE PLANS

Revision: 03
Ref: TS-20
Date: 28/09/2015

Job No. TSL/3727/24/05/2016



- Asbestos cement panels forming the ceiling
- Asbestos insulating board cladding to beams
- Asbestos textile flash pads within switch gear
- Asbestos insulation debris to floor
- Asbestos insulation to pipework at height
- Asbestos insulating wall boards
- Asbestos insulating boards above and below window / door
- Asbestos cement fascia panel above suspended ceiling
- Asbestos spray coating debris throughout area
- Asbestos cement ceiling panels

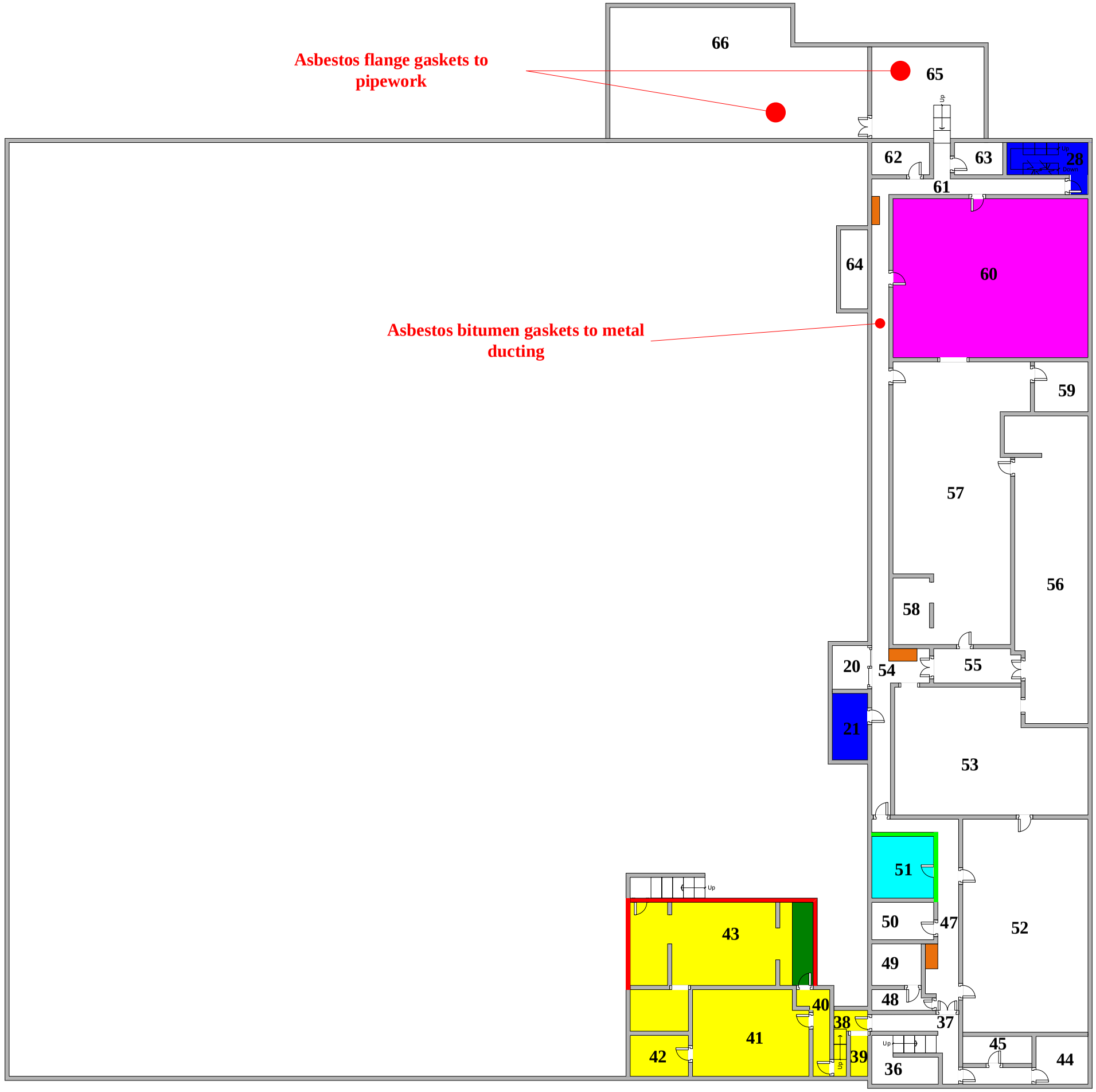
Building K38
IPP (Europe) Ltd
Acornfield Road
Kirkby
L33 7UF

Diagram 1 of 4

Ground Floor

TRIDENT SURVEYING LTD

Revision: 03
Ref: TS-20
Date: 28/09/2015



Asbestos insulating board forming the ceiling

Asbestos insulating wallboards

Asbestos textile flash pads within switch gear

Asbestos insulation debris to floor

Asbestos cement ceiling panels

Asbestos vinyl floor tiles with bitumen adhesive

Asbestos paper lining to to fibreboard panels above glazing

Asbestos spray coating debris throughout area

Job No. TSL/3727/24/05/2016

Building K38
IPP (Europe) Ltd
Acornfield Road
Kirkby
L33 7UF

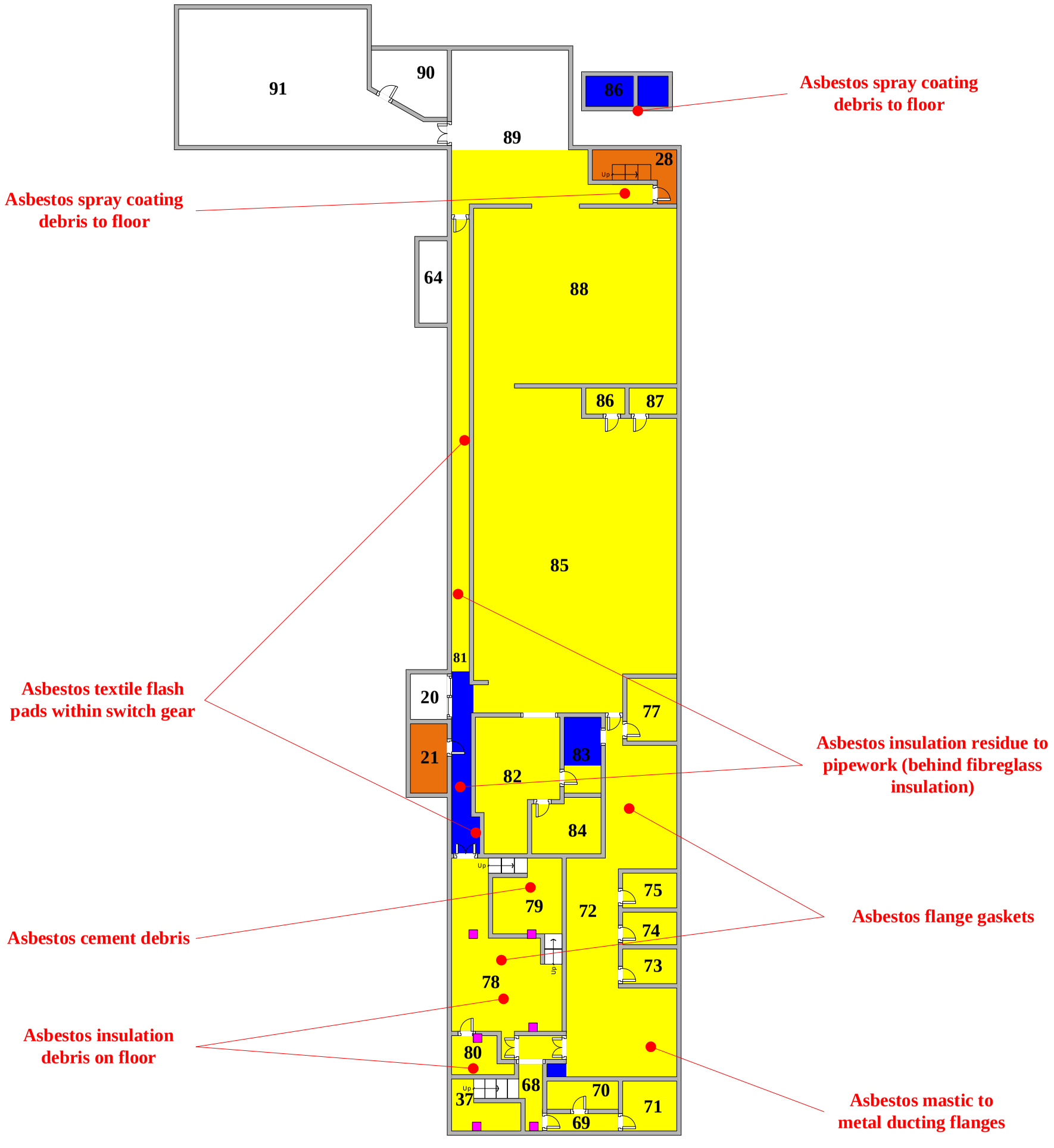
Diagram 2 of 4

First Floor

TRIDENT SURVEYING LTD

Revision: 03
Ref: TS-20
Date: 28/09/2015

Job No. TSL/3727/24/05/2016



Second Floor

	Asbestos cement ceiling panels with spray coating residue and debris to beams
	Asbestos spray coating to asbestos cement ceiling panels
	Asbestos insulating board closer to RSJ stanchion
	Asbestos spray coating debris throughout area

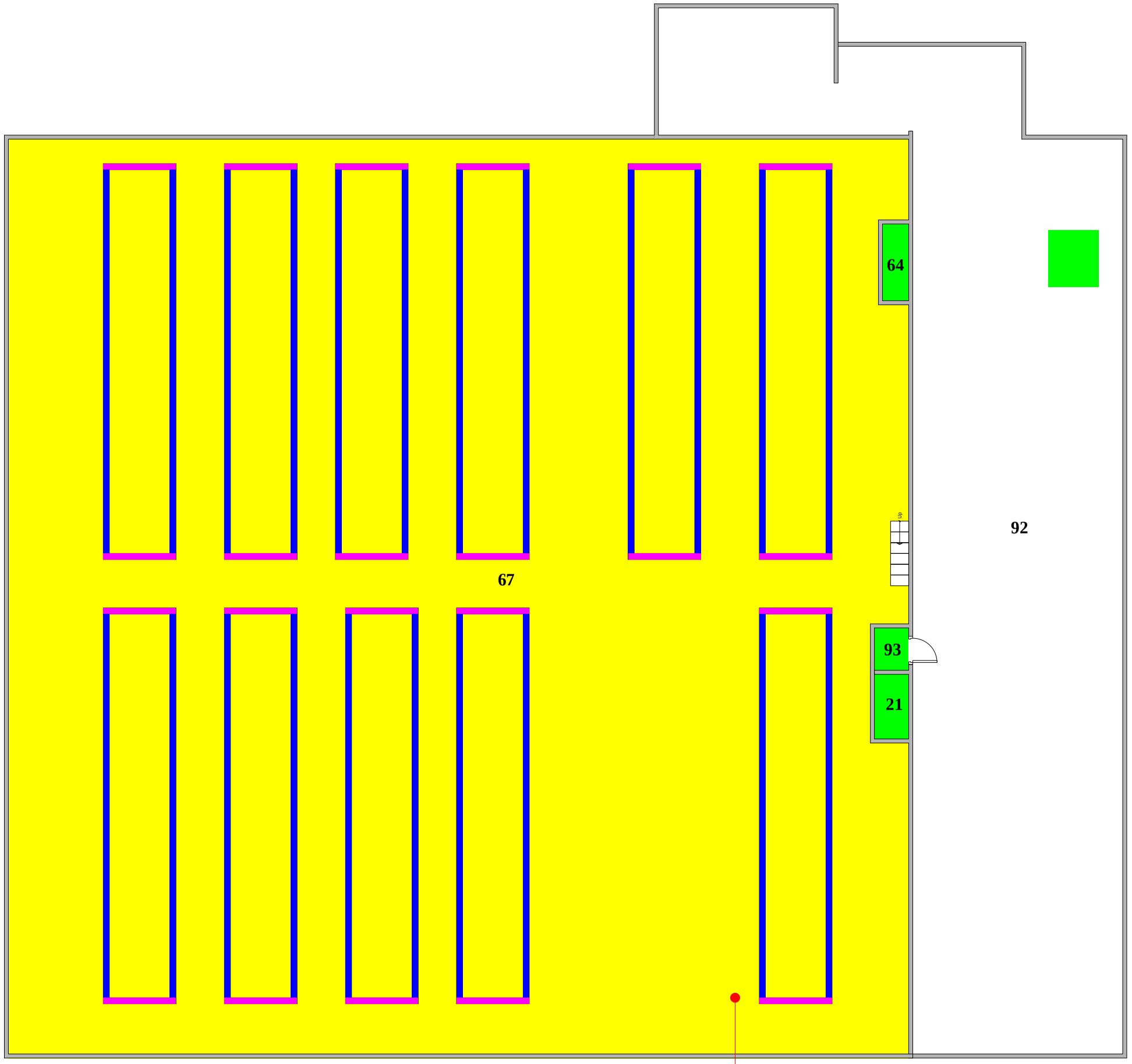
Building K38
IPP (Europe) Ltd
Acornfield Road
Kirkby
L33 7UF

Diagram 3 of 4

TRIDENT SURVEYING LTD

Revision: 03
Ref: TS-20
Date: 28/09/2015

Job No. TSL/3727/24/05/2016



Roof level

Asbestos cement pipe and cowl

	Asbestos cement ceiling panels overlaid with bitumen roofing felt
	Asbestos cement external end panels with asbestos insulating board internally to skylights
	Asbestos cement ceiling panels
	Asbestos rope seals to Northern skylights

Building K38
IPP (Europe) Ltd
Acornfield Road
Kirkby
L33 7UF

Diagram 4 of 4

TRIDENT SURVEYING LTD

APPENDIX 3

RISK ASSESSMENT

Appendix 3: Risk assessment of site	**Site Address:** Building K38, IPP (Europe) Ltd, Acornfield Road, Kirkby, L33 7UF.	**Inspector (s):** Jagdeep Sahajpal Varinder Khaira

HAZARD	Applicable Yes / No	Severity if accident happened High (H) Medium (M) Low (L)	Likelihood of Accident High (H) Medium (M) Low (L)	Action taken if hazard and risk present Abort (A) Control (C) Limit Inspection (LI) Protect (P)	Comments
Unsafe access and egress to area	Yes	H	M	C	Normal entry and exit routes to the property must remain unobstructed and clear of hazards.
Inadequate lighting	Yes	M	M	C	Surveyors to use torches and request that portable lighting is made available by client if required.
Working from ladders	Yes	M	L	C	Ladders should only be used for short duration tasks or when it is not practicable to use other forms of access equipment. i.e. aluminum scaffold towers, full scaffold platforms etc. Ladders should be in good condition before use. All ladders should be of a British Standard Grade 1. Ladders to be erected on a firm base and at the right angle i.e. a ratio of 1:4. Floors must be clean free from loose dirt and oil.
Working from height greater than 3m	Yes	H	L	C	A tower scaffold should be provided by client where applicable. This should be set up by a trained and competent person.
Working at height on fragile roof	Yes	H	M	A	There will be no access onto any roofs deemed unsafe or have no safe access points or walkways.

HAZARD	Applicable Yes / No	Severity if accident happened High (H) Medium (M) Low (L)	Likelihood of Accident High (H) Medium (M) Low (L)	Action taken if hazard and risk present Abort (A) Control (C) Limit Inspection (LI) Protect (P)	Comments
Lone working	Yes	H	L	C	Survey to be carried out by a competent and qualified surveyor. The surveyor attending site will hold P402 and / or RSPH Level 3 Certificate in asbestos surveying.
Confined Space	No	H	L	LI	No access will be made into any confined space unless full a method statement and risk assessment is carried out on day of survey.
Hazardous substances	Yes	H	H	A	If unknown substances are discovered on site, they must be brought to attention of the Site Manager / supervisor. COSHH Assessments to be made readily available to surveyors for consultation. Operatives to comply with the COSHH assessment control measures. All appropriate PPE must be used as required by the assessment.
Plant Machinery	Yes	H	H	LI	The surveyors will not access or open up any plant machinery. Client to make available a competent person.
Asbestos	Yes	H	L	C & P	Asbestos maybe present –safe working procedures in accordance with **'Asbestos: The Survey Guide HSG 264'** will be used throughout the course of this survey.

HAZARD	Applicable Yes / No	Severity if accident happened High (H) Medium (M) Low (L)	Likelihood of Accident High (H) Medium (M) Low (L)	Action taken if hazard and risk present Abort (A) Control (C) Limit Inspection (LI) Protect (P)	Comments
Electrical hazard	Yes	H	H	LI	No access will be made into fuse boxes or electrical equipment within the property unless it is isolated by a competent person, a certificate of disconnection is present or if they are clearly redundant.
Vehicle Movement	Yes	H	L	C	Hi-visibility clothing to be worn at all times and surveyors only to walk in designated areas as per site policy. Surveyors to abide by site speed limits and road markings on site at all times
Heavy Lifting	Yes	H	H	C	Inspection hatches will only be accessed if safe and practical to do so. Use of contractor and plant machinery may be required.
Personal safety	Yes	H	L	C & P	The surveyors will wear safety boots, hi visibility jackets, hard hats and light eye protection as required during the course of the survey. RPE and appropriate clothing will be worn for asbestos sampling.

Summary Report on Land Quality Considerations

Image Business Park, Knowsley

Client Name:	Knowsley (Image Business Park) Ltd
Document Reference:	QC315-01.R.1.5.1.SH
Project Number:	QC315

December 2017

Qallida Consulting Ltd
Tel 07778 189929

Author

Simon Handy BSc (Hons) CEng MICE

On behalf of Qallida Consulting Ltd

Signed

06/12/2017

Disclaimer

This summary report has been prepared by Qallida Consulting Ltd using all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. Site inspection has been limited to some specific tenant areas only.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

1. Overview 1
2. Past Operations and Investigations on Site 3
3. Remediation Works Completed 4
3.1 Zone 1: Playing Field & Eastman Chemicals 4
3.2 Zone 2: Photo-Chemicals Division (PCD) 4
3.3 Zone 3: Reservoir and Synchem Plant 5
3.4 Zone 4: Bulk Solvents Area 5
3.5 Zone 5: Former Synchem Plant 6
3.6 Zone 6: Drum Storage Compound and 'Mound' 6
3.7 Zone 7: Ames Goldsmith Area (Silver Nitrate) 6
3.8 Zone 8: Effluent Treatment Plant 6
4. On-Going Environmental Management 8
5. Drainage Review 12
5.1 Drainage Systems 12
5.2 Drainage Infrastructure Condition 12
6. Estate Management Recommendations 16
7. Development Considerations 20
7.1 Development Plot A 21
7.2 Development Plot B 21

Appendices

Appendix A Drawings
Appendix B Site Visit Notes
Appendix C Documents Received Index

1. Overview

This review is based on data provided by the vendor and information gathered during a site visit on 21 September 2016, including subsequent follow-up.

The site was previously occupied by Kodak and until recently was used for the manufacture of photo-chemicals. Production ceased during 2006 when the plant was shut down, with the exception of the silver nitrate plant which was leased to Ames Goldsmith and a research facility in the north-western corner which was leased to Eastman Chemicals. Subsequently, the site was purchased by Acorn Properties in 2007 and two further tenants were introduced: Future Industrial Services who operate a waste transfer area in the south-eastern corner of the site and Tradebe (previously Minerals Resource Management) who operate a waste plasterboard recycling business in part of Building 82. A number of newer tenants have also occupied the site and discussions are on-going with further potential tenants.

The site has been subject to voluntary remediation works and was split into eight zones by WSP for assessment and treatment purposes (see plan in Appendix A). The objectives of the remediation works were to remediate known contamination at the site to levels determined by appropriate quantitative risk assessment, to obtain regulatory support for the proposed remediation activities and to gain confirmation from the statutory authorities that the works were completed and validated accordingly. Upon completion of the remediation works, written confirmation was obtained from the regulators that, with respect to the known contamination, the site was in a satisfactory state with regard to Part IIA of the Environmental Protection Act 1990 and the 1998 Groundwater Regulations. Following this review, it is considered that this condition remains satisfactory.

The site has benefited from an insurance backed Transfer Agreement for Environmental Obligations, entered into by Acorn Developments to transfer certain liabilities to WSP Kirkby AT. This expired on 12 October 2017 but it is understood that no claims were made during the period of cover. However, a warranty was also provided by WSP Remediation to Acorn Developments, which appears to be valid until 15 October 2019.

The site's drainage network represents a potential source of contamination and it is understood that this is the responsibility of the landlord, with tenants taking control of maintenance on their plots. It is recommended that some key runs are surveyed to bring records up to date and the condition of the drainage infrastructure should be well maintained in the future to minimise the risk of leakage to the ground.

The roadway at the east end of South Street should be repaired particularly owing to the proximity of tanker unloading, the integrity of the former reservoir in Zone 3 should be improved as necessary owing to the nature of materials stored there and abandoned boreholes should be sealed to reduce the risk of contaminant percolation and migration.

Environmental management audits of the four main tenants were last completed in December 2010. The output from each audit includes recommendations to minimise the risk of contamination. The landlord has reviewed the recommendations with the tenants but not all work has been completed. Specific improvement recommendations are summarised for Ames Goldsmith and FIS in Section 6 of this report and should be followed through. It has been suggested by Kodak that responsibility for soil and shallow groundwater liability reverted to Ames Goldsmith under their lease agreement but this should be verified.

It is recommended that a comprehensive set of site records is established recording the status of the site in terms of contaminated land condition, environmental monitoring, drainage condition and environmental audit of tenants.

The site is considered suitable for redevelopment for a commercial / industrial end use, although further remedial or preventative measures are likely to be required as part of any such work and some limitations to development have been identified. However, risks to development on Plot A are considered to be low owing to its past use as playing fields. It is understood that Plot B is to be decommissioned, cleared of asbestos and demolished down to slab level as part of a future development, but poor geotechnical conditions and residual ground contamination will need to be addressed during the development stage.

Whilst outside the scope of this report, it is understood that the existing buildings have been reported as having substantial quantities of asbestos containing materials present and specialist advice should be sought where responsibility is not to be retained by the vendor.

2. Past Operations and Investigations on Site

The site was in agricultural use until late 1939, when construction of the Kirkby Munitions Factory commenced, covering some 743 acres, with the majority of development located off-site. The buildings on site were reportedly used as explosive test bays and the presence of earth bunds around some of the buildings suggests that explosives may have been stored here. The munitions factory was closed in 1946 and Kodak moved to the property in 1949. It appears that initially operations were small-scale, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's facility in Harrow. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

Between 1969 and 1974 production on site diversified to produce chemicals not specifically for the photo-chemicals industry, including production of hydroquinone, tecmangam (manganese ammonium sulphate) and benzoquinone. During the late 1970s a number of buildings were demolished and replaced. By 2001 the Powders & Solutions Department was closed and photo-chemical production ceased at the end of 2006.

Four main phases of environmental investigation and assessment work were conducted from the 1970's to 2010. The early work included several limited site investigations mainly for geotechnical purposes conducted in the 1970's.This was followed by environmental investigations undertaken by Aspinwall during the 1990s, with subsequent groundwater monitoring visits and assessments culminating in 2000. A new phase of environmental investigations was commenced by Conestoga Rovers Associates (CRA) in 2003 as part of a wider review of environmental liabilities associated with all Kodak properties.

In early 2007 CRA's brief was extended to include a site investigation of newly accessible areas, given that production at the facility had ceased at the end of 2006. WSP Environmental was then engaged in 2007 by the new site owner Acorn Properties, to undertake an environmental assessment based on the findings of the CRA investigation. Following this, WSP Environmental was retained to develop a plan for voluntary remediation works, which drew upon some 36 earlier reports for environmental data. The remediation works were undertaken from April 2007 to November 2010 and are well documented in their subsequent reports.

Since 2010 the four main tenants have remained in place, although MRM have changed name to Tradebe and have leased an additional plot of land on the east side of their premises. Also, Future Industrial Services have upgraded some facilities on the east side of Zone 4 and are currently extending the waste transfer station eastward but within their original plot area. Ames Goldsmith have installed a new silver oxide plant in Building 32 but the Eastman premises remain largely unchanged.

New tenants include Oscar Tyres in Building 46, AV Autos in Building 49, Martifer in a section of Building 38 and Surface Transform in Buildings 43 and 94. A plan showing tenant locations is included in Appendix A. Also, it is understood that negotiations are being advanced with Entrade to lease land between Buildings 42, 46 and 55, and also with Langdons to take the playing field plot for a large refrigerated storage building.

The site was visited on 21 September 2016 at which time meetings were held with the landlord and selected tenants. Notes of the site visit are included at Appendix B.

A list of technical documents made available by the landlord is included at Appendix C. A number of progress reports and a groundwater monitoring report were not provided as is noted, but they are not expected to be material to this report.

3. Remediation Works Completed

The programme of remediation was defined by WSP Environmental as the elimination of identified significant pollutant linkages in consideration of the continued industrial usage of the site, and as such, to avoid any statutory enforced remediation requirements.

The remediation works comprised a combination of reduction in contaminant load, contaminant containment and management; rather than a complete removal of contamination. The contaminant load was reduced through a combination of chemical extraction, stabilization of potential sources, onsite treatment, and reduction in the hydraulic gradients limiting the migration of compounds of concern. The post remediation condition aimed for significant pollutant linkages not to be present or unlikely to be present.

To avoid the future creation of pollutant linkages a combination of active site environmental management, the imposition of land use restrictions within various areas of the site and contaminant load reduction was prescribed.

Site wide monitoring was performed through the remediation period and for a post remediation period agreed by the Environment Agency. The monitoring was undertaken to demonstrate success of the works and to support natural attenuation predictions for the residual contamination concentrations. Acceptance of satisfactory completion from both the Environment Agency and the Environmental Health Officer was received in 2010.

3.1 Zone 1: Playing Field & Eastman Chemicals

Extensive testing was completed throughout this zone because of reported historical burning and waste disposal. Limited amounts of hydrocarbon contamination were identified in the Made Ground locally associated with tar fragments in the soil matrix. However, widespread impact was not identified nor was there evidence of significant disposal or burning ground residues. As a result, no remediation works were considered necessary, particularly as the underlying depths of boulder clay would prevent any significant pollutant linkage.

3.2 Zone 2: Photo-Chemicals Division (PCD)

Local contamination impact around Building 84 (Former Toner Storage Area) was identified by previous investigations as containing elevated concentrations of BTEX compounds, in particular Xylene affecting both the soil and perched groundwater. Polychlorinated Biphenyls (PCB's) was also identified in soils within the Building 84 area, associated with an ashy Made Ground layer located above the perched groundwater.

Strong chemical odours were recorded immediately down gradient of the PCD tank farm area but quantitative risk assessment showed no significant risk in this area. The remaining area of Zone 2 was considered relatively uncontaminated apart from a small section in the south-eastern part, previously occupied by the utilities area, which has been identified as having some limited Total Petroleum Hydrocarbon (TPH) impact.

Remedial treatment using Air Sparging/Soil Vapour Extraction was completed in compliance with remedial targets. Monitoring of the groundwater conditions was undertaken both during and after the works and validated to the satisfaction of the Regulators.

Following on from the validation of Zone 2, capping works were completed to negate potential infiltration into the made ground thus removing any risk of flushing of identified PCB chemicals in the shallow

subsurface. These works included the removal of the concrete plinth, a superficial surface scrape of the gravel surface and laying a concrete cap of approximately 150mm in depth, keyed into the existing surrounding concrete surface.

3.3 Zone 3: Reservoir and Synchem Plant

This is a relatively large area along the eastern boundary of the former processing areas. The northern portion is occupied by a war era reservoir and the southern portion by Building 82, which was occupied by Synchem. Local solvent odours were recorded within the northern part of Building 82. The contaminants of concern impacting the perched groundwater were identified as BTEX (Benzene, Toluene, Ethylbenzene and Xylene), Chlorinated Solvents and Acetone.

Remedial treatment using Dual Phase Vapour Extraction (DPVE) was completed in compliance with remedial targets. Since the cessation of the DPVE system all contaminants of concern were shown to have decreased and remained below the remedial target levels. Monitoring of the groundwater conditions was undertaken both during and after the works and validated to the satisfaction of the Regulators.

3.4 Zone 4: Bulk Solvents Area

Solvent contamination existed in proximity to above and below ground solvent storage tanks and associated infrastructure, and in connection with the chemical drainage system. Within the bulk solvent storage area, numerous chemical / solvent odours were recorded and these were accompanied by predominantly BTEX and Chlorinated Hydrocarbon impact within soils and perched groundwater.

Remediation works were undertaken to remove impacted soils, drain runs and treat in-situ residual groundwater. Groundwater treatment was achieved through a combination of in-situ systems including Dual Phase Vacuum Extraction (DPVE), dewatering during soils remediation, and passive remediation following soils remediation to address rebound and residual contamination. The existing site chemical drainage system was also identified as a risk area associated with historic contamination and consequently some remedial work was implemented.

An area of shallow buried chemical waste was identified as part of the remediation works and the source material was removed with the resultant 36 tonnes of hazardous waste disposed off-site. However, this area was re-excavated and an estimated further 135 tonnes of impacted soil removed, treated on site and then deposited within the Zone 5 southern excavation once treatment was complete.

The DPVE system was temporarily shut down in December 2008 after an investigation identified a section of foul sewer used by Future Industrial Services to discharge chemical waste to be leaking at the west side of Zone 4. The sewer was repaired in February 2009 but although this event impacted the monitoring results, it was considered to be outside the remediation remit. Further reference to on-going management issues is found in Section 4.

Since the cessation of the DPVE system all contaminants of concern were recorded below regulatory agreed remedial targets – both within remediation wells and the wider Zone 4 monitoring network. Monitoring of the groundwater conditions was undertaken both during and after the works and validated to the satisfaction of the Regulators.

This zone is considered suitable for continued industrial or commercial end use but poor geotechnical conditions encountered during the intrusive works should be considered during any future works. The

potential for pockets of contaminated materials to remain is likely in this area and any proposed earthworks will require appropriate assessment.

3.5 Zone 5: Former Synchem Plant

Investigation of the Former Synchem area identified elevated concentrations of TPH, BTEX and Chlorinated Hydrocarbons within the Made Ground and the underlying Shirdley Hill Sand. Within this area there was also evidence of limited downward migration directly through the Glacial Till to a depth of at least 7.0 metres.

This was the most heavily impacted area of the site and was subject to substantial soils remediation works. Following the demolition of residual buildings and the removal of surface concrete, remedial works were instigated. These included soil excavation, on site treatment, passive perched water removal, validation, and reinstatement with treated soils.

The works included two excavations to the north and south of the zone. Approximately 1,937m^3 of soils were excavated and treated from the northern excavation with 1,308m^3 of soils excavated and treated from the southern excavation. The northern excavation also contained many substantial subsurface structures that required removal, including three 1000 gallon tanks. In addition, piles driven to 4 metres below ground level were also removed from this area.

Validation data collected from the 11 sumps and window samples following the completion of the Zone 5 soils remediation works demonstrated that all contaminants of concern post remedial works were significantly below the agreed criteria and to the satisfaction of the Regulators. However, groundwater monitoring identified 'new contamination' within the southern Zone 5 area which appears to link to the foul sewer leakage associated with Future Industrial Services reported in section 3.4. The sewer was repaired in February 2009.

3.6 Zone 6: Drum Storage Compound and 'Mound'

No works were proposed in this zone on the basis of no evidence of contamination or a significant pollutant linkage. However, the area was used for management of soils excavated from other portions of the site.

Any future development of this area will require proper management of excavated soils and encountered shallow groundwater.

3.7 Zone 7: Ames Goldsmith Area (Silver Nitrate)

It is understood that TPH and Chlorinated Hydrocarbon contamination were recorded in the Made Ground and perched groundwater in the south central portion of the silver nitrate plant. However, the contamination was considered to be limited in this area and therefore a monitoring only strategy was proposed for this part of the site. The Ames Goldsmith area is subject to the terms of their lease and it is understood that Kodak interpreted that after five years all responsibility for soil and shallow groundwater reverted to Ames Goldsmith.

3.8 Zone 8: Effluent Treatment Plant

Three separate drainage systems were developed at the site, one for surface drainage, another for foul water, and a third for chemical drainage. Wastewater treatment was undertaken on site, comprising separator pits, neutralisation and biological treatment. The majority of this apparatus was located in this

zone but significant contamination was not recorded during investigations, post demolition or soils validation works undertaken in 2007. This programme was supervised and reported on by Kodak's consultants CRA.

4. On-Going Environmental Management

Image Business Park comprises numerous industrial buildings with associated tank farms and overhead pipework, together with offices, roadways, hardstandings and areas of landscaping. The north-eastern part of the site was until recently utilised as a grass sports pitch. Some buildings have been the subject of refurbishment or alteration in recent years. Four main tenants currently occupy a relatively small proportion of the property. Eastman Chemicals occupies a building in the northwest for research purposes and Ames Goldsmith operates a silver nitrate production facility in the southwest. Future Industrial Services undertakes effluent treatment and disposal in the south-west sector of the site and Tradebe (formerly MRM) occupies the southern part of Building 82 for the purpose of producing plasterboard from recycled gypsum. In addition, a new tenant, Surface Transform was fitting out their newly leased premises at the time of the site visit and it is understood that they manufacture ceramic brakes using a fibre weave which is stitched together, baked in furnaces and worked upon to machine the discs. A variety of small tenants use the site for storage of classic cars, tyres and metal products.

The environmental sensitivity of the site is relatively high and primarily relates to the underlying Sherwood Sandstone major aquifer, which is particularly shallow and vulnerable in the south-western corner of the site. As a consequence, good environmental management practices and regular maintenance of below ground infrastructure are important.

The site's drainage network represents a potential source of contamination and it is understood that this is the responsibility of the landlord outside tenant plots. WSP recommended that where necessary, the condition of the drainage infrastructure should be surveyed and maintained to minimise the risk of leakage to the ground. In particular, they advised that relevant sections of drainage should be assessed prior to use by new tenants. A detailed review of drainage condition survey records held on site was completed as part of this report and is included at Section 5.

Detailed audits were conducted by WSP for each tenant in 2010. They comprised a site inspection and interviews with relevant staff, a review of environmental permitting / licensing information and a review of published environmental datasets. A further review of the tenants' operations in respect to WSP's recommendations was undertaken in September 2016 as part of this report and notes of the visit are included in Appendix B. However, this does not constitute a full audit which would be essential upon change of any current lease, or when there are significant changes to existing tenants' operations.

Eastman Chemicals

No significant sources of ground contamination were identified from the current and on-going practices carried out at the subject site. The results of past site investigations have not identified significant sources of historical ground contamination. The landlord confirmed that the Eastman premises remain largely unchanged since the 2010 audit.

Ames Goldsmith

WSP reported that no significant sources of ground contamination were identified from the current and on-going practices carried out at the subject site. The results of previous site investigations had not identified significant sources of historical ground contamination, although part of the site had been subject to past remediation. It has been suggested that responsibility for soil and shallow groundwater liability reverted to Ames Goldsmith under the lease agreement.

It is understood that Ames Goldsmith have replaced sections of drainage runs that were seen to be a potential risk pathway to the underlying soils and groundwater.

Best practice improvements recommended by WSP were:

- General storage arrangements and awareness of environmental procedures to be maintained as good
- Visual inspections of the on-site tanks and associated pipework should be undertaken to ensure tank integrity and to detect any signs of damage or leakage
- The Pollution Prevention and Control permit required improvements to be completed within the designated time period stated within the permit document

Site management confirmed that the recommended improvements had been completed and on-going monitoring and sampling was continuing. Drainage surveys had identified areas of possible leakage and repairs have been made but are incomplete as set out in Section 5.

The tenant introduced a new silver nitrate process in Building 32 in 2012, which included the addition of two new production activities to those already permitted: the production of silver powder from a silver salt, and the production of a silver salt from silver nitrate.

During the site visit it was noted that an IBC at the back of Building 62 was unbunded and unalarmed, with the adjacent soft ground surface posing a risk of infiltration in the event of spillage of product.

It is understood that regular checks are made on the storage and handling of chemicals on site, including audits of the volume of chemicals purchased, stored and used. Regular checks are made for leaks, including any pipework leading to and from the machinery.

An improvement programme has been agreed with the EA although correspondence with the EA should be formally documented.

Future Industrial Services (FIS)

FIS occupies three separate areas of the business park as illustrated in Appendix A. They operate a waste management centre that incorporates a packaged waste transfer station, gypsum recycling, and blending / storage facilities for both waste solvents and waste oils. At the time of the site visit the transfer station was being extended eastward.

The facilities operate under an Environmental Permit which has been updated and varied to suit developments on site. Each year an Annual Groundwater Monitoring Report is compiled to summarise the findings of quarterly groundwater monitoring rounds undertaken by WSP. FIS have agreed an improvement programme with the EA which is being implemented on an on-going basis. In addition, United Utilities monitor drainage discharge from the site.

The 2010 Environmental Management Audit of all tenants by WSP highlighted a number of potential environmental concerns, predominantly associated with ground contamination. Subsequently, these items have been followed up by FIS and can be summarised as follows:

- Appropriate secondary containment should be provided for the two tanker off-loading areas, as current measures appear to be inadequate. Improvements have been made but further work is required to prevent risk to the surface water system or permeable surfaces

- Operation of the eastern off-loading area appears to be resulting in leakage to ground via the adjacent gravel area. Replacing the gravel with a hardstanding, or moving the off-loading area to a more suitable location should be completed. A new concrete hardstanding has been installed
- Integrity of all below ground infrastructure must be maintained and inspected on a regular basis. This should cover all surface water drains, all gullies, chemical drains and sumps / interceptors in use. This has been addressed by FIS and is reported in Section 5
- Integrity testing should be undertaken on the two underground storage tanks within Zone 4, including all associated below-ground pipework. FIS have been unable to locate these and will need to liaise with WSP
- Several surface water drains appear to be at risk of receiving effluent via surface run-off. All surface water drains within the vicinity of the FIS operations should be reviewed. All drains found to be at risk should be sealed and replaced as appropriate. Further work has been done on this as reported in Section 5. In addition, a concrete upstand has been installed adjacent to Gully 95 to deflect any spillage away
- Integrity of the concrete hardstanding within the Zone 3 storage area should be assessed to prevent escape of potentially contaminative stored materials where the condition is poor. This is outstanding and will need to be managed in the future
- All gullies used to collect surface run-off of effluent should be regularly maintained / cleaned to prevent blockages. Whilst regular work has been undertaken to improve the condition of the drainage system as reported in Section 5, further improvement is required

In June 2011 the Environment Agency noted staining of crushed materials likely to be associated with a leak from the manifold to Tanks 2 and 3 during a site inspection. This was investigated by WSP who found that the groundwater quality did not show any significant impact and only a minor amount appeared to have been spilt from the manifold, causing no significant detriment.

In August 2013 effluent Tank 5 overflowed as there was no high level cut off to the feed pump to the tank. It is understood from FIS that this has since been installed. WSP have reported that no significant impact has been detected to date, although they observed that groundwater contaminant concentrations at this location are variable and require further monitoring.

During the site visit it was noted that the off-loading bay at the side of Building 29 was in an unsatisfactory condition. Gullies appeared to be blocked and rainwater, spilt liquid and solids were ponding at the north-west corner of the building. It appeared that solids have been shovelled onto the adjacent bank and it is understood that liquids are pumped away from time to time to reduce ponding. The area is flanked by a low kerb onto a soft area that could be breached in the event of a spill.

A separator was seen to be operating at effluent pit 28, discharging into an IBC. It is understood that this is alarmed so that a replacement IBC can be provided, but the proximity of surface water drains and the lack of bunding is a cause for concern in the event of spillage.

Zone 3 is used by FIS for storage of solids arising from the treatment processes and other items of equipment. The far north-east section is covered by a limited area of temporary roofing, below which the solid material is stored. The area is a disused sunken concrete reservoir, which is undrained and its integrity requires assessment as stated above. Rainwater, liquid run-off and silt collect at a low point in the north-west corner. The product is inspected/tested informally and either discharged to sewer by manual opening

of a valve, or pumped from a sump to IBCs if found to be contaminated. This may not be covered by a permit and no management procedures were available.

Tradebe (formerly MRM)

Tradebe operate dry plasterboard recovery processes and do not discharge to sewer. The plasterboard is screened and crushed to form a powder, granules or pellets. Water spray is used for dust suppression but all water is absorbed by the plasterboard product. Diesel fuel is stored in an external above ground tank at the south side of the building.

The activities undertaken by Tradebe are generally not considered to have a significant potential to cause soil and groundwater contamination. Potential pathways by which waste and effluent could impact soil and groundwater quality on the site, together with existing control measures, were summarised by WSP in 2010 as set out below.

- The tank should be regularly inspected and maintained in order to ensure ongoing integrity of the facility
- Drip trays and spill kits should be available for use and staff trained in how to dispense fuel appropriately and manage spillages. Any area utilised for fuel storage/dispensing should be provided with impermeable hardstanding in order to prevent any spillages from entering the underlying soils
- Tradebe have assessed the condition of drains and gullies on the site, including the water drainage system.

Tradebe confirmed that the fuel tank is inspected every 2 years by Group Engineering and that it has been moved into a new concrete bund since the 2010 audit by WSP. Spill trays and a spill kit are available during refuelling. Gully maintenance is no longer necessary in the process area because they have all been sealed.

During the site visit in September 2016 it was noted that the building had been extended on the south elevation and a strip of land had been added to the leased area on the east side.

5. Drainage Review

The site's drainage network represents a potential source of contamination and it is understood that this is the responsibility of the landlord outside the demise of the current tenants.

The drainage across the site was recorded on a drainage plan in July 2004 by Kodak, showing chemical, foul and surface water drainage systems. In addition, further details have been confirmed by the landlord and representatives from Ames Goldsmith, FIS and Tradebe.

5.1 Drainage Systems

Chemical Effluent

Effluent generated from inside the Eastman laboratory areas drains into a neutralising pit, which then appears to discharge into a foul sewer located beneath North Street and then exits the site at North Gate, discharging into the mains foul water system located beneath Acornfield Road. The chemical drainage system used by Ames Goldsmith discharges off-site via a feed sump and recorder pit to the west of the premises and then into foul sewer below Acornfield Road. Chemical effluent drains utilised by FIS in Zones 4 and 6 appear to pass to an interceptor pit in the southwest corner of Zone 4, or in some cases directly to foul sewer below Central Avenue. Inevitably alterations will have been made to the drainage system with the introduction of new facilities by FIS. It is understood that Tradebe does not utilise the former chemical drain runs in their area. Surface Transform does not appear to have any chemical drains within their demise.

Foul Sewage

Foul water from the Eastman site drains directly into the foul drain located beneath North Street and follows the route described for the chemical effluent above. Ames Goldsmith have two foul water connections into the foul sewer running below South Street, which then follows a route below the west part of their demise to reach Acornfield Road. It appears that in Zone 4 there are a few connections from FIS facilities into the foul sewer running below Central Avenue and in Zone 3 water collecting in the former water tank is either pumped to tanker from a sump in the northwest corner or released by manual valve to a foul sewer which connects to the foul sewer running below North Street. Tradebe has a single connection to foul sewer. The Surface Transform premises are served by a network of foul drains but it is understood that no chemicals are introduced to the processes undertaken by the tenant but no audit has been performed.

Surface Water

Surface water from the site consists of run-off from the site buildings, roofs and hardstanding areas of the site. Rainwater falling on the un-surfaced areas of the site infiltrates into the ground and moves offsite via groundwater flow. In Zone 4, occupied by FIS, some surface water drains connect into the chemical effluent system. Connections to off-site surface water sewers are along Acornfield Road.

5.2 Drainage Infrastructure Condition

The condition of the chemical drainage system across the former Kodak site was assessed by WSP and reported by them in February 2008. The scope of the works included an assessment of the feasibility of re-using the existing chemical drainage infrastructure. The report stated that where pipes were identified as having structural defects there was the potential for leaching of chemicals into the subsoil and potential for infiltration into the underlying groundwater. Therefore, although limited contamination was identified to be

potentially impacting the site, it was recommended that the drainage infrastructure was to be replaced or repaired to prevent significant contamination.

Eastman

WSP prepared an Environmental Management Plan (EMP) in December 2010 which reported that the damaged drainage identified in the Eastman premises revealed by camera inspection was repaired/ replaced in July 2007 to improve the integrity of the drainage network and prevent leaching into the surrounding sub-soils. It is understood that no more recent surveys have been conducted by Eastman.

Ames Goldsmith

The WSP 2010 EMP reported that large sections of the drainage network on the Ames Goldsmith site were not assessed for integrity or condition, due to access restrictions. However, structural defects were previously recorded in two areas of the chemical drainage system such as cracks, fractures, holes, pipe collapse and displaced joints. The plant manager at Ames Goldsmith confirmed to WSP that work was undertaken to replace the drainage that was seen to be a potential pathway risk to the underlying soils and groundwater in March 2008. In October 2016 Ames Goldsmith completed camera surveys of the chemical drainage system within their demise which recorded generally satisfactory conditions with the exception of runs:

- C121 – gully: hole in 100mm sewer
- C102 – C156: highly fractured 150mm sewer with many displaced joints
- C 121 – C122: collapsed 150mm sewer

It is understood that these repairs have not been completed. In addition, drain runs C118 to C157, C157 to the Feed Sump and Feed Sump to C125 were omitted from the surveys owing to partial blockage and back-up of liquids. It is understood that Ames Goldsmith will arrange clearance, survey and repair as necessary.

