
COMPLETION REPORT
for
REMEDIATION & SITE PREPARATORY WORKS
at land off
ST KEVIN'S DRIVE, KIRKBY

Prepared for



ALM Consult Limited

Paddock Business Centre, 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire, WN8 9PL
T: 01695 213160 **E:** info@almconsult.co.uk

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1 INTRODUCTION

1.1 The Commission and Brief

- 1.1.1 ALM Consult Limited (ALM), were commissioned by McDermott Homes Ltd to prepare a Completion Report for remediation & site preparatory works at the residential development off St Kevin's Drive, Kirkby, Liverpool.
- 1.1.2 The site has been redeveloped with 173No. domestic dwellings, associated gardens, public open space and adoptable roads and sewers. A 'Proposed Site Layout' (MCK Associates Ltd Drawing No.16-075-0003_Rev_M), dated 26th October 2016, was provided by McDermott Homes, a copy of which is included in Appendix A to this report.
- 1.1.3 The site is situated in a dominantly residential area, with the site being historically occupied by a number of school buildings, associated playing fields, and residential properties, with all previous buildings having been demolished.
- 1.1.4 This document presents verification for works deemed necessary to render the site suitable for the proposed redevelopment of the site. Necessary remediation and site preparatory works were outlined in ALM Report No.30158-2_Rev1, 'Remediation Strategy for land off St Kevin's Drive, Kirkby', dated November 2017.

1.2 Previous Reports

- 1.2.1 ALM produced a 'Geoenvironmental Appraisal of land off St Kevin's Drive, Kirkby', ALM Report No.30158-1, dated November 2017, on behalf of McDermott Homes Ltd, which consolidated information presented in separate reports previously produced for the eastern and western halves of the site. The Geoenvironmental Appraisal report should be read in conjunction with this remediation strategy.
- 1.2.2 The above report was based on information contained within previous Desk Study reports produced by REC Consulting Ltd (REC) and ALM, initial phases of ground investigation undertaken by ESG in 2015 and CCG in 2016, and a supplementary phase of ground investigation undertaken by ALM in October 2017. The previous reports covering the site are listed below;
- Resource & Environmental Consultants Limited (REC). "Geo-Environmental Site Assessment. Knowsley Northern PSC". Report No. 45759Gp1r0, dated September 2014, undertaken for Morley Design Associates Limited on behalf of KMBC.
 - ALM Consult Limited. "Preliminary Geoenvironmental Appraisal of Land to the West of Bramcote Walk, Kirkby (Former Overdale Junior & Infants Schools)". Report No. 30090/15, dated October 2015, undertaken on behalf of KMBC.
 - ESG Limited. "Knowsley Northern Primary Support Centre, Kirkby. Factual Report on Ground Investigation". DRAFT Report No. F5014-15. September 2015.
 - CC Geotechnical Limited. "Intrusive Ground Investigation on Land Adjacent Roughwood Drive and Meadowsweet Road, Kirkby, Liverpool, L33". Report No. CCG-C-16-8827. March 2016.

- 1.2.3 The findings presented in the two Factual Reports on Ground Investigation produced by ESG Ltd and CCG Ltd, were interpreted by ALM in 2015 and 2016, who produced the following two reports;
- 'Geoenvironmental Appraisal of land at Roughwood Drive Kirkby (Former Knowsley Northern Primary Support Centre [Site 4] – Interpretive Report', ALM Report No.30090/4, dated September 2015.
 - 'Geoenvironmental Appraisal of land to the West of Bramcote Walk, Kirkby (Former Overdale Junior & Infant Schools – Interpretive Report', ALM Report No.30090/15/2, dated April 2016.
- 1.2.4 The above reports were produced on behalf of Knowsley Metropolitan Borough Council (KMBC) as part of a program of land disposal.
- 1.2.5 Necessary remediation and site preparatory works were outlined in ALM Report No.30158-2_Rev1, 'Remediation Strategy for land off St Kevin's Drive, Kirkby', dated November 2017.

1.3 The Proposed Development

- 1.3.1 The development comprises 173No. domestic dwellings, associated gardens, public open space and adoptable roads and sewers, as shown on the 'Proposed Site Layout' (MCK Associates Ltd Drawing No.16-075-0003_Rev_M), dated 26th October 2016.
- 1.3.2 The 'Proposed Site Layout' shows no development above the line of the existing culverted Kirkby Brook watercourse, which passes beneath the western edge of the site, with 'Linear Open Space' proposed above this area. The layout also shown a continuation of the 'Linear Open Space' along the northern boundary of the site, eventually connecting with the existing 'Forest Hills Country Park' in the east.
- 1.3.3 Vehicular access to the development will be from St Kevin's Drive in the west. Numerous pedestrian accesses to the site are located along the southern boundary, and to the proposed 'Linear Open Space' in the north and west.

2 BACKGROUND

2.1 Former Site Features

- 2.1.1 The site is located approximately 2km north of Kirkby town centre. The site comprises an irregular shaped parcel of land covering an area of approximately 9.685 hectares, centred on Ordnance Survey Grid Reference 341850E 399835N. A site location plan is presented as Drawing No.30158/1 presented in Appendix A.
- 2.1.2 Site features immediately prior to the redevelopment are presented on Drawing No.30158/2 in Appendix A.
- 2.1.3 The site was dominated by extensive areas of open grassland, present in the western and eastern parts of the site. The western area of grassland was partially maintained and used as an area of public open space. St Kevin's Drive entered the west of the site, continuing approximately 100m into the site before terminating at a 'turning circle'.
- 2.1.4 The center of the site was occupied by two areas surrounded by 2m high steel palisade fencing. These areas are covered by unmaintained grassland and self-seeded trees. A small electricity sub-station of brick construction was present within the northernmost of the two fenced areas. The two fenced areas are understood to have been formerly occupied by the Overdale Infant & Junior Schools in the central part of the site, and the Bramcote/Northfield Primary School in the northern central part.
- 2.1.5 A third area of open grass was present in eastern central parts of the site, which is maintained and is crossed by three tarmac pathways connecting Roughwood Drive to Bramcote Road and a footbridge crossing the railway to the north.
- 2.1.6 Tarmac covered roads and pavements (Bramcote Walk and Bramcote Close) entered the eastern central and eastern edges of the site, respectively.
- 2.1.7 An opening to a surface water culvert is present in the western corner of the site, which carries the north-westerly flowing Kirkby Brook. The Kirkby Brook is understood to pass within the culvert beneath the western edge of the site.
- 2.1.8 Ground levels across the site appeared relatively flat, but fell gently to the west, with ground levels generally ranging between 28.5mAOD in the west, to 33.5mAOD in the east.
- 2.1.9 Land to the west of the site comprises a recently constructed housing estate. The site is bound to the north by a railway line, which runs within a shallow cutting along much of its length, and on a low embankment in the northwest. The southern boundaries of the site are denoted by Roughwood Drive and the rear gardens and side elevations of residential properties located off Chadwell Road, Bramcote Close and Bramcote Road. To the east of the site is an area of dense trees comprising part of the Northwood Forest Hills Park, through which are a series of gravel footpaths.

2.2 Site History

- 2.2.1 Historical Ordnance Survey maps dating from 1850 show the site to have remained undeveloped and in agricultural use up to at least the late 1950s/early 1960s, at which time the Overdale Infant and Junior Schools were developed in the central part of the site. The Kirkby Brook, which flowed along the western boundary of the site would appear to have been culverted at this time and land in the west of the site was probably in use as school playing fields and used by either the Overdale Schools or the adjacent St Kevin's RC Secondary School. Residential development is also shown both within the eastern edge of the site and to the east at this time, and a former well feature in the east is no longer shown. Development of the Bramcote/Northfield Primary School is shown in northern central parts of the site from early 1970's.

- 2.2.2 Gradual clearance of residential properties is shown in the east of the site between the 1970's and 2000's.
- 2.2.3 Historical site features are shown on Drawing No.30158-4 in Appendix A.
- 2.2.4 Surrounding land within the immediate vicinity of the site would appear to have also substantially been in agricultural use throughout the 19th Century and the early 20th Century, with the development of residential properties and schools taking place on land to the north, east and south by the 1960s.

2.3 Ground Investigation

- 2.3.1 The site was subject to ground investigation undertaken by CCG in the western half of the site during 2016, ESG in the eastern half of the site during 2015, and a supplementary phase of ground investigation undertaken by ALM in 2017. The findings of the ground investigations are presented in the reports listed in Section 1.2 above, and are briefly summarized below.