Future Industrial Services (FIS)

WSP reported on the FIS plots in 2008, 2010 and more recently in their Annual Groundwater Monitoring Report 2015 dated March 2016 undertaken specifically for FIS. They reported that CCTV drainage surveys had been undertaken by Lanes Group PLC (North Wales) encompassing the drainage runs within Zone 4. A previous drainage survey undertaken in 2011 had identified the need for remedial works in various locations and further surveys were undertaken in 2013, 2014, 2015 and early 2016. The WSP March 2016 report stated that repairs were required on the following runs:

- SW130 – SW186: broken 150mm sewer
- C36 – C37: cracking to 150mm pipe
- C25-Gully: debris in 150mm pipe
- C30–C29: encrustation in 150mm pipe
- C31-C30: encrustation in 150mm pipe
- C36-Interceptor: debris in 150mm pipe in two places
- TP01 – Interceptor: significant debris in 900mm rectangular pipe
- C29 – GR: broken and collapsed 150 mm pipe

In July 2016 WSP issued a Quarter One 2016 Groundwater Monitoring Report which reviewed the findings of a drainage survey undertaken by Drainright in May 2016. This drainage survey targeted the runs where status information was outstanding and confirmed the condition of the following drainage runs to be satisfactory: SW130-SW186, C36-C37, C25-Gully, C29-C30 and C31-C30. The report confirms that all of

the above sewers had been repaired using high resistive resin in-situ patch liners but does not report on the outstanding remedial work required at C36-Interceptor, TP01 – Interceptor and C29 – GR. In particular, C29 – GR requires repair of the pipe to prevent leakage of potential contaminants.

The WSP March 2016 report recommended repairs to foul sewers F86-F87, F83-F81 and F83-F84 owing to damage recorded by the camera surveys. Responsibility for these drains falls to the landlord because they are outside the FIS boundary and therefore are considered further under the Landlord heading. Also WSP advised that drainage runs SW113-112, SW114-113, SW117-118, SW118-124 and SW132-117 are located beyond the FIS boundary and may require remediation. WSP stated that the landlord had been provided with the relevant drainage surveys and was seeking advice on the repairs required for the surface water drains. Again, this is considered further under the Landlord heading.

The WSP December 2010 report identified surface water drainage grids SW23, SW94 and SW95 to be potentially at risk from effluent run-off from FIS operations in Zone 4. During the site meeting with FIS it was confirmed that gullies at SW23 and SW94 have been sealed and the gully at SW95 has been protected with a raised concrete strip, allowing it to continue to drain the estate road.

Tradebe (formerly MRM)

No drainage surveys were available in this area but it is recorded by WSP in their December 2010 report that the chemical effluent drainage system has been decommissioned and the internal open surface water drain within the unit was sealed to prevent any waste materials entering the drainage system.

Surface Transform

No drainage surveys were available in this area and the tenant was starting to fit out the newly occupied buildings at the time of the site inspection. It is understood from the landlord that the processes are of low environmental risk in terms of discharge to sewer.

Landlord Areas

The landlord stated that they have responsibility for all drainage systems across the site except within the boundaries of tenanted areas. The landlord confirmed that the site had remained largely unaltered since 2010, although alterations had been made by tenants as noted in the sections above. The landlord does not maintain full records of the drainage system, but refers back to the 2004 Kodak drainage plan and any recommendations made as a result of tenant surveys.

The landlord has confirmed the following status of work undertaken to the systems:

- The 225mm foul drain running below South Street was lined in March 2012 at F86 – F87 and F87 – F90. Repairs and lining were completed in April 2012 at F90 - F91
- In the area of land west of Ames Goldsmith the 225mm foul sewer was lined in October 2009 at F120 – F121
- The 300mm surface water sewer below South Street at SW113 – SW112 was repaired in April 2012. However, the rest of the run from SW113 - SW128 was recommended to be surveyed by WSP in March 2016 but the landlord has not undertaken this work. This sewer appears to take run-off from FIS hardstandings that could be subject to spillage
- Drainage camera surveys were undertaken in September 2013 and March 2016 on the foul sewers running below Central Avenue, South Street and then crossing the land on the west side of the Ames Goldsmith plot from F80 - F122. These surveys showed that repairs/condition was satisfactory with the exception of F91 – F120 which was recorded in September 2013 as having multiple fractures and blocked with no evidence of subsequent repair

- The 375mm foul sewer below South Street from F56 – F86 has not been surveyed because the landlord considers that this drain has not been in use
- The foul sewer extending along Central Avenue from F62 – F81 has not been surveyed because the landlord considers that this drain has not been in use
- The foul sewer near West Avenue from F99 – F120 still exists and was safeguarded during ground remediation works. The drain run has not been surveyed but the landlord considers that this drain has not been in use
- The landlord is not aware that the foul sewer running below North Street to North Gate from F17 – F50 has been surveyed. It carries the foul and treated chemical drainage from the Eastman site
- The foul sewer running from the former reservoir to F17 in North Street is used by FIS when releasing the build-up of liquids and run-off. The landlord confirmed that this run has not been surveyed
- The chemical drain from the Pit via C124 to the Feed Sump on the west side of the Ames Goldsmith plot is not in use and the landlord stated that it was never really used

It will be important to maintain a comprehensive drainage assessment plan to monitor the condition of the systems and to maintain the infrastructure in order to minimise the risk of leakage to the ground. In particular, relevant sections of drainage should be assessed and repaired prior to use by new tenants. Existing tenants should be obligated to provide records of surveys, repairs and alterations undertaken to demonstrate that their systems are in good order. The landlord should maintain a full record of the drainage system showing live systems, redundant runs, alterations and survey/repair records.

6. Estate Management Recommendations

The site visit, review of site records, discussions with the landlord's representative and follow-up to information requests all point to a minimum standard of repair and maintenance being adopted in recent years by the landlord in respect of environmental risk management. However, a more pro-active approach has been adopted by both Ames Goldsmith and FIS in managing their assets in terms of environmental risk, partly driven by permits and agreements in force with the Regulatory Authorities.

The landlord relies upon a disparate set of records of the past investigations, remediation works, on-going monitoring, drainage surveys, repairs completed and tenant alterations. However, the records of remediation completed were well managed by WSP up to December 2010. It is recommended that a comprehensive set of site records is established recording the status of the site in terms of contaminated land condition, environmental monitoring, drainage condition and environmental audit of tenants. As well as keeping an up to date record of work completed by the landlord, the records should include monitoring, surveys, audits, alterations, repairs or remediation undertaken by tenants to ensure that any future proposals, threats or incidents can be managed appropriately.

Proposed alterations to buildings, facilities, hardstandings, drainage, services, roadways or new development across the estate should be subject to review and risk assessment to ensure that existing conditions and constraints are understood prior to commencing any work. Where the landlord or a tenant proposes to lift slabs or hardstandings, the opportunity to investigate the ground below, remediate as necessary and remove or seal redundant drainage infrastructure should be taken. The aquifer is vulnerable and will be sensitive to activities conducted at the surface. It is therefore recommended that all such work on site be subjected to an appropriate level of care and scrutiny to effectively manage the risk of future pollution.

The considerations for new development are discussed in Section 7, but it should be noted that in the vicinity of Building 84, within the demise of Surface Transform, capping works were completed to negate potential flushing of PCB chemicals in the shallow subsurface. These works included the laying of a concrete cap of approximately 150mm in depth, keyed into the existing surrounding concrete surface and which must be maintained intact.

Where drainage pipes have been identified as having structural defects there is the potential for leaching of chemicals into the subsoil and potential for infiltration into the underlying groundwater. Therefore, it is recommended that the drainage infrastructure is repaired or replaced wherever found to be defective.

The landlord stated that they have responsibility for all drainage systems across the site except within the boundaries of tenanted areas. Further to the review of drainage records it is concluded that as a minimum the following work will be required to maintain the landlord's system in a satisfactory condition.

- The 300mm surface water sewer from SW113 - SW128 was recommended to be assessed by WSP in March 2016 but the landlord has not undertaken this work. This sewer appears to take run-off from FIS hardstandings that could be subject to spillage and therefore camera survey and any necessary repair should be completed
- The survey of the foul drainage run below South Street near the west side of the Ames Goldsmith plot from F91 – F120 was recorded in September 2013 as having multiple fractures and blocked with no evidence of subsequent repair. Clearance and repair is recommended

- The landlord was not aware that the foul sewer running below North Street to North Gate from the former reservoir – F50 had been surveyed. It carries the foul and treated chemical drainage from the Eastman site and is used by FIS when releasing the build-up of liquids and run-off from the storage area in the former reservoir. This section of drainage will require survey and any necessary repair if it is continued to be used for the discharge of potentially contaminated liquids.

It will be important to maintain a comprehensive drainage assessment plan to monitor the condition of the systems and to maintain the infrastructure in order to minimise the risk of leakage to the ground. In addition to the immediate priorities, relevant sections of drainage should be assessed and repaired or replaced prior to use by new tenants. Existing tenants should be obligated to provide records of surveys, repairs and alterations undertaken to demonstrate that their systems are in good order. The landlord should maintain a full record of the drainage system showing live systems, redundant runs, alterations and survey/repair records.

The continued integrity of hardstandings is important in areas at risk of significant contamination being present in the underlying soils. The roadway at the east end of South Street and also the former reservoir structure will require assessment for repair.

A number of monitoring boreholes used by the landlord, including WSPX21 & WSPX23, WSP-B1, WSPR-C1, SUMP 1, SUMP 2 and SUMP 3 are disused but have not been decommissioned. It is recommended that where possible these are decommissioned and sealed to remove potential pathways for contaminants.

In the future, it is recommended that regular environmental audits of tenants are completed to ensure that all potential environmental risks are managed effectively. This will be essential upon change of any current lease, or when there are significant changes to existing tenants' operations. Where tenants plan to vacate premises, the extent of decommissioning should be agreed, particularly where former Kodak facilities have been re-used or left redundant. There may be considerable scope for misunderstanding in terms of responsibility for decommissioning tanks, pipelines, underground structures and disused equipment.

Any tenant agreements should be reviewed against the environmental responsibilities of the parties to ensure continued co-operation and improvement in the management of potential environmental risks. Responsibility for any future degradation of conditions or release of contaminants must be identified quickly and remedied to ensure that the satisfactory status of the site continues in terms of Environment Agency and Environmental Health Officer endorsement. It has been suggested by Kodak that responsibility for soil and shallow groundwater liability reverted to Ames Goldsmith under their lease agreement and this may be different to other tenants.

The remediation work completed in 2010 is covered by a bespoke insurance backed Transfer Agreement for Environmental Obligations, entered into by Acorn Developments to transfer certain liabilities to WSP Kirkby AT. This expired on 12 October 2017 but it is understood that no claims were made during the period of cover. However, a warranty was also provided by WSP Remediation to Acorn Developments, which appears to be valid until 15 October 2019.

Whilst outside the scope of this report, it is understood that the existing buildings have been reported as having substantial quantities of asbestos containing materials present and this must be considered when budgeting for maintenance, demolition or building alteration.

During this review a number of environmental management issues were identified which are the responsibility of the tenants but which should be followed up by the landlord as set out below.

Eastman

It is understood that Eastman have served notice to terminate their lease. Prior to departure an environmental audit should be completed, including a risk assessment in respect of ground contamination. The decommissioning of the facilities by Eastman should include tanks, pipelines, underground structures and disused equipment and the surrender of all permits to the satisfaction of the authorities. The presence of some asbestos containing materials is expected and specialist advice should be sought.

Ames Goldsmith

General storage arrangements and awareness of environmental procedures should be maintained as good. Regular checks should be made on the storage and handling of chemicals on site, including audits of the volume of chemicals purchased, stored and used.

Visual inspections of the on-site tanks and associated pipework should be continued to ensure tank integrity and to detect any signs of damage or leakage. All plant should be checked for leaks, including any pipework leading to and from the machinery.

The Pollution Prevention and Control permit required improvements to be completed within the designated time period stated within the permit document. An improvement programme has been agreed with the Environment Agency although correspondence with the Environment Agency should be formally documented.

During the site visit it was noted that an IBC at the back of Building 62 was unbunded and unalarmed, with soft ground surface adjacent posing a risk of infiltration in the event of spillage of product.

Recent surveys of the chemical drainage system recorded generally satisfactory conditions with the exception of runs which must be repaired as a priority:

- C121 – gully: hole in 100mm sewer
- C102 – C156: highly fractured 150mm sewer with many displaced joints
- C 121 – C122: collapsed 150mm sewer

In addition, drain runs C118 to C157, C157 to the Feed Sump and Feed Sump to C125 were omitted from the surveys owing to partial blockage and back-up of liquids. It is understood that Ames Goldsmith will arrange clearance, survey and repair as necessary as a priority.

Regular environmental audits of the operations should be completed and evidence that the drainage system is maintained in good working order should be provided. Where regular groundwater monitoring is continuing, the results should be provided to the landlord.

Future Industrial Services (FIS)

FIS have undertaken improvements recently but the integrity of all below ground infrastructure must be maintained and continue to be inspected on a regular basis. This should cover all surface water drains, all gullies, foul / chemical drains and sumps / interceptors in use. In particular, all gullies used to collect surface run-off of effluent should be regularly maintained and cleaned to prevent blockages.

WSP reported that appropriate secondary containment should be provided for the two tanker off-loading areas, as current measures appear to be inadequate. Whilst improvements have been made, further work is required to prevent risk to the surface water system or seepage through permeable surfaces.

WSP recommended Integrity testing of the two underground storage tanks within Zone 4, including all associated below-ground pipework. FIS have been unable to locate these and will need to liaise with WSP.

Several surface water drains appear to be at risk of receiving effluent via surface run-off. All surface water drains within the vicinity of the FIS operations should be reviewed and records updated to show which have been sealed.

During the site visit it was noted that the off-loading bay at the side of Building 29 was in an unsatisfactory condition. Gullies appeared to be blocked and rainwater, spilt liquid and solids were ponding at the north-west corner of the building. Improvements are required to manage run-off and the potential for contamination to enter the permeable ground via the low kerb that could be breached in the event of a spill.

The integrity of the concrete hardstanding within the Zone 3 storage area should be assessed and remedied to prevent seepage into the ground of potentially contaminative stored materials where the condition of the concrete or jointing is poor. Until this is addressed contaminative materials should be removed from this area. Some attempt has been made to control rainwater by the installation of temporary roofing, but this appears to be ineffective.

Rainwater, liquid run-off and silt collect at a low point in the north-west corner of the former reservoir in Zone 3. The product is inspected/tested informally and either discharged to sewer by manual opening of a valve, or pumped from a sump to IBCs if found to be contaminated. A formal written procedure and discharge consent must be provided by FIS.

During the site visit a separator was seen to be operating at effluent pit 28, discharging into an IBC. It is understood that this is alarmed so that a replacement IBC can be provided, but the proximity of surface water drains and the lack of bunding is a cause for concern in the event of spillage. This requires rectification.

Outstanding remedial work on the drainage system is required at C36-Interceptor, TP01 – Interceptor and C29 – GR. In particular, C29 – GR is necessary to prevent leakage of potential contaminants.

Regular environmental audits of the operations should be completed and evidence that the drainage system is maintained in good working order should be provided. Regular groundwater monitoring should continue and be enhanced where potential for leakage is found or where spills have occurred, with the results provided to the landlord.

Tradebe (formerly MRM)

The fuel tank should continue to be regularly inspected and maintained in order to ensure ongoing integrity of the facility.

Drip trays and spill kits should continue to be available for use and staff trained in how to dispense fuel appropriately and manage spillages. Any area utilised for fuel storage/dispensing should be provided with impermeable hardstanding in order to prevent any spillages from entering the underlying soils.

Surface Transform

No drainage surveys were available in this area and the tenant was starting to fit out the newly occupied buildings at the time of the site inspection. It is understood from the landlord that the processes are of low environmental risk in terms of discharge to sewer.

7. Development Considerations

The contamination identified is considered unlikely to pose a significant risk to human health provided that the majority of use as hard landscaping and commercial/industrial buildings is maintained. However, appropriate risk assessments, health & safety assessments and management plans should be developed for any workers or contractors likely to come into direct contact with soils in the event of any future redevelopment.

The planning authority will require appropriate investigation and assessment of development plots and remedial measures will be required during redevelopment where contamination risks are identified, including handling the possible presence of asbestos in soil. During any groundworks, particular care should be taken to avoid damage to redundant pipes, drainage infrastructure and underground tanks prior to their decontamination and cleansing.

Buried chemical waste has been recorded in several areas in the past and further locations are likely to be uncovered during redevelopment. Procedures for identifying such pockets of material and handling them should be included within the remediation proposal.

The previous investigations have concentrated on specific areas of the site and have been generally focussed on risks to controlled waters. Therefore, the risk to future buildings and associated services will require further consideration and investigation. These risks would include potential chemical attack (sulphates) on buried concrete, the possible presence of asbestos in soil, permeation of organic chemicals into drinking water supply lines, protection against gas or vapour ingress and the protection of landscape planting. In addition, any soils to be taken off-site will require appropriate testing, classification and handling, and should be minimised owing to enhanced disposal costs associated with any contaminated material.

Poor geotechnical conditions, underground tanks, pits, structures and large foundations have been recorded over much of the previously developed land and will require appropriate assessment prior to development.

During the site's operation and management by Kodak, the drainage network was split into three separate categories: surface water; foul drainage and chemical drainage. These were managed to ensure that no unauthorised chemicals were directed either into the surface or foul water drains. However, the surface water drainage system provides a potential means for the local migration of contaminants within the site and some previous incidents have been recorded, although none have been identified as having a significant impact on the Sandstone aquifer. Careful planning of alterations, terminations and diversions of existing systems to facilitate development will be essential and the impact of any such work on the satisfactory performance of the wider system must be assessed.

Some redundant land drains and underground tanks appear to have been sealed as part of the past remediation, but owing to the operational nature of some of the site, further work should be expected and diversions of utilities may be needed to clear plots for development. Careful management and safe cleansing and removal of all liquids from redundant tanks, pipes, sumps, manholes, interceptors, gullies etc. will be required to prevent the risk of a pollution incident.

Potentially volatile contaminants have been identified during the various phases of investigation. However, the main areas of impact are away from current buildings but this issue would require further consideration of the level of protection required should development be proposed over areas of known impact, especially in Zones 4 and 5.

A number of abandoned boreholes have been identified across the estate in areas of past contaminative activities. These should be decommissioned as far as possible before commencing slab removal or earthworks.

It should be noted that the footprint of Building 84 was the subject of remedial treatment, and capping works were completed to negate potential infiltration of identified PCB chemicals into the groundwater. These works included the laying of a concrete cap of approximately 150mm in depth, keyed into the existing surrounding concrete surface. Any proposed redevelopment nearby would need to assess solutions for safely containing this material on site because landfills cannot accept this contaminant in the concentrations recorded and incineration would be the only costly means of off-site disposal.

Existing buildings have been reported as having substantial quantities of asbestos containing materials present and this must be considered by an appropriate specialist when budgeting for maintenance, demolition or building alterations.

7.1 Development Plot A

The proposed area of Development Plot A is shown in Appendix A.

In summary, data presented shows that, as expected, risks to development on this plot are low and only limited contamination remediation measures are likely. A site investigation will be needed prior to development, which should check for the presence of asbestos in soil as part of the normal suite of tests.

Past investigations identified that Made Ground materials immediately underlie the plot to a depth of up to approximately 2 metres on the western part of the playing field area, and 1 metre on the eastern part. Beneath the Made Ground the Shirdley Hill Sand layer was encountered, underlain by Boulder Clay deposits.

The Made Ground appears to be mostly inert, although slight hydrocarbon odours and fragments of coal/charcoal were noted in the shallow soil. One borehole contained an isolated pocket of a tar-like substance at approximately 1.2 metres below ground. Fragments of wood were also found in many of the boreholes, some of which showed evidence of burning.

Underlying groundwater conditions showed no significant concentrations of contaminants, with the exception of hydrocarbons at one location, which was not considered significant.

Any future development of this area will require proper management of excavated soils and any encountered shallow groundwater.

7.2 Development Plot B

The proposed area of Development Plot B is shown in Appendix A.

Plot B is considered suitable for redevelopment for a commercial / industrial end use, although further investigation and remedial or preventative measures will be required as discussed in the opening paragraphs of Section 7 because previous remediation works focussed on continued use of the estate rather than on the requirements for new development. In addition, the shallow soils at the site will be variable in character and strength and are unlikely to be suitable as a bearing stratum for shallow foundations, which is evident from the extensive foundations encountered during the excavations. Therefore, appropriate geotechnical consideration will be required in future development proposals, both for building structures and hardstanding / roads.

The original synthetic chemicals manufacture took place in the southern 2/3 of Plot B and all associated buildings were demolished in the early 1980s. This was the area of the estate with the highest percentage of samples with evidence of contamination impact and it was subject to voluntary remediation works to deal with potential statutory liability. This included two large areas that were excavated, treated and validated. The northern excavation contained many substantial subsurface structures that required removal, which may be repeated across the plot and require removal during redevelopment. There is a strong possibility that isolated pockets of contaminated materials remain and will require assessment and remediation during any proposed redevelopment.

The photo-chemicals process commenced in 1961 with one of two major buildings occupying the northern 1/3 of Plot B, which was then closed in 2001. This area was not found to be significantly impacted by contamination, although some hydrocarbons were encountered, thought to be associated with fuel storage. Some limited pockets of contaminated materials may be encountered during redevelopment.

The location and status of any former abstraction wells or redundant boreholes used for monitoring should be determined and decommissioned where necessary prior to any works commencing.

The potential for isolated pockets of contaminated materials remain is high in this area and, as such, persons at greatest risk would include those disturbing the ground to a depth greater than 0.5m, for example if undertaking earthworks. Acknowledgement of this should be made in future risk assessments.

Potentially volatile contaminants have been identified during the various phases of investigation on Plot B. The level of protection required for a new development on this plot will require further assessment.

It is understood that the purchaser will take responsibility for decommissioning, asbestos removal, demolition and clearance of the entire plot prior to redevelopment. The purchaser should ensure that the asbestos register is up to date and should engage a specialist to complete a pre-demolition asbestos survey and ensure that all waste transfer notes are provided on completion of demolition.

Prior to demolition the purchaser should identify all sources of fuel or chemical storage within the plot. This should include, but not be limited to, above ground and below ground storage tanks, drums and other containers, plant, machinery and associated pipelines. The purchaser should check the integrity of all such items prior to decommissioning and safe removal. Furthermore, it will be important to ensure the safe removal and cleansing of all liquids from redundant tanks, pipes, sumps, manholes, interceptors, gullies etc. across the entire plot.

Consideration should be given to the safe termination of all live utility services to the buildings and to complete all diversions, adaptations or alterations necessary to ensure the continuance of uninterrupted services to all other parts of the estate. All service terminations should be at or below slab level and disused drainage pipes, gullies, gratings or other such outlets should be sealed against water ingress or egress. There will be a need to oversee the protection of electricity sub-stations and any re-housing or adaptations required by the utility company.

Regular monitoring of groundwater and nearby controlled waters and other sensitive receptors should be undertaken throughout the demolition works and in accordance with the requirements of the statutory authorities. During the demolition and clearance works, existing drains adjacent to the works should be appropriately protected from contamination arising from the works.

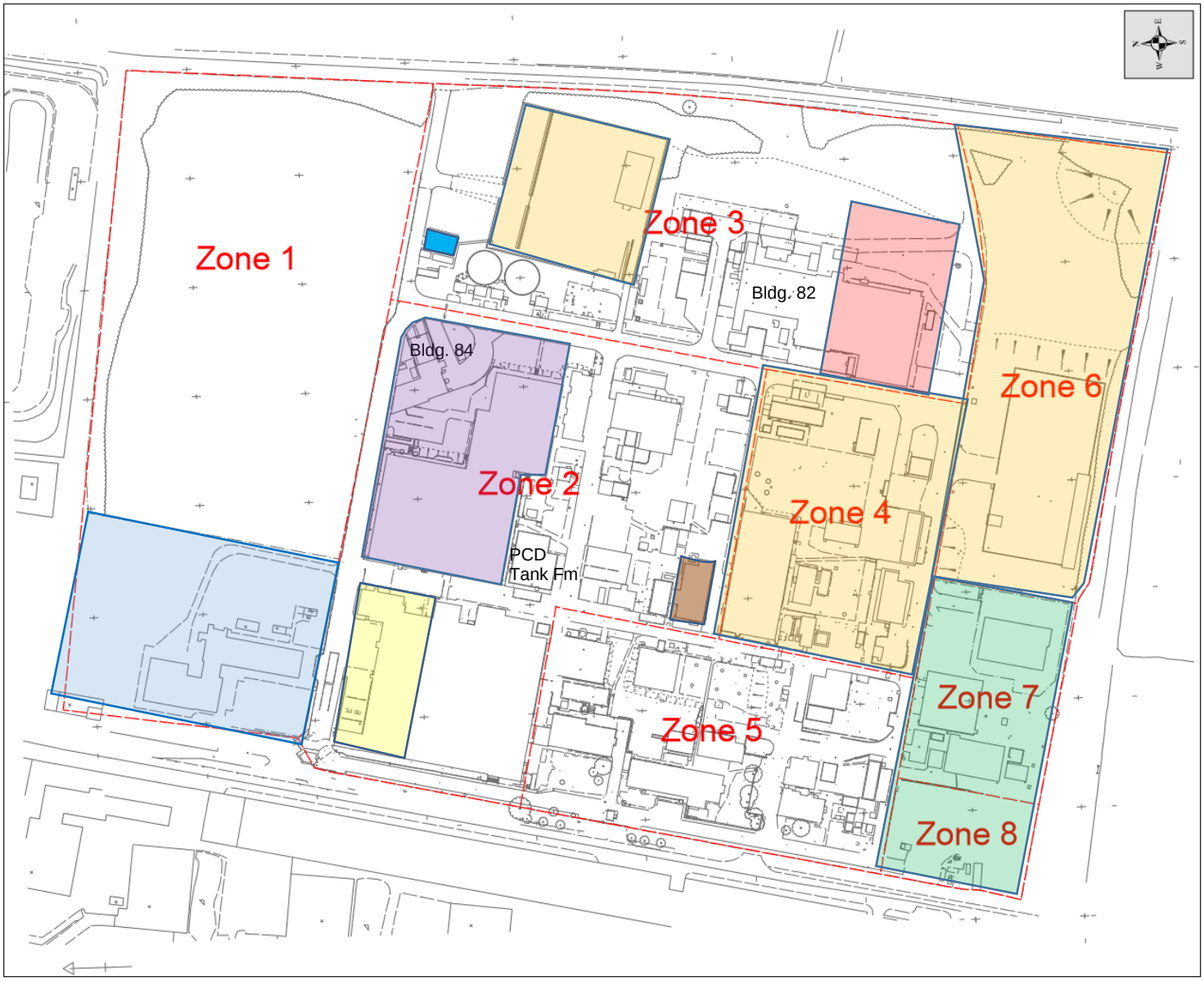
A full set of records for the work completed, plans of all infrastructure remaining on the plot and copies of confirmation of satisfactory completion of the works from the statutory authorities should be retained for future use.

During the planning of any proposed development works the site-wide considerations set out at the beginning of Section 7 should be observed, including thorough site investigation, assessing the extent of remediation works, minimising off-site disposal and taking particular care not to damage underground infrastructure.

Appendices

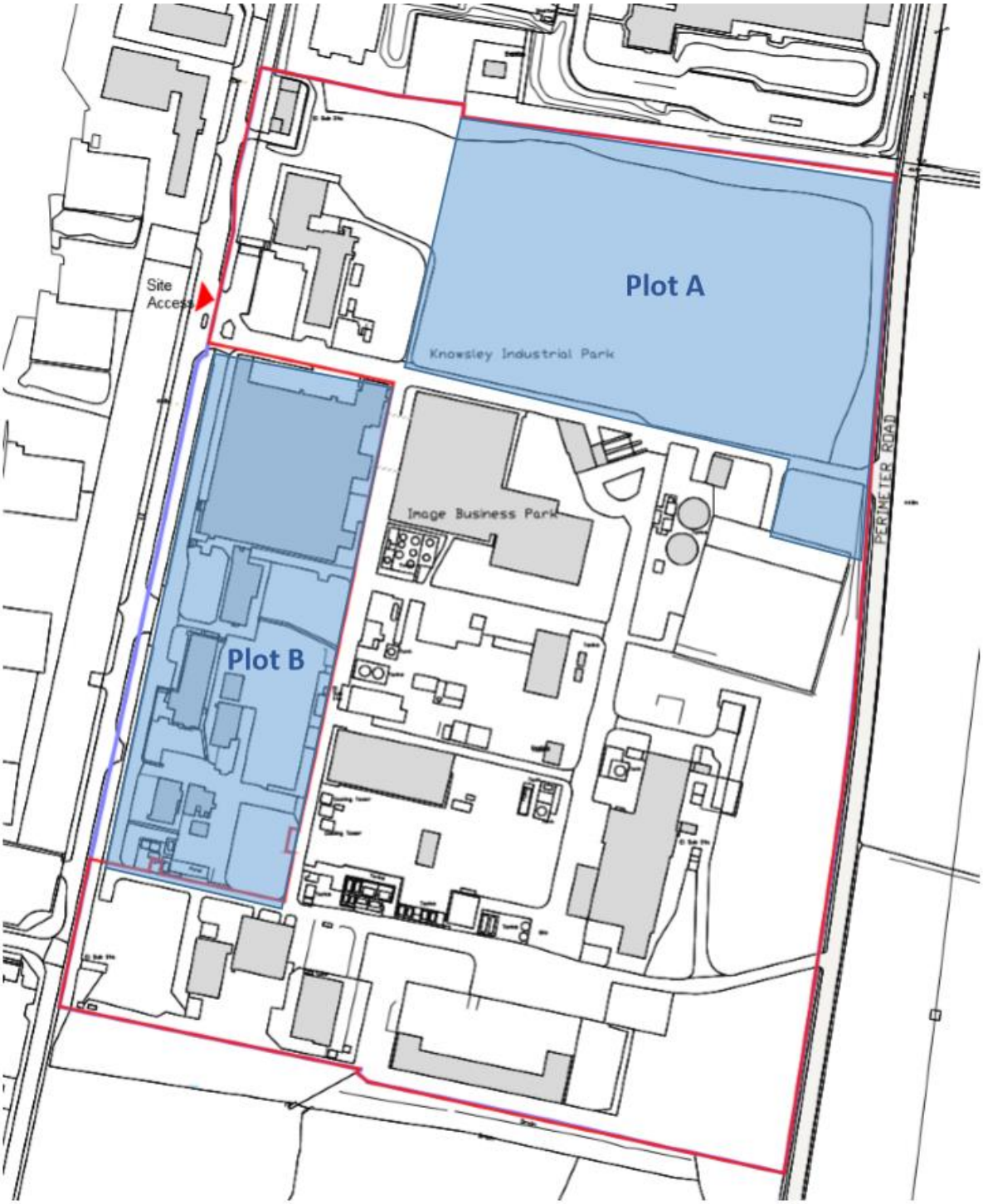
Appendix A Drawings

- **Site Plan Showing Tenant Areas and Assessment Zones**
- **Development Plot Plan**



Site Plan Showing Tenant Areas and Assessment Zones (WSP)

Eastman	Surface Transform
FIS	Martifer
Ames Goldsmith	Oscar Tyres
Tradebe (formerly MRM)	AV Autos



Development Plot Plan

Appendix B Site Visit Notes

Image Business Park, Knowsley

Notes of Site Visit 21st September 2016

Simon Handy met Peter Taylor (Seybourne), Tony Field (IPP Europe) and representatives of some of the tenants individually to review the site condition with respect to ground contamination. Agreed action items are shown in red.

1. Attendees

Tony Field (TF) – IPP Europe

Peter Taylor (PT) – Seybourne (initial briefing only)

Dave Sharkey (DS) – Future Industrial Services

Martin Hodges (MH) – Future Industrial Services

Jon Sowerby (JS) – Tradebe (formerly MRM)

Rob Garrett (RG) – Ames Goldsmith

Simon Handy (SH) – Qallida Consulting

2. Overview

Initially, SH met with PT and TF to review the scope of work to be covered and PT outlined the current position, including concerns about the cost of demolishing Building 38 owing to asbestos presence. SH explained that the purpose of the visit was to review the status of potential risks in respect to ground contamination, making particular reference to the drainage network and tenant activities highlighted by WSP in their Environmental Management Plan 2010. It was confirmed that a new environmental audit of the tenants was outside the scope of work, but the need for such an audit would be considered further by SH.

3. Current Tenants

TF confirmed that the 4 main tenants are still in place, but since 2010 Tradebe have leased an additional plot of land on the east side of their demise. Also, Future Industrial Services have upgraded some facilities on the east side of Zone 4 and are currently extending the waste transfer station eastward but within their original plot area. Ames Goldsmith premises remain largely unaltered since 2010, but they have installed a new silver oxide plant in Building 32. Eastman have not significantly changed their operations since 2010.

New tenants include Oscar Tyres in Building 46, AV Autos in Building 49, Martifer in a section of Building 38 and Surface Transform in Buildings 43 and 94. TF stated that negotiations are being advanced with Entrade to lease land between Buildings 42, 46 and 55, and also with Langdons to take the playing field plot for a large refrigerated storage building.

4. Future Industrial Services (FIS)

DS explained that FIS bring in hazardous and non-hazardous waste products for treatment, disposal and transfer of a range of industrial effluents and waste liquids. A new oil waste treatment plant has

been installed but awaits commissioning when economic conditions improve. Discharge from aqueous treatment is to foul sewer and solids are taken to landfill as non-hazardous material.

DS confirmed that gullies and interceptors are managed on an “as and when” basis. Visual inspections of bunds are made monthly. Generally, where redundant drains or gullies are encountered, the gullies are sealed with grout.

DS confirmed that redundant storage tanks, interceptor pits and live containment bunds had been checked and tested regularly. DS agreed to provide summary records.

DS stated that FIS had engaged both Lanes Group and Drainrite to survey all live drains within their demise and repair/alterations had been completed where necessary. DS agreed to provide summary records and handed over some data in the meeting.

It was noted that the transfer station building has a central line of gullies with external valve pits to give protection in the case of an emergency or spill.

Since the 2010 WSP Environmental Management report was prepared improvements have been made to some of the tanker off-loading areas as noted below:

- The eastern off-loading area has been re-formed with a concrete slab which replaced the permeable gravel surface.
- The off-loading bay at the side of Building 29 is in an unsatisfactory condition. Gullies are blocked and rainwater, spilt liquid and solids pond at the north-west corner of the building. It appears that solids are shovelled onto the adjacent bank and liquids are pumped away from time to time to reduce ponding. The area is flanked by a low kerb onto a soft area that could be breached in the event of a spill. DS confirmed that this requires attention and will forward proposals for improvement.
- Surface water gullies 23, 94 and 95 adjacent to the off-loading area on South Street recorded by WSP as “at risk” have been addressed. Gullies 23 and 94 have been sealed and gully 95 has been protected with a raised concrete strip, allowing it to continue to drain the estate road.

A separator was seen to be operating at effluent pit 28, discharging into an IBC. It is understood that this is alarmed so that a replacement IBC can be provided, but the proximity of surface water drains and lack of bunding is a cause for concern in the event of spillage. DS to confirm Improvement measures to manage the risk.

Zone 3 is used by FIS for storage of solids arising from the treatment processes and other items of equipment. The far north-east section is covered by a limited area of temporary roofing, below which the solid material is stored. The area is a disused sunken concrete reservoir, which is undrained and its integrity requires assessment. Rainwater, liquid run-off and silt collect at a low point in the north-west corner. The product is inspected/tested informally and either discharged to sewer by manual opening of a valve, or pumped from a sump to IBCs if found to be contaminated. This may not be controlled by EA permit. DS agreed to check whether this operation is set out as a written procedure and to provide a copy.

TF and DS agreed that the landlord is responsible for all drainage outside the demise perimeter and recalled that the main foul sewer on the west side of FIS had been lined and that the off-site discharge was separated from that of Ames Goldsmith.

FIS considers that all tanks, redundant tanks and equipment are their responsibility and would be removed at the end of the lease, leaving only buildings in place.

DS confirmed that the site had not been the subject of a spillage, fire or other emergency, except for an H&S incident involving the release of fumes.

FIS maintains a quarterly groundwater monitoring programme from boreholes in their demise, with reports provided to the EA. DS agreed to provide recent data or a summary report.

The presence of two historical underground waste holding tanks were recorded by WSP in 2010 and are thought to be situated below the ASTs and would be used in an emergency. No current information was provided to WSP regarding the integrity of the tanks and if any residue wastes remained. DS was unaware of the underground tanks and agreed to investigate further.

FIS have agreed an improvement programme with the EA which is being implemented on an on-going basis. In addition, United Utilities monitor drainage discharge from the site. DS agreed to provide summary data or reports.

5. Tradebe

JS stated that Tradebe operate dry plasterboard recovery processes and do not discharge to sewer. The plasterboard is screened and crushed to form a powder, granules or pellets. Water spray is used for dust suppression but all water is absorbed by the plasterboard product. Diesel fuel is stored in an external above ground tank at the south side of the building.

JS confirmed that the fuel tank is inspected every 2 years by Group Engineering and that it has been moved into a new concrete bund since the 2010 audit by WSP. Spill trays and a spill kit are available during refuelling. Gully maintenance is no longer necessary in the process area because they have all been sealed.

The building has been extended since 2010 and some additional land has been leased on the east side of the plot.

6. Ames Goldsmith

RG stated that Ames Goldsmith took over the operation of silver nitrate production from Kodak in early 2007 and few alterations have been made since that time, except for the addition of a new silver oxide plant in Building 32.

RG confirmed that Ames Goldsmith acquired the use of the chemical drains, which are now independent from other areas of the wider site. Effluent treatment is undertaken on site to remove trace amounts of silver and the effluent is discharged to foul sewer. A treatment pit is used to adjust pH prior to discharge off-site. No effluent is tankered off site.

Regular monitoring of effluent, drainage discharge, groundwater and borehole water supply was confirmed by RG and he noted that elevated levels of nitrates had been recorded which may be associated with a leaking drain at the back of the premises, possibly now redundant. RG agreed to forward summary records.

RG confirmed that the site had not been the subject of a spillage incident, fire or other emergency.

An improvement programme has been agreed with the EA and correspondence with the EA should be formally documented. Copies of relevant permits and agreements will be forwarded by RG.

RG stated that some bunds had been relined, including at the nitric acid tank by Building 47, but that generally formal inspection records are not available. RG agreed to forward relevant management procedures covering bunds, pits etc.

It was noted that an IBC at the back of Building 62 was unbunded and unalarmed, with soft ground surface adjacent. RG stated that it only required emptying twice a year, but agreed that improvement is required.

RG stated that all the repairs to the drainage system recommended by WSP had been completed. RG agreed to forward the latest drainage arrangement plan and survey results.

7. Other Site Areas

TF confirmed that the site had remained largely unaltered since 2010, although alterations had been made by tenants as discussed earlier. Surface Transform are currently refurbishing their buildings (43 and 94). No site fires, spills or other emergencies had occurred in the landlord areas.

Roadways were noted to be in need of repair in some areas, most notably to the south of Tradebe. TF confirmed that some work had been done to the drainage system in about 2010, including surveys and relining. TF agreed to forward records.

TF confirmed that he held services plans and would forward copies.

TF confirmed that old tanks and equipment on tenant areas are the responsibility of the tenant. He expects all such items to be removed prior to the end of the lease. The responsibility for removal of old Kodak tanks, pipes, plant and equipment at the end of the lease is uncertain and leases would need checking.

The landlord stores a wide range of redundant equipment on site, which he hopes to sell. It appears that some equipment is brought in from other sites for storage.

Appendix C Documents Received Index

Index No	*Description of Documents*	*Copy Rec'd*
1	Site Wide Phase II Environmental Site Investigation (Northern Area) Report KO0102F/R3 Feb-94 by ASP	✓
2	Site Wide Phase II Environmental Site Investigation Report KO0102F/R3 Mar-94 by ASP	✓
3	Site Wide Additional Phase II Environmental Site Assessment Report 933380-02 May-07 by CRA	✓
4	Site Wide Ground Contamination Review & Agreed Programme of Remediation Report 12121392/001/7885(4) Apr-07 by WSP E&E	✓
5	Site Wide Proposal for Remediation Services Report 13010908/111007 Sep-07 by WSP R	✓
6	Site Wide Voluntary Remediation Strategy Report 12121392/003/8434(1) Nov-07 by WSP E&E	✓
7	Progress Report 1 Memo 1 03/12/2007 by WSP R	
8	Progress Report 2 Memo 2 02/01/2008 by WSP R	
9	Progress Report 3 Memo 3 01/02/2008 by WSP R	
10	Site Wide Proposed Remedial Targets Report 12121392/003/8466(2) Mar-08 by WSP E&E	✓
11	Progress Report 4 Memo 4 03/03/2008 by WSP R	
12	Zone 4 & 5 Remediation Options Appraisal & Detailed Methodology Zone 4 & Zone 5 Report 13010908-ROA-Rev 1 Apr-08 by WSP R	✓
13	Site Wide Factual Report on December 2007 Site Investigation Report 12121392(004) Apr-08 by WSP E&E	✓
14	Progress Report 5 Memo 5 07/04/2008 by WSP R	
15	EA correspondence Environment Agency Response to Proposed Remedial Targets Report (8466(2)) Letter CL6/KN/1051/sfc 11/04/2008 EA	✓
16	Progress Report 6 Memo 6 28/04/2008 by WSP R	
17	Progress Report 18 Memo 18 01/05/2009 by WSP R	
18	EA correspondence Environment Agency Response to December 2007 SI & Zone 4/5 ROA Letter CL6/KN/1051/sfc 13/05/2008 EA	✓
19	EA correspondence Letter from WSP R to EA - Response to EA Letter of 13/05/08 Re. Validation Methodology Letter 160508.EA.13010908.im 16/05/2008 by WSP R	✓
20	Progress Report 7 Memo 7 04/06/2008 by WSP R	
21	Progress Report 8 Memo 8 01/07/2008 by WSP R	
22	Progress Report 9 Memo 9 12/08/2008 by WSP R	
23	Progress Report 10 Memo 10 18/09/2008 by WSP R	

24	Progress Report 11 Memo 11 06/10/2008 by WSP R	
25	EA correspondence Environment Agency Response to Q1 - 2009 Report Letter CL6/KN/1051/sfc 08/10/2008 EA	✓
26	Progress Report 12 Memo 12 06/11/2008 by WSP R	
27	Progress Report 13 Memo 13 01/12/2008 by WSP R	
28	Progress Report 14 Memo 14 12/01/2009 by WSP R	✓
29	Zone 3 Environmental Assessment Building 82 Report 12121392/006/8731(1) Feb-09 by WSP R	✓
30	Zone 3 Remediation Options Appraisal & Detailed Methodology Zone 3 Report 13010908-ROA-Z3 Feb-09 by WSP R	✓
31	Progress Report 15 Memo 15 04/02/2009 by WSP R	
32	Zone 2 Environmental Assessment Building 84 Report 12121392/006/8929(1) Mar-09 by WSP E&E	✓
33	EA correspondence Letter from WSP E&E to EA - Calculation of SSTL for Acetone beneath Building 82, Zone 3 Letter 12121392/002/8922-let 03/03/2009 by WSP E&E	✓
34	Progress Report 16 Memo 16 04/03/2009 by WSP R	
35	EA correspondence Environment Agency Response to Zone 3 ROA Email N/A 30/03/2009 EA	✓
36	Progress Report 17 Memo 17 01/04/2009 by WSP R	
37	Zone 2 Remediation Options Appraisal & Detailed Methodology Zone 2 Report 13010908/090309/im May-09 by WSP R	✓
38	Site Wide 2008 Groundwater Monitoring Report 12121392/007/8957(1) Jun-09 by WSP E&E	✓
39	Progress Report 19 Memo 19 01/06/2009 by WSP R	
40	Progress Report 20 Memo 20 01/07/2009 by WSP R	
41	EA correspondence Environment Agency Response to Zone 2 ROA Letter CL6/KN/1051/sfc 23/07/2009 EA	✓
42	Site Wide Quarterly Groundwater Monitoring Report - Q1 2009 Report 13010908-Q1-2009 Aug-09 by WSP R	✓
43	EA correspondence Letter from WSP R to EA - Update on Remediation System Performance Letter 050809.EA.13010908.im 06/08/2009 by WSP R	✓
44	Zone 5 Soils Remediation Validation Report 13010908-VRZ5 Sep-09 by WSP R	✓
45	Progress Report 22 Memo 22 01/09/2009 by WSP R	
46	Site Wide Quarterly Groundwater Monitoring Report - Q2 2009 Report 13010908-Q2-2009 Oct-09 by WSP R	✓
47	Site Wide Quarterly Groundwater Monitoring Report - Q3 2009 Report 13010908-Q3-2009 Oct-09 by WSP R	✓
48	Progress Report 23 Memo 23 01/10/2009 by WSP R	

49	EA correspondence Environment Agency Zone 5 Soils Remediation Sign Off Letter CL6/KN/1051/sfc 19/10/2009 EA	✓
50	Zone 4 Soils Remediation Validation Report 13010908-VRZ4S Nov-09 by WSP R	✓
51	Progress Report 24 Memo 24 02/11/2009 by WSP R	
52	Progress Report 25 Memo 25 30/11/2009 byWSP R	
53	EA correspondence Environment Agency Zone 4 Soils Remediation Sign Off Letter Letter CL6/KN/1051/sfc 07/12/2009 EA	✓
54	Progress Report 27 Memo 27 01/01/2010 by WSP R	
55	Zone 5 Groundwater Remediation Validation Report Letter 080110.EA.13010908.IM 07/01/2010 by WSP R	✓
56	EA correspondence Environment Agency Zone 5 Groundwater Validation Sign Off Letter CL6/KN/1051/sfc 13/01/2010 EA	✓
57	Progress Report 28 Memo 28 01/02/2010 by WSP R	
58	Site Wide 2009 Groundwater Monitoring Report 13010908Q2009 Mar-10 by WSP R	✓
59	Site Wide Quarterly Groundwater Monitoring Report - Q1 2010 Report 13010908-Q1-2010 Mar-10 by WSP R	
60	Progress Report 29 Memo 29 08/03/2010 by WSP R	
61	Progress Report 30 Memo 30 26/03/2010 by WSP R	
62	Site Wide Quarterly Groundwater Monitoring Report - Q2 2010 Report 13010908-Q2-2010 Apr-10 by WSP R	✓
63	EA correspondence Letter from WSP R to EA - Zone 2 & 3 System Update Letter 160410.EA.13010908.im 16/04/2010	✓
64	Progress Report 31 Memo 31 04/05/2010 by WSP R	
65	Progress Report 32 Memo 32 25/05/2010 by WSP R	
66	EA correspondence Environment Agency Response to 2009 Annual Groundwater Report & Q1/Q2 - 2010 Reports Letter CL6/KN/1051/sfc 27/05/2010 EA	✓
67	Zone 4 Shallow Groundwater Remediation Validation Report Report 13010908-VRZ4G Jun-10 by WSP R	✓
68	Progress Report 33 Memo 33 30/06/2010 by WSP R	
69	EA correspondence Environment Agency Zone 4 Shallow Groundwater Sign Off Letter CL6/KN/1051/sfc 27/07/2010 EA	✓
70	Site Wide Quarterly Groundwater Monitoring Report - Q3 2010 Letter 13010908-Q3-2010 Aug-10 by WSP R	✓
71	Progress Report 34 Memo 34 31/08/2010 by WSP R	
72	Zone 2 Shallow Groundwater Validation Report 13010908/VRZ2G Sep-10 by WSP R	✓
73	Site Wide Sherwood Sandstone Condition Report 12121392/002/2987(2) Oct-10 by WSP E&E	✓

74	Zone 3 Shallow Groundwater Validation Report 13010908-VRZ3G Oct-10 by WSP R	✓
75	EA correspondence Environment Agency Zone 2 Shallow Groundwater Sign Off Letter CL6/KN/1051/sfc 11/10/2010 EA	✓
76	Environment Agency Response to Sherwood Sandstone Condition Report Letter CL6/KN/1051/sfc 25/10/2010 EA	✓
77	EA correspondence Environment Agency Zone 3 Shallow Groundwater Sign Off Letter CL6/KN/1051/sfb 04/11/2010 EA	✓
78	Progress Report 36 Memo 36 04/11/2010 by WSP R	
79	EHO Correspondence Sign Off Letter for Zones 2, 3, 4 and 5 Letter DAL/WSPR 25/11/2010 KMBC	✓
80	Site Wide Decommissioning Report 13010908/261110/DR/JM 26/11/2010 by WSP R	✓

Additional Unnumbered Environmental Documents Provided by the Seller

Index No	*Description of Additional Environmental Documents*	*Copy Rec'd*
A	Report Phase II Environmental Site Assessment Playing Field Area 23 August 2005 by CRA	✓
B	Report Phase II Environmental Site Assessment and Validation Former Effluent Treatment Plant for Kodak Limited dated 21 June 2007 by CRA	✓
C	Transmittal for Insurance Application based on Ground Contamination Report 26 April 2007 (Draft)	✓
D	Transfer Agreement for Environmental Liabilities dated 15 October 2007	✓
E	Site Wide Sherwood Sandstone Condition Report 12121392/002/2987(1) Aug-10 by WSP E&E	✓
F	Chronology Report Image Business Park, Kirkby 13010908.CR 19/11/2010 by WSP	✓
G	Environmental Management Plan December 2010 12121392/007/8948(2) by WSP	✓
H	Remediation Completion Letter 22 Dec 2010 by WSP	✓

Further Miscellaneous Unnumbered Technical Documents Provided by the Seller

Index No	*Description of Further Miscellaneous Documents**	*Copy Rec'd*
M1	Site Plan showing building reference numbers July 2004	✓
M2	Final Report Type II/III Asbestos Survey February 2007	✓
M3	Asbestos Refurbishment / Demolition Survey Report Building K38 Job No. TSL/3727/24/05/2016 Revision: 03 Ref: TS-20 Date: 28/09/2016 by Trident Surveying Limited	✓
M4	Site Wide layout of Drainage - DWG file rev S dated 9/2009	✓
M5	Site Wide layout of American Fire Hydrants - DWG file rev A dated Nov 1996	✓
M6	Site Wide layout of Mains Water, Red Fire Hydrants and Gas Mains - DWG file rev C dated March 2007	✓
M7	Topographical Survey of the Former Kodak Site Jan 2008	✓
M8	Drainage Inspection Report 6/09/2013 by Drainrite Environmental Services Limited	✓
M9	Drainage Inspection Report 29/03/2016 by Drainrite Environmental Services Limited	✓
M10	Invoices for Sewer Lining 86 – 87, 87 – 90, 90 -91, 120 – 121 attached to email 22 Sept 2016 from Tony Field	✓

* *Some documents apply to the 5 acre plot and also may require a warranty to be provided*

Key Documents Provided by Tenant FIS

Index No	*Description of FIS Documents*	*Copy Rec'd*
FIS 1	United Utilities Discharge Consent Revised 1 March 2011	✓
FIS 2	WSP Report No 70011961v3 Annual Groundwater Monitoring Report 2015 dated March 2016 for Future Industrial Services	✓
FIS 3	WSP Quarter One 2016 Groundwater Monitoring Report dated 18 July 2016	✓

Key Documents Provided by Tenant Ames Goldsmith

Index No	*Description of AG Documents*	*Copy Rec'd*
AG 1	UU Trade Effluent Discharge Consent dated 2 April 2015	✓
AG 2	Drainrite Drainage Inspection Report dated 4 October 2016	✓
AG 3	Groundwater Monitoring Technical Note – Round 17 Jan 2016	✓

Demolition Specification

Image Business Park, Knowsley

Client Name:	Knowsley (Image Business Park) Ltd
Document Reference:	QC315-01.R.3.1.1.SH
Project Number:	QC315

November 2018

Qallida Consulting Ltd
Tel 07778 189929

Author

Simon Handy BSc (Hons) CEng MICE

On behalf of Qallida Consulting Ltd

Signed

05/11/2018

Disclaimer

This summary report has been prepared by Qallida Consulting Ltd using all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our General Terms and Conditions of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. Site inspection has been limited to external areas and some accessible buildings only.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

1. Introduction 1
2. Parties to the Contract 2
3. Objectives of the Demolition Works 4
4. Information and Reports Available 5
5. Background Information 7
   - 5.1 Estate History 7
   - 5.2 Existing Tenants 7
   - 5.3 Estate Services 8
   - 5.4 Drainage Systems 8
   - 5.5 Hazardous Materials 10
6. General Works Requirements 12
   - 6.1 Preliminaries 12
   - 6.2 Regulatory Context and Approvals 13
   - 6.3 Health and Safety 14
   - 6.4 Environmental Management 15
   - 6.5 Design Responsibility 15
7. Demolition Works 17
   - 7.1 Site Set Up and Preparation 17
   - 7.2 Existing Site Services 17
   - 7.3 Electricity Substations 20
   - 7.4 Demolition and Site Clearance 21
   - 7.5 Materials Management 22
   - 7.6 Finished Levels 22
   - 7.7 Water Management and Control 23
   - 7.8 Environmental Monitoring 23
   - 7.9 Unforeseen Asbestos Containing Materials or Contaminants 23
   - 7.10 Laboratory Testing and Accreditation 24
   - 7.11 Site Management 24
   - 7.12 Contractor's Records/Progress Report 24
8. Validation Report 25

Appendices

Appendix A Estate Plans and Aerial Photographs
Appendix B Site Plans and Record Drawings (Attached File)
Appendix C Past Reports (Attached File)

1. Introduction

Qallida Consulting Ltd “Qallida” has been instructed by Knowsley (Image Business Park) Ltd “the Employer” to prepare the Demolition Specification for the proposed demolition and clearance of buildings and other structures on 2 plots within the estate (hereafter termed “the Site”). The 2 plots are known as the Eastman Plot (Plot A) and the 5 Acre Plot (Plot C), and shall be considered for demolition both jointly and separately as options within the tender response.

This document sets out the demolition requirements for the specific areas of the Site to facilitate its intended future use as development within categories B1 business, B2 general industrial or B8 storage or distribution.

The Contractor shall provide a fully detailed method statement to the Employer to describe how the requirements of this document will be achieved. The Contractor shall be responsible for obtaining all necessary written consents prior to implementing the contract works.

The Contractor shall carefully study the contents of the contract documents and satisfy themselves on all matters associated with the works. It is assumed that the Contractor will undertake sufficient Site visits to familiarise themselves with the requirements of the contract works. In addition, site records are held in a central office on the estate and the Contractor shall familiarise itself with the Health & Safety File, the Asbestos Management Register and other relevant records.

The Contractor’s attention is drawn to the environmental management requirements set out in the Contract documents.

The Contractor is required to procure a comprehensive insurance policy in accordance with the Contract and shall notify the Employer if any terms are proposed to be modified or if any conditions are to be breached that might alter the cover provided.

2. Parties to the Contract

The parties to the Contract, as defined under the Contract are as follows:

Party (Principal Contact)	Organisation/Address	Contact Details
Employer (Peter Taylor/Paul Bewers)	**Seybourne Estates Ltd** 180 Piccadilly London W1J 9HF	ptaylorsam@gmail.com Direct: +44 1242 263977 Mob: +44 7582 304752 paul.bewers@seybourne.co.uk Direct: +44 20 8502 9190 Mob: +44 7836 643700
Architect (Roland Lee/Michael Graham)	**Hale Architecture** 22c Leathermarket Street London SE1 3HP	Office: +44 207 740 0950 rlee@hale-adm.com Mob: +44 7970 600257 mgraham@hale-adm.com Mob: +44 7970 600 131
Technical Consultant & Contract Administrator (Simon Handy)	**Qallida Consulting Ltd** The Oast House Nurstead, Meopham Kent DA13 9AD	simon.handy@qallida.com +44 7778 189929
Services Consultant (Steve Leftly)	**Levertech** Unit 11 Century Park Caspian Road, Altrincham WA14 5HH	Steve.Leftly@levertech.com Tel: +44 161 746 7788 Mob: +44 7976 051 521
CDM Advisor (David Sexton)	**Hyperion** KG House Kingsfield Way Northampton NN5 7QS	david@hyperionpc.co.uk Tel: +44 1604 460 180 Mob: +44 7734 467 251

Ecologist (Georgie Hayworth)	**Clarkson and Woods Ltd** Overbrook Business Centre, Poolbridge Road, Blackford, Somerset BS28 4PA	Georgie.Hayworth@clarksonwoods.co.uk

3. Objectives of the Demolition Works

The objectives of the works can be summarised as follows:

- Demolition Options – Demolition will be completed either in a combined Contract for the 2 plots, or as individual Contracts for each plot. Pricing should reflect these options and the Employer may decide to award a Contract for only a single plot. See below for the pricing format required.
- Demolition and Site Clearance – Termination of all live services to the buildings, but safeguard all services serving the wider estate. Review of Pre-Demolition Asbestos Surveys, update as necessary and asbestos removal for all buildings. Strip out buildings and remove all stored items for disposal. There is an option to hand over boiler equipment in the Eastman Plot free of charge to the Employer for re-use by a tenant on the estate. Demolition of existing buildings down to top of floor slab and termination of above ground services as specified in the Contract. Removal of above ground tanks, lines or pumps from within buildings. Removal of a specified section of service gantry.
- Electricity Sub-Stations – Safeguarding and protection of a sub-station on the Eastman Plot and three substations on the 5 Acre Plot, provision of access routes to substations and liaison with Freedom Group during the works.
- Drainage Systems – Plug all chemical, foul and surface water drainage pipes and gullies at floor or ground surface level, ensuring that the remaining system continues to function for the wider estate. All underground pipework and drainage infrastructure must be protected from damage or deterioration owing to the potential presence of contamination.
- Materials Management – Appropriate management of materials and stockpiles onsite. Management of any unforeseen asbestos containing materials or contaminants encountered during the works. The Contractor shall remove all demolition materials from Site, but an option is requested to crush, screen, and process site won demolition arisings to maximise beneficial future re-use of suitable, recycled aggregate at a site in Nottingham.
- Environmental Monitoring – Adherence to an agreed Environmental Management Plan. Monitoring of nearby surface water and other sensitive receptors if required by the Statutory Authorities.

Demolition Tender Pricing Format

Tender Prices are to be summarised as follows:

A. Plot A as a stand-alone contract;

B. Plot C as a stand-alone contract;

C. Plots A and C as a combined contract;

D. Adjustment to tender prices A or C for handing the Eastman boiler-house equipment to the Employer free of charge; and

E. Adjustment to tender prices A, B and C for delivering crushed material to a Nottingham site. The material shall comply with Class 6F5 product in accordance with the Specification for Highway Works 600 Series and delivered at a time to be agreed with the Employer.

4. Information and Reports Available

A schedule of Documents and Drawings associated with the works and appended to this document is provided in Table 1.

Table 1: Schedule of Documents and Drawings

Appendix	Title	Reference
A	Site Plan Showing Tenant Areas and WSP Assessment Zones	See back of this document
A	Development Plot Plan	See back of this document
A	Aerial Photographs of the 2 Plots	See back of this document
A	5 Acre Plot - Demolition Notes on Photographs	See back of this document
B-1	Site Plan Showing Building Reference Numbers July 2004	N/A
B-2	Plot Boundary Plan	SK2004A
B-3	Constraints Plans	SK2020 and SK2021 (Superseded by Levertech Report at Appendix C-11)
B-4	Demolition Plan	SK2026
B-5	Layout of Site Chemical, Foul and Surface Water Drainage System - dated Sept 2009	K000-530-4730-01 rev S
B-6	Layout of American Fire Hydrants (Yellow) - dated Nov 1996	K000-532-5067-01 rev A
B-7	Mains Water, Red Fire Hydrants and Gas Mains dated March 2007	K000-532-5067-02 rev C
B-8	Layout of Underground Electrical Cables NW Sector 1990	Photo of drawing. Original available on site
B-9	Layout of Underground Services SW Sector 1993	Photo of drawing. Original available on site
B-10	Layout of Underground Water & Gas Mains NW Sector 1993	Photo of drawing. Original available on site
B-11	Layout of Underground Water & Gas Mains SW Sector 1997	Photo of drawing. Original available on site
B-12	Electrical Metering Diagram dated Jan 2006	K000-332-0444-078 rev X
B-13	Single Line Diagram of 11KV Ring Main and Sub-Stations dated March 2007	K000-332-0444-103 rev V
B-14	Kodak HV System Diagram dated Nov 2005	K000-332-0444-244 rev B
B-15	2 Combined Services Plans of the Eastman Plot	Poor quality photos of drawings. Originals available on site
B-16	Plan of Sub-Stations	SK2002B

Appendix	Title	Reference
B-17	Topographical Survey April 2018	S15946-T
B-18	Utilities Survey April 2018	S15946-U
C-1	Final Report Type II/III Asbestos Survey February 2007	933389(1)
C-2	Asbestos Refurbishment / Demolition Survey Report Building K38 Dated 28/09/2016 by Trident Surveying Limited	TSL/3727/24/05/2016 rev 03 ref: TS-20
C-3	Pre-Demolition Asbestos Survey of Eastman Building and letter, May 2018	N/A (Provided with original tender Pack)
C-4	Summary Report on Land Quality Considerations by Qallida Consulting dated December 2017	QC315-01.R.1.5.1.SH
C-5	Environmental Management Plan December 2010 by WSP	12121392/007/8948(2)
C-6	Zone 5 Soils Remediation Validation Report dated Sep-09 by WSP R	13010908-VRZ5
C-7	Zone 5 Groundwater Remediation Validation Report Letter dated 07/01/2010 by WSP R	080110.EA.13010908.IM
C-8	Pre-Demolition Ecology Report from Clarkson & Woods for Plot A, v2.0 dated June 2018	N/A
C-9	Pre-Demolition Ecology Report from Clarkson & Woods for Plot C, v1.0 dated August 2018	N/A
C-10	Plot A Demolition Correspondence with Council	(Folder of 5 Documents)
C-11	Levertech Survey of Services Report	N/A
C-12	Plot C Demolition Application to Council	(Folder of 3 Documents)

Key: New Documents Shaded:

5. Background Information

5.1 Estate History

The estate was in agricultural use until late 1939, when construction of the Kirkby Munitions Factory commenced, covering some 743 acres, with the majority of development located off-site. The buildings on site were reportedly used as explosive test bays and the presence of earth bunds around some of the buildings suggests that explosives may have been stored here. The munitions factory was closed in 1946 and Kodak moved to the property in 1949. It appears that initially operations were small-scale, manufacturing sensitising dyes, emulsion addenda and film couplers. Activities increased in 1957 when production was relocated from Kodak's facility in Harrow. In 1962 the Powder & Solutions Department was transferred to Kirkby and in 1968 the production of silver nitrate commenced.

Between 1969 and 1974 production on the estate diversified to produce chemicals not specifically for the photo-chemicals industry, including production of hydroquinone, tecmangam (manganese ammonium sulphate) and benzoquinone. During the late 1970s a number of buildings were demolished and replaced. By 2001 the Powders & Solutions Department was closed and photo-chemical production ceased at the end of 2006.

WSP Environmental was engaged to develop a plan for voluntary remediation of the estate, which drew upon some 36 earlier reports for environmental data. The remediation works were undertaken from April 2007 to November 2010. The southern 2/3^{rds} of the 5 Acre Plot was the most heavily contaminated area of the site and was subject to substantial soils remediation works. Following the demolition of residual buildings and the removal of surface concrete, remedial works were instigated. These included soil excavation, on site treatment, passive perched water removal, validation, and reinstatement with treated soils. The remediation works across the estate were accepted as complete by the Environment Agency and Local Authority in late 2010.

5.2 Existing Tenants

When Kodak's operations ceased in 2006, the plant was shut down with the exception of the silver nitrate plant which was leased to Ames Goldsmith and a research facility in the north-western corner which was leased to Eastman Chemicals. Subsequently, the site was purchased by Acorn Properties in 2007 and two further tenants were introduced: Future Industrial Services (FIS) who operate a waste transfer area in the south-eastern corner of the estate and Tradebe (previously Minerals Resource Management) who operate a waste plasterboard recycling business in part of Building 82. A number of newer tenants have also occupied the estate and discussions are on-going with further potential tenants. New tenants include Oscar Tyres in Building 46, AV Autos in Building 49 and Surface Transform in Buildings 43 and 94. Eastman vacated the site in 2017 and their building remains unoccupied. A plan showing tenant locations is included in Appendix A.

Tenants access the estate via the main security gate and utilise a weighbridge set into North Street adjacent to the Eastman Building.

5.3 Estate Services

The estate's services network is complex and records of routes date from the days of Kodak ownership. Information on services includes:

- Foul, chemical and surface water drainage
- Mains Water, Red Fire Hydrants and Gas
- American Fire Hydrants (Yellow)
- Power Layouts, including Sub-Station and Metering Diagrammatics

The plots are crossed and bounded by a number of overhead gantries carrying both live and redundant services serving the wider estate. No detailed plans showing routing are available, but a review of services on Plots A and C has been completed by Levertech in October 2018. Also, some information is discernible from the topographic and utilities surveys. It is likely that buried fuel lines, data cabling, telecoms equipment, fire alarm and security cabling etc are present on both the Eastman and 5 Acre Plots.

One electricity sub-station is present on the Eastman Plot, housed at the north end of the main building. A further sub-station is located adjacent to the plot in Building 95, which is the estate's primary sub-station. Three sub-stations are located on the 5 Acre Plot, one freestanding at the south-west corner, one freestanding on the north side of the junction between 4TH Street and Central Avenue and one freestanding on the south side of Building 38.

Access to the estate and contact with the tenants or estate service providers should be arranged via Rob Blackwood of Keppie Massie Tel: 0151 255 0755 Mob: 07720 268245. Tony Abban is the estate manager based on site.

It is understood that the following companies provide services to the estate landlord:

- Securitas - site guarding
- ADT – fire alarm systems
- Tyco – fire pump servicing
- Freedom Group – HV system
- Gaskell – waste collection
- Haven – electricity
- Axtec – weighbridge
- Water Plus – water supply and waste water
- Senior Surveyor
- Property Management

5.4 Drainage Systems

The site's drainage network represents a potential source of contamination that has been considered by the Environment Agency during the voluntary remediation works completed in 2010. The status of the

system was accepted by the Environment Agency on the understanding that regular maintenance would be completed. In addition, two tenants, FIS and Ames Goldsmith continue to perform regular groundwater monitoring as a condition of their licences with the Environment Agency.

The drainage across the site was recorded on a drainage plan in July 2004 by Kodak, showing chemical, foul and surface water drainage systems. The utilities on the 2 plots were surveyed in 2018 by SEP and further reported on by Levertech in October 2018.

The condition of the chemical drainage system across the former Kodak site was assessed by WSP and reported by them in February 2008. The scope of the works included an assessment of the feasibility of re-using the existing chemical drainage infrastructure. The report stated that where pipes were identified as having structural defects there was the potential for leaching of chemicals into the subsoil and potential for infiltration into the underlying groundwater. Therefore, although limited contamination was identified to be potentially impacting the site, it was recommended that the drainage infrastructure was to be replaced or repaired to prevent significant contamination. Since that time a number of alterations have been completed and both the landlord and tenants have performed repairs and relining to parts of the system.

Chemical Effluent

Effluent from inside the Eastman laboratory areas drains into a neutralising pit, which then appears to discharge into a foul sewer located beneath North Street and then exits the site at North Gate, discharging into the mains foul water system located beneath Acornfield Road. The chemical drainage system is used by Ames Goldsmith and FIS, and possibly Surface Transform. Inevitably alterations will have been made to the drainage system with the introduction of new facilities by FIS and Surface Transform. Chemical drains from tenanted areas cross the 5 Acre Plot but other redundant routes are also present in that area.

Foul Sewage

Foul water from the Eastman site drains directly into the foul drain located beneath North Street and follows the route described for the chemical effluent above. On the east side of the estate, water collecting in the former water tank is either pumped to tanker from a sump in the northwest corner or released by manual valve to a foul sewer which connects to the foul sewer running below North Street.

Foul water sewers from the Surface Transform and FIS tenanted areas cross the 5 Acre Plot and numerous other redundant routes are also present in that area. Inevitably, owing to alterations made by the landlord and tenants since 2004, the network may be different from that shown on the drawings.

Surface Water

Surface water from the site consists of run-off from the site buildings, roofs and hardstanding areas of the site. Rainwater falling on the un-surfaced areas of the site infiltrates into the ground and moves offsite via groundwater flow. Connections to off-site surface water sewers are along Acornfield Road.

Fire Water

Fire water pits are located at the southern end of the 5 Acre Plot and are managed by the landlord in the event of spillage or firefighting on the wider estate.

5.5 Hazardous Materials

The Eastman property comprises a large laboratory / office building. The ground floor contained small-scale plastics processing laboratories and offices. The first floor contained analytical and research laboratories, formulation laboratories for paint coatings, stores and offices. The second floor contains paint formulation laboratories and spray booths. An exterior boiler house is located to the rear of the main building. In addition, a chemical store, a 'clean' solvent and a waste solvent building are located immediately to the east of the main building. Upon vacation of the property, Eastman confirmed that the drains and sump were professionally cleaned, but the status of laboratory equipment, fume cupboards, test areas, flues etc is unknown.

The photo-chemicals process commenced in 1961 and was closed in 2001, occupying Building 38 within the 5 Acre Plot. This area was also the location of the historical hydroquinone / benzoquinone and tecmangam production during the late 1960s to early 1970s. The original synthetic chemicals manufacture took place in the southern part of the 5 Acre Plot, but all associated buildings were demolished in the early 1980s to ground level. This area has been the subject of remediation work as already described in section 5.1.

CMEC Demolition completed a Type II/III Asbestos Survey of buildings located on the estate in January 2007 for Kodak. The survey was conducted on all site buildings, exterior pipework and plant. The survey involved a review of previous asbestos reports to confirm the presence and quantity of the asbestos recorded and to validate and assess the quality of any asbestos abatement. In summary, CMEC reported the following relevant to the demolition plots:

The Eastman Building reported 163m2 of chrysotile wall board, 120m2 of chrysotile flooring, chrysotile tape in the electrical boxes, amosite duct insulation and chrysotile residue on overhead pipes.

Building 8 on the 5 Acre Plot reported 12m2 of chrysotile board, 150m2 of amosite board and 170m2 of chrysotile cement boarding.

Building 9 on the 5 Acre Plot had 66m2 of chrysotile cement board.

Building 11 on the 5 Acre Plot reported 4m2 of chrysotile cement board.

Building 20 on the 5 Acre Plot reported 402m2 of chrysotile board, 20m2 of amosite/chrysotile board and 450m2 of chrysotile cement board.

Building 38 on the 5 Acre Plot reported 705m2 of chrysotile board, 9.5m2 of amosite/chrysotile board, 5,546m2 of chrysotile cement board, 507m2 of ceiling with residual limpet, amosite/chrysotile lagging and chrysotile rope glazing around the north lights.

An additional Asbestos Refurbishment/Demolition Survey on Building 38 was completed by Trident Surveying in July 2016. This survey identified extensive evidence of asbestos containing materials in the form of asbestos flange gaskets, asbestos cement panels forming the ceiling, asbestos sprayed coating to cement ceiling panels and associated debris, asbestos insulating board to walls, beams and ceilings, asbestos sprayed coating residue to cement ceiling panels, pipework and beams, asbestos textile flash pads, asbestos mastic and gaskets to metal ducting, asbestos insulation and associated debris, asbestos paper lining to fibreboard panels, asbestos bitumen backing to vinyl floor tiles, asbestos cement and board end panels to skylights, asbestos rope seals to northern skylights, and asbestos residue to tanks and pipework.

Due to the heavy asbestos contamination from loose insulation, degraded spray coatings and the associated uncontrolled transfer of dust and debris in Building 38, access is restricted and full PPE and RPE must be worn if access is required. The remedial work on the asbestos material must be undertaken by an HSE licensed asbestos contractor and completed prior to any demolition commencing.

An asbestos contractor has surveyed the Eastman Building and the pre-demolition asbestos survey report is provided at Appendix C-3. The contractor may be able to assist with pricing the removal works. Contact, if required:

Jamie Perkins-Best
Managing Director
Environmental Management Solutions
(T) 0800 3581100

www.ems-asbestos.co.uk

Prior to commencement of any demolition works, the Contractor shall assess the asbestos survey information provided and undertake all necessary additional survey work to ensure compliance with the regulations, the requirements of the authorities and waste management obligations.

6. General Works Requirements

6.1 Preliminaries

The Contractor shall allow within its proposals for the works to be completed either as a combined Contract for the two plots, or as individual Contracts for each plot. Whether awarded as a contract for an individual plot or as a combined contract for the two plots, the Contractor shall comply with all obligations and provide all necessary facilities for the appointed works, without diminution owing to the scale of the works.

The Contractor shall provide secure temporary fencing 2.4 m high to the boundary of the works in each plot within the area of demise shown on the Plot Boundary Plan in Appendix B. The Contractor shall provide entrances to each plot at positions that do not impact on existing vehicle movements, that do not affect the normal operation of the weighbridge and that do not cause damage to existing estate services, including overhead gantries. The entrances shall be in positions shown in the Demolition Applications included in Appendix C and 6m wide with appropriate access splays and provided with secure, lockable, 2.4m high double gates.

The Contractor shall adequately maintain approaches to the Site and keep such free from debris. Any contamination of surrounding roads by Site traffic shall be removed immediately.

The Contractor shall ensure adequate 24 hour security to the Site for the duration of the demolition works. The Site security shall operate within the estate wide systems already in place. The Contractor must ensure compliance with the estate security systems in place at the time of undertaking the work.

The Contractor shall not allow its or any other operatives employed on the works to trespass upon the grounds or buildings outside the boundaries of the Site.

The Contractor shall not use any portion of the Site for any purpose other than that connected with the works.

The Contractor shall confine its operations to within the confines of the Site and must carry out the contract with the minimum of inconvenience to surrounding tenants and occupiers. Adequate precautions shall be taken to prevent excessive noise, vibration and dust, and to maintain cleanliness.

The Contractor shall protect and ensure the safety and continued operation of adjacent buildings, structures, paved surfaces and roadways adjacent to the works and shall make good immediately any damage resulting directly or indirectly from its operations.

The Site has been the subject of voluntary land remediation and will be regularly scrutinised by the Environment Agency for signs of deterioration due to leakage, spillage or contaminant release via permeable soils. The Contractor shall ensure that no fuels, chemicals, effluent etc. are stored unbunded on the Site, and that no products are permitted to enter the drainage systems, sumps or holding pits, except where authorised in writing by the Environment Agency or relevant authority. Any impact from any uncontrolled release of contaminants shall be remediated to the satisfaction of the authorities at the cost of the Contractor.

All drawing dimensions are for information only and shall be verified by the Contractor. The Contractor shall be provided with one electronic copy of each drawing.

In the event of any discrepancies being discovered in the Contract documents, the Contractor shall at once notify the Employer in writing. If amendments to the design are required by the Contractor as a result of

discrepancies in the documents, then such amendments shall not be regarded as a claim and the Contractor shall pay all fees and costs in connection therewith.

The Contractor shall make allowance to attend project progress meetings during the Contract works at the request of the Employer.

It shall be the responsibility of the Contractor to visit the Site, and to take into account all local and existing conditions. The Contractor shall additionally thoroughly acquaint themselves with the position and accessibility of the proposed works and the conditions under which they shall have to be carried out.

Up to the point where the Contractor takes possession of the Site, arrangements to visit the Site shall be made through the Employer.

Statutory Authorities requirements shall be complied with in all respects.

6.2 Regulatory Context and Approvals

Unless otherwise stated, the works shall be carried out and comply with all applicable legislation, codes of practices, guidance notes, standards, health and safety conditions, local authority planning conditions, building acts or requirements imposed or recommended which are current or promulgated at the time of tender. In particular the contractor shall comply with the requirements of:

- The Health and Safety Executive;
- Knowsley Council;
- Merseyside Environmental Advisory Service;
- Relevant Highways Authorities and Utility Companies; and
- The Environment Agency.

The Contractor shall also follow the guidance, recommendations or requirements of the following and any other relevant documentation:

- The Environment Act 1995;
- The Environmental Protection Act 1990;
- The Environmental Protection (Duty of Care) Regulations 1991;
- The Landfill Regulations 2005;
- The Waste (England and Wales) (Amendment) Regulations 2014;
- The Hazardous Waste (England and Wales) Regulations 2005, as amended;
- The Environmental Permitting (England and Wales) Regulations 2016;
- List of Waste (England) Regulations 2005, as amended;
- Code of practice for Full and Partial Demolition BS6187:2011
- ICRCL Guidance Note 61/84 “Notes on the Fire Hazards of Contaminated Land”;
- ICRCL Guidance 64/85 “Asbestos on Contaminated Sites”;
- The Construction (Design and Management) Regulations 2015;
- The Site Waste Management Plans Regulations 2008 (No. 314);
- The Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended);

- The Control of Asbestos Regulations 2012 together with all related HSE approved codes of practices & guidance;
- Investigation of Potentially Contaminated Sites. Code of Practice BS 10175: 2011;
- Protection of Workers and the General Public During the Development of Contaminated Land, Health and Safety Executive; and
- BS 5228 Code of Practice for Noise and Vibration Control on Construction and Demolition Sites.

Where references of British Standards and Codes of Practice do not give year of issue or dates of amendments, the published version at the Contract Date shall apply.

The Contractor is responsible for obtaining all approvals from the relevant statutory authorities, in particular, Knowsley Council and the Environment Agency. This shall include discharging all planning or permit conditions that relate to environmental matters.

The Contractor shall allow for obtaining all necessary prior written approvals from the relevant Highways Authorities and Utility Companies and Merseytravel.

The Contractor shall allow sufficient time in their programme to obtain these approvals.

Police Regulations

The Contractor shall at all times observe any Police and Home Office Regulations including those regarding the loading and unloading of vehicles on the public highway or on any road. Loading and unloading of vehicles on the public highway shall be avoided wherever possible.

The Contractor shall comply with all future changes or amendments made to all regulations applicable to the contract works.

6.3 Health and Safety

The Contractor shall ensure that they meet their responsibilities with respect to the Health and Safety at Work Act 1974 and CDM Regulations 2015. The Contractor shall be the Principal Designer and Principal Contractor as defined by the CDM Regulations 2015.

The Contractor shall refer to the Pre-Construction Information provided by the CDM Advisor in the tender pack and shall prepare a Construction Phase Plan for the works in accordance with the CDM Regulations.

The Demolition Contractor is to perform the role of Principal Designer/Principal Contractor under Construction (Design & Management) Regulations 2015, and the demolition contract should include the following:

- Complete CDM notification to the HSE. (F10 Issue/ Review)
- Complete Pre-Construction Information Pack. (MSDS/ COSHH/ Drawing Folder/ RAMS/ Training + Competence/ Asbestos Information/Materials Management Plan/Traffic Management Plan/ Waste Management Plan)
- Complete Project Health, Safety, Security & Environmental Plan. (Incorporating Construction Phase Plan)
- Monitoring and review of approved sub-contractors
- Establish and maintain CDM H+S Folder

- Provide full traceability of materials disposed via Environmental Accounting Report
- Issue of QHSE Audit Reports

6.4 Environmental Management

The Contractor shall prepare an Environmental Management Plan (EMP) to set out the standards of demolition and asbestos removal logistics and practices that will minimise (if not eliminate) the impacts of the project upon the local environment and local community surrounding the Site. The EMP shall relate to all demolition contract works, including all monitoring activities.

This EMP shall be a practical working document, developed in agreement with the Employer, the Project Manager and Knowsley Council.

The EMP shall address the following issues:

- Works Activities and Responsibilities;
- General Site Management;
- Neighbour and Local Tenant Liaison and Management of Complaints;
- Control of Emissions to Air (including odour);
- Noise and Vibration;
- Waste Minimisation and Management;
- Transport Management;
- Waste Management and Pollution Control;
- Ecological Management and Minimisation of Ecological Disturbance;
- Pollution Incident Control Procedure;
- Soil Contamination; and
- Environmental Auditing and Verification Monitoring.

The Contractor shall comply with the requirements of the agreed EMP and shall prepare appropriate method statements and protocols to demonstrate and ensure compliance with the EMP.

6.5 Design Responsibility

The Employer has set out the intended scope of demolition works within this specification and the appended documents. During the tender process the Contractor shall review the proposed scope and shall identify any variations required to ensure the safe completion of the works. Upon appointment, the Contractor shall take full responsibility for:

- Planning the works and completing any feasibility studies
- Obtaining all licences and permits required to undertake the works
- Additional surveys, testing and studies required prior to undertaking any of the works
- Environmental, health and safety assessments, monitoring and reporting, including management of contaminants
- Design of the works

- Assessment, monitoring and full management of asbestos removal
- Decontamination and decommissioning all equipment
- Assessment of all requirements for services protection, terminations and diversions/relocation required by the Demolition Specification. Design and specification of all works required to utility services and the wider network
- Temporary works design to ensure safe demolition of the buildings
- Assess the stability of buildings or parts of buildings and gantries that are to remain on site, or are abutting the site
- Investigation of post-completion problems

7. Demolition Works

7.1 Site Set Up and Preparation

The Contractor shall prepare the site ready for the demolition works. This shall include, but not be limited to, decontamination facilities, clean and dirty working areas, welfare facilities, security, hoarding, scaffolding, licensing and permit requirements, labour, working hours, traffic management, facilities, etc.

The Contractor's attention is drawn to the contaminated nature of the Site and must familiarise itself with the conditions set out in reports contained in Appendix C of this Specification. In addition, the Contractor shall inspect the Site to determine the current situation and carry out all necessary tests and assessments to ensure safe working conditions. Decontamination and removal of stored chemicals shall be completed as necessary prior to demolition commencing.

The Contractor shall establish ecological protection measures in accordance with recommendations set out in the Pre-Demolition Ecology Survey Reports included in Appendix C and liaise with Clarkson and Woods to provide access for monitoring and any mitigation measures required.

7.2 Existing Site Services

Existing information on site services is included in Appendix B for information purposes only. In addition, a Survey of Site Services report prepared by Levertech is included in Appendix C. The location and status of services on Site, including live gas mains, pipework and other above ground and buried apparatus shall be checked by the Contractor prior to works commencing on Site. The Contractor shall liaise with utility providers including Freedom Group at the earliest possible opportunity to discuss disconnection and/ or rerouting of any live services.

Eastman Plot

The Contractor shall isolate or cap off all services as described below and shall be responsible for obtaining approvals from the relevant utility company for these works. It should be noted that a combined services trench runs around the north and east sides of the Eastman Plot, delineated by marker posts on Site. The Survey of Services report prepared by Levertech shows key routes to be protected.

- Drainage – The Contractor shall plug all chemical and foul drainage at floor or ground surface level, including in and around the boiler house at Building 27. Surface water gullies and rain water pipes shall be plugged at floor or ground surface level to ensure no ingress of contaminants. The neutralising pit shall be protected in accordance with the recommendations of the Pre-Demolition Ecology Survey Report throughout the works and the exclusion zone shall be strictly observed.
- Water – The Contractor shall isolate the water services outside the plot boundary or adjacent to the water meter pit without causing impact to the wider estate. It should be noted that the water meter pit serves the entire estate and that it should be protected from damage at all times. In addition, the Contractor shall allow unrestricted access to the water meter pit for routine readings, maintenance or repairs by the Employer or its representatives.
- Red Fire Hydrants – The Contractor shall isolate the main at the plot boundary adjacent to the gantry.
- American Fire Hydrants (Yellow) – The Contractor shall maintain and protect the yellow fire hydrant within the plot boundary and pipework serving the wider estate. The spur connecting to the Eastman

Building shall be isolated as close to the plot boundary as is possible, whilst not disrupting the ring main.

- Gas – The Contractor shall isolate the mains at the plot boundary and protect and make safe all remaining pipework on site. It should be noted that two different routes are shown on record drawings but it is believed that only one live main is present on the plot, but this must be verified within the buildings and on site prior to demolition.
- Power - The Contractor shall isolate all supplies to the buildings and infrastructure at sub-station 7 whilst ensuring no disruption of service to the wider estate. It should be noted that the estate ring main includes sub-station 7 which must be safeguarded at all times.
- Fuel Lines, Data, Telecoms, Fire Alarms, Security etc. – The Contractor shall investigate the site for such routes and safely terminate all supplies to the buildings at the plot boundary or gantry where there is no effect on the wider estate. Where a system serves the wider estate, it shall be protected and maintained in good working order, with any termination of supply to the plot being at a position agreed with the Employer.

5 Acre Plot

The Contractor shall isolate or cap off all services as described below and shall be responsible for obtaining approvals from the relevant utility company for these works. It should be noted that numerous service routes for the wider estate cross the plot both above and below ground and must be maintained in good working order throughout the works. The Survey of Services report prepared by Levertech shows key routes to be protected. In addition, telecommunications and CCTV equipment serving the wider estate is housed at Building 24 and must be protected and safeguarded at all times. A variety of former buildings were on this plot and associated redundant services may be present and unrecorded.

- Drainage – The Contractor shall plug all chemical and foul drainage at floor or ground surface level where pipes are to be severed by the works or where gullies, gratings, sumps etc will be exposed to the elements by the works. All surface water gullies and rain water pipes across the plot shall be plugged at floor or ground surface level to ensure no ingress of contaminants. The fire water pits at the southern end of the plot shall be protected intact and shall be maintained in a clean condition, with no disposal of liquids permitted, except where a licence has been granted from the Statutory Authorities. These pits shall be managed in accordance with the recommendations of the Pre-Demolition Ecology Report.

  The condition of the drainage system must not be permitted to deteriorate as a result of the works, owing to the presence of ground contamination and its potential impact on controlled waters. Protection to existing drainage routes must be maintained throughout the works and any damage repaired immediately at the cost of the Contractor. The Survey of Services report shows many key drainage routes to be protected, some of which serve the wider estate. The condition of these runs has been recorded in the report where access has been gained.

  Many existing and redundant drainage runs connect into the wider estate system and must be plugged where encountered on the plot to prevent ingress of debris or liquids. Such plugging must not impact on the correct functioning of the remaining system.

  Access must be provided to the Employer or its representatives to maintain the system and give access to manholes, pits etc where they serve the wider estate.

- Water – The Contractor shall isolate or cap off the water services at or close to the plot boundary without causing impact to the wider estate. Runs to be protected from damage have been identified in the Survey of Services report by Levertech.
- Red Fire Hydrants – The Contractor shall isolate or cap off the mains at or close to the plot boundary.
- American Fire Hydrants (Yellow) – The Contractor shall maintain and protect the three yellow fire hydrants within the plot boundary and pipework serving the wider estate. The spurs connecting to the buildings shall be isolated or capped off and protected from damage during the works, whilst ensuring no disruption to the ring main.
- Gas – The Contractor shall ensure that gas valve at the south-west corner of the estate is shut off and cap off the mains close to Building 22, whilst protecting and making safe all remaining pipework on site.
- Power - The Contractor shall isolate all supplies to the buildings and infrastructure at sub-stations 1, 2 and 3, whilst ensuring no disruption of service to the wider estate. It should be noted that the estate ring main includes underground connections into all three sub-stations which must be safeguarded at all times.
- Fuel Lines, Data, Telecoms, Fire Alarms, Security etc. – The Contractor shall investigate the site for such routes and safely terminate all supplies to the buildings at the plot boundary or gantry where there is no effect on the wider estate. Where a system serves the wider estate, it shall be protected and maintained in good working order, with any termination of supply to the plot being at a position agreed with the Employer. It should be noted that a telecommunications and CCTV hub serving the wider estate is located in Building 24 on the plot and must be safeguarded throughout the works, with access provided to the Employer or its representatives as required. Underground and overground telecommunications routes to and from Building 24 are shown in the Levertech report.
- Services Gantries – The Contractor shall terminate all services on the spur gantry on 4TH Street leading to Building 9 to allow removal of this short section of gantry as shown on the Demolition Plan. Where services connect to Building 24 or serve the wider estate, they shall be safeguarded during these alterations. The services gantry along Central Avenue passes through sections of building to be demolished and shall be fully protected throughout the demolition works. Furthermore, the stability of the gantry shall be assessed prior to demolition of Building 38 and strengthened as necessary to allow it to function satisfactorily in freestanding circumstances, whilst maintaining support to the canopy connecting to Building 43.

General Requirements

The Contractor shall ensure that surrounding properties or estate-wide systems are not cut off from services without prior notice and agreement. Any financial losses incurred by others as a result of an unexpected cut off from a service or being cut off from a service without prior agreement shall be borne in full by the Contractor.

Where any portion of the works is close to, across, or under any existing live apparatus of Public Utilities, estate services or other parties' equipment, the Contractor shall temporarily support and ensure the safety and stability of such services and work round, under or adjacent to all apparatus in a manner designed to avoid damage, leakage or danger, and to ensure uninterrupted operation. Such works shall be agreed by the Contractor with the specific utility provider or Employer as appropriate prior to being undertaken.

Should any leakage or damage be discovered, the Contractor shall at once notify the Contract Administrator and the Statutory Authority or Employer concerned, and the Contractor shall afford every facility for the repair or replacement of the apparatus affected.

The Contractor shall be liable for all damage or interference that may arise out of or in consequence of the works. The Contractor shall immediately, at its cost, repair and make good such damage, or should the Employer or authorities concerned decide to effect repairs themselves, the Contractor shall afford proper facilities and bear the costs of such repairs. The Contractor must fully acquaint itself with all facilities, equipment, services, structures and properties that it must safeguard throughout the Contract period.

The Contractor shall not store materials over live pipes, drains, cables, gas mains or lines or do anything of a nature to hinder the operations of the authorities and Employer concerned in maintaining such apparatus. The Contractor must establish clearly defined crossing points for vehicle access across all drainage runs and live service ducts to ensure their security. Vehicles and heavy plant must not travel across the Site indiscriminately.

Drainage infrastructure must be protected from deterioration as a result of the works and any leakage, blockage or damage shall be immediately repaired. On-going groundwater monitoring is performed on the estate and any evidence of contamination being released from the Site as a result of the works shall be immediately investigated by the Contractor and remedied to the satisfaction of the Employer and the Statutory Authorities at the cost of the Contractor.