Made Ground

- 2.3.2 A number of different types of made ground were encountered during ground investigations at the site. These included; reworked topsoil, culvert backfill, demolition fill, granular fill and cohesive fill, as well as tarmac hardstand and granular sub-base materials.
- 2.3.3 Reworked topsoil was encountered to depths between 0.1m to 0.9m, but generally <0.5m, above made ground (where present) across the site, and generally comprised dark brown silty sand with occasional gravel of brick, sandstone, concrete and occasional pieces of wood, plastic, metal and ceramic. Reworked topsoil comprising brown clayey sand with much gravel of sandstone, was present in northern central parts of the site to depths between 0.15m to 0.25m.
- 2.3.4 A thin layer (0.1m) of tarmac was encountered beneath a veneer of reworked topsoil in two isolated locations at the western boundary of the site and within the former Overdale School area in the center of the site. The tarmac was underlain by a 0.2m thick layer of gravelly sand /sandy gravel of sandstone to 0.4m depth, which was considered to represent granular subbase to the tarmac. Similar material, but perhaps with greater thickness, can be expected to be present beneath existing roads entering the east and west of the site, and beneath footpaths in the eastern central part of the site.
- 2.3.5 Made ground was generally encountered to depths between 0.55m to 1.5m in the vicinity of the culverted Kirkby Brook in the west of the site. The Culvert Backfill materials were noted to be granular in nature, typically comprising gravelly sand containing brick, sandstone and concrete fractions. No deleterious materials such as metal, wood/timber etc. were noted within the Culvert Backfill materials.
- 2.3.6 Made ground typically comprising gravelly sand/sandy gravel containing brick, sandstone and concrete fractions, with occasional pieces of glass, metal, pipework, wood/timber and pipework etc. were noted materials to depths of between 0.3m and >1.8m in a number of trial pits located in the central and northern central parts of the site. These materials were observed to vary over relatively short distances and their distribution is typically coincident with the footprint of former school buildings, and were therefore considered to reflect materials derived from the demolition of the former School buildings (Demolition Fill).
- 2.3.7 Granular fill was encountered to depths between 0.4m and 1.7m (ave.0.6m) in a number of locations beneath eastern parts of the site, generally coincident with the footprint of former residential properties. The Granular Fill materials were typically encountered as a dark brown slightly gravelly sand containing gravel of brick, concrete, ceramic and macadam and, locally, occasional cobbles of brick and concrete.

- 2.3.8 Cohesive made ground was encountered in beneath the northern central and eastern parts of the site. The Cohesive Fill was encountered site as a dark brown very sandy gravelly clay with the gravel fraction comprising of mixed lithologies with rare brick and ceramic fragments. The Cohesive Fill materials were observed to depths of between 0.7m and 1.0m and extended to an average depth 0.8mbegl (average thickness 0.7m).
- 2.3.9 Pale orange brown gravelly sand with many cobbles of reddish orange sandstone was encountered to a depth in excess of 1.5m, whilst investigating in the vicinity of a possible former well feature in the eastern central part of the site. This was interpreted as a possible location of the former 'Well', and was positioned at National Grid Reference: 341907E 399850N.
- 2.3.10 Below ground structures were recorded in three locations beneath the eastern edge of the site, in locations coincident with former residential buildings.

Natural Ground

- 2.3.11 Natural strata was encountered in all but one exploratory hole across the site, and was generally found to be variable, comprising of topsoil, wind blown (Aeolian) sand, glacial sand, glacial clay, and sandstone bedrock.
- 2.3.12 Natural topsoil, generally comprising dark brown silty sand, was encountered in the majority of exploratory holes located within the central western parts of the site, and parts of the northeast of the site, beneath former playing fields (ave 0.3m). Natural topsoil was also encountered beneath the area of public open space off Bramcote Walk in the central part of the site (ave. 0.5m).
- 2.3.13 Natural clay strata are present immediately beneath topsoil in central western parts of the site. The glacial clay was noted to be variable in nature and often interbedded with glacial sand strata. The glacial clay was typically noted to be firm/firm to stiff, particularly where present at near surface, with undrained shear strengths of between ca. 50-100kPa. However, deeper clay strata were frequently noted to be very soft or soft in nature, often where overlain by glacial sand deposits or present as softer bands within the firm/stiff clays, with recorded undrained shear strengths of between ca. 15-40kPa. These softer clay materials could be a reflection of softening due to perched groundwater within the more permeable interbedded sand horizons.
- 2.3.14 Granular glacial deposits were encountered in a large number of exploratory holes interbedded within or present above the Glacial Boulder Clay strata. These deposits were typically recorded, where encountered, as silty fine to medium sand and locally contained minor fractions of fine to coarse gravel.
- 2.3.15 Where present above the glacial clays, particularly in the east of the site, near surface pale orange brown sand deposits have been interpreted as wind blown sands (Shirdley Hill Sands). The wind blown sands were generally loose to very loose in nature, becoming progressively medium dense with depth, and extended to depths between 1.3m to 3.6m, deepest in the eastern edge of the site.
- 2.3.16 Weathered sandstone bedrock was encountered in a number of exploratory holes, at depths between 3.3m to 5.2m. The bedrock was generally recovered as very dense gravelly sand or very stiff friable clay.