The existing drains adjacent to the Site shall be appropriately protected from contamination arising from the Site works.

7.3 Electricity Substations

The works can be divided into two parts as follows:

Eastman Plot

The Contractor shall be responsible for protection of the existing electricity substation on the plot in accordance with the requirements of Freedom Group. Owing to the proximity of the Eastman Building, special protection measures shall be erected to ensure that no accidental damage can occur to equipment or cabling connecting to the sub-station. The Contractor shall provide Freedom Group 24 hour access to the electricity substation. The Contractor shall liaise with Freedom Group with regards to notice periods, access and attendance that are required to facilitate the works.

The Contractor shall ensure that the main sub-station in Building 95 and remaining sub-stations on the estate are not impacted by the works.

5 Acre Plot

The Contractor shall be responsible for protection of the 3 existing electricity substations on the plot in accordance with the requirements of Freedom Group. The Contractor shall provide Freedom Group 24 hour access to the 3 electricity substations. The Contractor shall liaise with Freedom Group with regards to notice periods, access and attendance that are required to facilitate the works.

The Contractor shall ensure that the main sub-station in Building 95 and remaining sub-stations on the estate are not impacted by the works.

7.4 Demolition and Site Clearance

Vegetation and Surfacing

On the Eastman Plot, the Contractor shall leave all trees as marked on the Demolition Plan and hard surfacings in place, with the exception that low level shrubs and planting adjacent to the building shall be removed. The Contractor shall erect protective fences around the trees to protect the ground surface from compaction or excavation, and canopies from physical damage in accordance with BS5837: 2012 *'Trees in Relation to Design, Demolition and Construction – Recommendations'*. Protective fencing shall be erected before any other materials or machinery are brought onto the site and before any demolition takes place.

On the 5 Acre Plot, the Contractor shall clear the site of all trees, shrubs and other vegetation, but hard surfacings must remain in place. However, trees on the Acornfield Road frontage on the estate but outside the strict plot boundary shall be protected from damage.

Demolition of Buildings and Structures

The Contractor shall undertake the demolition of all buildings and structures identified on Drawing No SK2026 (Demolition Plan) in Appendix B. Buildings 18 (off Site), 24, 95 (off Site) and the pits on the south side of the 5 Acre Plot are not scheduled for demolition and must be protected from any damage throughout the works. In addition, the neutralising pit on Plot A must be retained and protected in accordance with recommendations in the Pre-Demolition Ecology Report. Also, the stability of Building 24 shall be assessed and strengthened as necessary to permit the demolition of adjoining Building 21 and to ensure continued stability as an independent watertight structure for 6 years. In addition, a canopy connects from Building 38 to Building 43, which shall be left intact and severed from Building 38 without damage to the canopy support structure or Building 43, which is occupied by Surface Transform.

Prior to demolition, the Contractor shall review the Demolition Asbestos Surveys provided in the Works Information and shall carry out additional Pre-Demolition asbestos survey works as necessary to fully comply with the regulations. The Contractor shall ensure that all asbestos and asbestos containing materials are safely removed from buildings and structures by a specialist and appropriately licensed asbestos removal contractor before disposal at a licensed facility. The Contractor shall ensure that the asbestos register is updated and that all waste transfer notes are retained.

All furniture, furnishings and fittings shall be removed from the buildings prior to demolition and, where possible, recycled or reused. Where materials cannot be recycled or reused they shall be disposed of at an appropriate waste management facility/ landfill. All waste transfer notes shall be retained.

As an option, the Contractor shall remove without damage and deliver the boiler equipment housed in Building 27 on the Eastman Plot to the Employer free of charge.

Prior to demolition the Contractor shall identify all sources of fuel or chemical storage within all buildings and structures at the Site. The Contractor shall allow for cleaning or draining of tanks, vessels etc (except external pits scheduled for retention), removal of contaminated sludges and residues, cleaning of open pits prior to infill, disconnection or diversion of services and purging of internal pipework. This shall include, but not be limited to, above ground storage tanks, drums and other containers. The Contractor shall check the integrity of all chemical and fuel storage containers prior to removal. Where there is evidence that spillage or leakage may have impacted surrounding materials to be removed, samples shall be taken for chemical testing as necessary and arrangements made for suitable disposal off-site.

The Contractor shall undertake demolition of the buildings and structures in a phased manner taking cognisance of all standards, best practice methods, etc. As an option, suitable concrete, brick and mortar shall be crushed in accordance with section 7.5 and delivered for future reuse on a site in Nottingham.

The Contractor shall demolish all buildings to ground level only and shall make the ground surface safe, ensuring that all protuberances (eg rebar) are flush with the surface and shall clear the site of all debris. The Contractor shall plug any drains from inspection pits or other redundant voids and fill with crushed concrete to ground level. Existing manhole covers shall be retained in place or replaced where damaged and drainage connections, gullies etc plugged in accordance with section 7.2.

7.5 Materials Management

The generation of stockpiles of material shall be minimised as far as is reasonably practical. Any materials that are stockpiled shall be managed in a controlled manner in compliance with the Demolition Application information in Appendix C, with different material types or contaminated product segregated and clearly labelled. Stockpiles shall be physically separated to avoid cross contamination and temporary road access provided for loading. Stockpiles containing contaminated products shall be positioned on impervious surfaces to collect drainage and prevent loss of liquids and leachate to ground.

Mitigation measures shall be employed to minimise wind whip from stockpiled materials. The Contractor shall determine the methods for appropriate handling and storage of materials which may include damping down and covering of stockpiles where necessary.

As an option, concrete, brick and mortar demolition won materials shall be stockpiled and crushed and delivered for reuse on a site in Nottingham wherever possible. The processing of recycled aggregate shall be undertaken in line with the WRAP Quality Protocol for the Production of Aggregates from Inert Waste, 2004.

If the option to deliver crushed material to the Nottingham site is accepted, the material shall comply with Class 6F5 product in accordance with the Specification for Highway Works 600 Series and delivered at a time to be agreed with the Employer.

The Contractor shall ensure appropriate permits are in place for any crushing plant and crushing operations prior to commencement of such operations.

The stockpiles left for future reuse on Site shall be tested by the Contractor at a rate of one sample per 500m3 to demonstrate that the material is inert and free of asbestos contamination.

Full records of the quantities of materials disposed off-Site and the receiving facilities shall be kept by the Contractor during the Works. In addition, consignment notes for the materials shall be collated.

7.6 Finished Levels

The Contractor shall leave the Site clear of debris with the surface matching existing Site levels. The Contractor shall leave the edges of the Site with safe slopes to the adjacent land/public highways and where needed shall provide collection of rainwater/surface water run off to prevent this leaving the plot or crossing onto estate roads.

7.7 Water Management and Control

During the demolition and clearance works, existing drains adjacent to the works and crossing the plots should be appropriately protected from contamination arising from the works.

The Contractor shall ensure that the demolition works do not adversely impact upon the surface water sewers running below the adjacent estate roads and those which cross the Site. During the site works the Contractor shall ensure that any impact to the sewers is avoided and that appropriate emergency response procedures are in place to manage any incident.

The Contractor shall undertake monitoring in surface water drains in the event of any potential release or seepage of liquids from the site into the surface water system, including surface run-off, or if required to do so by the Statutory Authorities.

The Contractor shall ensure that all surface water on Site is dealt with in a controlled manner. All stockpiles containing contaminated materials shall be protected against rainwater to prevent contaminated run-off from entering surrounding gullies, sewers, public footpaths or road networks.

The Contractor shall ensure that no materials, debris or liquids are released into manholes, sumps, chambers or pits, except where permitted by the Statutory Authorities.

7.8 Environmental Monitoring

The Contractor shall undertake Site operations in accordance with an Environmental Management Plan agreed with the Employer and Local Authority prior to commencement of the works and shall take all necessary precautions to limit odour, noise, vibration and dust generation.

The Contractor shall undertake noise, vibration and dust monitoring at the plot boundaries, focussing on the most sensitive receptors and the activities that are most likely to generate high noise, vibration and/or dust levels. Where the levels exceed the agreed threshold levels, mitigation measures must be put in place to reduce the noise, vibration and dust levels. The monitoring data shall be made available to the Employer and/or Environmental Health Officer for review at any time.

The Contractor shall allow access to the Employer's ecologist to survey and monitor the plots, and to implement any mitigation measures considered necessary.

7.9 Unforeseen Asbestos Containing Materials or Contaminants

There is a potential for previously unforeseen asbestos or contaminants to be encountered across the Site during the progression of the demolition works.

Should suspected additional contaminative materials be encountered during demolition, either visually or olfactory, the Contractor shall implement the following procedures:

- Works shall be halted and the Contractor's Site manager shall be contacted to inspect the area of concern;
- Photographs of the area shall be taken and detailed plans and method statements for dealing with the issue shall be drafted and forwarded to the Contract Administrator;

- If necessary, a Method Statement shall be prepared by the Contractor and evaluated by the Contract Administrator prior to being issued to the Statutory Authorities for written approval and subsequent implementation;
- If required, the Contract Administrator and Local Authority Office will visit the Site to inspect the area and comment on the Contractors proposals; and
- Time and resources will need to be allocated to complete these further works/assessments with laboratory testing analysis to be undertaken as necessary. The Contractor may need to adjust their programme to enable works in other area of the Site to be progressed.

7.10 Laboratory Testing and Accreditation

The Contractor shall use a UKAS and MCERTS accredited laboratory and test methods for the chemical analysis of materials, leachates and surface water, as required.

7.11 Site Management

The Contractor shall ensure that their operations do not deposit dirt or mud on the highway. As a minimum, compliance with Local Authority wheel washing and street sweeping requirements shall apply.

The Contractor shall take precautions to minimise nuisance to the public and neighbouring occupiers caused by dirt, noise or other issues arising from the Contractors operations. Water sprays shall be used to reduce dust nuisance.

The Contractor shall produce and maintain a Site Waste Management Plan (SWMP) to set out how the various waste streams shall be segregated and managed.

The requirements for all working methods shall be agreed with Knowsley Council where required prior to works commencing. The Contractor shall ensure that the Site is managed appropriately including adherence at all times to the EMP, ecological recommendations, stockpile management/segregation methods and spill management and response procedures.

7.12 Contractor's Records/Progress Report

The Contractor shall keep detailed site records and produce progress reports on a fortnightly basis throughout the entirety of the Contract period. These records shall describe the progress made to date, a record of the number of staff and plant utilised onsite, weather conditions, visual observations of nuisance (noise, odour, dust), the condition of nearby sensitive receptors, the condition of remaining structures, a record of unforeseen contaminants, records of all imports and exports from Site and a record of all testing undertaken. The report shall include photographic evidence and documentation where appropriate.

8. Validation Report

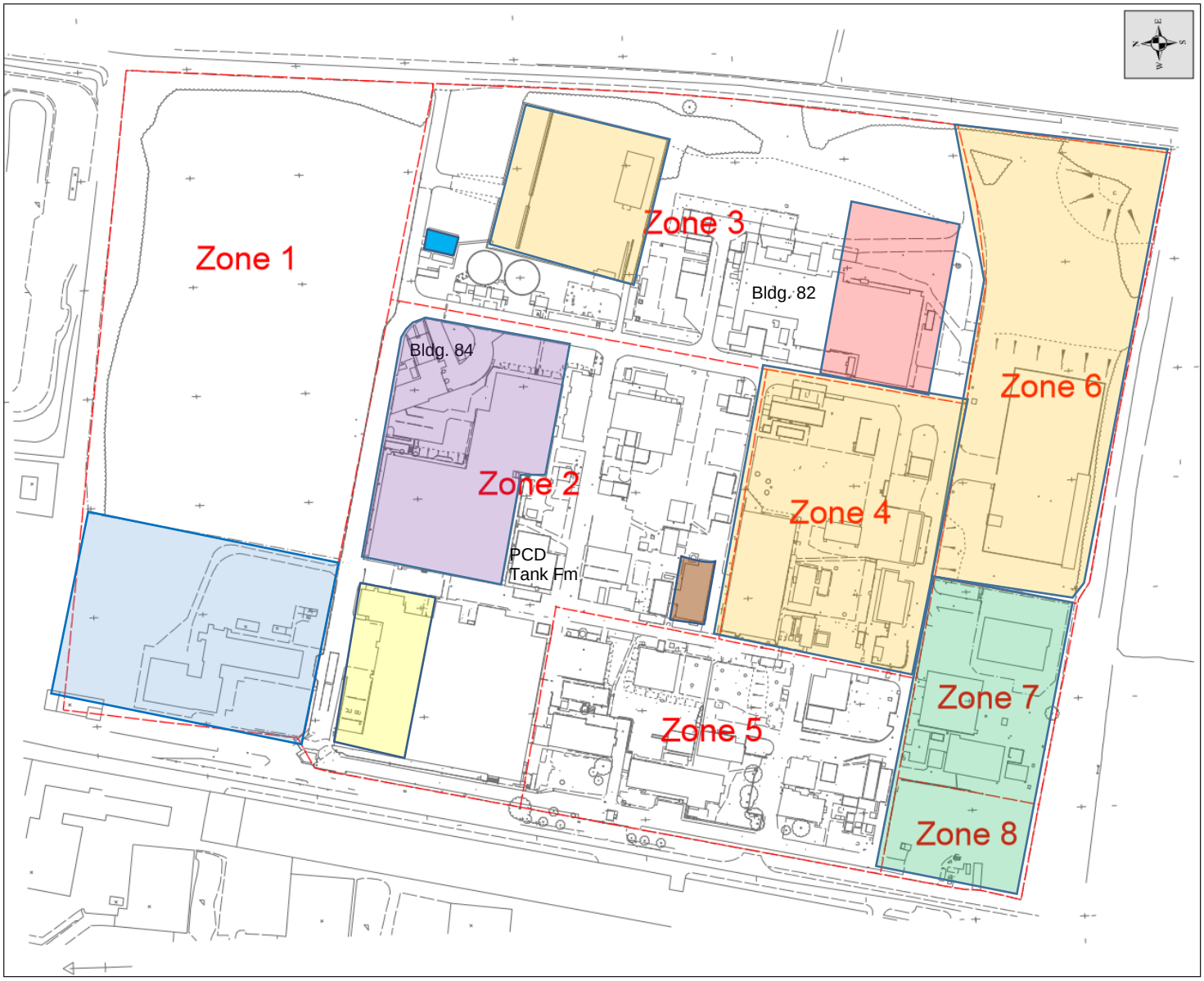
The Contractor shall provide a Validation Report on completion of the Contract. The Validation Report shall provide a full record of all works undertaken under the Contract. This shall include (but not be limited to) the following information:

- Locations and volumes of recovered concrete from demolition retained on the Site including records of tests on the crushed material intended for reuse on site or as an option, to be delivered to Nottingham;
- Remedial works undertaken to services within the Site perimeter;
- Remedial works undertaken to boundaries, adjacent property, on-site structures that remain and adjacent surface water drainage;
- Details of any unforeseen asbestos or contaminants encountered during the works and subsequent actions;
- Summary of consignment notes and chain of custody documents relating to the disposal of all waste materials, liquids and asbestos containing materials from the Site;
- Relevant approvals from Knowsley Council, the Environment Agency and utility companies for the works carried out;
- Communications with the HSE;
- Results of all noise, vibration, dust and odour monitoring carried out;
- Results of any surface water monitoring and testing carried out; and
- All licenses and permits obtained as part of the Contract.

Appendices

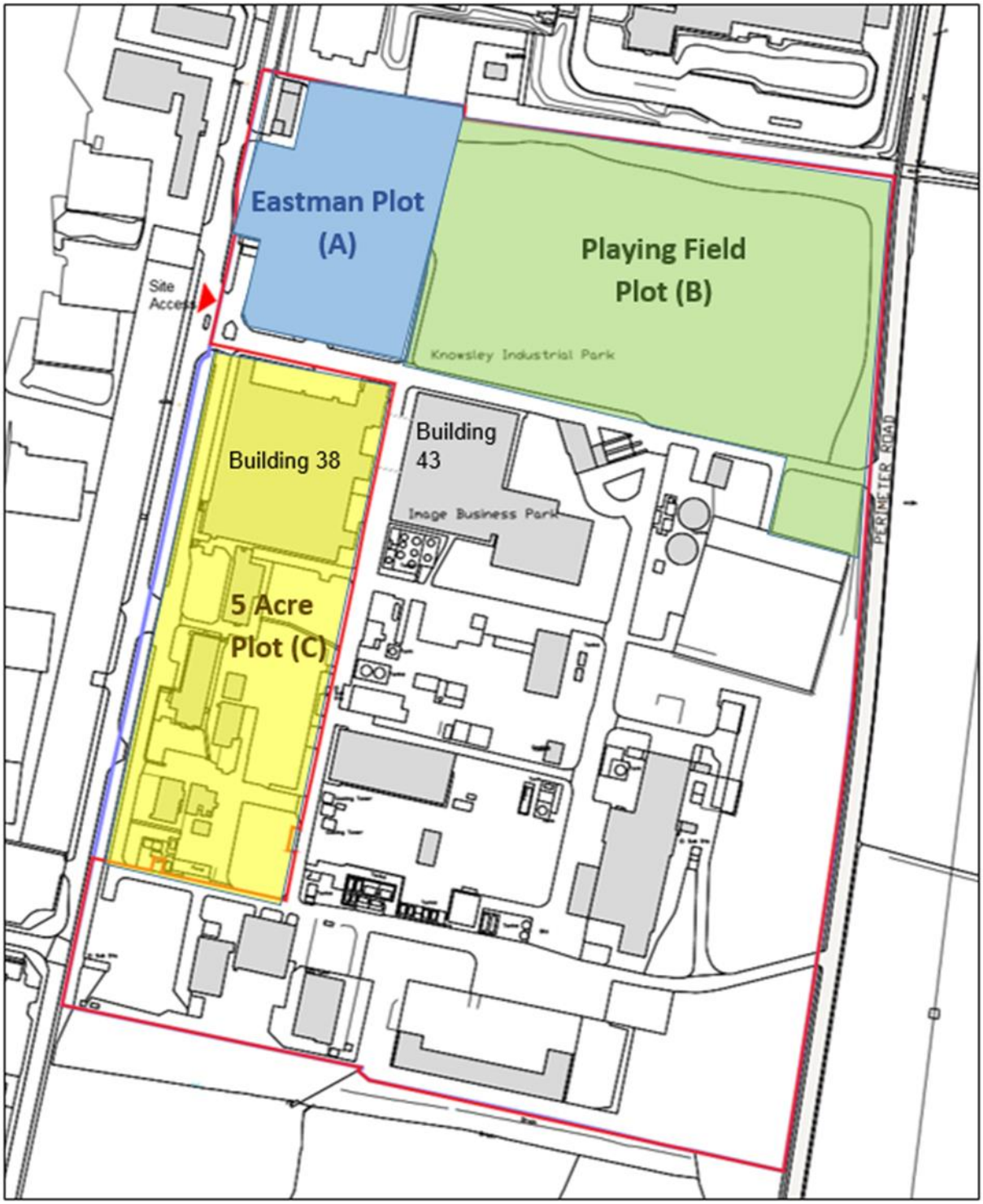
Appendix A Estate Plans and Aerial Photographs

- Site Plan Showing Tenant Areas and WSP Assessment Zones
- Development Plot Plan
- Aerial Photographs
- 5 Acre Plot - Demolition Notes on Photographs

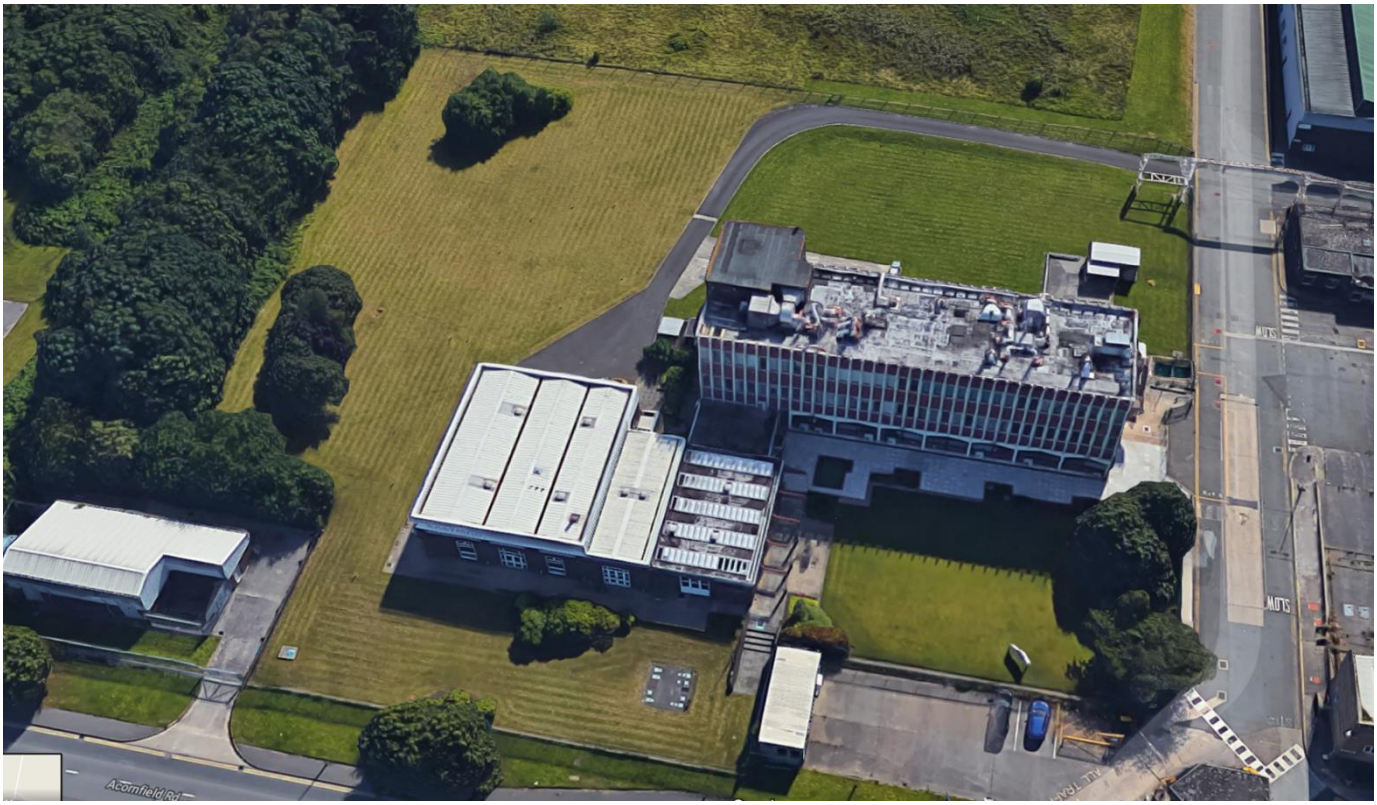


Site Plan Showing Tenant Areas and WSP Assessment Zones

Eastman (vacated)	Surface Transform
FIS	Martifer (vacated)
Ames Goldsmith	Oscar Tyres
Tradebe (formerly MRM)	AV Autos



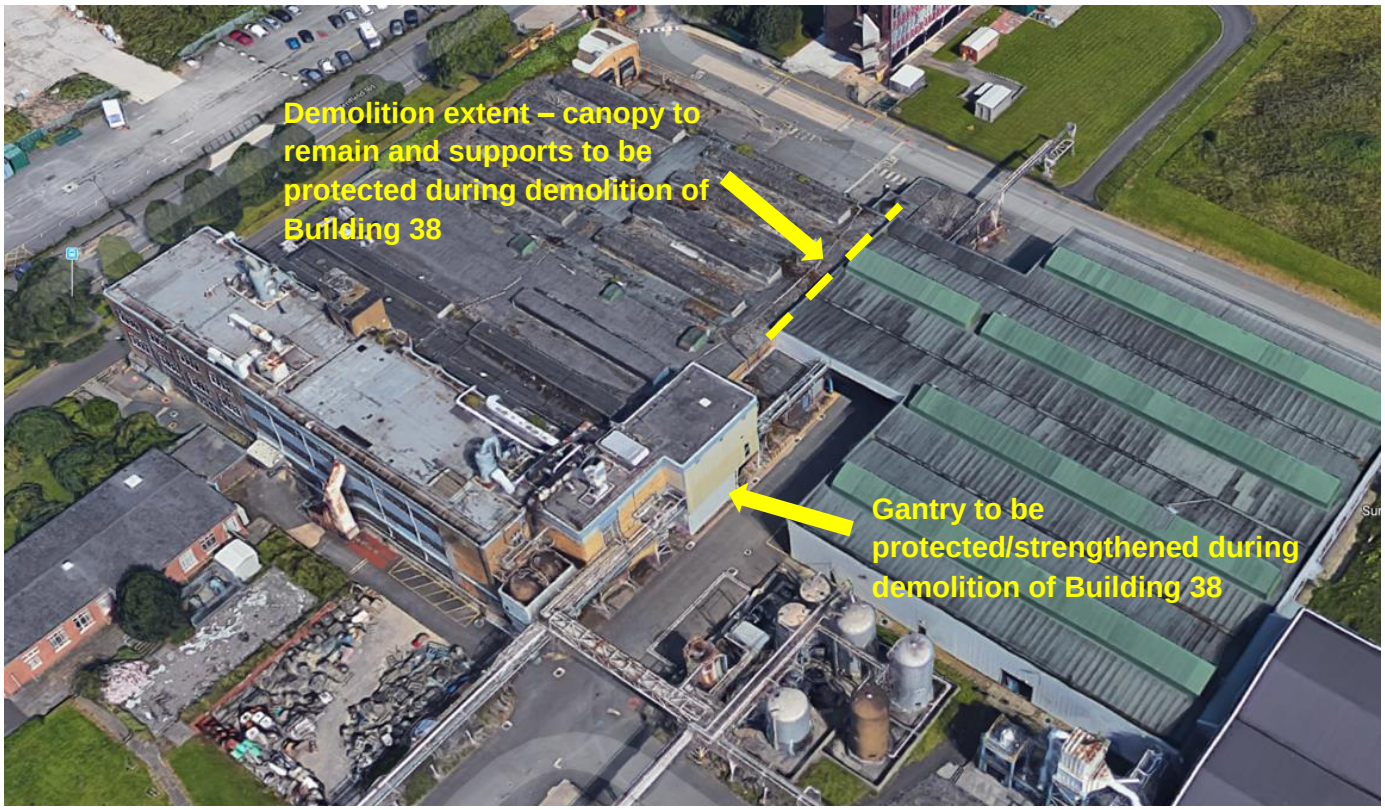
Development Plot Plan



Aerial Photograph of the Eastman Building

Aerial Photograph of the 5 Acre Plot

5 Acre Plot – Demolition Notes



Appendix B Site Plans and Record Drawings (Attached File)

Appendix C Past Reports (Attached File)

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Demolition Asbestos Survey

Eastman Site
Acornfield Road
Kirby
Liverpool
L33 7TY

E-10254/

On behalf of

Knowsley

23 May 2018

UKAS INSPECTION

4238

Demolition Asbestos Survey

Eastman Site
Acornfield Road
Kirby
Liverpool
L33 7TY
Knowsley

Date of Survey: 14 May 2018 to 16 May 2018
Surveyor: Jamie Perkins-Best, Paul Hodgkiss

Report Issue and Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description (Including amendments)	Checked	Date	Signed
1	0	Report	Jamie Perkins-Best	23 May 2018	

UKAS INSPECTION

4238

Type C

Inspection Body

Accredited to

ISO/IEC 17020:2012

Contents

1	**Executive Summary**	**4**
2	**Introduction**	**9**
	2.1 General	9
	2.2 Scope	9
	2.3 Legislation	9
	2.4 Asbestos surveyors	10
	2.5 Demolition Asbestos Survey	10
	2.6 Limitations of the report	10
3	**Survey Description**	**12**
	3.1 Building description	12
	3.2 Areas not accessed	12
	3.3 Sampling Strategy	12
	3.4 Presumed materials	12
4	**Survey Results**	**14**
	4.1 Introduction	14
	4.2 Material Risk Assessment	14
	4.3 Asbestos Register	15
	4.4 Negative Samples Register	15
	4.5 Areas not Accessed Register	15
5	**Conclusions**	**69**
	5.1 General	69
	5.2 Conclusions and Recommendations	69
Appendix A Site Plans		**70**
Appendix B Test Results		**83**

1 Executive Summary

Environmental Management Solutions Ltd (EMS) has undertaken a Demolition Asbestos Survey at Eastman Site, Acornfield Road, Kirby, Liverpool, L33 7TY. The survey was undertaken by Jamie Perkins-Best, Paul Hodgkiss of EMS on the 14 May 2018 to 16 May 2018.

The report was commissioned by KNOWSLEY to address the potential risk of asbestos containing materials (ACMs) within the property prior to planned demolition or major works as part of the client's commitment to the Control of Asbestos Regulations 2012 (CAR2012).

The scope of the survey included in the Demolition Asbestos Survey for the unoccupied building known as the Eastman Plot Acornfield Road Kirkby Liverpool as shown in the appended plans

The survey was carried out utilising standard access equipment as stated in our terms and conditions, unless otherwise agreed. The scope excludes sub-surface areas and soil contamination.

Full details of all materials, their locations, full MRA scores and management recommendations can be found within the asbestos register section of the report. Areas not accessed are also recorded.

In summary, the following materials were identified:

Asbestos Register & Risk Assessment: Eastman Site			
Risk Rating	**Material**	**Location**	**Recommendation**
High	Pipe Scraping - Thermal Insulation	3rd Floor, Plant room, 014	Remove
High	Debris to Wall 2 - Thermal Insulation	3rd Floor, Plant room, 014	Remove
High	Debris to Wall - Thermal Insulation	3rd Floor, Plant room, 014	Remove
Medium	Pipe Lagging - Thermal Insulation	Ground Floor, Corridor, 062	Remove
Medium	Pipe Lagging - Thermal Insulation	1st Floor, Laboratory 1, 019	Remove

Asbestos Register & Risk Assessment: Eastman Site			
Risk Rating	**Material**	**Location**	**Recommendation**
Medium	Pipe Lagging - Thermal Insulation	1st Floor, Laboratory 2, 022	Remove
Medium	Pipe Lagging - Thermal Insulation	1st Floor, Laboratory 3, 023	Remove
Medium	Extractor hood - Insulating Board	1st Floor, Laboratory 3, 023	Remove
Medium	Pipe Lagging - Thermal Insulation	1st Floor, Service Shaft, 035	Remove
Medium	Pipe lagging - Paper Product	1st Floor, Service Shaft, Service Shaft	Remove
Medium	Electrics - Woven Product	2nd Floor, Corridor Electric Cupboard, 012	Remove
Medium	Lift Motor - Gaskets (compressed)	3rd Floor, Lift Motor Room, 015	Remove
Medium	Electrics - Woven Product	Throughout, Corridor, 062	Remove
Medium	Electrics - Woven Product	External, compressor house, 069	Remove
Low	Ceiling Void Ventilation ducting - Insulating Board	Ground Floor, Laboratory 5, 055	Remove
Low	Wall - Insulating Board	Ground Floor, Break room, 064	Remove
Low	Door Header - Insulating Board	1st Floor, Laboratory 1, 019	Remove
Low	Door Header - Insulating Board	1st Floor, Laboratory 2, 022	Remove
Low	Door Header - Insulating Board	1st Floor, Laboratory 3, 023	Remove
Low	Extractor Vent pipework - Insulating Board	1st Floor, Laboratory 3, 023	Remove

Asbestos Register & Risk Assessment: Eastman Site			
Risk Rating	**Material**	**Location**	**Recommendation**
Low	Extractor Vent pipework - Insulating Board	1st Floor, Laboratory 4, 024	Remove
Low	Door Header - Insulating Board	1st Floor, Laboratory 4, 024	Remove
Low	Ventilation pipework - Insulating Board	1st Floor, Laboratory 5, 031	Remove
Low	Ceiling Void - Rope	1st Floor, Office 10, 033	Remove
Low	Ceiling Void - Rope	1st Floor, Toilet Gents, 034	Remove
Low	Flue - Cement	1st Floor, Corridor, 037	Remove
Low	Partition Wall - Insulating Board	2nd Floor, Laboratory, 002	Remove
Low	Electrics - Woven Product	2nd Floor, Office 6, 004	Remove
Low	Door Lining - Insulating Board	Throughout, Lift Shaft, 006	Remove
Low	Flue - Cement	Throughout, Corridor, 062	Remove
Low	Flue - Cement	External, Roof Main Building, 013	Remove
Very Low	Ceiling - Cement	Ground Floor, Plastic process lab, 042	Remove
Very Low	Floor Covering - Linoleum Floor Covering	Ground Floor, Office 3, 060	Remove
Very Low	Floor Covering - Linoleum Floor Covering	Ground Floor, Office 4, 061	Remove
Very Low	Floor Covering - Vinyl Floor Tile	Ground Floor, Reception, 063	Remove
Very Low	Fume Cupboard - Cement	1st Floor, Laboratory 1, 019	Remove

Asbestos Register & Risk Assessment: Eastman Site			
Risk Rating	**Material**	**Location**	**Recommendation**
Very Low	Fume Cupboard – Cement	1st Floor, Laboratory 2, 022	Remove
Very Low	Fume Cupboard – Cement	1st Floor, Laboratory 3, 023	Remove
Very Low	Fume Cupboard - Cement	1st Floor, Laboratory 4, 024	Remove
Very Low	sink pad - Bitumen	1st Floor, Laboratory 6, 032	Remove
Very Low	Wall & Ceiling Boards - Cement	1st Floor, Cold Store, 038	Remove
Very Low	Ventilation pipework - Mastic	2nd Floor, Throughout, 002	Remove
Very Low	sink pad 1 - Bitumen	2nd Floor, Laboratory, 002	Remove
Very Low	sink pad 2 - Bitumen	2nd Floor, Laboratory, 002	Remove
Very Low	sink pad 3 - Bitumen	2nd Floor, Laboratory, 002	Remove
Very Low	Pipe - Bitumen	2nd Floor, Throughout, 003	Remove
Very Low	Ventilation pipework - Mastic	Throughout, Ceiling Void, 020	Remove
Very Low	Pipe Joints throughout - Putty	Throughout, Service Shaft, 036	Remove
Very Low	Promenade Tiles - Cement	External, Roof Main Building, 013	Remove
Very Low	Window - Putty	External, External, 074	Remove
Very Low	Window - Putty	External, External, 074	Remove
Limited Access	2nd Floor, Service Shaft 027 Ventilation Duct		presumed AIB within brick shaft

Asbestos Register & Risk Assessment: Eastman Site			
Risk Rating	**Material**	**Location**	**Recommendation**
Limited Access	Throughout, Dumb Waiter 026 Ducts		Limited access gained Shaft viewed around car, Shaft not fully accessed
Limited Access	External, Substation 7 070 Electrics		
No Access	External, External underground plant room 075		flooded no access
No Access	External, External underground sump 075		flooded no access

2 Introduction

2.1 General

Environmental Management Solutions Ltd (EMS) has carried out a Demolition Asbestos Survey at Eastman Site, Acornfield Road, Kirby, Liverpool, L33 7TY. The survey was undertaken by Jamie Perkins-Best, Paul Hodgkiss of EMS on the 14 May 2018 to 16 May 2018.

The survey was commissioned by Knowsley, Parkside, Church Path, London, N12 8RH. The purpose of this report is to address the potential for asbestos containing materials (ACMs) within the property as part of the client's commitment to the Control of Asbestos Regulations (CAR). Appendix A shows the layout of the property.

2.2 Scope

The scope of the survey included in the Demolition Asbestos Survey for the unoccupied building known as the Eastman Plot Acornfield Road Kirkby Liverpool as shown in the appended plans

The survey was carried out utilising standard access equipment as stated in our terms and conditions, unless otherwise agreed. The scope excludes sub-surface areas and soil contamination.

2.3 Legislation

A demolition survey is required prior to any demolition work being carried out. This type of survey is used to locate and describe, as far as reasonably practicable, all ACMs in the area where the work will take place or in the whole building if full demolition is planned. The survey will be fully intrusive and involve destructive inspection, as necessary, to gain access to all areas, including those that may be difficult to reach. A demolition survey may also be required in other circumstances, eg when more intrusive maintenance and repair work will be carried out or for plant removal or dismantling.

There is a specific requirement in CAR 2012 (regulation 7) for all ACMs to be removed as far as reasonably practicable before major refurbishment or final demolition.

The survey report should be supplied by the client to designers and contractors who may be tendering for or undertaking the work, so that the asbestos risks can be addressed. In this type of survey, where the asbestos is identified so that it can be removed (rather than to 'manage' it), it is not a requirement to assess the condition of the asbestos, other than to indicate areas of damage or where additional asbestos debris may be present. However, where the asbestos removal may not take place for some time, the ACMs' condition will need to be assessed

and the materials managed until such time as they are removed. For this reason risk assessment scores have been assigned to the materials identified.

A demolition survey has been undertaken and the technique used is in accordance with EMS in house procedures based upon the guidelines within the Health and Safety (HSE) Guidance HSG264 Asbestos: The survey guide. This report will describe the survey and document the results to enable the asbestos risk in the building to be managed during the planned works in accordance with the appropriate legislation.

The survey will aim to identify suspect material, confirm by testing and presume by inspection, those areas of asbestos containing material (ACM). These areas can then be dealt with in the appropriate manner to prevent contamination of the building or exposure of subcontractors, employees or members of the public to unnecessary risk.

2.4 Asbestos surveyors

CAR2012 and HSG 264 refer to asbestos surveys being carried out by "competent persons" with experience, training and suitable qualifications. EMS confirm that their lead surveyors hold a minimum of the British Occupational Hygiene Society Module P402: Building Surveys and Bulk Sampling for Asbestos or equivalent and will hold the relevant experience for the project they are undertaking. EMS maintain a qualification and authorisation matrix in accordance with the UKAS document RG8 'Accreditation of Bodies Surveying for Asbestos in Premises'.

2.5 Demolition Asbestos Survey

This report is a description of a demolition asbestos survey undertaken prior to planned works. The purpose of which is to determine the nature and extent of any asbestos containing materials (ACM) within the area of the proposed demolition work.

This report will also provide an assessment of the condition of ACM present and risk of fibre release from the material to allow interim management before demolition takes place.

A demolition survey is used to locate and describe, as far as reasonably practicable, all ACMs in the area where the work will take place or in the whole building if full demolition is planned. The survey will be fully intrusive and involve destructive inspection, as necessary, to gain access to all areas, including those that may be difficult to reach.

2.6 Limitations of the report

This report is based on the information that has been made available to us from the client regarding site operations. The conclusions drawn in the report are considered correct although any subsequent additional information may allow refinement of the conclusions. It should be noted that:

- The report has been prepared under the express instructions and solely for the use of KNOWSLEY.

- The findings of this report represent the professional opinion of experienced asbestos surveyors and is produced in accordance with EMS in house procedures based upon the guidelines within the Health and Safety (HSE) Guidance Health and Safety (HSE) Guidance HSG264 Asbestos: The survey guide. EMS does not provide legal advice and the advice of lawyers may also be required.

- All work carried out in preparing this report has utilised, and is based upon, EMS's current professional knowledge and understanding of current relevant UK standards, codes, technology and legislation. Changes in this legislation and guidance may occur at any time in the future and cause any conclusions to become inappropriate or incorrect. EMS does not accept responsibility for advising KNOWSLEY or other interested parties of the facts or implications of any such changes.

- It is stressed that while every effort was made to identify the locations and full extent of all asbestos materials in the specified area, such material may be located within the structural matrix of the building and will not become visible until final demolition.

- The report is limited to the areas identified by KNOWSLEY on this site.

- All samples were analysed by Scopes Asbestos Analysis Ltd, Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU. Scopes are UKAS accredited for identification of asbestos.

3 Survey Description

3.1 Building description

3 story office building with flat roof, a single story more recent extension, various outbuildings and underground plant room and pit. The building was last used as a chemical lab, offices and warehouse. The walls throughout are a mix of plasterboard and brick and block, the floors throughout are solid and the ceilings are suspended with a secondary concrete ceiling. Service riser are present throughout the corridors on each floor with a mixture of pipework with lagging present. Ventilation ducting is also present throughout.

3.2 Areas not accessed

In accordance with the HSE Guidance HSG264 Asbestos: The survey guide, areas which cannot be accessed or inspected at the time of the survey must be presumed to contain asbestos, unless there is strong evidence to prove otherwise.

The areas not accessed during the survey can be found in the register within Section 4; arrangements will need to be made to access these areas prior to demolition being undertaken.

3.3 Sampling Strategy

Sampling was not carried out where it would have caused structural damage to the building or where it would be unsafe to attempt to obtain a sample. In some cases asbestos materials have been identified without sampling.

All sampling was undertaken in accordance with EMS in house procedures based upon the guidelines within HSE Guidance HSG264 Asbestos: The survey guide. The samples were double bagged, labelled and submitted to the laboratory as bulk samples.

Samples taken during the survey are detailed on the test certificate in Appendix B. Each sample, along with a photograph of each sampling point, is included within the asbestos register in section 4 of this report; positive materials, along with presumed materials, will be evaluated and risk assessed in accordance with HSG264.

3.4 Presumed materials

In areas where sampling was not possible or practical, materials are either presumed or strongly presumed in accordance with EMS in house procedures based upon the guidelines within the Health and Safety (HSE) Guidance HSG264 Asbestos: The survey guide.

As defined by the HSE, materials that are strongly presumed look as if they may contain asbestos, upon visual inspection by an experienced, trained surveyor.

Materials that are presumed to contain asbestos where there is insufficient evidence to confirm that it is asbestos free.

Presumed materials should be treated as asbestos containing materials until proven otherwise and therefore are included in the asbestos register within this report.

4 Survey Results

4.1 Introduction

All testing was undertaken by Scopes Asbestos Analysis, Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU in accordance with their "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on the Health and Safety Executive HSG248'. The certificates of analysis are included in appendix B of this report.

4.2 Material Risk Assessment

Each ACM has been risk assessed in accordance with the algorithm within HSG264 Asbestos: The survey guide; this is shown below. The Material Risk Assessment (MRA) score identifies the risk level of the materials, that is, the risk that the material will release airborne fibres if disturbed. Presumed materials are scored as asbestos if they were asbestos containing.

Materials with assessment scores of 10 or more are regarded as having a high potential to release fibres, if disturbed. Scores of between 7 and 9 are regarded as having a medium potential, and between 5 and 6 a low potential. Scores of 4 or less have a very low potential to release fibres. Non-asbestos materials are not scored.

For presumed materials the asbestos type must be calculated as Crocidolite until proved otherwise. In most cases it is unlikely that Crocidolite has been used; but unless the material risk assessment highlights a medium or high potential for fibre release it is acceptable to manage the presumed materials on the presumption of Crocidolite. Further investigation may be required before major maintenance or demolition.

Variable	Score	Examples of scores
Product type or debris from product	1	Asbestos – reinforced composites (plastics, resins, mastics, roofing felts, vinyl floor tiles, semi rigid paints, or decorative finishes, asbestos cement etc.)
	2	Asbestos insulating board, asbestos millboard, other low-density insulation boards, asbestos textiles, gaskets ropes and woven textiles, asbestos paper and felt.
	3	Thermal insulation (e.g. Pipe and boiler lagging) loose and sprayed asbestos, asbestos mattresses and packing.
Extent of damage or deteriorat ion	0	Good condition – no visible damage
	1	Low damage – a few scratches or surface marks; broken edges on boards, tiles etc.
	2	Medium damage; significant breakage of materials or several small areas where material has been damaged revealing loose asbestos fibres.
	3	High damage or delamination of materials, sprays and thermal insulation. Visible asbestos debris
Surface treatment	0	Composite materials containing asbestos.: reinforced plastics, resins and vinyl tiles
	1	Enclosed sprays and lagging, AIB (with exposed face painted or encapsulated) asbestos cement sheets etc
	2	Unsealed AIB, or encapsulated lagging and sprays
	3	Unsealed lagging and sprays
Asbestos type	1	Chrysotile
	2	Amphibole asbestos excluding Crocidolite
	3	Crocidolite
Risk Rating	Very Low	Scores of 4 or less have a very low potential for fibre release if disturbed.
	Low	Scores of between 5 and 6 have a low potential to release fibres if disturbed.
	Med.	Scores of between 7 and 9 have a medium potential to release fibres if disturbed
	High	Materials with assessment scores of 10 and more are regarded as having a high potential to release fibres if disturbed

4.3 Asbestos Register

The asbestos register for the site, including the MRA scores, can be found overleaf. The asbestos register contains materials both proven and presumed to contain asbestos; the register also offers guidance as to whether work with each product is likely to be classified as licensed, therefore requiring a licensed contractor and a 14 day notification period. The basis for determining tasks that require a license is dependant upon a risk assessment of the potential fibre release during work with the product. Therefore further assessment or consultation with the HSE may be required.

Along with the MRA scores recommendations have been made for future management of the materials

4.4 Negative Samples Register

Samples that have tested negative for the presence for asbestos are presented within the following register, along with photographs of each sampling point.

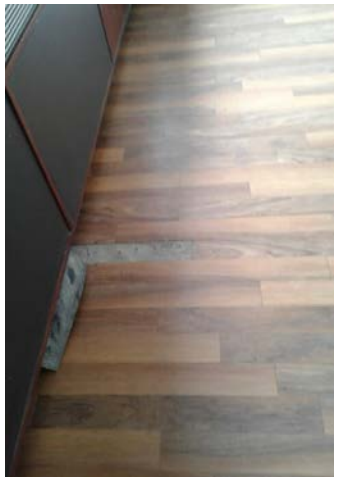
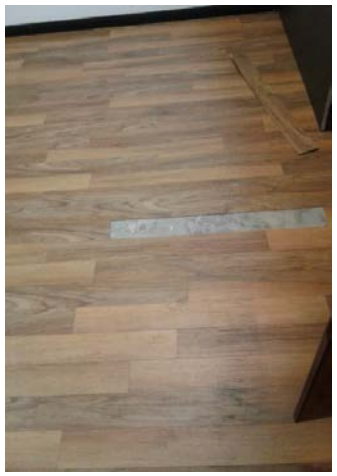
4.5 Areas not Accessed Register

Areas that have not been accessed during the survey are presented within the following register with a photograph of each location.

These areas have not been risk assessed but a worst case scenario of ‘High Risk’ of fibre release if these areas are disturbed.

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Ground Floor, Plastic process lab, 042 Ceiling - Cement		E-10254/S055	N	150 m²	Difficult	1	1	1	Chrysotile 1	4 Very Low	**Remove**
Ground Floor, Laboratory 5, 055 Ceiling Void Ventilation ducting - Insulating Board		E-10254/VS037	Y	10 lin m	Medium	2	1	1	Amosite / Chrysotile 2	6 Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Ground Floor, Office 3, 060 Floor Covering - Linoleum Floor Covering Beneath modern vinyl flooring		E-10254/S065	N	20 m²	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**
Ground Floor, Office 4, 061 Floor Covering - Linoleum Floor Covering Beneath modern vinyl flooring		E-10254/VS065	N	20 m²	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Ground Floor, Corridor, 062 Pipe Lagging - Thermal Insulation		E-10254/S066	Y	10 lin m	Difficult	3	1	3	Amosite / Chrysotile 2	9 Medium	**Remove**
Ground Floor, Reception, 063 Floor Covering - Vinyl Floor Tile beneath modern vinyl flooring		E-10254/S069	N	8 m²	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Ground Floor, Break room, 064 Wall - Insulating Board		E-10254/S070	Y	12 m²	Medium	2	1	1	Chrysotile 1	5 Low	**Remove**
1st Floor, Laboratory 1, 019 Fume Cupboard – Cement Ceiling, Baffle and Front		E-10254/S030	N	12 m²	Medium	1	1	1	Chrysotile 1	4 Very Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 1, 019 Pipe Lagging - Thermal Insulation		E-10254/S032	Y	10 lin m	Medium	3	2	3	Chrysotile 1	9 Medium	**Remove**
1st Floor, Laboratory 1, 019 Door Header - Insulating Board		E-10254/S036	Y	2 m²	Easy	2	0	1	Amosite / Chrysotile 2	5 Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 2, 022 Fume Cupboard - Cement Ceiling, Baffle and Front		E-10254/VS030	N	12 m²	Easy	1	1	1	Chrysotile 1	4 Very Low	**Remove**
1st Floor, Laboratory 2, 022 Pipe Lagging - Thermal Insulation		E-10254/VS032	N	10 lin m	Medium	3	1	3	Chrysotile 1	8 Medium	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 2, 022 Door Header - Insulating Board		E-10254/VS036	Y	2 m²	Easy	2	0	1	Amosite / Chrysotile 2	5 Low	**Remove**
1st Floor, Laboratory 3, 023 Fume Cupboard - Cement Ceiling, Baffle and Front		E-10254/VS030	N	12 m²	Medium	1	1	1	Chrysotile 1	4 Very Low	**Remove**

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 3, 023 Pipe Lagging - Thermal Insulation		E-10254/VS032	N	10 lin m	Medium	3	1	3	Chrysotile 1	8 Medium	**Remove**
1st Floor, Laboratory 3, 023 Door Header - Insulating Board		E-10254/VS036	Y	2 m²	Easy	2	0	1	Amosite / Chrysotile 2	5 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 3, 023 Extractor hood - Insulating Board packers		E-10254/S037	Y	3 lin m	Difficult	2	1	2	Amosite / Chrysotile 2	7 Medium	**Remove**
1st Floor, Laboratory 3, 023 Extractor Vent Ducting - Insulating Board		E-10254/S038	Y	30 lin m	Difficult	2	1	1	Amosite / Chrysotile 2	6 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 4, 024 Fume Cupboard - Cement Ceiling, Baffle and Front		E-10254/VS030	N	12 m²	Medium	1	1	1	Chrysotile 1	4 Very Low	**Remove**
1st Floor, Laboratory 4, 024 Door Header - Insulating Board		E-10254/VS036	Y	2 m²	Easy	2	0	1	Amosite / Chrysotile 2	5 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 4, 024 Extractor Vent ducting - Insulating Board		E-10254/VS038	Y	30 lin m	Difficult	2	1	1	Amosite / Chrysotile 2	6 Low	**Remove**
1st Floor, Laboratory 5, 031 Ventilation ducting - Insulating Board		E-10254/VS037	Y	6 lin m	Difficult	2	1	1	Amosite / Chrysotile 2	6 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Laboratory 6, 032 sink pad - Bitumen		E-10254/S041	N	1 no	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**
1st Floor, Office 10, 033 Ceiling Void - Rope		E-10254/S043	Y	1 lin m	Difficult	2	1	1	Chrysotile 1	5 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Toilet Gents, 034 Ceiling Void - Rope		E-10254/VS043	Y	1 lin m	Difficult	2	1	1	Chrysotile 1	5 Low	**Remove**
1st Floor, Service Shaft, 035 Pipe Lagging - Thermal Insulation		E-10254/S044	Y	1 lin m	Difficult	3	1	3	Amosite 2	9 Medium	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Corridor, 037 Flue - Cement		E-10254/VS019	N	4 lin m	Difficult	1	1	1	Amosite / Chrysotile 2	5 Low	**Remove**
1st Floor, Cold Store, 038 Wall & Ceiling Boards - Cement		E-10254/S048	N	30 m²	Difficult	1	1	1	Chrysotile 1	4 Very Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
1st Floor, Service Shaft, Service Shaft Pipe lagging - Paper Product		E-10254/S047	N	2 lm	Difficult	2	2	2	Chrysotile 1	7 Medium	**Remove**
2nd Floor, Laboratory, 002 Partition Wall - Insulating Board		E-10254/S001	Y	24 m²	Medium	2	1	1	Chrysotile 1	5 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
2nd Floor, Laboratory, 002 Ventilation ducting - Mastic		E-10254/S003	N	>100 lin m	Difficult	1	0	0	Chrysotile 1	2 Very Low	Presumed to all metal ducting **Remove**
2nd Floor, Laboratory, 002 sink pad 1 - Bitumen		E-10254/S004	N	1 no	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
2nd Floor, Laboratory, 002 sink pad 2 - Bitumen		E-10254/S005	N	1 no	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**
2nd Floor, Laboratory, 002 sink pad 3 - Bitumen		E-10254/S006	N	1 no	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
2nd Floor, Laboratory Office, 003 Foul Pipe - Bitumen		E-10254/S002	N	Throughout	Difficult	1	1	0	Chrysotile 1	3 Very Low	**Remove**
2nd Floor, Office 6, 004 Electrics - Woven Product		E-10254/P	Y	Small Amounts	Difficult	2	0	1	Presumed Asbestos 3	6 Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
2nd Floor, Corridor Electric Cupboard , 012 Electrics - Woven Product		E-10254/P	Y	Small Amounts	Difficult	2	1	1	Presumed Asbestos 3	7 Medium	**Remove**
3rd Floor, Plant room, 014 Debris to Wall - Thermal Insulation		E-10254/S023	Y	Small	Difficult	3	3	3	Amosite / Chrysotile 2	11 High	Debris to all walls in Plant Room **Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
3rd Floor, Plant room, 014 Pipe Scraping - Thermal Insulation		E-10254/S025	Y	Small	Difficult	3	3	3	Chrysotile 1	10 High	All pipes to be treated as contaminated. **Remove**
3rd Floor, Plant room, 014 Debris to Wall 2 - Thermal Insulation		E-10254/S026	Y	Small	Difficult	3	3	3	Amosite 2	11 High	Debris to all walls **Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
3rd Floor, Lift Motor Room, 015 Lift Motor - Gaskets (compressed)		E-10254/P	Y	1 no	Difficult	1	3	0	Presumed Asbestos 3	7 Medium	It was not possible to access as the equipment was live at the time of the survey. **Remove**
Throughout, Lift Shaft, 006 Door Lining - Insulating Board		E-10254/S013	Y	30 m²	Difficult	2	1	1	Amosite / Chrysotile 2	6 Low	2 No. doors on each level **Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Throughout, Ceiling Void, 020 Ventilation ducting - Mastic		E-10254/VS003	N	50 lin m	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**
Throughout, Service Shaft, 036 Foul Pipe Joints throughout - Putty		E-10254/S045	N	50 lin m	Difficult	1	1	0	Amosite 2	4 Very Low	All foul pipes should be treated as asbestos containing. **Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
Throughout, Corridor, 062 Flue - Cement		E-10254/VS019	N	4 lin m	Medium	1	1	1	Amosite / Chrysotile 2	5 Low	**Remove**
Throughout, Corridor, 062 Electrics - Woven Product		E-10254/P	Y	20 no	Difficult	2	3	1	Presumed Asbestos 3	9 Medium	It was not possible to access as the equipment was live at the time of the survey. **Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
External, Roof Main Building, 013 Flue - Cement		E-10254/S019	N	1 lin m	Difficult	1	1	1	Amosite / Chrysotile 2	5 Low	**Remove**
External, Roof Main Building, 013 Promenade Tiles - Cement		E-10254/S021	N	20 m²	Medium	1	1	0	Chrysotile 1	3 Very Low	Individual tiles spread around roof top. **Remove**

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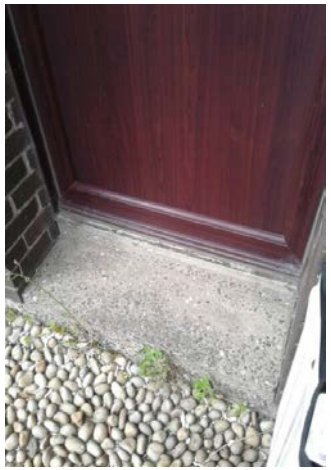
Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
External, compressor house, 069 Electrics - Woven Product		E-10254/P	Y	2 no	Difficult	2	3	1	Presumed Asbestos 3	9 Medium	Access was not possible as the services were still live at the time of the survey. **Remove**
External, Extension, 074 Window - Putty		E-10254/S077	N	50 lin m	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

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Asbestos Register & Risk Assessment											
Location / Description	**Photograph**	**Sample ref /Presumed**	**Licensed?**	**Quantity**	**Access.**	**Product**	**Condition**	**Surface**	**Asbestos Type**	**MRA Score**	**Comments / Recommendations**
External, External 074 Window - Putty		E-10254/S080	No	100 lm	Easy	1	1	0	Chrysotile 1	3 Very Low	**Remove**

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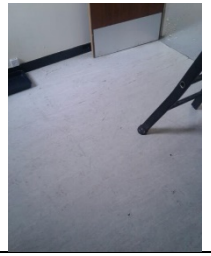
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Workshop 039 Floor - Linoleum Floor Covering		E-10254/S053	No Asbestos Detected in Sample	grey
Ground Floor, Office 1 040 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
Ground Floor, Office 2 041 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
Ground Floor, Plastic process lab 042 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	

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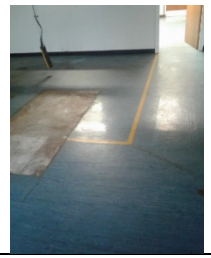
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Plastic process lab 042 Fire Door enclosure - Insulating Board		E-10254/S054	No Asbestos Detected in Sample	
Ground Floor, Plastic process lab 042 Ceiling above pipework - Insulating Board		E-10254/S056	No Asbestos Detected in Sample	
Ground Floor, Fabrication workshop 043 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
Ground Floor, Fabrication workshop 043 Wall - Textured Coating		E-10254/S057	No Asbestos Detected in Sample	

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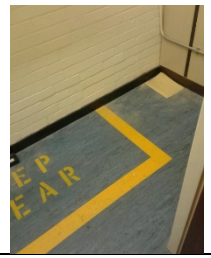
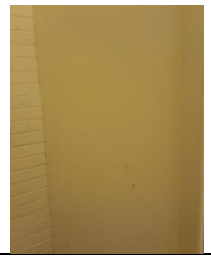
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Fabrication workshop 043 Beam cladding - Insulating Board		E-10254/S058	No Asbestos Detected in Sample	
Ground Floor, Electric Cupboard 044 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
Ground Floor, Electric Cupboard 044 Wall - Insulating Board		E-10254/S059	No Asbestos Detected in Sample	
Ground Floor, Electric Cupboard 044 Ceiling - Insulating Board		E-10254/VS059	No Asbestos Detected in Sample	

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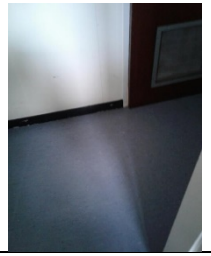
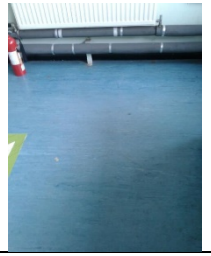
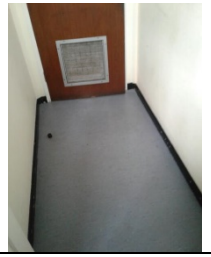
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Chemical hall 045 Floor Covering - Composite		E-10254/S060	No Asbestos Detected in Sample	
Ground Floor, Toilet Ladies 046 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
Ground Floor, Laboratory 1 047 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
Ground Floor, Toilet Gents 048 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	

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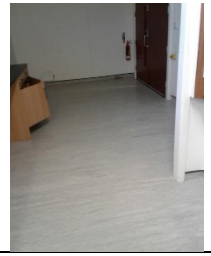
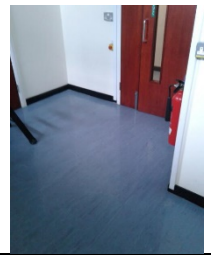
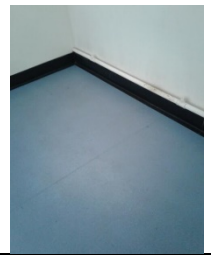
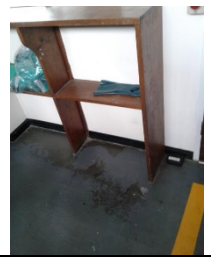
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Laboratory 2 049 Floor - Linoleum Floor Covering		E-10254/VS053	No Asbestos Detected in Sample	
Ground Floor, Laboratory 3 051 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
Ground Floor, Laboratory 4 052 Kicker Skirting - Composite		E-10254/S062	No Asbestos Detected in Sample	
Ground Floor, Store 053 Floor - Linoleum Floor Covering		E-10254/VS053	No Asbestos Detected in Sample	

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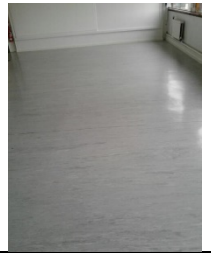
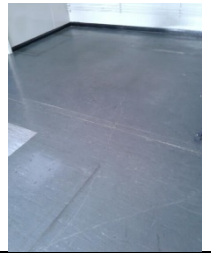
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Laboratory 5 055 Floor - Linoleum Floor Covering		E-10254/VS053	No Asbestos Detected in Sample	
Ground Floor, Laboratory 6 056 Floor - Linoleum Floor Covering		E-10254/S063	No Asbestos Detected in Sample	
Ground Floor, Laboratory 7 office 057 Floor Covering - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
Ground Floor, Laboratory 7 057 Fume Cupboard Dividers - Insulating Board		E-10254/VS040	No Asbestos Detected in Sample	

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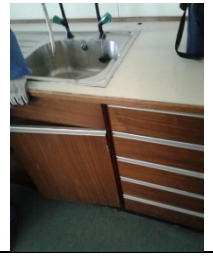
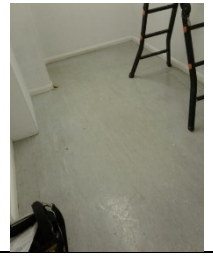
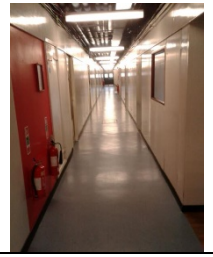
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Laboratory 7 057 Floor Covering - Linoleum Floor Covering		E-10254/VS053	No Asbestos Detected in Sample	
Ground Floor, Laboratory 7 057 sink pad - Bitumen		E-10254/S064	No Asbestos Detected in Sample	
Ground Floor, Store 2 059 Floor Covering - Linoleum Floor Covering		E-10254/VS053	No Asbestos Detected in Sample	
Ground Floor, Corridor 062 Floor Covering - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	

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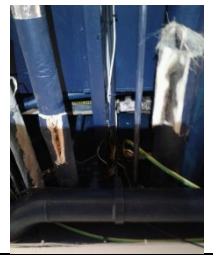
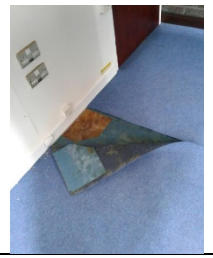
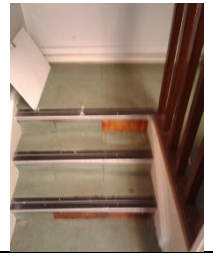
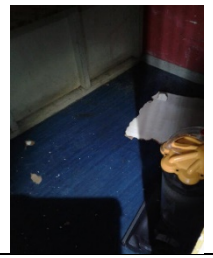
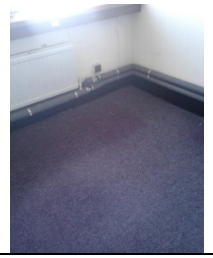
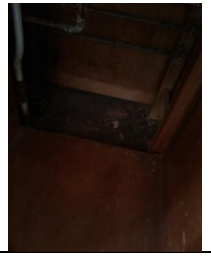
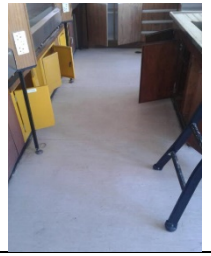
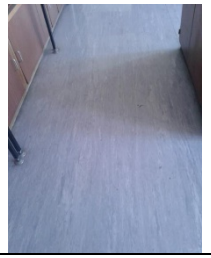
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Corridor 062 Pipe Scraping - Thermal Insulation		E-10254/S068	No Asbestos Detected in Sample	
Ground Floor, Corridor 062 Pipe Scraping 2 - Thermal Insulation		E-10254/VS068	No Asbestos Detected in Sample	
Ground Floor, Break room 064 Floor Covering - Vinyl Floor Tile		E-10254/S071	No Asbestos Detected in Sample	
Ground Floor, Store 065 Stair nosings - Composite		E-10254/VS028	No Asbestos Detected in Sample	

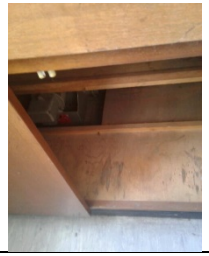
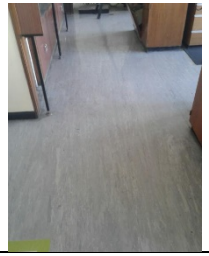
Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Ground Floor, Store 065 Floor - Vinyl Floor Tile		E-10254/S072	No Asbestos Detected in Sample	
Ground Floor, Cupboard under stairs 066 Floor Covering - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
1st Floor, Office 1 017 Floor - Linoleum Floor Covering		E-10254/S029	No Asbestos Detected in Sample	
1st Floor, Office 2 018 Floor - Linoleum Floor Covering		E-10254/VS029	No Asbestos Detected in Sample	

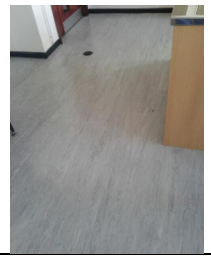
Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Laboratory 1 019 sink - Bitumen		E-10254/S031	No Asbestos Detected in Sample	
1st Floor, Laboratory 1 019 Floor - Linoleum Floor Covering		E-10254/S033	No Asbestos Detected in Sample	Dark Blue
1st Floor, Laboratory 1 019 Floor - Linoleum Floor Covering		E-10254/S034	No Asbestos Detected in Sample	Light Blue
1st Floor, Laboratory 2 022 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	

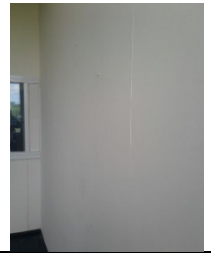
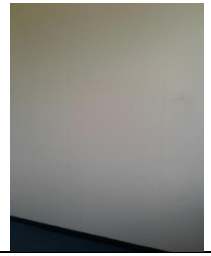
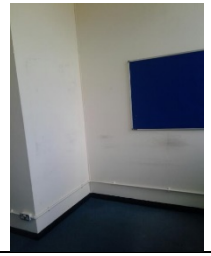
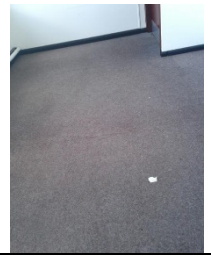
Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Laboratory 2 022 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
1st Floor, Laboratory 2 022 sink pad - Bitumen		E-10254/S035	No Asbestos Detected in Sample	
1st Floor, Laboratory 3 023 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
1st Floor, Laboratory 3 023 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Laboratory 3 023 sink pad - Bitumen		E-10254/VS035	No Asbestos Detected in Sample	
1st Floor, Laboratory 4 024 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
1st Floor, Laboratory 4 024 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	
1st Floor, Office 5 025 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Office 6 027 Partition Wall - Insulating Board		E-10254/S039	No Asbestos Detected in Sample	
1st Floor, Office 7 028 Partition Wall - Insulating Board		E-10254/VS039	No Asbestos Detected in Sample	
1st Floor, Office 8 029 Partition Wall - Insulating Board		E-10254/VS039	No Asbestos Detected in Sample	
1st Floor, Office 5 030 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	

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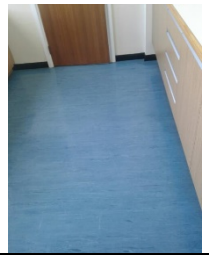
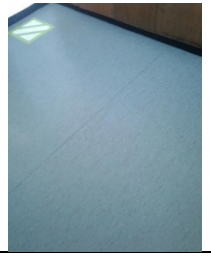
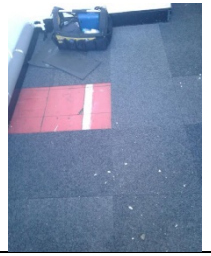
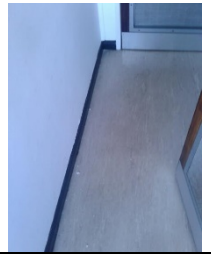
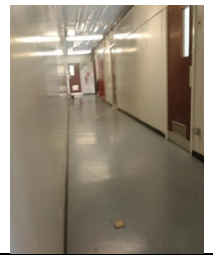
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Office 9 030 Partition Wall - Insulating Board		E-10254/VS039	No Asbestos Detected in Sample	
1st Floor, Office 9 030 Door Header - Insulating Board		E-10254/VS039	No Asbestos Detected in Sample	
1st Floor, Laboratory 5 031 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
1st Floor, Laboratory 5 031 Floor - Linoleum Floor Covering		E-10254/VS034	No Asbestos Detected in Sample	

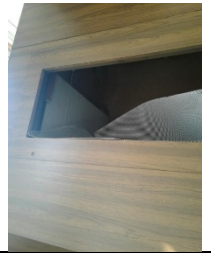
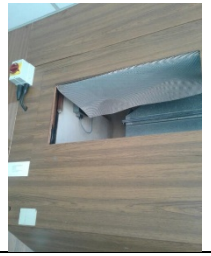
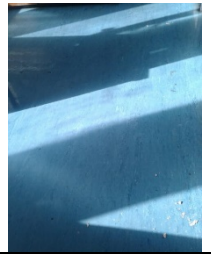
Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Laboratory 6 032 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	
1st Floor, Laboratory 6 032 Fume Cupboard Dividers - Insulating Board		E-10254/S040	No Asbestos Detected in Sample	
1st Floor, Office 10 033 Floor - Vinyl Floor Tile		E-10254/S042	No Asbestos Detected in Sample	
1st Floor, Toilet Gents 034 Floor - Linoleum Floor Covering		E-10254/VS033	No Asbestos Detected in Sample	

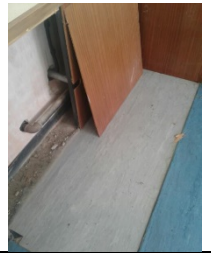
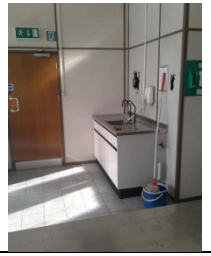
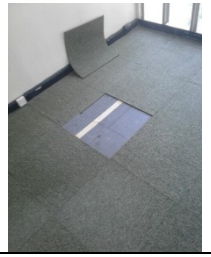
Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
1st Floor, Corridor 037 Pipe Scraping - Thermal Insulation		E-10254/S046	No Asbestos Detected in Sample	
1st Floor, Corridor 037 Floor - Linoleum Floor Covering		E-10254/S049	No Asbestos Detected in Sample	
1st Floor, Corridor 037 Pipe Scraping 2 - Thermal Insulation		E-10254/S050	No Asbestos Detected in Sample	
1st Floor, Corridor 037 Canopy over fire exit - Insulating Board		E-10254/S051	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
2nd Floor, Laboratory 002 Fume Cupboard 1 Dividers - Insulating Board		E-10254/S007	No Asbestos Detected in Sample	
2nd Floor, Laboratory 002 Fume Cupboard 2 Dividers - Insulating Board		E-10254/VS007	No Asbestos Detected in Sample	
2nd Floor, Laboratory 002 Fume Cupboard 2 - Insulating Board		E-10254/S008	No Asbestos Detected in Sample	
2nd Floor, Laboratory 002 Floor - Linoleum Floor Covering		E-10254/S009	No Asbestos Detected in Sample	Blue

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
2nd Floor, Laboratory 002 Floor - Linoleum Floor Covering		E-10254/S010	No Asbestos Detected in Sample	Grey
2nd Floor, Testing Laboratory 003 sink pad 4 - Bitumen		E-10254/S011	No Asbestos Detected in Sample	
2nd Floor, Testing Laboratory 003 sink pad 5 - Bitumen		E-10254/S012	No Asbestos Detected in Sample	
2nd Floor, Office 13 005 Floor - Vinyl Floor Tile		E-10254/S015	No Asbestos Detected in Sample	Grey

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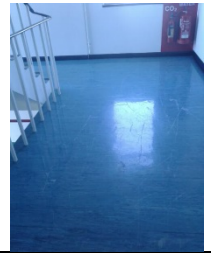
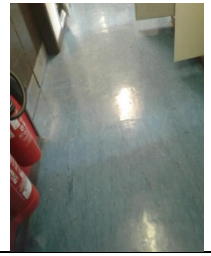
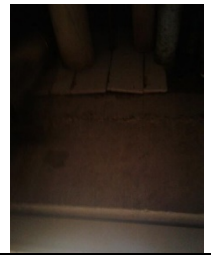
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
2nd Floor, Toilet Ladies 007 Sanitary Burner - Insulating Board		E-10254/S014	No Asbestos Detected in Sample	
2nd Floor, Stairwell 008 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
2nd Floor, Corridor 009 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
2nd Floor, Service Shaft 010 Partition Wall - Insulating Board		E-10254/S017	No Asbestos Detected in Sample	

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Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
2nd Floor, Corridor Bulkhead 011 Partition Wall - Insulating Board		E-10254/S016	No Asbestos Detected in Sample	
2nd Floor, Corridor Electric Cupboard 012 Door Lining - Insulating Board		E-10254/S018	No Asbestos Detected in Sample	
3rd Floor, Plant room 014 Electrics - Rope		E-10254/S024	No Asbestos Detected in Sample	
3rd Floor, Plant room 014 Debris to Floor - Thermal Insulation		E-10254/S027	No Asbestos Detected in Sample	

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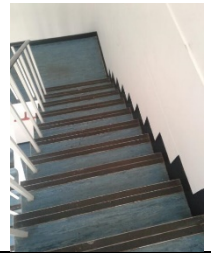
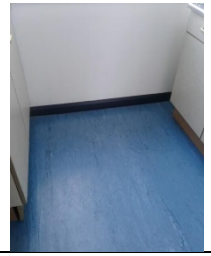
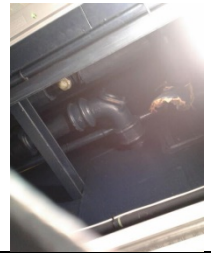
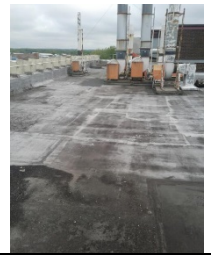
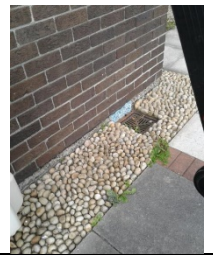
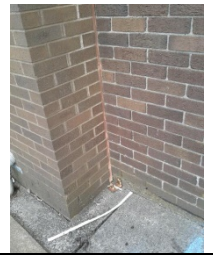
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
3rd Floor, Stairwell 016 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
3rd Floor, Stairwell 016 Stair nosings - Composite		E-10254/S028	No Asbestos Detected in Sample	
3rd Floor, Kitchen 038 Floor - Linoleum Floor Covering		E-10254/VS009	No Asbestos Detected in Sample	
3rd Floor, Kitchen 038 sink pad - Bitumen		E-10254/S052	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
Throughout, Service Shaft 036 Downpipe - Bitumen		E-10254/S074	No Asbestos Detected in Sample	paint
Throughout, Corridor 062 Pipe inspection covers - Gaskets (compressed)		E-10254/S067	No Asbestos Detected in Sample	
External, Roof Main Building 013 Equipment - Mastic		E-10254/S020	No Asbestos Detected in Sample	
External, Roof Main Building 013 Roof - Mastic		E-10254/S022	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
External, Roof Main Building 013 Evaporator - Mastic		E-10254/S061	No Asbestos Detected in Sample	
External, External 074 Damp Proof Course - Bitumen		E-10254/S073	No Asbestos Detected in Sample	
External, External 074 expansion joints 2 - Putty		E-10254/S078	No Asbestos Detected in Sample	
External, External 074 expansion joints - Putty		E-10254/S077A	No Asbestos Detected in Sample	

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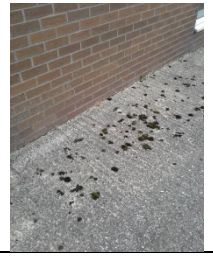
Negative Samples				
Location / Description	**Photograph**	**Sample Ref**	**Asbestos Type**	**Comments**
External, External 074 Damp Proof Course - Bitumen		E-10254/S078	No Asbestos Detected in Sample	
External, External roof 075 Wrap - Woven Product		E-10254/S076	No Asbestos Detected in Sample	
External, Rear of Main Building, 074 Wall damp Proof Course - Bitumen		E-10254/S081	No Asbestos Detected in Sample	
External, Chemical Hall, 074 Damp Proof Course - Bitumen	No Image Available	E-10254/S079	No Asbestos Detected in Sample	

Key: S=Sampled, P=Presumed, SP=Strongly Presumed, VS=Visually Similar

No Accessed Areas		
Location / Description	**Photograph**	**Recommended Action**
2nd Floor, Service Shaft 027 Ventilation Pipework - Limited Access Gained		Presumed AIB within brick shaft Remove
Throughout, Dumb Waiter 026 Ducts - Limited Access Gained		Limited access gained Shaft viewed around car, Shaft not fully accessed
External, Substation 7 070 Electrics - Limited Access Gained		
External, External underground plant room 075 – No Access Gained		flooded no access

No Accessed Areas		
Location / Description	**Photograph**	**Recommended Action**
External, External underground sump 075 – No Access Gained		flooded no access

5 Conclusions

5.1 General

During the survey asbestos materials have been identified on the site. Any identified materials and associated material risk assessment are detailed in the tables in section 3 of this report. In addition any no accessed areas are recorded in the relevant table.

5.2 Conclusions and Recommendations

Under CAR 2012, there is a legal duty to remove asbestos during a demolition, whilst materials remain in-situ an asbestos management plan for the property will be required.

The asbestos register states if removal of a material is likely to require a licensed contractor. If a licensed contractor is required the HSE will require a 14 day notification period prior to commencement of works.

Depending on the materials identified some removal tasks may not require a licensed contractor but may be considered 'Notifiable Non-Licensed Work' (NNLW). A suitable risk assessment should be carried out prior to any work with asbestos in accordance with CAR2012 and the correct procedures put into place.

Site Specific Comment

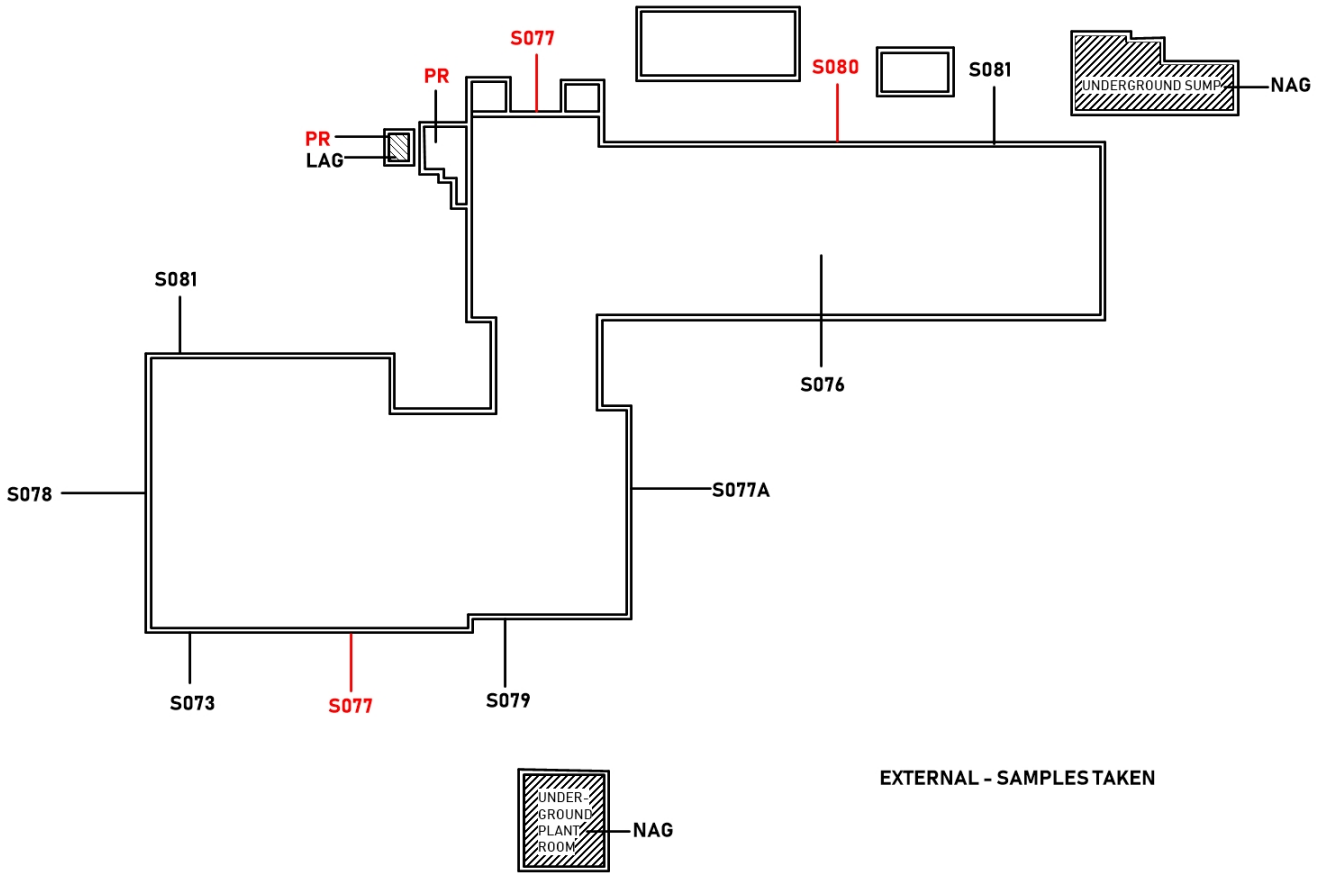
Within the plantroom debris has been identified on the walls and pipework, therefore it is recommended that the area is treated as contaminated and a full clean undertaken.

Throughout the building, remnants of asbestos containing thermal insulation has been identified. These areas will require licenced removal. There is a significant amount of pipework lagged with glass fibre insulation. It is recommended these areas are stripped in semi-controlled conditions on the expectation that there maybe minor isolated occurrences of asbestos debris.

The foul pipe system throughout is coated in bitumen paint throughout which tested positive for asbestos. In addition, several types of asbestos containing jointing has been used.

The ventilation ducting is largely formed from asbestos insulating board. However, in some locations, the ducting is metal but the jointing mastic is asbestos containing.

Appendix A
Site Plans



EXTERNAL - SAMPLES TAKEN

Key

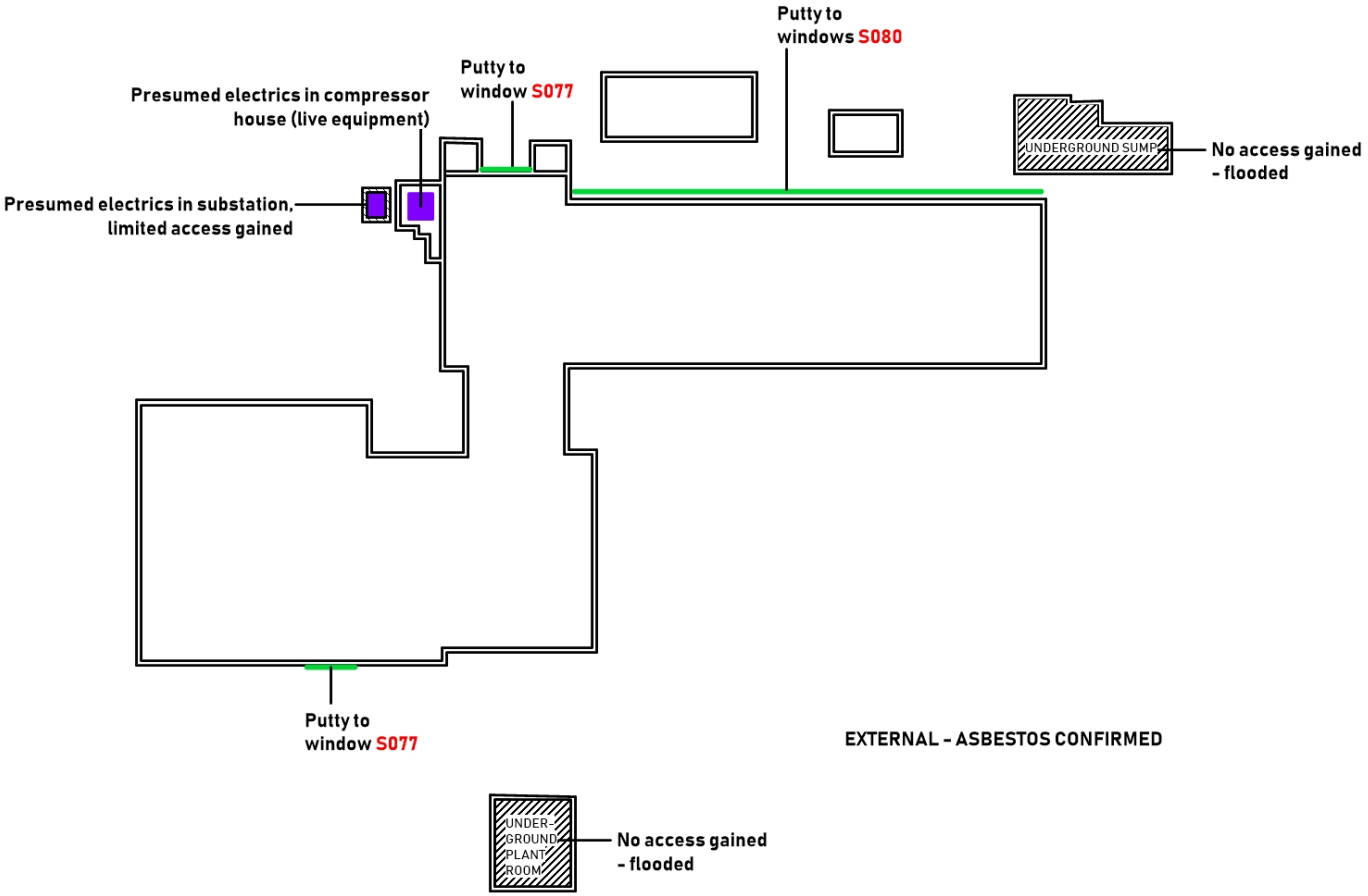
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



Key

S001	Sample No. Negative
S001	Sample No. Positive
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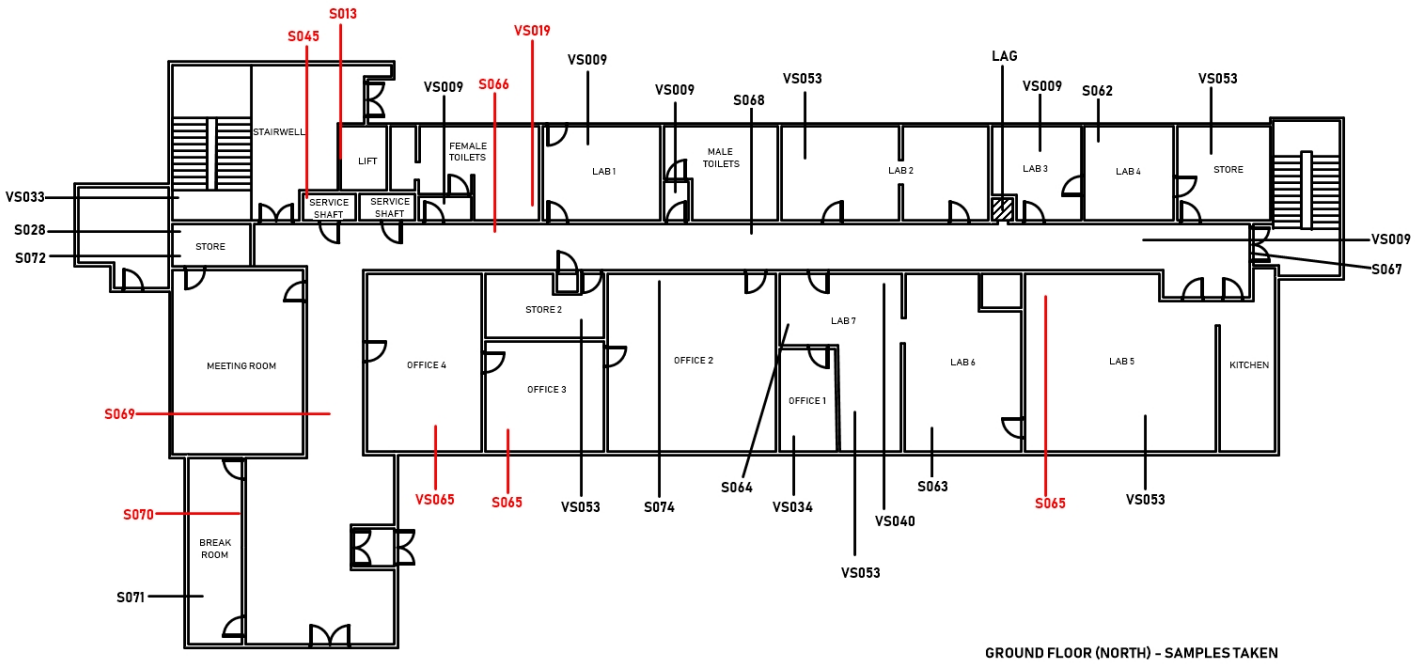
ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



Key

S001	Sample No. Negative
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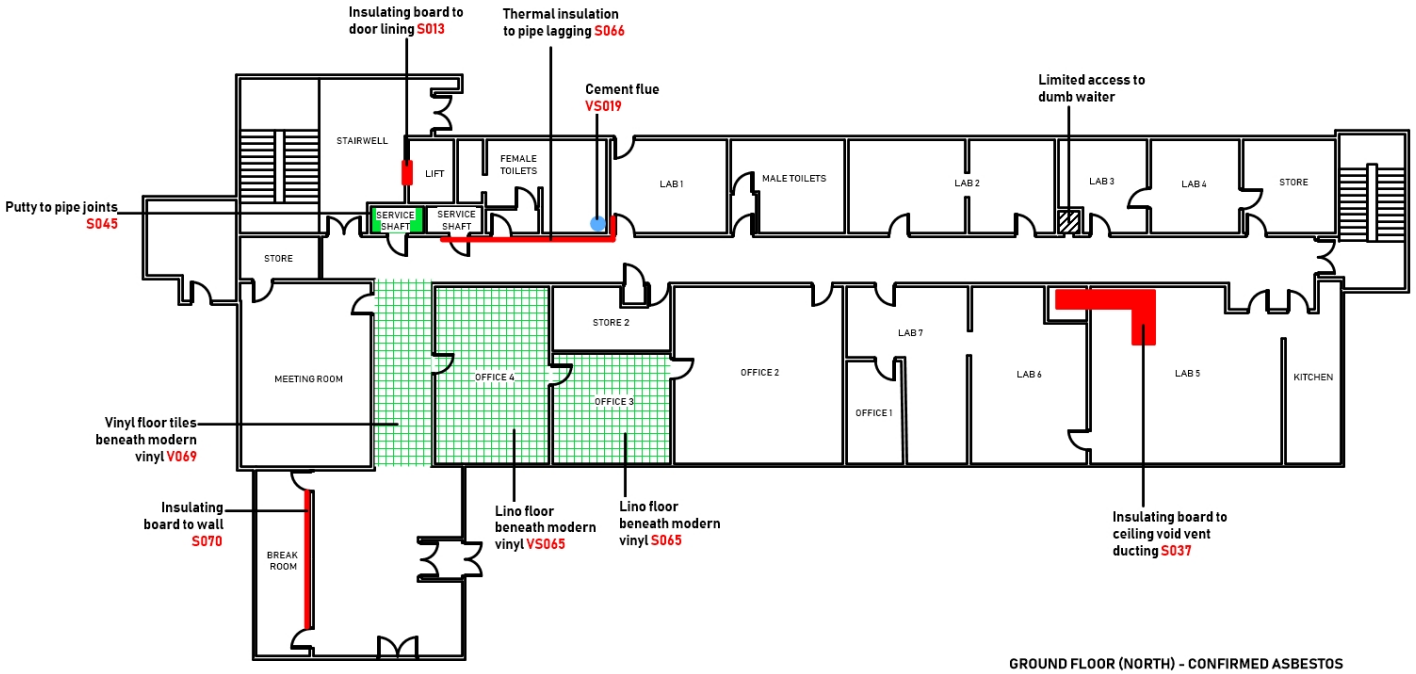
ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



GROUND FLOOR (NORTH) - CONFIRMED ASBESTOS

Key

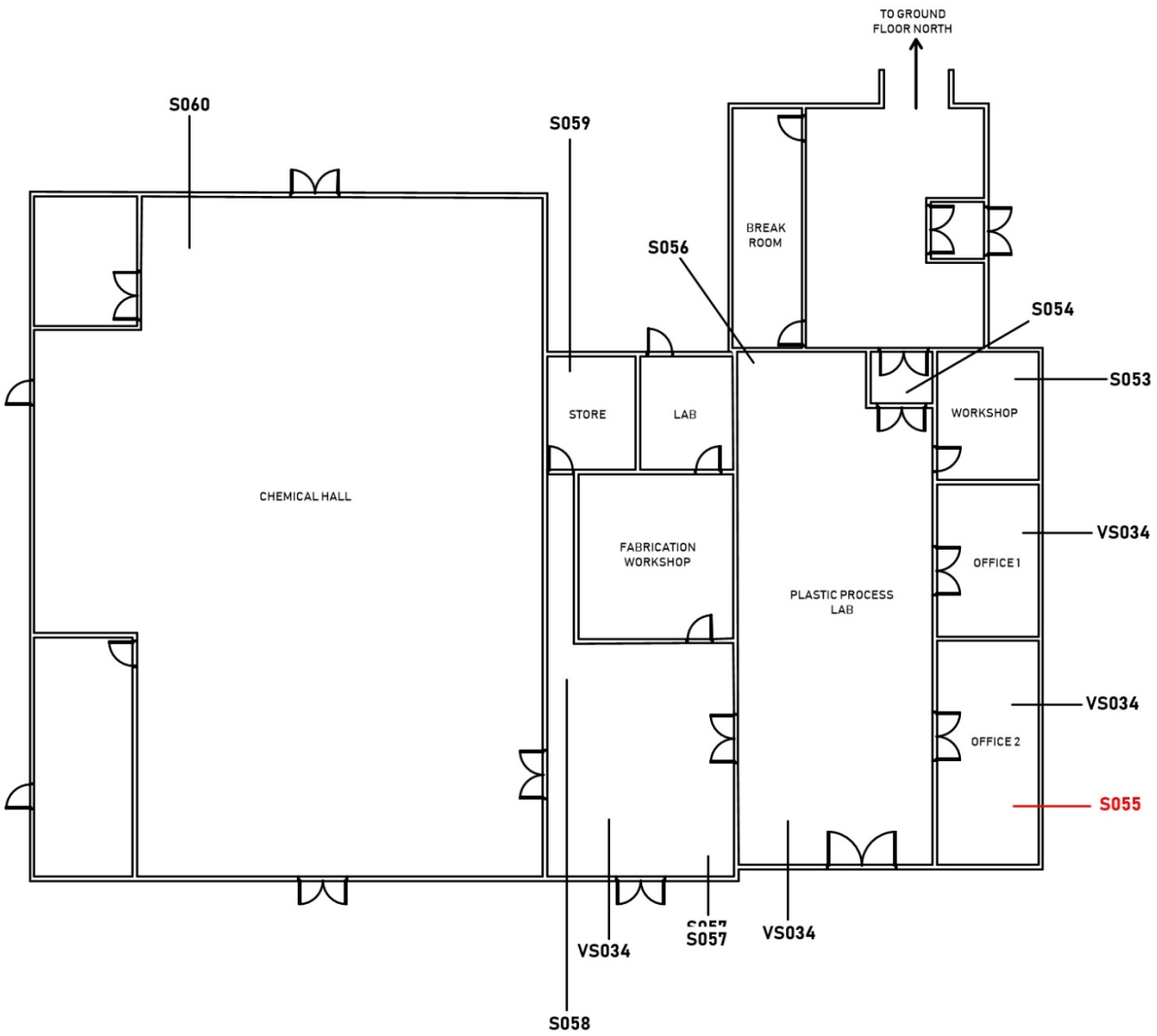
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



GROUND FLOOR (SOUTH) - SAMPLES TAKEN

Key

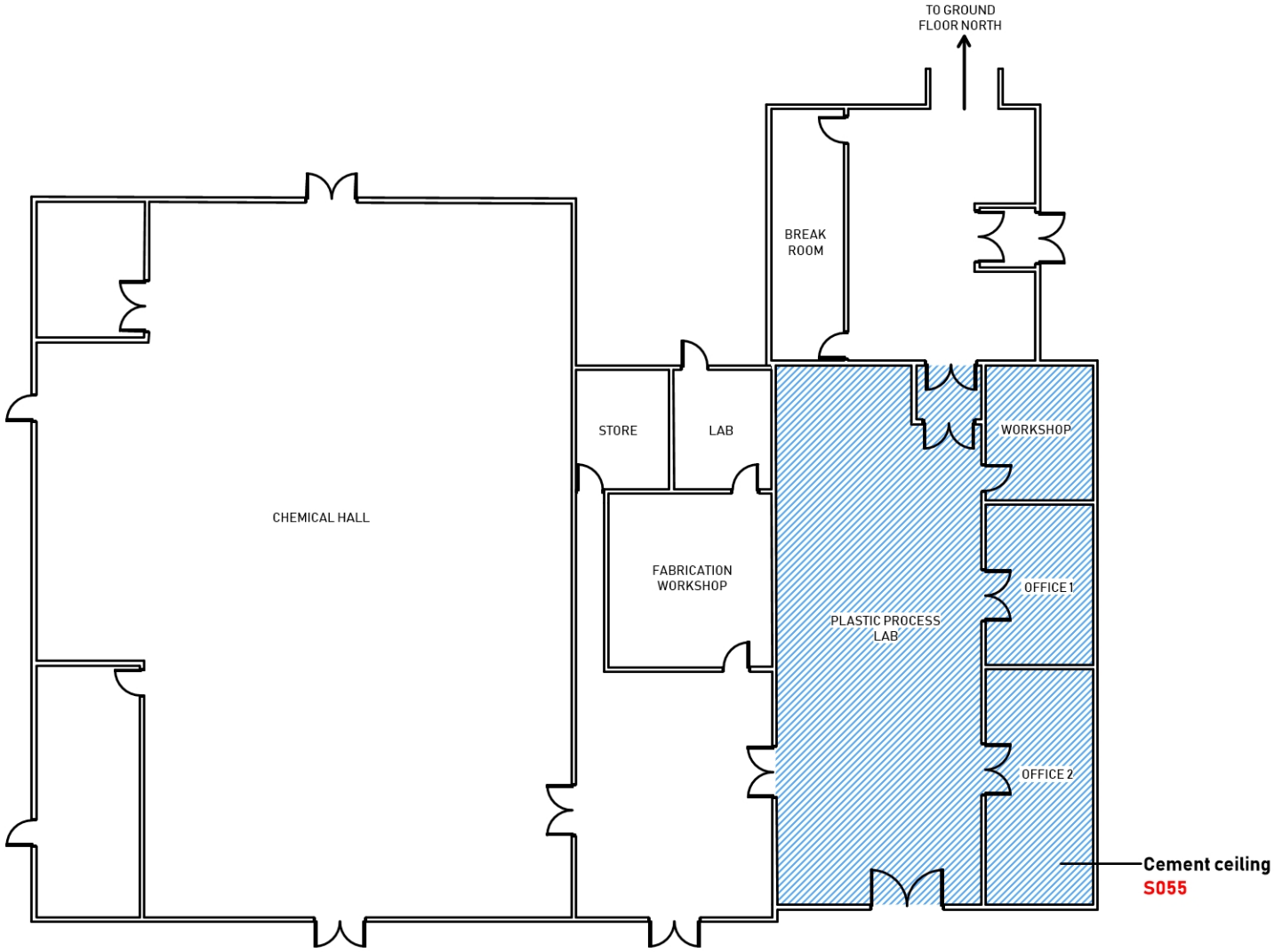
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



GROUND FLOOR (SOUTH) - CONFIRMED ASBESTOS

Key

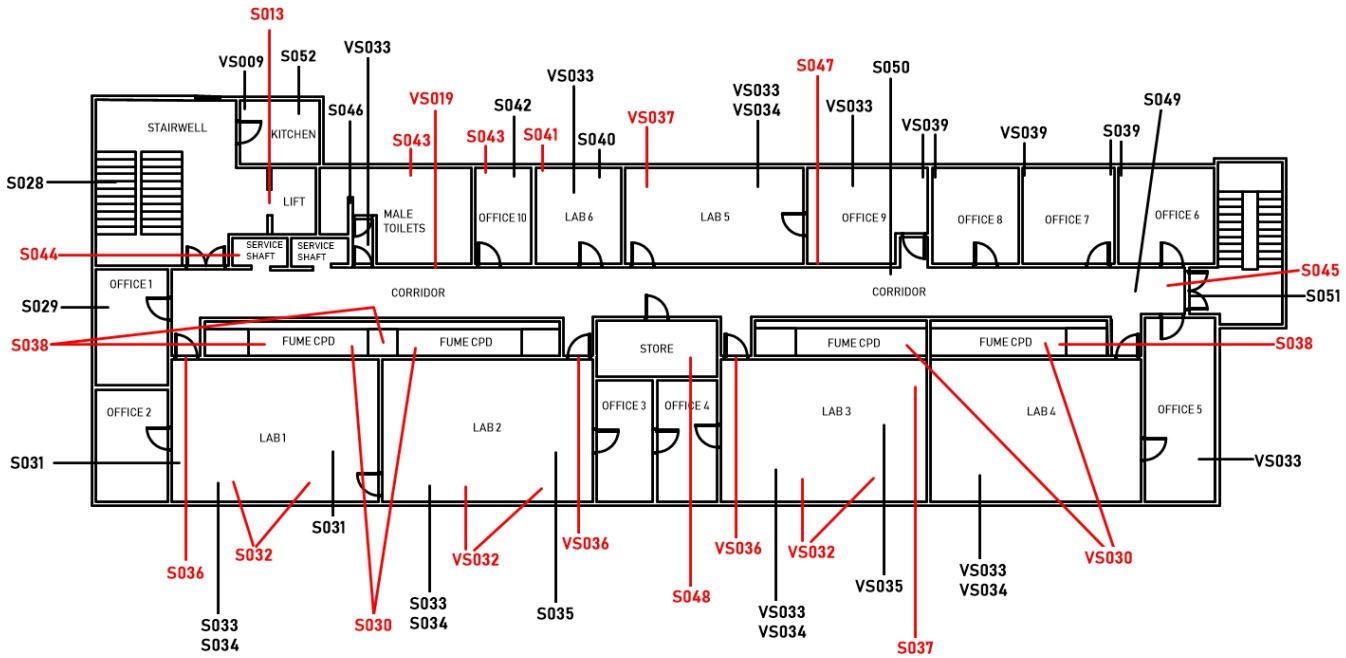
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



FIRST FLOOR - SAMPLES TAKEN

Key

S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
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ENVIRONMENTAL MANAGEMENT SOLUTIONS

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Eastman Site

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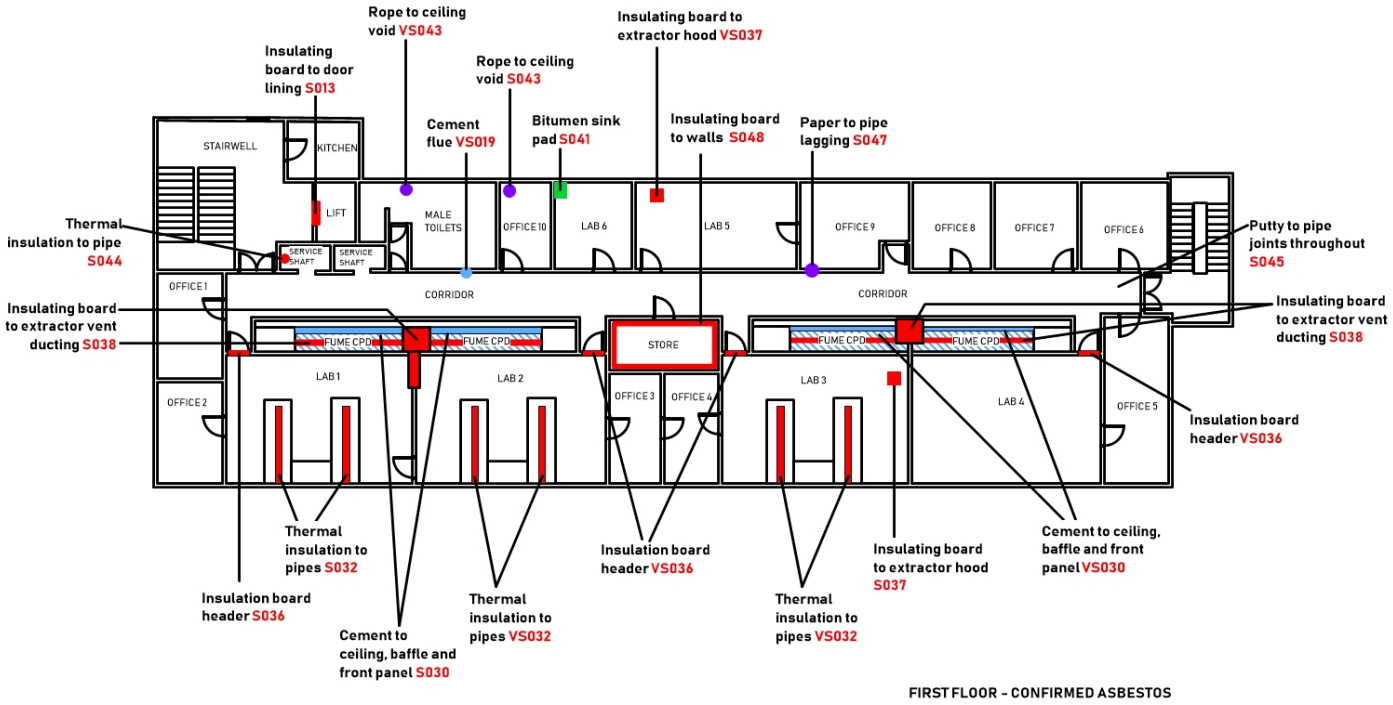

FIRST FLOOR - CONFIRMED ASBESTOS

Key

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S001	Sample No. Positive
VS	Visually Similar
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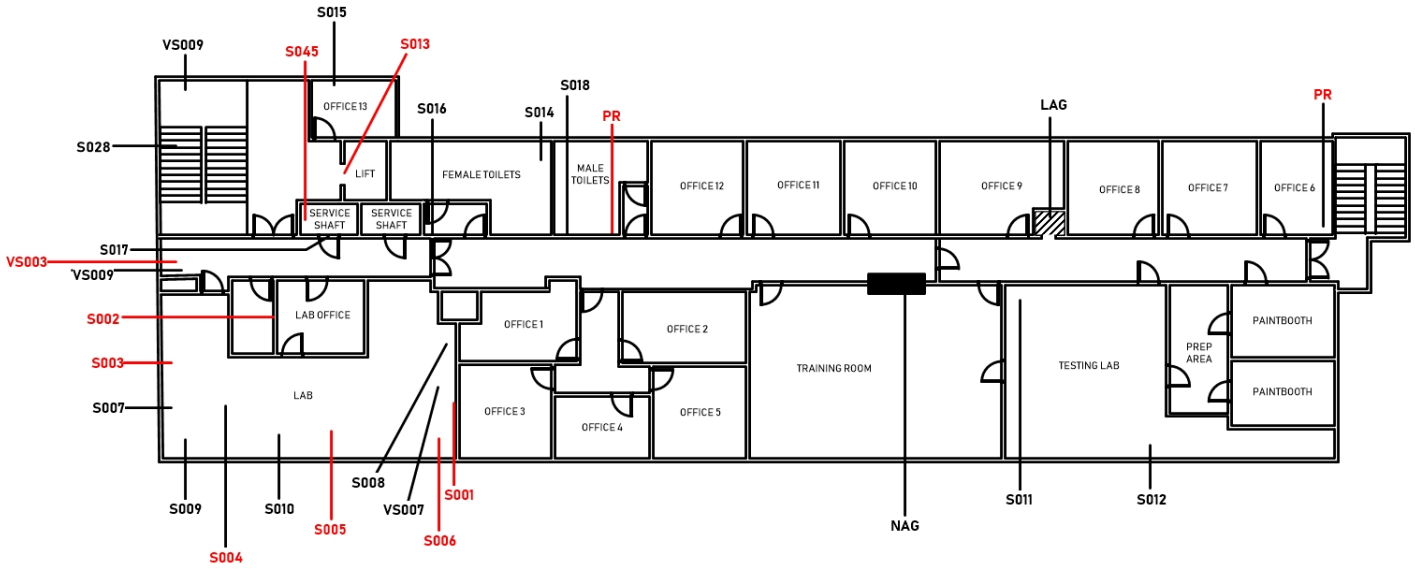
Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



SECOND FLOOR - SAMPLES TAKEN

Key

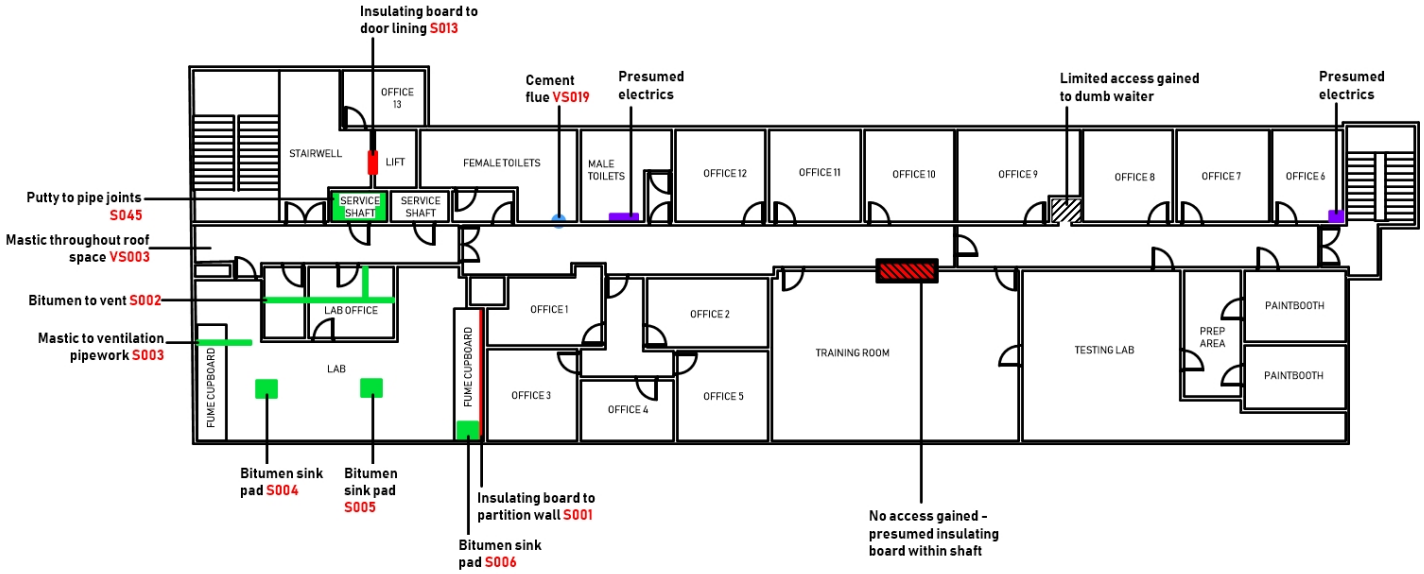
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



SECOND FLOOR - CONFIRMED ASBESTOS

Key

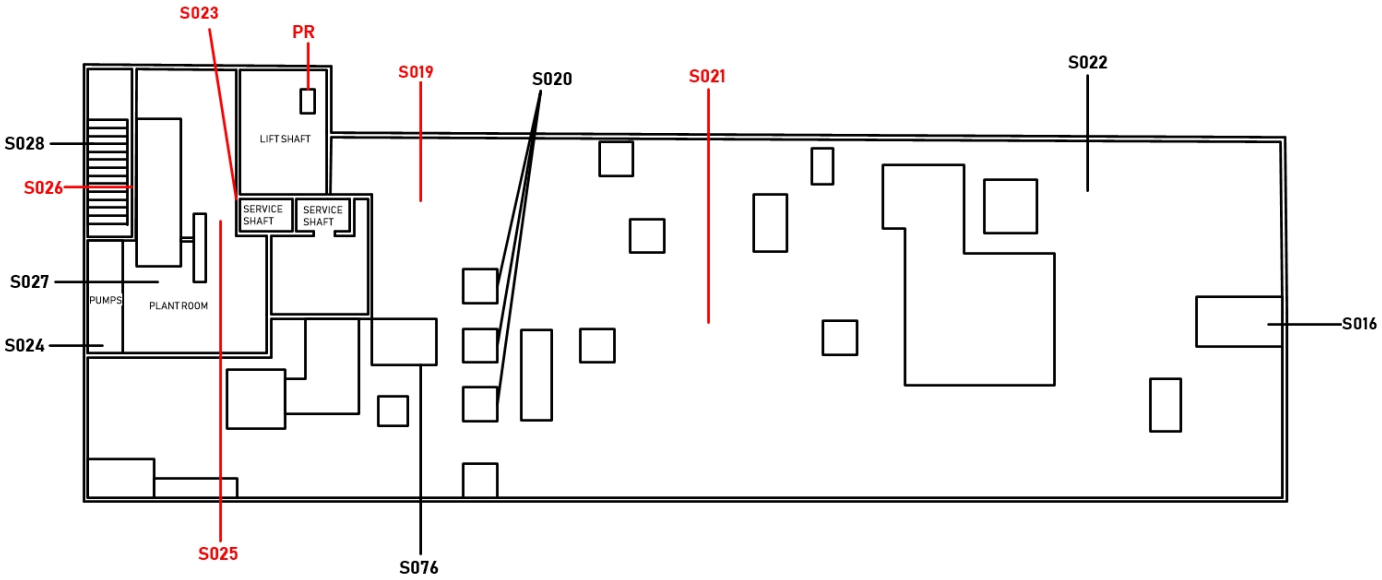
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



ROOF- SAMPLES TAKEN

Key

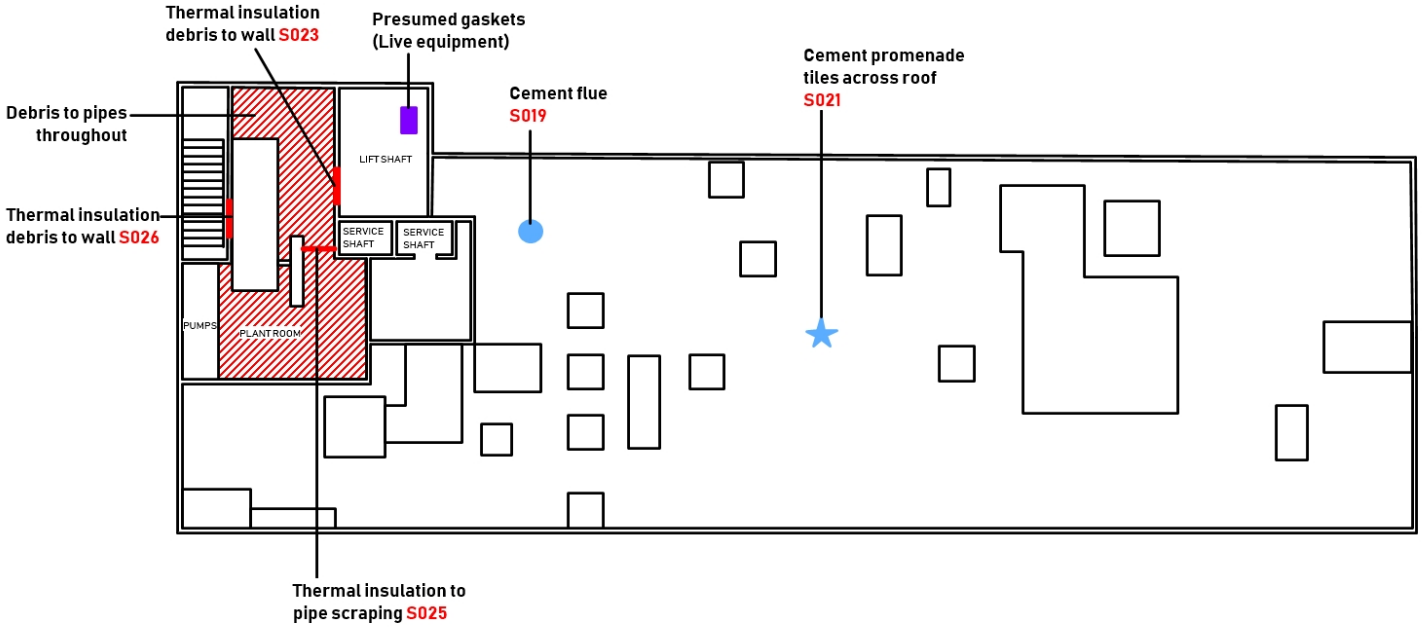
S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1



ROOF- ASBESTOS CONFIRMED

Key

S001	Sample No. Negative
S001	Sample No. Positive
VS	Visually Similar
PR	Presumed
PS	Previously Sampled
L001	Location Number

- Area of No Access
- Insulation Material
- Asbestos Cement
- Textured Coating
- Composite Products
- Ropes/Textiles/Paper

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Project:
Eastman Site

Project No.: E-10254
Date of Survey: 14 May 2018
Building Ref: 1

Appendix B
Test Results

2707

SCOPES
Asbestos Analysis Services Ltd.

CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

STANDARD ☐
PREMIUM ☐
EMERGENCY ☐

Client:	ENVIRONMENTAL MANAGEMENT SOLUTIONS LTD		
Address:	SIGERIC BUSINESS PARK HOLME LACY ROAD HEREFORD HR2 6BQ	Analysis Report No.	SCO/18/3885
Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	1 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248.
If samples have been DELIVERED the site address and actual sample location is as given by the client at the time of delivery. Scopes Asbestos Analysis Services Limited are not responsible for the accuracy or competence of the sampling by third parties. Under these circumstances Scopes Asbestos Analysis Services Limited cannot be held responsible for the interpretation of the results shown.

SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
1	E-10254/001	LABORATORY- WALL BOARD	CHRYSOTILE
2	E-10254/002	OFFICE 1 CEILING VOID- BITUMEN TO PIPE JOINTS	CHRYSOTILE
3	E-10254/003	LABORATORY- CEILING VOID- MASTIC TO VENTILATION PIPES	CHRYSOTILE
4	E-10254/004	LABORATORY- SINK PAD 1	CHRYSOTILE
5	E-10254/005	LABORATORY- SINK PAD 2	CHRYSOTILE
6	E-10254/006	LABORATORY- SINK PAD 3	CHRYSOTILE
7	E-10254/007	LAB- FUME CUPBOARD 1- INSULATION BOARD DIVIDER PANELS	NADIS
8	E-10254/008	LAB- FUME CUPBOARD 2- INSULATION BOARD AROUND VENTILATION PIPES	NADIS
9	E-10254/009	LAB- BLUE VINYL FLOORING	NADIS
10	E-10254/010	LAB- GREY VINYL FLOORING	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
Note: This Certificate for Identification of Asbestos Fibres shall not be reproduced except in full without the written approval of the Laboratory.

Analysed by:	M ZHOU	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM

Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU
Tel: 01268 724785 Fax: 01268 724796 Mob: 07765 685132 E-Mail: enquiries@scopesasl.co.uk
Company Reg No: 5191390 Reg Address: As above

2707

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Asbestos Analysis Services Ltd.

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PREMIUM ☐
EMERGENCY ☐

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Address:	SIGERIC BUSINESS PARK HOLME LACY ROAD HEREFORD HR2 6BQ	Analysis Report No.	SCO/18/3885
Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	2 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248.
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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
11	E-10254/011	TESTING LAB- SINK PAD 4	NADIS
12	E-10254/012	TESTING LAB- SINK PAD 5	NADIS
13	E-10254/013	LIFT SHAFT- INSULATION BOARD PANELS	AMOSITE/CHRYSOTILE
14	E-10254/014	LADIES WC- SANITARY BURNER- INSULATION BOARD PANEL	NADIS
15	E-10254/015	OFFICE 13- GREY VINYL FLOOR TILES	NADIS
16	E-10254/016	CORRIDOR- BULKHEAD ABOVE FIRE DOOR- INSULATION BOARD PANEL	NADIS
17	E-10254/017	SERVICE SHAFT- INSULATION BOARD TO BULKHEAD	NADIS
18	E-10254/018	ELECTRIC CUPBOARD- INSULATION BOARD DOOR LINING	NADIS
19	E-10254/019	ROOF- CEMENT FLUE	CHRYSOTILE/AMOSITE
20	E-10254/020	ROOF- VENTILATION TYPE- MASTIC TO JOINTS	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
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Analysed by:	M ZHOU	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

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Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU
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2707

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Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	3 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
21	E-10254/021	ROOF- PROMENADE TILES	CHRYSOTILE
22	E-10254/022	ROOF- MASTIC	NADIS
23	E-10254/023	PLANT ROOM- DEBRIS TO WALL	AMOSITE/CHRYSOTILE
24	E-10254/024	PLANT ROOM- ROPE TO ELECTRICS	NADIS
25	E-10254/025	PLANT ROOM- PIPE SCRAPING	CHRYSOTILE
26	E-10254/026	PLANT ROOM- DEBRIS TO WALL 2	AMOSITE
27	E-10254/027	PLANT ROOM- DEBRIS TO FLOOR	NADIS
28	E-10254/028	STAIRWELL- STAIR NOSINGS	NADIS
29	E-10254/029	1ST FLOOR- OFFICE 1- LINO TO FLOOR	NADIS
30	E-10254/030	1ST FLOOR- LAB 1- CEMENT PANEL- FUME CUPBOARD	CHRYSOTILE

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
Note: This Certificate for Identification of Asbestos Fibres shall not be reproduced except in full without the written approval of the Laboratory.

Analysed by:	C GOROMBEI	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM

Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU
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Asbestos Analysis Services Ltd.

CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

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PREMIUM ☐
EMERGENCY ☐

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Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	4 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248.
If samples have been DELIVERED the site address and actual sample location is as given by the client at the time of delivery. Scopes Asbestos Analysis Services Limited are not responsible for the accuracy or competence of the sampling by third parties. Under these circumstances Scopes Asbestos Analysis Services Limited cannot be held responsible for the interpretation of the results shown.

SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
31	E-10254/031	1ST FLOOR- LAB 1- BITUMEN TO SINK	NADIS
32	E-10254/032	1ST FLOOR- LAB 1- PIPE LAGGING	CHRYSOTILE
33	E-10254/033	1ST FLOOR- LAB 1- DARK BLUE VINYL LINO	NADIS
34	E-10254/034	1ST FLOOR- LAB 1- LIGHT BLUE VINYL LINO	NADIS
35	E-10254/035	1ST FLOOR- LAB 2- SINK PAD	NADIS
36	E-10254/036	1ST FLOOR- LAB 1- INSULATION BOARD DOOR HEADER PANEL	AMOSITE/CHRYSOTILE
37	E-10254/037	1ST FLOOR- LAB 3- EXTRACTOR HOOD	AMOSITE/CHRYSOTILE
38	E-10254/038	1ST FLOOR- LAB 3- EXTRACTOR VENT PIPEWORK	AMOSITE/CHRYSOTILE
39	E-10254/039	1ST FLOOR- OFFICE 6- PARTITION WALL	NADIS
40	E-10254/040	1ST FLOOR- LAB 6- FUME CUPBOARD DIVIDERS	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
Note: This Certificate for Identification of Asbestos Fibres shall not be reproduced except in full without the written approval of the Laboratory.

Analysed by:	C GOROMBEI	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM

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Date sample taken:	UNKNOWN	Page No:	5 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
41	E-10254/041	1ST FLOOR- LAB 6- SINK PAD	CHRYSOTILE
42	E-10254/042	1ST FLOOR- OFFICE 10- RED VINYL FLOOR TILES	NADIS
43	E-10254/043	1ST FLOOR- OFFICE 10- ROPE HOLDING PIPEWORK	CHRYSOTILE
44	E-10254/044	1ST FLOOR- SERVICE SHAFT- THERMAL INSULATION	AMOSITE
45	E-10254/045	1ST FLOOR- THROUGHOUT- PUTTY TO PIPE JOINTS	AMOSITE
46	E-10254/046	1ST FLOOR- CORRIDOR- PIPE SCRAPING 1	NADIS
47	E-10254/047	1ST FLOOR- SERVICE SHAFT- PAPER TO PIPE LAGGING	CHRYSOTILE
48	E-10254/048	1ST FLOOR- COLD STORE- WALL BOARDS	CHRYSOTILE
49	E-10254/049	1ST FLOOR- CORRIDOR- BLUE VINYL LINO	NADIS
50	E-10254/050	1ST FLOOR- CORRIDOR- PIPE SCRAPING 2	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
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Analysed by:	P ROWLAND	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM

Unit 14 Britannia Court, Burnt Mills Industrial Estate, Basildon, Essex, SS13 1EU
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2707

SCOPES
Asbestos Analysis Services Ltd.

CERTIFICATE FOR IDENTIFICATION OF ASBESTOS FIBRES

STANDARD ☐
PREMIUM ☐
EMERGENCY ☐

Client:	ENVIRONMENTAL MANAGEMENT SOLUTIONS LTD		
Address:	SIGERIC BUSINESS PARK HOLME LACY ROAD HEREFORD HR2 6BQ	Analysis Report No.	SCO/18/3885
Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	6 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

Samples of material, referenced below, have been examined to determine the presence of asbestos fibres, using Scopes Asbestos Analysis "in house" method of transmitted/polarised light microscopy and centre stop dispersion staining, based on HSE's HSG248.
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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
51	E-10254/051	1ST FLOOR- CORRIDOR- INSULATION BOARD ABOVE FIRE DOORS	NADIS
52	E-10254/052	1ST FLOOR- KITCHEN- SINK PAD	NADIS
53	E-10254/053	GROUND FLOOR- WORKSHOP- GREY VINYL LINO	NADIS
54	E-10254/054	GROUND FLOOR- PLASTIC PROCESS LAB- WALL PANELS	NADIS
55	E-10254/055	PLASTIC PROCESS LAB- CEILING	CHRYSOTILE
56	E-10254/056	PLASTIC PROCESS LAB- INSULATION BOARD PANEL ABOVE PIPEWORK	NADIS
57	E-10254/057	FABRICATION WORKSHOP- TEXTURED COATING TO WALLS	NADIS
58	E-10254/058	FABRICATION WORKSHOP- CLADDING TO BEAMS	NADIS
59	E-10254/059	ELECTRIC CUPBOARD OFF WORKSHOP- INSULATION BOARD WALLS	NADIS
60	E-10254/060	CHEMICAL HALL- RESIN TO FLOOR	NADIS

KEY: NADIS - No Asbestos Detected in Sample

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		Print name:	S.BOLTON – Q.C.M

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Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	7 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
61	E-10254/061	ROOF- MASTIC TO EVAPORATOR	NADIS
62	E-10254/062	GROUND FLOOR- LAB 4- SKIRTING BOARD	NADIS
63	E-10254/063	GROUND FLOOR- LAB 6- LINO	NADIS
64	E-10254/064	GROUND FLOOR- LAB 7- SINK PAD	NADIS
65	E-10254/065	GROUND FLOOR- OFFICE 3- GREY THERMOPLASTIC FLOOR TILE AND BITUMEN	CHRYSOTILE TO BOTH
66	E-10254/066	GROUND FLOOR- CORRIDOR- PIPE LAGGING	AMOSITE/CHRYSOTILE
67	E-10254/067	GROUND FLOOR- CORRIDOR- GASKETS TO PIPEWORK	NADIS
68	E-10254/068	GROUND FLOOR- CORRIDOR- PIPE SCRAPING	NADIS
69	E-10254/069	GROUND FLOOR- RECEPTION- BLUE THERMOPLASTIC FLOOR TILES AND BITUMEN	CHRYSOTILE TO BOTH
70	E-10254/070	BREAK ROOM- INSULATION BOARD WALLS	CHRYSOTILE
71	E-10254/071	BREAK ROOM- BLUE VINYL FLOOR TILES	NADIS

KEY: NADIS - No Asbestos Detected in Sample

Note: All samples will be retained for a minimum of six months.
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Analysed by:	T CROOT	Authorised signatory:	
		Print name:	S.BOLTON – Q.C.M

BULK 001-VER 5 12-AUGUST-09-QCM

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Attention:	TECHNICAL MANAGER	Report Date.	18/05/18
Site Address:	EASTMANS KNOWSLEY	Site Ref No.	E-10254
Date sample taken:	UNKNOWN	Page No:	8 Of 8
Date sample received:	18/05/18	No. of Samples:	8
Date of Analysis:	18/05/18	Obtained:	DELIVERED

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SCOPES SAMPLE No.	CLIENT SAMPLE No.	Sample Location	Fibre Type Detected
72	E-10254/072	STORE OFF MEETING ROOM- BLUE VINYL FLOOR TILES	NADIS
73	E-10254/073	EXTERNAL- DAMP PROOF COURSE 1	NADIS
74	E-10254/074	SERVICE SHAFT- BITUMEN TO DOWNPIPE	NADIS
75	E-10254/075	GROUND FLOOR- CORRIDOR- PIPE SCRAPING 2	NADIS
76	E-10254/076	ROOF- WRAP	NADIS
77	E-10254/077	EXTERNAL- WINDOWS (OLD)- PUTTY	CHRYSOTILE
78	E-10254/077A	EXTERNAL- EXPANSION JOINT 1	NADIS
79	E-10254/078	EXTERNAL- EXPANSION JOINT 2	NADIS
80	E-10254/079	CHEMICAL HALL- DAMP PROOF COURSE	NADIS
81	E-10254/080	EXTERNAL- WINDOWS PUTTY	CHRYSOTILE
82	E-10254/081	EXTERNAL- TIMBER WALL CLADDING- DAMP PROOF COURSE	NADIS

KEY: NADIS - No Asbestos Detected in Sample

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Company Reg No: 5191390 Reg Address: As above

Knowsley (Image Business Park) Ltd
C/O Seybourne Estates Limited
180 Piccadilly
London
W1J 9HF

18 May 2018

Building 38
Five Acre Site - Knowsley

Dear Tim

Introduction

Following your instruction, we visited the above site on Wednesday 16th May 2018. The purpose of the visit was to assess the suitability of the existing Type 3 survey and to establish airborne levels within the building to ensure correct procedures are in place to protect any persons entering the property.

Firstly, it should be noted, as highlighted in the existing report, large areas of the building are heavily contaminated with asbestos. A combination of spray coating that has delaminated from the ceiling and is lying loose on the floor, there was also an historic incident of metal theft which resulted in asbestos containing thermal insulation being stripped from the metal pipes and this is now in poor condition spread through the areas. The area is currently secured and asbestos labels present on each entrance and this control procedure should be maintained.

EMS's visit to site was not a survey and no intrusive investigations were undertaken, the identified materials were not risk assessed and no formal asbestos report will be produced. The report is outside our UKAS accreditation for surveying. The comments made here are based on a visual assessment and our professional opinion and are purely designed to allow the client to determine the most suitable way to proceed to demolition.

Observations - Survey

The building structure mostly appears to be very simple, the majority of areas do not have fixtures and fittings that may mask additional materials. Many of the services and likely uses of asbestos have been removed either through decommissioning or the theft. There are some office/lab areas where there is equipment, desks and furnishings remaining which may harbour hidden asbestos occurrences. However, in some of these areas there has been sustained water ingress and the floors are unstable.

The report seems to have recorded the high-risk materials and these seem to be documented with a reasonable degree of accuracy. The report appears to present some inconsistencies but having inspected the site, most of these make sense or have reasons where the occurrences are recorded as they are.

Some intrusive investigation has obviously been undertaken, with investigation holes still visible. It is difficult to judge if there are enough of these, but with the simplicity of the structure it is more than possible they have covered all areas.

There appears to be a lack of 'low risk' materials recorded, such as floor tiles, sink pads, gaskets. There doesn't appear to be an abundance of these but there are certainly some.

Large sections of the ground floor have not been surveyed, they are marked as 'no access' in the report. It still was not possible to access these areas as the doors are screwed shut.

An additional observation regarding the report is that the colours for annotation on the plans are not consistent and when initially scanning the plans they can be confusing / misleading.

Observations – Air Testing

Five pumps were placed throughout the area to monitor the background levels of airborne fibres. In addition, the analyst wore a personal monitor as he walked around the building, this was to simulate a low disturbance activity.

All readings were shown to be at an acceptable level, all levels were below that permitted for clearance following asbestos removal.

The building has been vacant for many years and it is my understanding even the theft incident which disturbed the asbestos was several years ago. The building is locked, and no entrance is permitted. There are several leaks within the roof, so the environment inside is very 'still' and 'damp' and it is likely this accounts for the low levels recorded.

Recommendations – Demolition Survey

In theory I feel the demolition survey could have been more intrusive in areas, I also feel the ground floor should have been accessed, but there may be reasons that this wasn't undertaken that I am unaware of.

The survey shows large areas of the site to be contaminated, so it is unlikely that additional asbestos occurrences in those areas will affect the cost or schedule for demolition. The low risk items not identified are largely insignificant and again are unlikely to affect the process. A concern maybe if there is asbestos within the structure that may affect the demolition process, for example spray coating within the wall cavities. I am also unsure of the roof construction, this may not be an issue for an asbestos removal contractor or demolition contractor, but the spray coating is applied to the underside of the cement sheets and there is potential for the spray to be within the roof structure (for example between sheets if double skinned), it maybe the cement should be removed under controlled conditions.

The practicality of undertaking a demolition survey in that environment is not easy, whilst the air testing showed relatively low airborne fibre levels they are from a non-disturbed environment and the personal monitor only covered a low disturbance activity (walking around). I feel going in and breaking holes in walls and floors should not be carried out with the building in its current condition.

The areas of 'no access' should be surveyed prior to commencement.

The structural areas should be investigated prior to demolition. This maybe done following the initial phase of removal or with HSE's approval as a watching brief during the asbestos removal/demolition phase, it will largely depend on the approach and programme from the demolition contractor.

Asbestos Management Plan

Currently access to the building is restricted and suitable signage is in place, this practise should be maintained and enforced. It is understood the front stairwell has been cleaned by an asbestos contractor and can be used as a safe area to 'suit up' and decontaminate after entering the area.

Should anyone wish to enter the areas they should wear overshoes or boots that can be cleaned, type 5 coveralls and face fitted FP3 respirators. Any person entering the area should have suitable asbestos knowledge to enable them to decontaminated properly on exit. All persons entering the area should act in a way as not to disturb the loose asbestos.

This procedure should be reviewed periodically to ensure it is still suitable. If the building changes or prolonged activities are required inside further air testing including personal monitoring should be undertaken.

If you require any further information, please do not hesitate to contact me.

Kind regards

Jamie Perkins-Best

Managing Director

Sigeric Business Park, Holme Lacy Road, Rotherwas, Hereford, HR2 6BQ
Tel: 01432 263333 Email: emsinfo@ems-asbestos.co.uk
Website: www.ems-asbestos.co.uk

PRE-DEMOLITION ECOLOGICAL SURVEY,

PLOT C, IMAGE BUSINESS PARK

ACORNFIELD ROAD, KNOWSLEY

carried out by

CLARKSON & WOODS

ECOLOGICAL CONSULTANTS

commissioned by

HALE ARCHITECTURE

On behalf of

SEYBOURNE ESTATES

AUGUST 2018

ECOLOGICAL SURVEY

PLOT C, IMAGE BUSINESS PARK, ACORNFIELD ROAD, KNOWSLEY

CONTENTS

EXECUTIVE SUMMARY 2

1 INTRODUCTION 3

2 SURVEY AND ASSESSMENT METHODOLOGY 5

3 SURVEY LIMITATIONS 10

4 RESULTS 12

5 ECOLOGICAL EVALUATION 24

6 ASSESSMENT AND RECOMMENDATIONS FOR MITIGATION AND ENHANCEMENT 26

7 CONCLUSIONS 30

APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION 31

APPENDIX B: ECOLOGICAL EVALUATION CRITERIA 35

APPENDIX C: PHOTOGRAPHS OF SITE FEATURES 38

APPENDIX D: BAT SURVEY DATA 42

APPENDIX E: FIGURE 4 BAT SURVEY SUMMARY 45

APPENDIX E: FIGURE 5 GREAT CRESTED NEWT EDNA 46

Project title	Plot C, Image Business Park, Acornfield Road, Knowsley			
Project number	6011			
Document title	Ecological Survey Report			
Client	Seybourne Estates			
Author	Eleanor Weir / Georgie Hayworth			
Status	Checked by	Date	Approved for C&W by	Date
V1.0	Polly Luscombe	08/08/2018	Jo Donnelly	14/08/2018

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.

EXECUTIVE SUMMARY

- Clarkson and Woods Ltd. was commissioned by Seybourne Estates to carry out an ecological survey of Plot C, Image Business Park, Acornfield Road, Knowsley Industrial Park, in Liverpool, Merseyside.

- An 'Extended' Phase I Habitat survey of the site was undertaken, including building inspections for bats and nesting birds.

- The site included large modern buildings, amenity grassland, six pits containing open standing water, unmanaged vegetation including scrub and tall ruderals, and managed landscaping including scattered broadleaved trees and introduced shrubs.

- Buildings 8, 9, 20 and 39 were assessed to have 'low' potential to support roosting bats, and in accordance with the BCT 2016 guidelines, a dusk emergence or dawn re-entry bat survey were subsequently undertaken of each building. No bat roosts were found, and no further bat surveys are required.

- The six pits were assessed to have 'Below Average' potential to support breeding great crested newts. As these features are due to be destroyed, an eDNA survey for this species was undertaken. Five of the waterbodies tested negative for great crested newt eDNA. The sixth was not tested as it was too shallow to safely reach, but was assumed to be negative due to the close proximity to the other pits. However as a pit in Plot A (280m to the north of Plot C) has tested positive for great crested newt eDNA, a RAMs has been outlined to enable careful demolition of buildings in Plot C during winter.

- Vegetation removal and demolition should avoid the bird breeding season or be subject to a pre-works inspection by an experienced ecologist.

- Precautionary measures are proposed to protect hedgehogs during construction and provide habitat features for the long term.

- Bird boxes are recommended to enhance the site for nesting birds.

1 INTRODUCTION

1.1.1 Clarkson and Woods Ltd. was commissioned by Seybourne Estates to carry out ecological surveys of Plot C at Image Business Park, Acornfield Road, Knowsley Industrial Estate, Liverpool, Merseyside, L33 7UF.

1.1.2 The following surveys were carried out to inform a pre-demolition notification application:

- A Phase 1 Habitat survey and building inspection for roosting bats and nesting birds;
- Dusk emergence and dawn re-entry bat surveys of four buildings; and
- environmental DNA (eDNA) survey of brick pits in Plot C to test for presence of great crested newts *Triturus cristatus*.

1.1.3 Unless the client indicates to the contrary, information on the presence of species will be passed to the county biological records centre in order to augment their records for the area.

1.2 Report Aims

1.2.1 The aims of this report are:

- To identify and describe all potentially significant ecological effects associated with demolition of the buildings;
- To outline mitigation measures that are needed to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- To identify appropriate enhancement measures.

1.3 Site Description Summary

1.3.1 Image Business Park is situated on the north-east corner of Knowsley Industrial Park, an extensive industrial area approximately 2 km east of Kirkby, Liverpool. Image Business Park contains numerous large warehouses and industrial buildings, some of which are in current use. There is also a large area of rough grassland and woodland margin within/surrounding the business park.

1.3.2 The buildings proposed for demolition within Plot C (the site) were formerly used by Kodak as offices and laboratories, with associated areas of landscaping.

1.3.3 The site (Plot C) contained numerous buildings of varying sizes, most of which have been disused since 2006, but are relatively well maintained. The site also contained patches of amenity grassland, shrubs, young trees and hardstanding and six brick pits which contained water.

1.3.4 The site is approximately 2.36 hectares (ha) in size, and the approximate centre of the site was at OS Grid Ref. SJ437986, as shown in Figure 1.

Figure 1: Ordnance Survey Map Showing Location of Plot C (OS Licence 100050456)

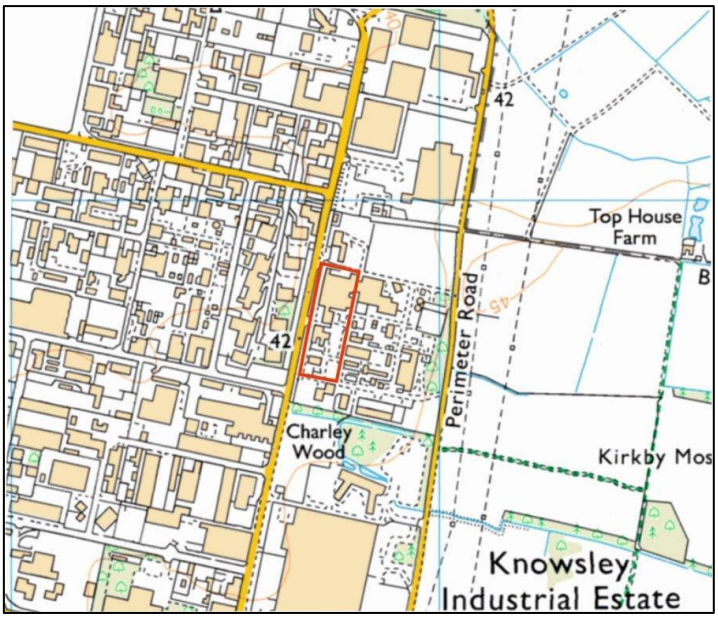


Figure 2: Aerial photograph of Site boundary (©2018 Google)

1.4 Development Proposals

1.4.1 The proposals comprise the demolition of the existing buildings. The brick pits will be removed subject to the agreement of other occupiers of the industrial estate.

1.4.2 Any significant changes to the works prior to submitting for demolition consent should be issued to Clarkson and Woods Ltd. for review. Ecological impacts and mitigation opportunities may be affected by these changes.

2 SURVEY AND ASSESSMENT METHODOLOGY

2.1 Data Search

2.1.1 Statutory designated sites within proximity of the site were identified using the Natural England/DEFRA web-based MAGIC database (www.MAGIC.gov.uk).

2.1.2 Ordnance Survey maps (1:25,000) and aerial images of the site were examined online (bing.com/maps and maps.google.co.uk).

2.1.3 Records of protected species and species of conservation concern within 2 km of the site were obtained from Merseyside Biobank and Lancashire Environment Record Network (LERN) (a record request was made to both record centres due to a data boundary occurring within 2 km of the site).

2.1.4 The Knowsley Local Plan (Core Strategy January 2016) was consulted for details of planning policies relevant to designated sites, protected species and habitats, and general ecological and environmental protection.

2.2 Field Survey

Personnel

2.2.1 The ecological surveys were led by Eleanor Weir, MCIEEM. Eleanor has 16 years' experience undertaking ecological surveys and has a BSc in relevant subjects. Eleanor was accompanied by Carl Capewell, Grad CIEEM who has been undertaking ecology surveys for 4 years and holds a BSc and MSc in ecological related subjects.

2.2.2 Eleanor has been assessed under the Clarkson and Woods QA processes as competent to lead and complete the survey.

2.2.3 Eleanor holds current Natural England survey licences for bats (2015-12689-CLS-CLS Level 2), dormice, great crested newts (2015-18861-CLS-CLS) and barn owls. Carl holds current Natural England survey licences for bats (2017-29923-CLS-CLS Level 1) and great crested newts (2017-29731-CLS-CLS).

2.2.4 Dave Allen assisted Carl with bat activity and great crested newt eDNA sampling. Dave has been undertaking bat and great crested newt surveys for 7 years and holds a great crested newt survey licence (2015-17946-CLS-CLS) and is currently applying for his bat licence. Dave is an Associate member of IEMA and has a current membership application to CIEEM. Dawn Goodfellow assisted with a dusk and dawn bat activity survey; Dawn is an ecologist with 4 years' experience of bat surveys, and is working towards a bat licence. Dawn is a full member of CIEEM.

Habitats

2.2.5 A habitat survey was carried out based on standard field methodology set out in the *Handbook for Phase 1 Habitat Survey* (2010)[1].

2.2.6 Botanical names follow Stace (1997)[2] for higher plants and Edwards (1999)[3] for bryophytes.

2.2.7 Habitats are mapped following the codes and conventions described within the Phase 1 Habitat Survey Handbook and Target Notes (Table 4) are used to describe habitats not readily conforming to recognised types and evidence of or suitability for protected species and species of conservation concern.

2.3 Protected and Notable Species

2.3.1 Details of the legislative protection afforded to those protected species which have been identified as occurring or potentially occurring on the site are detailed in Appendix A.

Badgers

2.3.2 A search was made for badger *Meles meles* setts, and any sett entrances found were checked for signs of use by badgers or other mammals. Setts were classified into the following categories; Main, Subsidiary, Annexe or Outlying.

2.3.3 Any sett entrances present were counted and mapped to record tunnel direction and their relative level of usage.

2.3.4 Field signs such as 'snuffle holes' (holes dug by badgers when searching for invertebrates), pathways through vegetation, 'latrines' (small pits in which badgers deposit their faeces) and 'day nests' (nests of bedding material made by badgers for sleeping above ground) were also mapped where recorded in the site.

Bats

2.3.5 The assessment of the suitability of the site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust[4].

2.3.6 *Buildings:* the exteriors of the buildings were examined through the use of ladders, torches and binoculars for potential roosting features (PRFs). Wherever possible, these points were thoroughly investigated using ladders and a video fibrescope to determine the likelihood of their occupation and evidence of presence. Extra factors taken into consideration included the potential for noise disturbance to the potential roost feature, exposure to the elements, lighting levels, proximity/connectivity of vegetation and water and whether these PRFs led on to cavities further into the structure.

---

[1] JNCC (2010) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (Revised reprint). Joint Nature Conservancy Council, Peterborough.
[2] Stace, C. (1997). *New Flora of the British Isles Second Edition*. Cambridge University Press
[3] Edwards, S.R. (1999). *English Names for British Bryophytes*. BBS, Cardiff
[4] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

2.3.7 Internally, all accessible roof voids and accessible parts of the building were entered where safe and possible to do so in order to describe their characteristics and to look for PRFs. A 1 million candle-power torch, ladders and a video fibrescope were used where necessary. Any signs of occupation including urine staining, prey remains, fur rubbing marks and droppings were noted where found. Droppings were compared against reference material to identify likely species, but DNA analysis may be undertaken in certain circumstances to confirm species identification

2.3.8 Following the inspections, each building was assigned a 'high', 'medium', 'low' or 'negligible' category as a guide to inform any necessary further survey effort as stipulated in the Bat Surveys Good Practice Guidelines (Bat Conservation Trust (BCT) 2016).

2.3.9 Bat activity surveys were subsequently undertaken as follows (see Figure 4 for building and surveyor locations);

- Building 20 – dusk emergence survey on 2nd July 2018
- Building 39 – dawn re-entry survey on 3rd July 2018
- Building 8 – dusk emergence survey on 16th July 2018
- Building 9 – dawn re-entry survey on 17th July 2018.

2.3.10 The dusk emergence survey commenced 15 minutes before sunset and continued for 2 hours. The dawn re-entry survey commenced 1.75 hours before sunrise and continued until 15 minutes after sunrise. Surveys were undertaken in suitable weather conditions (avoiding strong winds, fog, heavy / persistent rain or overnight temperatures lower than 8°C). Weather conditions experienced during the surveys are included in Appendix D.

2.3.11 Surveyors used the following bat detectors: Anabat Walkabout, Elekon Batlogger M and a Batbox Duet / SSF Bat 3. Bat calls were recorded and analysed where necessary using BatSound 4.2 and Bat Explorer. Surveyors focused on identifying any bats emerging or returning to the buildings, but general bat activity on site (foraging, commuting) was also recorded.

2.3.12 *Trees:* an inspection of trees on site was carried out from the ground, using binoculars, to look for any PFRs and/or evidence of bat activity. A ladder, powerful torch and a video fibrescope were available. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.

2.3.13 *Habitat:* the habitats within the site were appraised for their suitability for use by foraging and commuting bats. In particular, the connectivity of the habitats on site to those lying beyond was taken into account. Vegetated linear features are typically important for many species to navigate around the landscape, while the presence of woodland, scrub, gardens, grassland and wetland features increases a site's foraging resource value to bats. The potential for noise or lighting disturbance which may affect commuting links was also recorded.

Amphibians

2.3.14 All waterbodies within 250m of the site were identified using Ordnance Survey maps and aerial imagery. Waterbodies within the site ownership and on publically accessible land were assessed during the field survey for their suitability to support amphibian species where access was possible.

2.3.15 Where suitable water bodies were identified on accessible land a Habitat Suitability Index (HSI) score was calculated for each one following the methodology described by Oldham et al[5]. HSI scores give a relative indication of the likelihood that a water body would support breeding great crested newts. Factors which increase these scores include the presence of other ponds nearby, water quality, pond size, absence of fish/waterfowl, vegetation cover and shading.

2.3.16 Following assessment of six waterbodies on site (water-filled brick pits), eDNA survey for great crested newts was subsequently undertaken on 26th June 2018 on five of the pits (see Constraints Section 3). Water samples were collected from each pit, in strict accordance with the Natural England Technical Advice Note WC1067 (Biggs et al, 2014)[6] and using specific kits and protocols provided by SureScreen Scientifics. Where the water surface was below ground level, telescopic poles were used to secure the sampling ladle using waterproof tape. The poles, tape and ladles were either brand new or had been thoroughly cleaned, disinfected and were therefore uncontaminated for each waterbody. The samples were sent for DNA analysis to SureScreen Scientifics, a Natural England approved and accredited laboratory.

2.3.17 Terrestrial habitats were also assessed for their suitability for foraging and sheltering amphibians. Amphibians require habitats such as grassland, scrub, woodland and hedgerows for dispersal and hibernation. Further hibernation features include buried rubble and logs, or mammal burrows.

Reptiles

2.3.18 Features on site were assessed for their potential to provide suitable habitats for use by reptile species. These include rough, tussocky grassland, scrub, disturbed land or refugia such as wood piles, rubble or compost heaps. Where present, suitable existing refugia were inspected for sheltering reptiles, and the ground was scanned whilst walking to look for basking species.

Birds

2.3.19 The buildings and vegetation were surveyed for signs of use by nesting birds and any birds seen or heard during the survey were noted. The site's potential to support bird species of particular conservation concern (i.e. Schedule 1, NERC S41 and Red List species) was assessed, taking into

[5] Oldham. R.S., Keeble L., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

[6] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

consideration the bird species assemblage observed during the survey, the habitats present on and around the site, the context of the site in the wider landscape and the results of the desk study.

Invasive Species

2.3.20 Invasive species, such as Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera* were searched for and recorded if found within the site.

Other Notable Species and Species of Conservation Concern

2.3.21 Field signs or incidental sightings of other species of conservation concern, such as hares *Lepus europaeus,* harvest mice *Micromys minutus* and hedgehogs *Erinaceus europaeus* (Species of Principal Importance under the NERC Act (2006)) were recorded. Habitats were also assessed for their potential to support such species.

2.4 Quality Assurance

2.4.1 All ecologists employed by Clarkson and Woods Ltd are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct[7] when undertaking ecological work.

2.4.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)[8].

2.4.3 This report has been prepared in accordance with the relevant British Standard: *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*[9].

2.5 Ecological Evaluation

2.5.1 The evaluation of ecological importance builds upon the criteria provided within the CIEEM guidelines for Ecological Impact Assessment (2016)[10] and the Criteria for Nature Conservation Evaluation described by Ratcliffe (1977)[11]. These criteria are described further in Appendix B. With due consideration to the evaluation criteria ecological receptor importance is then classified on a scale between 'International' and 'Site' importance with an additional Negligible category included for those features which are of no intrinsic ecological value. Where further information is required to determine the true importance of a species or habitat present the importance of the receptor is marked as 'unknown'.

[7] CIEEM (2013). *Code of Professional Conduct*. www.cieem.net/professional-conduct.
[8] CIEEM (2013). *Competencies for Species Survey (CSS).* www.cieem.net/competencies-for-species-survey-css-
[9] The British Standards Institution (2013*). BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*. BSI Standards Ltd.
[10] *CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition.* Chartered Institute of Ecology and Environmental Management. www.cieem.net
[11] Ratcliffe, D.A. (1977). *A Nature Conservation Review*, Cambridge University Press

3 SURVEY LIMITATIONS

3.1 Desk Study

3.1.1 The data presented within the report should not be seen as exhaustive. Data obtained from within the search area is highly unlikely to constitute a complete record of habitats and species present within the search area. It is therefore possible that protected species may occur within the vicinity of the proposed development site that have not been identified within the desk study.

3.1.2 The data presented within the desk study section of this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

3.2 Badgers

3.2.1 Areas with dense ground cover (scrub, woodland etc.) were examined closely. If impenetrable vegetation prevented entry then the perimeter was examined in order to detect badger paths suggesting a hidden sett within the area.

3.2.2 It cannot be guaranteed that all the entrances have been located, especially if a small sett is currently inactive or used seasonally and concealed in an area of thick scrub. Badgers may dig new holes and create new setts in a very short space of time.

3.3 Bats

3.3.1 Bats are very small creatures, capable of secreting themselves away into extremely small spaces and it is possible that these animals, or their signs, might have been missed during the survey if they are normally present opportunistically or in small numbers for a short period of time each year.

3.3.2 Not all features in trees or buildings suitable for use by bats are visible from the ground and there can be no external evidence of use of features by bats; consequently it is only possible to make a best effort when carrying out such a survey.

3.3.3 Building 38 had partially restricted access for internal survey as certain areas were bricked up due to untreated presence of asbestos.

3.3.4 Building 8 was not fully inspected internally due to potentially hazardous electrical wiring (sudden presence of smoke and strange smells following lights being switched on) and it was assessed to be unsafe to proceed with the internal inspection.

3.3.5 Both Buildings 38 and 8 were partially inspected and the areas which were visible were of negligible potential for roosting bats with very few roosting crevices identified and no roof spaces present) and it was reasonable to assume the areas not inspected were likely to be very similar.

3.4 Great crested newts

3.4.1 It was not possible to safely net the water in the brick pits during the survey to assess the water quality by the type of aquatic invertebrates present (there were safety nets over the top of the

brick pits). Instead an assumption of water quality was undertaken based on the appearance and character of the waterbodies for the Habitat Suitability Index assessment.

3.4.2 The eDNA sampling followed strict protocols to prevent potential contamination with great crested newt DNA from surveyor's hands, clothes or boots. New equipment was used for each waterbody, and sterilised disposable gloves were worn during the sampling process. However, potential contamination of DNA from other sources (e.g. other amphibians, through drains etc.) cannot be controlled, and the general influence of DNA contamination from such sources is currently unknown.

3.4.3 Whilst eDNA tests confirm presence or absence of great crested newts, they do not provide information on numbers/ population estimates or whether the waterbody is used for breeding.

3.4.4 Waterbody 2 was partially drained, and the surface of the water was approximately 4 m below ground level. It was not possible to safely reach the water to take samples even with telescopic poles. However, given the close proximity of Waterbodies 1, 3, 4 and 5, it is considered very likely that if great crested newts were found to be absent from the adjacent waterbodies, it is unlikely they would be in Waterbody 2.

3.4.5 A SuDS feature 160m south of the site was not subject to eDNA survey, and therefore presence of great crested newts in this feature is unknown. Although accessibility from this feature into the site by great crested newts is limited by presence of buildings and hardstanding, there is not a complete barrier to movement. However, given the lack of terrestrial habitat on site and proven absence of great crested newts from the waterbodies within Plot C through eDNA surveys, even if this species were present in the SuDS the recommendations for Plot C would remain the same as they are still considered likely to be absent from the pits with several precautionary measures proposed during demolition.

3.5 General

3.5.1 The surveys undertaken offer only 'snapshots' of the site and take no account of seasonal differences, or of any species which might choose to take up residence subsequently. At the same time a lack of signs of any particular species does not confirm its absence, merely that there was no indication of its presence during this survey.

3.5.2 If no action or development of this land takes place within twelve months of the date of this report, then the findings of this survey should be reviewed and may need to be updated. After three years the findings will be out of date and the full survey should be repeated.

4 RESULTS

4.1 Data Search – Designated Sites

International Designations within 5km of the Site

4.1.1 No internationally designated sites occur within 5 km of the site.

National Designations within 2km of the Site

4.1.2 No nationally designated sites occur within 2 km of the site.

Local Designations within 1km of the Site

4.1.3 One Local Nature Reserve (LNR) is present within 1 km of the site: Acornfield Plantation, the edge of which is approximately 600 m south of Plot C. This is 11.6 hectares of mature broadleaf woodland with a unique basin mire, acid and neutral unimproved grassland and ponds, and 46 locally rare species of plants. The nature reserve also supports breeding water voles *Arvicola amphibius* and great crested newts.

4.1.4 There is one Local Wildlife Site (LWS) within 1 km: Charley Wood, the edge of which is approximately 75 m to the south of Plot C. This is 7.7 hectares of broadleaf woodland on acid peat soil, with large glades and unimproved acid and neutral grassland. Invertebrate interest is high but un-surveyed.

4.2 Data Search – Protected and Notable Species

The following records detailed are potentially relevant to the site's habitats, and were obtained from Biobank Merseyside (BM) and Lancashire Environment Record Network (LERN).

4.2.1 BM returned multiple records of common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared *Plecotus auritus*, *Myotis* sp. and Daubenton's bat *Myotis daubentonii*. LERN returned several records of common pipistrelle, Daubenton's and noctule. Many of these records were from recent detector surveys, with several older roost records although none related to the site or immediate surrounds. The nearest records were from 2009, approximately 620 m to the south of the site.

4.2.2 There were no records of badger or dormouse *Muscardinus avellanarius* within 2 km of the site.

4.2.3 BM returned multiple records of red squirrel *Sciurus vulgaris* approximately 1.7 km to the east of the site, mainly associated with several large parcels of woodland in this area.

4.2.4 BM and LERN returned numerous records of brown hare, mainly in farmland to the east of the site.

4.2.5 BM returned multiple records of hedgehog within 2 km, although only a few of these records were recent (last 10 years).

4.2.6 BM and LERN returned numerous records of birds within 2 km, although none appeared to relate to the site or immediate surrounds. Species which may be relevant to the site's habitats include

barn owl *Tyto alba*, skylark *Alauda arvensis*, grey partridge *Perdix perdix*, lesser redpoll *Acanthis cabaret*, kestrel *Falco tinnunculus* and song thrush *Turdus philomelos*.

4.2.7 BM returned several records of common lizard *Zootoca vivipara*, in Kraft Meadow which lies within the Knowsley Industrial Estate approximately 2 km south-west of the site, the most recent record dating from 1996. No other species of reptile were recorded.

4.2.8 BM returned several records of great crested newt in Acornfield Plantation, approximately 630 m to the south of the site, the most recent record dating from 2014. Common toad *Bufo bufo* was also recorded in Acornfield Plantation and to the east of the site. Froglife's Toad Crossing map showed there were no 'toad' road crossings within 2 km of the site.

4.2.9 BM returned numerous records of invertebrates within 2 km, the majority of which were dragonfly records from Acornfield Plantation.

4.2.10 BM returned numerous records of flowering plants within 2 km, which included large numbers of records of invasive species Japanese knotweed and Himalayan balsam. None of the records related to the site or immediate surrounds; although LPA local wildlife sites status reports from 2012 noted that Japanese knotweed, rhododendron and Himalayan Balsam were all previously recorded in Charley Wood (75m south).

MAGIC search for EPS Licences

4.2.11 The MAGIC website showed no European Protected Species (EPS) licensed sites within 2 km of the site.

4.3 Planning Policy

4.3.1 The Knowsley Local Plan sets out details for protection, management and enhancement of Green Infrastructure in Policy CS8, and of particular relevance is (b) - to sustain and promote biodiversity in accordance with importance and contribution to ecological networks.

4.3.2 CS11 sets out policy for regeneration of Knowsley Industrial and Business Park. The policy seeks to enhance green infrastructure within the industrial park, by improving accessibility through footpaths and cycle routes, to improve the amenity value of the green spaces and perception of the park, but without compromising the biodiversity value of Charley Wood and Acornfield Plantation which are both situated on Knowsley Industrial Park.

4.3.3 Policy CS21 gives policy with regards to Green Spaces and of particular relevance is (9.30) - appropriate consideration is given to the protection and enhancement of tree coverage on development sites, irrespective of whether the trees are statutorily protected (i.e. have Tree Preservations Orders).

4.4 Data Search – Local Conservation Priorities

4.4.1 The following habitats and species are listed on the North Merseyside Biodiversity Action Plan and are potentially relevant to the site.

Habitats

- *Urban Trees*
- *Urban Grasslands*
- *Urban Green Infrastructure*

Species

- *Bats*
- *Red squirrel*
- *Grey partridge*
- *Skylark*
- *Song thrush*
- *Urban birds*
- *Common lizard*
- *Great crested newt*

4.4.2 These habitats and species have been identified as local conservation priorities and therefore will be given appropriate additional weight within the site ecological evaluation.

4.5 Field Survey Results

4.5.1 The results of the ecological survey are included in map form on Figure 3. Habitats are mapped following the codes and conventions described within the Phase 1 Habitat Survey Handbook and Target Notes (Table 4) are used to describe habitats not readily conforming to recognised types and evidence of or potential for protected species and species of conservation concern. Photographs of the site are provided in Appendix C at the end of this report.

4.6 Habitats

Scattered broadleaf trees

4.6.1 Young planted trees were present in the landscaped areas around the buildings, including Scot's pine *Pinus sylvestris*, cherry *Prunus* sp., and silver birch *Betula pendula*. There was a line of young willow *Salix* sp. and dogwood *Cornus sanguinea* along the western fenced boundary.

Scattered scrub

4.6.2 An unmanaged area vegetated with grasses and tall ruderals was recorded within the site, with young willow saplings, butterfly-bush *Buddleia davidii* and bramble *Rubus fruticosus* agg. becoming established.

Amenity Grassland

4.6.3 Areas of mown grassland were present adjacent to the buildings within the site, with a sward length ranging from 5 to 10cms. Grasses were dominated by rough-stemmed meadow-grass *Poa trivialis*, with frequent patches of red fescue *Festuca rubra* and Yorkshire-fog *Holcus lanatus*. Herbs were frequent and included ragwort *Senecio jacobaea*, common mouse-ear *Cerastium fontanum*, daisy *Bellis perennis*, dandelion *Taraxacum officinale*, broad-leaved dock *Rumex*

obtusifolium, creeping buttercup *Ranunculus repens*, meadow buttercup *Ranunculus acris*, ribwort plantain *Plantago lanceolata* and yarrow *Achillea millefolium*.

Tall ruderal herbs and scrub

4.6.4 An area of unmanaged vegetation occurred to the east of the site, which was dominated by willowherbs *Epilobium* sp. This area also contained grasses, a high moss level, frequent horsetail *Equisetum arvense*, occasional soft-rush *Juncus effusus* and willow scrub, indicating a damp substrate.

4.6.5 An area of hardstanding was present in the site, which appeared to be rubble foundations of a former building, and was sparsely vegetated by species such as Yorkshire-fog, mosses, broad-leaved dock, scattered butterfly bush and silver birch saplings.

Ephemeral / Short perennial

4.6.6 Species typical of disturbed ground and shallow soils were also located within the rubble foundations mentioned above including common cat's-ear *Hypochaeris radicata*, Colt's foot *Tussilago farfara* and ribwort plantain.

Open Standing Water

4.6.7 On the south edge of the site were four pits immediately adjacent to each other, all of which contained water. Each pit measured approximately 2 m x 2 m, and the water level was mostly around 0.75 m – 1 m below the top of the brickwork which was at ground level. The exception was one of the pits which was partially drained, where the water level was approximately 4 m below ground level. Drainage pipes were observed in the brickwork above the water and some had floating rubbish/leaves. No aquatic vegetation could be seen. The depth of the pits and water could not be confirmed but were likely several metres with straight sheer sides constructed of bricks.

4.6.8 A larger pit was also present on the south edge of the site which measured approximately 20 m x 5 m. Again there was no vegetation noted, and there was netting over the pit as the top of the pit was at ground level.

4.6.9 Another small pit occurred on the eastern side of the site, which was shallow compared to the other pits, and the sides were raised approximately 20 cm above ground level. The water was clear with some algae present, and there was a small amount of bulrush *Typha* sp emerging from the water.

4.6.10 It is understood that the pits were previously used as part of the Kodak chemical factory for water run-off/washing off chemicals.

Introduced shrubs

4.6.11 There were a variety of shrubs planted in borders around the buildings which included flowering currants and small ornamental conifer bushes.

Buildings

4.6.12 A variety of buildings were present within Plot C, most of which had been disused since 2006. A summary of each building is provided in Section 4.7.2 (Table 1) below.

4.7 Protected Species and Species of Conservation Concern

Badgers

4.7.1 No badger setts or evidence of badger activity was found in Plot C. The majority of Plot C comprised hardstanding and buildings, with small areas of grassland. Given the lack of suitable foraging habitat, disturbance and lack of cover, it is considered unlikely that badgers would create a sett within Plot C in the future.

Bats

4.7.2 The buildings were inspected externally and internally as far as possible for evidence of roosting bats. The following table shows potential features which could be used by roosting bats, any evidence found and an assessment of potential of each feature to support a roost.

Table 1: Building Inspection

Building Number	Description	Potential Roosting Features	Evidence found / Potential for building to support a roost
6	Single storey shed with concrete / pebbledash rendered walls and pitched metal roof. Open at one end.	No features noted inside or outside.	No evidence of bats **Negligible** potential
8	Two storey office block with brick walls and flat roof. Wooden fascia which appeared to be well fitting. Internally the rooms had suspended ceilings and were well sealed. There was one broken window present on upper floor.	Occasional missing mortar between bricks.	No evidence of bats **Low** potential
9	Single storey building previously used as a laundry, with brick walls and a metal pitched roof which was unlined. The rooms were open to the roof inside.	Possible gaps under external wooden fascia.	No evidence of bats. **Low** potential
20	Single storey building not used since 2006. Constructed of brick walls and a shallow pitched roof which was covered in felt. Internally there were suspended ceilings and rooms which were well maintained and sealed.	Small hole at gable apex on south-east side.	No evidence of bats. **Low** potential

21	Single storey building currently in use as a tyre store. The building was open to the roof internally, and was constructed of brick with a metal pitched roof which was unlined.	No features noted inside or outside.	No evidence of bats. **Negligible** potential.
23	Pre-fabricated single storey building made of plastic / metal, formerly used as a gym.	No features noted inside or outside.	No evidence of bats. **Negligible** potential.
24	Single storey lean-to brick building with a flat concrete roof. Two rooms inside used as a telephone exchange, with suspended ceilings and damp and full of cobwebs from lack of use.	No features noted inside or outside.	No evidence of bats. **Negligible** potential.
38	Large open warehouse with walls constructed of metal, concrete and brick. There were large glass roof-lights allowing light into the warehouse and the roof was flat and accessible via a ladder. Inside the warehouse felt cold and damp with some pools of water on the floor. The southern end of the building was offices which were sealed off due to contamination by asbestos. The eastern side of the building had external concrete and metal structures from former tanks / industrial workings.	No roosting features noted.	No evidence of bats found. **Negligible** potential for bats.
39	Two storey office block constructed of brick with a flat roof. Internally the rooms were well sealed with suspended ceilings. There were occasional ceiling panels missing and the concrete roof above was visible.	Gaps under wooden fascia boards and gaps in external brickwork above windows where mortar missing.	No evidence of bats found. **Low** potential for bats.

4.7.3 None of the trees within Plot C had any features suitable for roosting bats. The trees were relatively young and considered unlikely to develop potential roosting features in the near future.

4.7.4 The habitats on Plot C were considered to have low value for foraging bat populations. Nevertheless, trees, shrubs and waterbodies could provide limited foraging opportunities for small numbers of bats.

4.7.5 Buildings 8, 9, 20 and 39 were assessed to have 'Low' potential for bats, and a single dusk or dawn survey was subsequently recommended to confirm presence or likely absence of a roost in accordance with BCT guidelines. Dusk emergence surveys were undertaken on 2nd July 2018 on Building 20 and 16th July 2018 on Building 8. A dawn survey was undertaken on 3rd July of Building 39 and on 17th July 2018 on Building 9.

4.7.6 The dusk and dawn surveys found that no bats emerged, or returned to roosts within any part of Buildings 8, 9, 20 or 39. Full survey data including weather conditions is shown in Appendix D.

4.7.7 Despite suitable weather conditions, the dusk and dawn bat surveys recorded very low levels of bat activity on Plot C; activity was limited to infrequent foraging and commuting of one or two common pipistrelle bats. A possible long-eared bat was seen foraging around a tree, although this was not confirmed due to no echolocation call being heard.

Amphibians

4.7.8 There were six pits containing water on the south and south-eastern edges of Plot C (Waterbodies (WB) 1 – 6). WB 1 - 4 were approximately 2 m x 2 m and immediately adjacent to each other, with drainage pipes in the walls above the surface of the water. The top of the wall of the pits was at ground level, and two were covered with a mesh. The water level was 0.75 m – 1 m below ground level apart from WB2, which was partially drained and had a water level approximately 4 m lower than ground level. The pits had no visible aquatic vegetation but some had floating rubbish and leaves. It was not possible to check the water depth. The pits may have been formerly used for chemical waste / storage.

4.7.9 WB5 was a larger pit, measuring approximately 20 m x 5 m. Again, no vegetation was visible, but the top of the pit was flush with ground level and the water level was approximately 1 m below ground level.

4.7.10 WB6 was a shallow pit, with a raised concrete lip approximately 20 cm high. This pit had some emergent vegetation (*Typha*) and the water was clear.

4.7.11 All pits were subject to HSI. As WBs 1 - 4 were immediately adjacent to each other and appeared the same in size and character, they were assessed as a single waterbody.

4.7.12 The Ordnance Survey and aerial maps showed a water body, thought to be a SuDS associated with a development approximately 160m southeast of the site. This was not surveyed as a barrier [12]of hardstanding and buildings was present between this waterbody and the site, largely limiting the movement of great crested newt (should they be present) into the site. The surveyor did not have permission to access the waterbody. All other waterbodies were >500m from the site.

4.7.13 Further to this, the nearest waterbodies were two similar pits in Plot A in the northern section of the business park, approximately 280 m away from Plot C. A Habitat Suitability Index assessment and eDNA surveys were undertaken of the pits in Plot A. One of the pits in Plot A tested positive for presence of great crested newt eDNA. This pit is similar in nature to those found in Plot C, and was not considered to provide suitable breeding habitat, but is more likely to have acted as a 'pitfall' for a newt dispersing from the wider area especially considering that the adjacent pit returned a negative result. Further details on this result are provided in the demolition report for Plot A.

[12] Clarkson &Woods (June 2018), Pre-Demolition Ecological Survey Plot A, Image Business park, Acornfield Road, Knowlsley

Table 2: Habitat Suitability Index assessment[13]

Scoring System	Score for WB's 1, 2, 3 & 4	Score for WB5	Score for WB6
Location	A - Optimal (1)	A - Optimal (1)	A - Optimal (1)
Pond Area	16 m^2 (0.05)	100 m^2 (0.1)	6 m^2 (0.05)
Pond Drying	Never (0.9)	Never (0.9)	Rarely (1)
Water Quality	Poor (0.33)	Poor (0.33)	Poor (0.33)
Shade	0% (1)	0% (1)	5% (1)
Fowl	Absent (1)	Absent (1)	Absent (1)
Fish	Absent (1)	Absent (1)	Absent (1)
Density of Ponds in 1 km	8 ponds (2.54/km) (0.9)	8 ponds (2.54/km) (0.9)	8 ponds (2.54/km) (0.9)
Terrestrial Habitat	Poor (0.33)	Poor (0.33)	Poor (0.33)
Macrophytes	0% (0.3)	0% (0.3)	10% (0.4)
Calculated score (scores multiplied and tenth root taken)	0.51	0.55	0.53
Pond Suitability	**Below Average**	**Below Average**	**Below Average**

4.7.14 The resulting score for all six pits was 'Below Average', and given the lack of vegetation difficult access, and lack of other ponds nearby, the chance of great crested newts breeding in the pits is likely to be low. Nevertheless, populations of great crested newts have occasionally been found breeding in apparently unsuitable features such as brick pits and other disused industrial waterbodies, and with populations being recorded within 2 km, this possibility cannot be ruled out.

4.7.15 The immediate surrounding habitat was hardstanding, which is poor terrestrial habitat for great crested newts, but there were some small, discrete areas of shrubs and scrub which provide more opportunities for shelter and foraging albeit limited.

4.7.16 As a precaution, water in the pits was subsequently sampled and analysed for presence of great crested newt eDNA. The water samples were collected from WB1, 3, 4, 5 and 6 on 26th June 2018 and received by SureScreen Scientifics on 29th June 2018. WB2 was not tested due to access issues (See 3.4.4 Constraints). The results were issued on 11th July 2018, and showed that all of the waterbodies tested in Plot C were negative for eDNA, indicating great crested newts were absent.

Reptiles

4.7.17 The amenity grassland within Plot C was well managed and regularly mown, and is currently likely to be of limited value to reptiles. There was a patch of unmanaged vegetation including scrub and tall ruderals, but this area was isolated from other potentially suitable habitat features.

[13] Oldham R.S., Keeble, J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10 (4), 143 – 155.

Overall Plot C was assessed to have low potential to support reptiles should they occur in the locality.

Birds

4.7.18 The introduced shrubs within the landscaping around the buildings was likely to be of most value to nesting and foraging birds. The ivy covered wall of Building 39 may also be used by birds for nesting and foraging.

4.7.19 Nesting pigeons and collared doves were noted in the external metal structure attached to the outside of Building 38. Other buildings could potentially support nesting birds during the breeding season and potentially at other times of year (species such as collared dove and wood pigeon can nest all year round if conditions are suitable).

4.7.20 Species recorded on site during the survey were as follows:

Table 3: Bird Species Recorded During the Field Survey

Species	Latin	Behaviour
Black-headed gull	*Chroicocephalus ridibundus*	Flying over site
Blackbird	*Turdus merula*	Foraging around shrubs and borders
Blue tit	*Cyanistes caeruleus*	Foraging in woodland
Carrion crow	*Corvus corone*	Flying over site
Chiffchaff	*Phylloscopus collybita*	Singing in woodland
Common gull	*Larus canus*	Flying over site
Great tit	*Parus major*	Singing in woodland
Herring gull	*Larus argentatus*	Flying over site
Long tailed tit	*Aegithalos caudatus*	Foraging in woodland
Magpie	*Pica pica*	Foraging in trees
Robin	*Erithacus rubecula*	Foraging around shrubs and borders

Invertebrates

4.7.21 Few invertebrates were noted in Plot C during the survey, and the typical amenity habitats which are well managed and fairly low in diversity, are considered unlikely to support a notable or rare community of terrestrial invertebrates.

Other Protected Species, Species of Conservation Concern and Invasive Species

4.7.22 A foraging hedgehog was observed in Plot C during the bat survey on 2nd July 2018. The amenity grassland habitats with patches of introduced shrubs and scrub provide foraging opportunities for this species. Hedgehogs may also shelter beneath dense shrubs or low conifers.

4.7.23 No invasive species were found.

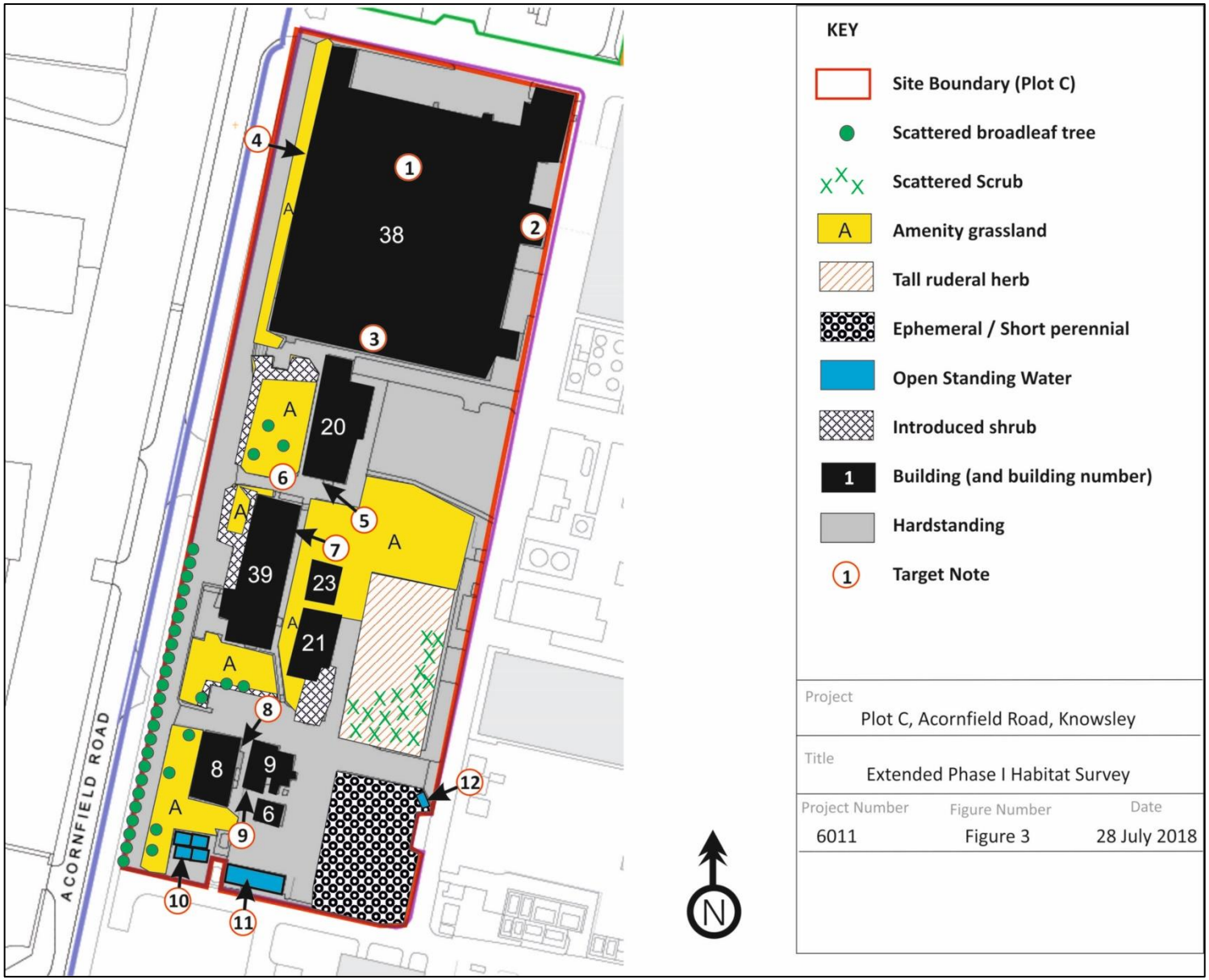

KEY
Site Boundary (Plot C)
Scattered broadleaf tree
Scattered Scrub
A
Amenity grassland
Tall ruderal herb
Ephemeral / Short perennial
Open Standing Water
Introduced shrub
1
Building (and building number)
Hardstanding
1
Target Note
ACORNFIELD ROAD
38
20
39
23
21
8
9
6
A
N
Project
Plot C, Acornfield Road, Knowsley
Title
Extended Phase I Habitat Survey
Project Number
6011
Figure Number
Figure 3
Date
28 July 2018

Table 4: Target Notes

No.	Description
TN1	Large warehouse building, open, light and airy inside with two dead pigeon carcasses but no live birds or nests seen. Limited roosting potential for bats.
TN2	External tank area on side of warehouse open and used by nesting feral pigeons and collared doves. Lots of droppings, feathers and egg shells observed.
TN3	Southern end of Building 38 (offices) was bricked up due to untreated presence of asbestos. This part of the building was not accessible from the inside, but from the outside the offices appeared similar to other office blocks (sealed rooms, suspended ceilings, flat roof). Some glass panels missing could allow birds to enter and nest inside the building.
TN4	External west facing wall covered in very thick ivy – could be used by nesting birds.
TN5	Gap at apex of single storey building (Building 20) which was the only feature noted that could be used by bats.
TN6	Hedgehog observed foraging in this location during bat survey on 2nd July 2018.
TN7	Potential bat access gaps noted under external wooden fascia boards and missing mortar in brickwork above windows of Building 39.
TN8	Potential bat access gaps in brickwork where mortar missing between bricks on Building 8.
TN9	Potential bat access gap under wooden fascia on Building 9.
TN10	4 pits next to each other (WB1, WB2, WB3 & WB4). Each pit approximately 2 m x 2 m, and water levels varied, mostly being 1 – 1.5 m below ground level. WB2 extended several metres below ground level due to being partially drained. No vegetation could be seen in the pits. Some had floating rubbish in and there were drainpipes feeding the pits.
TN11	One larger pit (WB5) with netting over the top, approximately 20 m x 5 m.
TN12	One shallow pit (WB6), former deluge system tank, approximately 2 x 3 m with a small amount of emergent vegetation and algae present.

5 ECOLOGICAL EVALUATION

5.1.1 This section provides an analysis of the value of ecological receptors (the designated sites, habitats and protected species) identified as actually or potentially occurring within or in proximity of the site. The valuation of the receptor reflects its legal protection, rarity and conservation status as well as its relative abundance on site and whether it is identified as a local or national conservation priority. Where appropriate the social and economic importance of ecological receptors has also been considered.

Table 5: Ecological Evaluation

Ecological Receptor	Description/Comments	Ecological Importance
Designated Sites		
Acornfield Plantation LNR	Broadleaved woodland, mire, unimproved grassland and ponds with water vole and great crested newt populations and diversity of dragonflies.	County
Charley Wood LWS	Broadleaved woodland on peat with glades and acid grassland	Local
Habitats		
Scattered broadleaf trees	Young planted trees	Site
Scattered scrub	Small amount of bramble, young willow and birch saplings and butterfly-bush.	Site
Open standing water	Six pits containing standing water, only one had a small amount of emergent vegetation.	Site
Amenity grassland	Mown amenity grassland with typical grasses and relatively low diversity of herbs, common in local area.	Site
Tall ruderal herbs and scrub	Area of grasses interspersed with scattered willowherbs, soft-rush and scrub	Site
Ephemeral / Short perennial	Area of hardstanding becoming vegetated with patchy pioneer species	Site

Ecological Receptor	Description/Comments	Ecological Importance
Introduced shrub	Planted ornamental shrubs, may attract birds and invertebrates.	Site
Buildings	Large modern buildings of low potential for bats and nesting birds. Building 38 had confirmed nesting birds.	Site
Species		
Bats	No bat roosts found in buildings during dusk and dawn surveys. Trees provide negligible potential for roosting bats. Low levels of bat foraging activity over the grassland.	Negligible importance for roosting bats. Site importance for foraging bats.
Birds	Trees and shrubs may be used by common species of nesting birds. Nesting (pigeon and dove) confirmed within parts of Building 38 (TN2 and 4)	If common species of nesting birds are present: Site to Local Importance depending on the species.
Great crested newt	Pits (WBs 1, 3, 4, 5 and 6) tested negative for great crested newts.	Pits in Plot C have negligible importance for great crested newt.
Hedgehog	One foraging hedgehog observed in Plot C.	Site importance for hedgehog.

6 ASSESSMENT AND RECOMMENDATIONS FOR MITIGATION AND ENHANCEMENT

6.1 Introduction

6.1.1 This section considers the effects of the demolition of buildings upon the ecological receptors identified in Section 6. Avoidance, mitigation and compensatory measures are then described to ensure adverse effects associated with the construction and operation of the proposed development can be eliminated or reduced as far as possible. Recommendations are also provided for any further work that might be required as well as suggestions for ecological enhancement measures that would be appropriate within the development in line with the National Planning Policy Framework.

6.2 Designated Sites

6.2.1 Due to its proximity, and the small-scale nature of the impact, the demolition of buildings on site is not anticipated to have any significant impacts, either directly or indirectly, on the designated sites identified during the desk study.

6.3 Habitats

6.3.1 All buildings will be removed as part of this application. The sunken water pits may also be remediated and infilled, subject to the use of these pits by other residents at the industrial estate. It is likely that the amenity grassland, scrub and ephemeral/short perennial habitat surrounding the buildings will be negatively affected by the movement of demolition machinery, but will not be removed. Introduced shrubs adjacent to the buildings will also be lost. The existing trees will be retained.

6.3.2 To protect the scattered trees during demolition, tree protection fencing (in line with BS 5837:2012 Trees in relation to design, demolition and construction) will be erected, precluding the storage of material and use of machinery in root protection zones.

6.3.3 Further details on mitigation required for protected species during demolition is provided in Section 6.4 below.

6.4 Protected Species and Species of Conservation Concern

Badgers

6.4.1 Badgers were not found to be present on site during the survey. The site provided negligible habitat for badgers and no records were obtained from the data search. As it is unlikely that badgers would create setts within or adjacent to Plot C, a pre-commencement badger survey is not considered necessary.

Bats

6.4.2 No evidence of bats was found during the building inspection, but a limited range of features were identified on Buildings 8,9, 20 and 39 and these buildings were therefore assessed to have overall low potential for roosting bats. As per good practice guidelines, a single dusk emergence OR dawn re-entry survey was undertaken of the buildings to confirm presence or likely absence

of a bat roost. The surveys found no bats were roosting in the buildings and general bat activity on site was low.

6.4.3 None of the trees were identified to have any potential bat roosting features, and removal of scattered trees is not constrained by the potential presence of roosting bats.

6.4.4 As no bat roosts were identified in Plot C, no further survey or mitigation for bats is required.

Reptiles

6.4.5 The site was assessed to be negligible-low potential for reptiles to be present on this part of the site with no connective habitat to more optimal areas of habitat, and therefore no further survey or mitigation for reptiles is required in Plot C.

Great crested newts

6.4.6 The eDNA testing found that great crested newts were absent from the pits, and as such no further survey for great crested newts is required for Plot C. However, one of the pits in Plot A, 280m north of the waterbodies in Plot C tested positive for great crested newt eDNA in 2018[14], and great crested newts are known to be present in the local area (Acornfield Plantation 600m south). Both confirmed GCN records to the north and south are separated from Plot C by industrial development with minimal opportunities for migration onto the site. Furthermore given the distance of these records and negligible-low quality habitat offered by the site it is considered highly unlikely that great crested newts would actively disperse into the site. As such, works to demolish the buildings and remove the pits are considered unlikely to affect great crested newts but will take place following the Reasonable Avoidance Measures (RAMs) detailed below:

- Contractors to have a tool-box talk by an ecologist to ensure they can identify a great crested newt and are aware of the laws pertaining to this species;
- Rubble from the demolition will either need to be removed off site immediately; stored off ground (e.g. within skips); or amphibian proof fencing installed around any new rubble piles. This is to prevent rubble piles being used as places of shelter by great crested newts;
- Vehicles, equipment and machinery to be restricted to existing areas of hardstanding or a compound established with amphibian-proof fencing.
- The grassland will be maintained as short mown amenity grassland prior to, and for the duration of demolition works;
- If the pits are not removed this year, a second eDNA survey will be required next year (between mid-April and the end of June), prior to removal of the pits, to confirm that great crested newts continue to be absent from the waterbodies.

6.4.7 Provided the above measures are followed the risk of accidental killing or injury to individual great crested newts entering Plot C (considered unlikely) during demolition of the buildings within Plot C will be minimised. Due to the absence of newts recorded within the pits and negligible to

[14] Clarkson &Woods (June 2018), Pre-Demolition Ecological Survey Plot A, Image Business park, Acornfield Road, Knowlsley

low quality habitat offered by the site, with works confined to the existing built footprint effects on great crested newts will be negligible.

6.4.8 Installation of amphibian-proof fencing to prevent entry into discrete areas such as compounds or rubble piles by great crested newt can be carried out if necessary without the need for a Natural England licence as it will be a precautionary measure with no impact to great crested newt habitat or fragmentation of habitat.

Birds

6.4.9 Common species of birds may use trees, shrubs and buildings for nesting in the breeding season which generally runs from March to August inclusive (although some species such as collared dove and wood pigeon can nest all year round). Building demolition and any associated vegetation removal should be planned to occur outside the bird breeding season, or be subject to an ecologist check for active nests. Active nests must be left until chicks have fledged.

Other Protected Species and Species of Conservation Concern

6.4.10 A foraging hedgehog was observed in Plot C. Mitigation measures before, during and after construction include:

- Careful removal of vegetation by hand, especially underneath dense scrub, ornamental conifers and shrubs, with a careful check underneath for hedgehogs. Ideally vegetation removed in September/early October, which is outside of hedgehog hibernation season as well as avoiding bird breeding season. Any hedgehogs found will be moved to an area of cover in an undisturbed part of the site (e.g. woodland edge at the northern end of the industrial estate) either by or in consultation with an ecologist.
- Immediate removal of vegetation cuttings rather than stacking and burning.
- Wildlife escape ramps to be provided within any open excavations. Ramps could comprise earth ramps, or rough sawn planks and should be at a 45º angle. Excavations should ideally be covered at night.

6.5 Cumulative Impacts

6.5.1 As the majority of the development footprint is on brownfield land, which is already developed and highly managed, cumulative impacts are not foreseen.

6.6 Ecological Enhancements

6.6.1 The National Planning Policy Framework[15] (NPPF), issued in March 2012, states that the planning system should contribute to "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures". It also states that "opportunities to incorporate biodiversity in and around developments should be encouraged".

[15] DCLG (2012). *National Planning Policy Framework*. www.communities.gov.uk

6.6.2 Enhancements for biodiversity, such as the following, are additional to specific mitigation measures mentioned above and are not expressly required. Any adopted enhancements would, however, make a positive, permanent contribution to local biodiversity.

6.6.3 The installation of six bird boxes on scattered trees around the site would provide an enhancement for nesting birds on site. The following boxes are recommended:

- Schwegler 1B/woodcrete box with opening 26mm;
- Schwegler 1B/woodcrete box with opening 32mm;
- Schwegler 2H Robin Box/woodstone open nest box

6.6.4 If Schwegler boxes are not available similar, long-lasting boxes should be used.

6.6.5 The open fronted box is noted to be suitable for nesting thrushes which are listed as a BAP species by North Merseyside. Other bird species relevant to this site listed by North Merseyside are 'Urban Birds', primarily, house sparrow, house martin, swift and starling. Further enhancements, including features for 'Urban Birds' can be provided as and when an application for the development of the site is submitted.

6.7 Summary of Recommended Further Work

6.7.1 Below is a summary of the recommended further work which should be carried out prior to any planning application being submitted and/or before construction commences.

Habitats/Species	Scope of work	Timescale
Badgers	No further surveys required.	N/A
Bats	No further surveys required.	N/A
Reptiles	No further surveys required.	N/A
Great crested newts	RAMs Method Statement to be followed during demolition/removal of pits.	To be prepared before works affecting the pits commences
Birds	If any vegetation and/or buildings are to be directly affected by construction activities (including site clearance) during the months of March to August inclusive, a check of suitable habitat for nesting birds prior to site activity in that area should be carried out by a suitably qualified ecologist.	Nesting bird checks should take place no more than 48hrs prior to site clearance activities commencing. March to August
Hedgehog	Removal of vegetation (associated with building demolition) particularly dense low shrubbery or conifers should be removed in autumn or early spring, to avoid potentially disturbing hibernating hedgehogs. A check of hedgehogs should be undertaken during careful removal of vegetation. Any hedgehogs found should be moved to an undisturbed area of the site	Shrub removal in September / October

Habitats/Species	Scope of work	Timescale
	(the woodland strip to the north of Image Business Park would be ideal).	

7 CONCLUSIONS

7.1.1 The site was largely considered to be of negligible-low value for ecology. The proposed demolition works may result in **adverse impacts** on nesting birds and hedgehogs. Avoidance and mitigation measures have been proposed to ensure that these adverse impacts are reduced as far as possible.

7.1.2 The remaining habitats on site will be retained in line with policy CS21.

APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION

BATS

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

AMPHIBIANS

Great Britain supports seven native amphibian species. The four most widespread species; smooth and palmate newts, common frog, and common toad, receive partial protection under the Wildlife and Countryside Act 1981 (as amended) which prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy. The great crested newt, pool frog and natterjack toad are also fully protected in England and Wales under the Conservation of Habitats and Species Regulations 2017. Penalties for offences against amphibian species include fines of up to £5,000 and/or up to six months in prison.

Four amphibian species (great crested newt, pool frog, common toad, natterjack toad) are listed as priority species under the UK Biodiversity Action Plan, and are therefore considered to be Species of Principal Importance in England and Wales (excluding the pool frog, which does not occur in Wales) under the Natural Environment and Rural Communities (NERC) Act 2006. All public bodies including local and regional authorities have a duty under this legislation to have regard for the conservation of biodiversity.

GREAT CRESTED NEWTS

Great crested newts are protected in England and Wales under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a great crested newt, or to deliberately disturb a great crested newt such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place for great crested newts. Intentional or reckless disturbance of great crested newts in places of shelter (ponds or terrestrial refuges), and damage to or obstruction of places of shelter are also offences under the Wildlife and Countryside Act 1981 (as amended). Penalties for offences against great crested newts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of ponds or terrestrial habitat, or which could result in killing of or injury to great crested newts, need to take place under licence. Works which could disturb great crested newts may also be licensable, though this is rarely the case unless loss of great crested newt habitat is also proposed, and should be assessed on a case by case basis. In practice this means that works involving any removal of or

significant modification to ponds or terrestrial habitats (typically rough grassland, scrub, hedgerow bases and woodland) supporting great crested newts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of great crested newts in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

BIRDS

All British birds, their nests and eggs (with certain exceptions) are protected under the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to: intentionally kill, injure or take a wild bird; intentionally take, damage or destroy nests which are in use or being built; intentionally take or destroy birds' eggs; or possess live or dead wild birds or eggs. A number of species receive additional protection through inclusion on Schedule 1 of the Wildlife and Countryside Act; for these it is also an offence to intentionally or recklessly disturb birds while nest building, or at a nest containing eggs or young, or to disturb the dependant young of such a bird. Penalties for offences against bird species include fines of up to £5,000 and/or up to six months in prison.

General licences for control of some bird species are issued by Natural England and Natural Resources Wales in order to prevent damage or disease, or to preserve public health or public safety, but it is not possible to obtain a licence for control of birds or removal of eggs/nests for development purposes. Consequently if nesting birds are present on a development site when works are programmed to start it is usually necessary to delay works, at least in the areas supporting nests, until any chicks have fledged and left the nest. It is usually possible, once chicks have hatched, for an experienced ecologist to predict approximately when they are likely to fledge, in order to inform programming of works on site.

PLANNING POLICY IN RELATION TO BIODIVERSITY - ENGLAND

The National Planning Policy Framework (NPPF), issued in March 2012, has superseded Planning Policy Statement 9: Biodiversity and Geological Conservation (August 2005). Additional guidance can be found online at http://planningguidance.planningportal.gov.uk/blog/guidance/. Further guidance is also available within the Government Circular ODPM 06/2005 on Biodiversity and Geological conservation although it should be noted that this document is currently being updated by DEFRA. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 109), including:

- protecting and enhancing valued landscapes, geological conservation interests and soils;
- recognising the wider benefits of ecosystem services;
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 115):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 118) by applying principles including:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it

of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;

- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

In England, the National Planning Policy Framework (NPPF), issued in March 2012, states that the planning system should contribute to "*minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures*". It also states that "*opportunities to incorporate biodiversity in and around developments should be encouraged*".

In Wales, Technical Advice Note 5 on Nature Conservation and Planning (2009) states that the planning system should "look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally", and that when making planning decisions, local authorities should "promote the conservation and enhancement of statutorily designated areas and undeveloped coast" and "adopt a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation".

UK BIODIVERSITY ACTION PLANS

The UK Biodiversity Action Plan (UK BAP) 2011 is a policy first published in 1994 to protect biodiversity and stems from the 1992 Rio Biodiversity Earth Summit. The policy is continuously revised to combine new and existing conservation initiatives to conserve and enhance species and habitats, promote public awareness and contribute to international conservation efforts. Each plan details the status, threats and unique conservation strategies for the species or habitat concerned, to encourage spread and promote population numbers.

Species or habitats identified as priorities under the UK Biodiversity Action Plan receive some status in the planning process through their identification as Species/Habitats of Principal Importance in England and Wales, under the Natural Environment and Rural Communities (NERC) Act 2006 (as amended).

Current planning guidance in England, the National Planning Policy Framework, does not specifically refer to Species or Habitats of Principal Importance, though it includes guidance for conservation of biodiversity in general. Supplementary guidance is available online at http://planningguidance.planningportal.gov.uk/blog/guidance/ and this guidance indicates that it is '*useful to consider*' the potential effects of a development on the habitats or species on the Natural Environment and Rural Communities Act 2006 section 41 list.

Current planning guidance in Wales, TAN 5 (2009) states that when making planning decisions, local authorities should "protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans".

PROTECTED PLANTS

All wild plants receive some protection under the Wildlife and Countryside Act 1981 (as amended), which makes it an offence for any unauthorised person to intentionally uproot any wild plant. Additionally, certain rare species of plants listed on Schedule 8 of the Act are given greater protection. For these species, it an offence to intentionally pick, uproot or destroy them, or to possess or sell them (live or dead), or anything derived them. Penalties for offences under this legislation include fines of up to £5,000 and/or up to six months in prison.

Schedule 8 of the Act is reviewed every 5 years, but currently it includes 185 species or sub-species of vascular plants, bryophytes (mosses, liverworts and hornworts), lichens and stoneworts (see www.jncc.gov.uk for current list), all protected due to their rarity and/or restricted distributions.

Works which could result in uprooting or destruction of plants listed on Schedule 8 of the Act could result in an offence being committed, unless measures are taken to minimise the risk of this occurring. Any inadvertent impacts on Schedule 8 plants despite these mitigation measures being in place, and impacts on other plant species during development works, would be considered an 'incidental result of an otherwise lawful operation' which 'could not reasonably have been avoided' and therefore not an offence.

In practice, the mitigation measures required on the very rare occasions when Schedule 8 plants are affected by development proposals will be determined by the ecological requirements of the species concerned, and any mitigation strategy should be agreed in advance with Natural England or Natural Resources Wales.

THE HEDGEROW REGULATIONS

In England and Wales the Hedgerows Regulations (1997) as amended confer a level of protection on hedgerows (though hedgerows within or bordering domestic gardens are excluded), particularly those hedgerows classified as 'Important' under the legislation. The Regulations require those wishing to remove hedgerows to submit a Hedgerow Removal Notice to the Local Planning Authority (LPA), which will then determine whether the hedgerow affected is classified as 'Important' under the Regulations. If it is, the LPA will either approve the proposed hedgerow removal, or issue a retention notice. It is an offence to remove or destroy a hedgerow which is subject to a retention notice, or to remove one without a removal notice.

Routine management of hedgerows, removal of hedgerows for development which has been granted planning consent, and certain other situations are allowed under the Regulations, which also specifically exclude hedgerows within or bordering domestic gardens. Determination of whether a hedgerow should be classified as 'Important' is based on a number of criteria including assessment of its likely historic value (e.g. old parish boundary or part of an ancient monument), ecological value (e.g. presence of protected species, and/or diversity of tree/shrub species in the hedgerow), and landscape value (e.g. associated with a public footpath, or being associated with hedgebanks, ditches, hedgerow trees etc).

Ancient and species-rich hedgerows are listed as a priority habitat in the UK Biodiversity Action Plan (2011)

APPENDIX B: ECOLOGICAL EVALUATION CRITERIA

It is important to appreciate that the level of protection given to a particular species or habitat through national or international legislation does not necessarily relate to the evaluated level of importance of that receptor to nature conservation. Whilst species may be widespread or common nationally, but of scarce occurrence in a particular county (for example, it might be at the limit of its geographical range), a species may also be considered to be rare nationally or internationally but be abundant within particular areas.

The Ratcliffe Criteria (Ratcliffe, 1977) provide a long established and widely accepted method of determining the nature conservation value of a particular site and have been used to aid the evaluation of the habitats associated with the Scheme. The attributes of the Ratcliffe Criteria are described below.

Ratcliffe Criteria for Nature Conservation Evaluation	
Criteria	**Description**
Size	Large, continuous areas of habitat are considered to be of greater importance than small or fragmented areas.
Diversity	Species and habitat diversity, including variations in topography and wetness, increase the wildlife value.
Naturalness	This reflects man's intervention or management of the habitat. Most habitats of this survey are semi-natural. Naturalness indicates the amount of modification of the land by man. Generally a less modified area results in an increase in the nature conservation value.
Rarity	The scarceness of a habitat, and the presence of rare/uncommon species, relates to its importance and priority for nature conservation. Rarity is related to the frequency of occurrence at national or county level.
Fragility	Fragile habitats are those where changes due to man's intervention, environmental factors or natural succession can directly threaten it. Scrub invasion, agricultural improvement, fire and changes in hydrological regime are the most common threats.
Typicalness	This relates to the quality of the habitat in terms of how good an example it is of a recognised type.
Position in an ecological/geographical unit	The relationship of a site to adjacent areas of nature conservation value. It is important to recognise the important and characteristic formations, communities and species of a district.
Recorded history	The extent to which a site has been used for scientific study and research is a factor of some importance.
Potential wildlife value	The likely quality of the habitat for birds, mammals, reptiles, amphibians and invertebrates if it is managed for wildlife. If appropriate habitat management is undertaken, it is possible for an increase in the diversity and nature conservation value of an area.
Intrinsic appeal	The knowledge of the distribution and numbers of popular groups of species such as birds, is greater than for obscure groups. Similarly, colourful wild flowers and rare orchids arouse more enthusiasm than liverworts. It is pragmatic to give more weight to some groups than to others.
Criteria are based on Ratcliffe, D.A. (1977). A Nature Conservation Review, Cambridge University Press	

Following the CIEEM Guidelines for Ecological Impact Assessment in the UK, when determining the biodiversity importance of natural features found on or in proximity to the site the following characteristics will be considered:

- Naturalness;
- animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitat diversity;
- habitat connectivity and/or synergistic associations;
- habitats and species in decline;
- rich assemblages of plants and animals;

- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species-poor communities; and
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change. The criteria described by Ratcliffe and CIEEM will then be used to ascribe importance to each feature according to its value in a geographic context. This is described in the table overleaf.

Level of Importance	Ecological Features
International	A habitat or species cited as a reason for the designation or proposed designation of a World Heritage Site, Biosphere Reserve, Biogenetic Reserve, Ramsar Site, Special Protection Area (SPA) or Special Area of Conservation (SAC). A large extent of habitat that is listed as a Priority Habitat Type in Annex 1 of the EC Habitats Directive in good condition with typical species diversity. A large and viable population of a regularly occurring species that is rare within an international context.
National	A habitat or species cited as a reason for the designation or proposed designation of a National Nature Reserve (NNR), Marine Nature Reserve (MNR), National Park, Site of Special Scientific Interest (SSSI) or Area of Special Scientific Interest (ASSI). Any area of habitat listed as a Priority Habitat Type in Annex 1 of the EC Habitats Directive that has potential to support typical species diversity. A large extent of habitat listed as a Priority Habitat in the UK BAP in good condition that supports an abundance of typical species. A large and viable population of a regularly occurring species that is scarce within an international context. A very large and viable population of a regularly occurring species that is listed as a Priority Species in the UK BAP. A large and viable population of a regularly occurring rare species that occurs in 15 or fewer 10km squares of the National Grid (e.g. a species that is listed in UK Red Data Books). A bird species with a British breeding population of <1,000 pairs.
Regional	A large extent of habitat listed as a Priority Habitat in the UK BAP that supports typical species diversity and is in good condition. A large and viable population of a regularly occurring species that is listed as a Priority Species in the UK BAP. A large and viable population of a regularly occurring plant species that is known to occur in 16 to 100 10km squares of National Grid (Stewart, Preston and Pearman 1994). A large and viable population of a regularly occurring insect species (Nationally Notable categories Na and Nb) that is known to occur in 16 to 100 10km squares of the National Grid [Ball, 1986]. A bird species with a British breeding population of 1,000 to 10,000 pairs.
County	A habitat or species cited as a reason for the designation or proposed designation of a Local Site (known locally as a County Wildlife Site (CWS), Site of Importance for Nature Conservation (SINC), Ecology Database Site (EDS) etc.), a Local Nature Reserve (LNR), a Nature Reserve (owned or managed by: The Wildlife Trusts, The Woodland Trust or equivalent body etc) or an Ancient Woodland. A habitat listed as a Priority Habitat in the UK BAP which is large in extent and supports typical species diversity. A medium and viable population of a regularly occurring species that is listed as a Priority Species in the UK BAP. A viable population of a regularly occurring species listed in a County Red Data Book, County Flora or found in less than 10% of 1km squares of the National Grid within the count. A small population of a plant species that is known to occur in 16 to 100 10km squares of National Grid. A small population of an insect species (Nationally Notable categories Na and Nb) that is known to occur in 16 to 100 10km squares of the National Grid. A bird species with a British breeding population of 10,000 to 100,000 pair
District	A habitat or species cited as a reason for the designation or proposed designation of a Local Site (known locally as a Local Wildlife Site (LWS), Site of Importance for Nature Conservation (SINC), Ecology Database Site (EDS) etc.), a Local Nature Reserve (LNR), a Nature Reserve (owned or managed by: The Wildlife Trusts, The Woodland Trust or equivalent body etc) or an Ancient Woodland. A habitat listed as a Priority Habitat in the UK BAP which is small in extent, supports typical species diversity or is in an unfavourable condition. A small and viable population of a species that is listed in the UK BAP or LBAP. A bird species with a British breeding population of 100,000 to 500,000 pairs.
Local	A habitat or species cited as a reason for the designation or proposed designation of a site which is officially listed e.g. on a Parish Register.

Level of Importance	Ecological Features
	A semi-natural habitat that is listed in the UK BAP or LBAP, which is either small in extent and/or is in an unfavourable condition. A species which occurs occasionally that is listed in the UK BAP or LBAP. A bird species with a British breeding population of >500,000 pairs.
Site	An artificial habitat or habitat that has readily established e.g. amenity grassland. A species which is common and not listed on the UK BAP or LBAP e.g. Badger.
Negligible	A habitat or species common within the Application Site, offering little benefit to British wildlife and biodiversity.

APPENDIX C: PHOTOGRAPHS OF SITE FEATURES

Plate 1: Building 8 with 'Low' bat potential due to gaps under fascia boards and in brickwork

Plate 2: Typical amenity landscaping around buildings in Plot C, with young trees, amenity grassland and introduced shrubs.

Plate 3: Building 20 with gap at gable apex ('low' bat potential). Hedgehog seen near to this building.

Plate 4: Dense ivy covered wall of Building 38 may support nesting birds

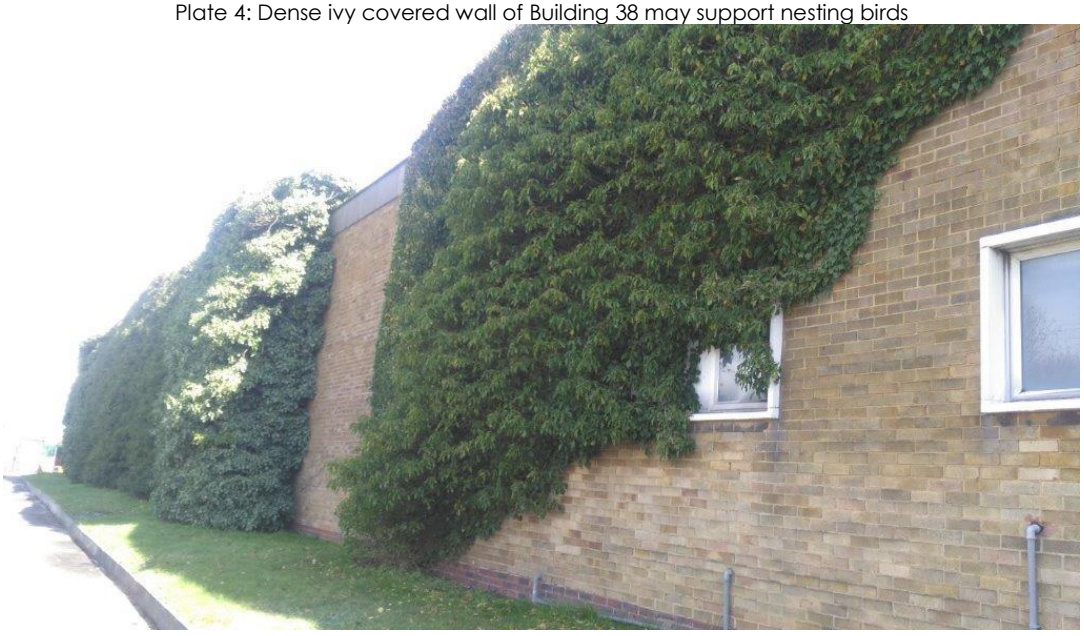


Plate 5: Inside Building 38 warehouse showing lack of features for bats (Negligible potential).

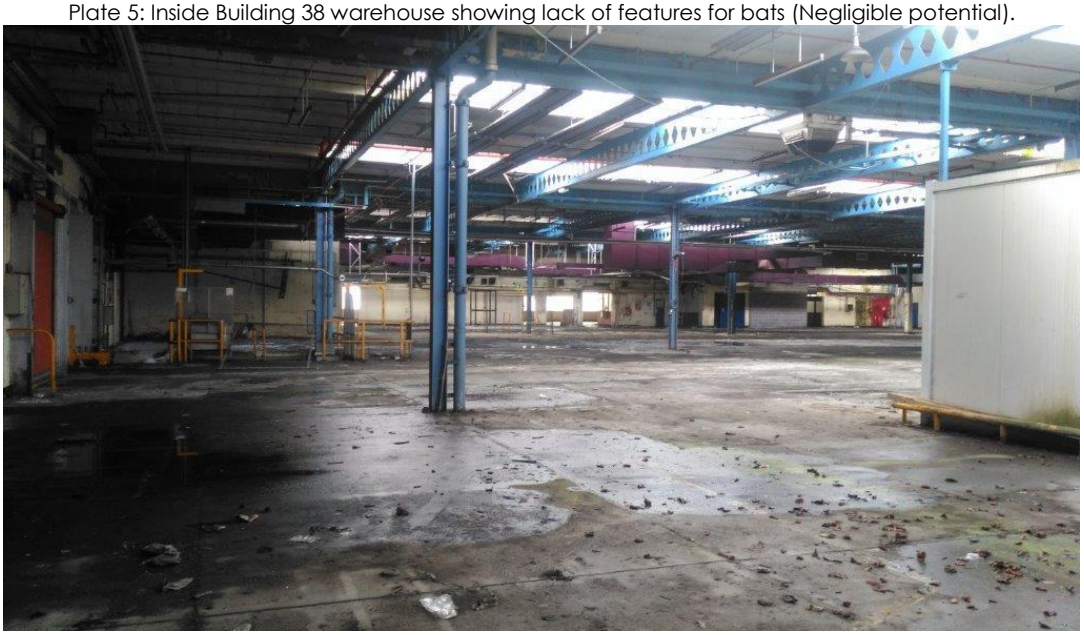


Plate 6: Pits in Plot C which tested negative for great crested newts

Plate 7: Brick pit in Plot C (WB6) which tested negative for great crested newts

Plate 8: Area of unmanaged vegetation (scattered scrub and tall ruderals) to east of Plot C

APPENDIX D: BAT SURVEY DATA

Dusk Emergence Survey: 2nd July 2018

Focusing on Building 20

Date	Building	Survey Timing	Sunset Time	Start / End of Survey	Temp (°C)	Wind (Beaufort Scale)	Cloud cover	Rain
02/07/18	Building 20	Dusk	21:41	Start (21:26)	20	3	0%	Dry
				End (23:10)	18	1	0%	Dry

Surveyor / Location	Time	Species	Number of Bats	Behaviour	Notes
Surveyor 1 (Observing south and west sides of Building 20)	N/A	No Bats Heard	N/A	N/A	N/A
Surveyor 2 (Observing South and east sides of Building 20)	22:29	Pip sp.	1	Foraging	No echolocation heard (still quite light), bat flying like a pipistrelle
	22:35	Long-eared?	1	Foraging	Bat foraging around pine tree, appeared to be gleaning from tree, no echolocation heard so species cannot be confirmed.

Dawn Re-entry Survey: 3rd July 2018

Focusing on Building 39

Date	Building	Survey Timing	Sunrise Time	Start / End of Survey	Temp (°C)	Wind (Beaufort Scale)	Cloud cover	Rain
03/07/18	Building 39	Dawn	04:48	Start (03:18)	16	1	0%	Dry
				End (05:03)	12	1	0%	Dry

Surveyor / Location	Time	Species	Number of Bats	Behaviour	Notes
Surveyor 1 (Observing north and east side of Building 39)	03:35	Common pipistrelle	1	Foraging	Not seen, very brief
	03:37	Common pipistrelle	1	Foraging	Very brief pass, not seen
Surveyor 2 (Observing South and west Side of Building 39)	03:36	Common pipistrelle	1	Foraging	Brief

Dusk Emergence Survey: 16th July 2018

Focusing on Building 8

Date	Building	Survey Timing	Sunset Time	Start / End of Survey	Temp (°C)	Wind (Beaufort Scale)	Cloud cover	Rain
16/07/18	Building 8	Dusk	21:31	Start (21:14)	15	2	95%	Dry
				End (23:00)	14	1	60%	Dry

Surveyor / Location	Time	Species	Number of Bats	Behaviour	Notes
Surveyor 1 (Observing north and east sides of Building 8)	21:52	Common pipistrelle	1	Foraging	Two passes
	22:39	Common pipistrelle	1	Foraging	Two passes
Surveyor 2 (Observing South and west sides of Building 8)	22:40	Common pipistrelle	1	Foraging	Heard not seen.

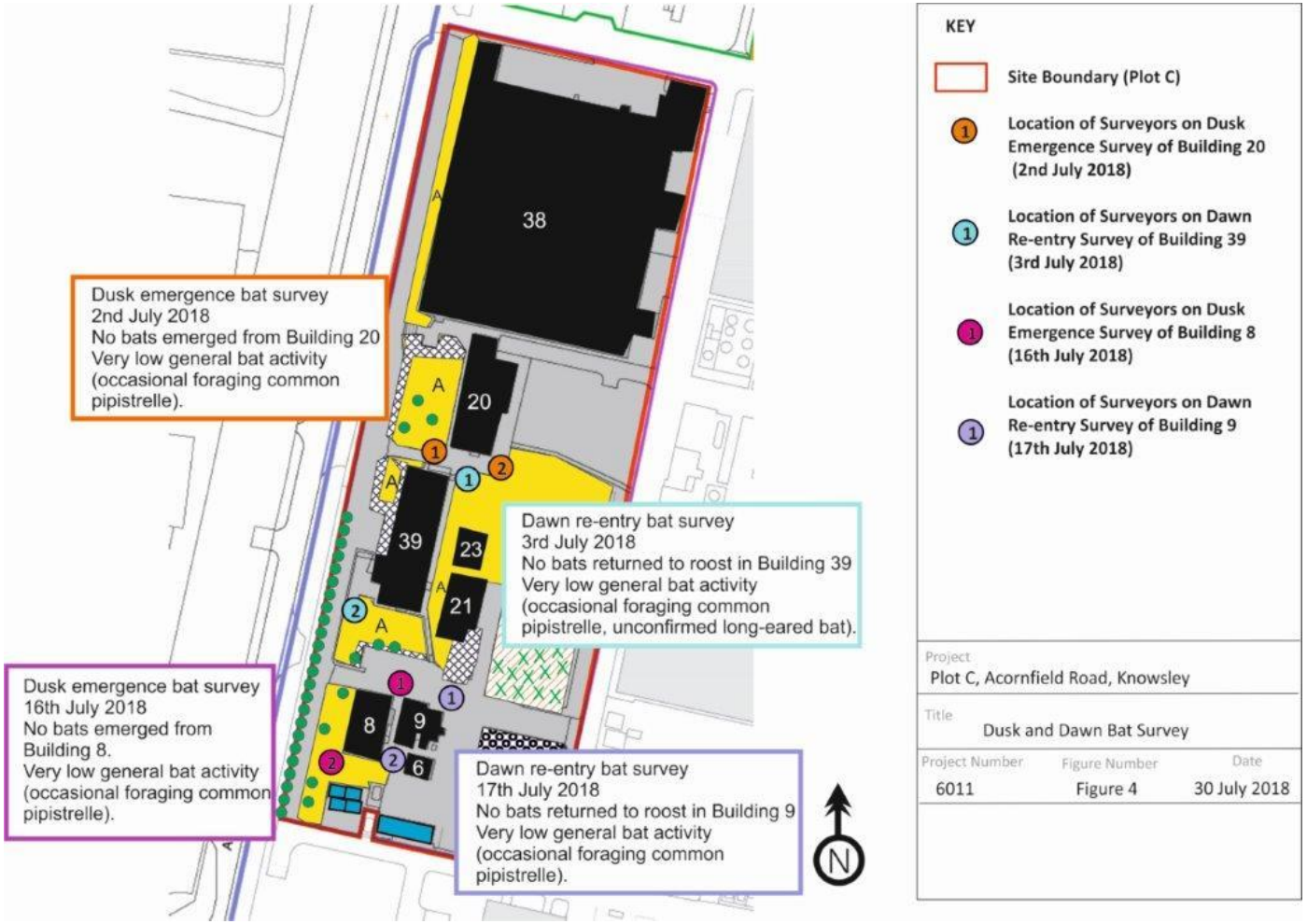
Dawn Re-entry Survey: 17th July 2018

Focusing on Building 9

Date	Building	Survey Timing	Sunrise Time	Start / End of Survey	Temp (°C)	Wind (Beaufort Scale)	Cloud cover	Rain
17/07/18	Building 9	Dawn	05:04	Start (03:30)	13	1	100%	Dry
				End (05:20)	14	1	100%	Dry

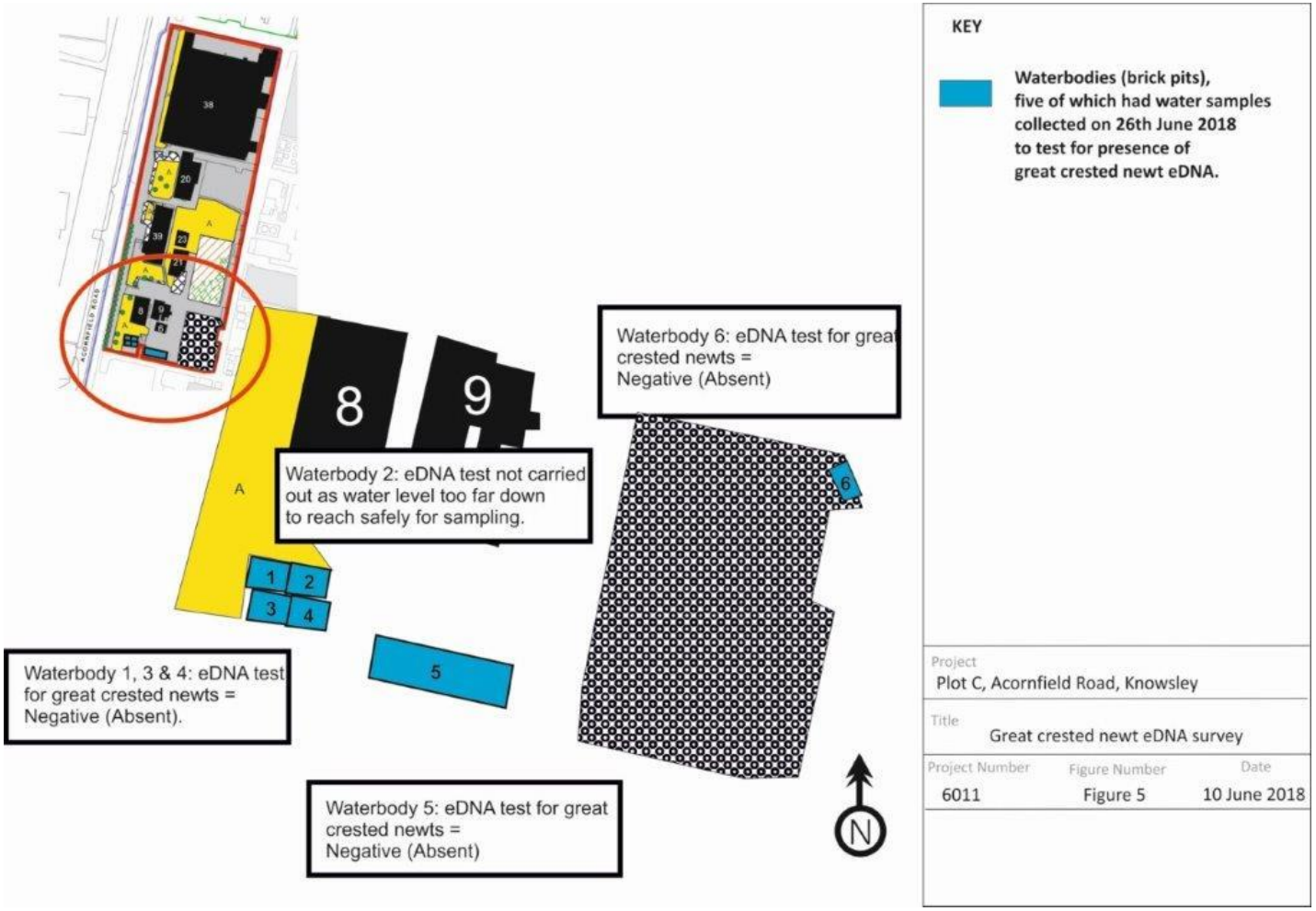
Surveyor / Location	Time	Species	Number of Bats	Behaviour	Notes
Surveyor 1 (Observing north and east side of Building 9)	03:33	Common pipistrelle	1	Commuting and social calls	
Surveyor 2 (Observing South and west Side of Building 39)	03:31	Common pipistrelle	1	Commuting	Brief pass, not seen

APPENDIX E: FIGURE 4 BAT SURVEY SUMMARY



7.1.3

APPENDIX E: FIGURE 5 GREAT CRESTED NEWT EDNA



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Appendix G – Risk Definitions

Contaminated Land Risk Definitions

The following methodology is based on the methodology presented in CIRIA C552 Contaminated Land Risk Assessment: A Guide to Good Practice 2001. It requires the classification of the:

- Magnitude of the potential consequence (severity) of the Risk occurring: and
- Magnitude of the Probability (likelihood) of the Risk occurring.

The classifications are then compared to indicate the risk presented by each pollutant linkage.

Consequence to Receptor Definition Matrix

	Human Health	Controlled Waters	Buildings/Services
Severe Consequence	Acute or chronic permanent impact on human health.	Sensitive controlled water pollution ongoing, or just about to occur.	Catastrophic collapse
Medium Consequence	Chronic permanent impact on human health	Gradual pollution of sensitive controlled water	Degradation of materials
Mild Consequence	Chronic temporary impact on human health	Gradual pollution of non-sensitive controlled water	Damage to building rendering it unsafe.to occupy (eg foundation damage resulting in instability).
Minor Consequence	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc).	Slight discoloration of water	Easily repairable effects of damage to buildings, structures and services, i.e discoloration of concrete

Probability Definitions

Probability	Definition in Context
Higher	There is a pollution linkage and an event that either appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution. Positive evidence of source, pathway and receptor.
Likely	There is a pollution linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term. Suspect source, pathway, and receptor
Low Likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place, and is less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term No evidence of hazard, pathway, and receptor

Standard Risk Matrix

		Consequence/ Magnitude of impact			
		Severe	Medium	Mild	Minor
Probability	**High**	Very High	High	Moderate	Moderate/Low
	Likely	High	Moderate	Moderate/low	Low
	Low Likelihood	Moderate	Moderate/low	Low	Very Low
	Unlikely	Moderate/low	Low	Very Low	Very Low

Classified risks and likely action

Significance Level	**Definition/Comments**
Very High Risk	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required. Demonstrable contaminated land situation, highest threat & liability level, urgent action recommended.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short term and are likely over the longer term. Likely contaminated land situation, risk assessment and action recommended.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, if is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer term. Plausible contaminated land situation, risk assessment and possible action recommended.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild. Unlikely contaminated land situation, possible risk assessment and possible action.
Very Low Risk	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe. Negligible risk, no action recommended except vigilance for changes in conditions.

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Geotechnical Risk Classification

The geohazards listed in the report within Section 4 follow guidance presented in Clayton, C.R.I. (2001) *Managing Geotechnical Risk*, Thomas Telford and the Highways Agency document HD22/08 '*Managing Geotechnical Risk'* (2008) which aims to identify and manage the geotechnical risks associated with a scheme throughout its lifespan, from planning to construction to maintenance.

For each geohazard the probability of the hazard occurring (P) has been considered together with the impact it would have (I) if it were to happen to calculate the risk rating between 1 and 25.

Risks that fall within Moderate, Significant and Severe categories below are considered to be ***substantial*** and are therefore listed within the report.

Probability	**(P)**
Very Likely (VLk)	5
Likely (Lk)	4
Plausible (P)	3
Unlikely (U)	2
Very Unlikely (VU)	1

X

Impact	**(I)**
Very High (VH)	5
High (H)	4
Medium (M)	3
Low (L)	2
Very Low (VL)	1

=

(R)	**Risk**
20 – 25	Severe
15 – 19	Substantial
10 – 14	Moderate
5 – 9	Minor
1 – 4	Negligible