Groundwater

- 2.3.17 In general terms, no significant inflows of groundwater were encountered in exploratory holes during drilling/excavation. However, seepage of groundwater was noted in sand strata within the glacial drift and at the base of demolition fill in some exploratory holes.

- 2.3.18 Standing water levels recorded in monitoring wells across the site, suggest that there is a shallow groundwater body present within the glacial drift deposits with a direction of groundwater flow generally towards the west/southwest.

Contamination & Remediation

- 2.3.19 Asbestos fibres were recorded in reworked topsoil, cohesive made ground and demolition fill in four locations (TP106, TP107, WS704 and WS704N1) within the former Bramcote/Northfield School area in the norther central part of the site. Demolition fill in this area has also reported elevated concentrations of PAH and TPH. Therefore, all made ground beneath this area of the site was considered unsuitable for retention at the surface within the proposed redevelopment.
- 2.3.20 It was recommended that made ground from beneath the former Bramcote/Northfield School area, should be either excavated and disposed of to a suitable licensed landfill, or could be retained on site beneath a suitably thick clean soil cover. As no asbestos quantification has been undertaken on soils from this area, ALM recommended the soils are disposed of off-site if >0.1% asbestos is present, or retained beneath a 1m clean soil cover if <0.1% asbestos is present. As no asbestos containing materials are noted on exploratory hole logs, or were obvious in the soils during the supplementary ground investigation, preliminary estimates are that <0.1% asbestos will be present within the impacted soils.
- 2.3.21 Laboratory chemical analysis and subsequent statistical analysis (where necessary) showed that, with the exception of statistical outliers in samples from the former Bramcote/Northfield School area, reworked topsoil, culvert backfill, demolition fill, granular made ground, natural topsoil and natural drift strata, were free from significant soil contamination.
- 2.3.22 Reworked topsoil and natural topsoil were considered suitable for re-use as topsoil within the proposed redevelopment.
- 2.3.23 Whilst considered free for significant soil contamination, culvert backfill, demolition fill, and granular made ground contain a proportion of coarse materials such as brick and concrete, which would be generally unsuitable for retention at the surface in private garden and landscape areas. Therefore, where present at the surface following any site regrade works, and where deemed necessary, it was recommended that these soils be retained beneath a 300mm clean soil cover (typically 150mm subsoil and 150mm topsoil) in private gardens and landscaped areas, which will provide amenity and a growing medium for plants.

3 REMEDIATION & SITE PREPARATORY WORKS

3.1 General

3.1.1 A number of general items of site preparatory work were listed in the Remediation Strategy (ALM Report No.30158-2_Rev1), which included;

- Identification/fencing of existing trees that are to be retained and protected.
- Clearance of pre-existing vegetation and removal of unprotected trees.
- Excavate existing tarmac/concrete hardstand, where present.
- Excavate/turn over and screen oversized material from Demolition Fill and Granular Made Ground from the central and eastern parts of the site.
- Breakout any relict floorslabs/foundations that may be encountered.
- Crush and screen to a suitable grading all hard arisings.
- Re-locate crushed/screened materials to separate stockpiles (e.g. crushed tarmac, crushed concrete etc.).
- Prepare adoptable road footprints using selected stockpiled/imported granular materials (re-engineered to specification).

These items are considered to represent works undertaken to provide general amenity and geotechnical improvement and are not covered in any detail within this report.

3.1.2 ALM understand that the above general works were carried out, although hard materials arising from breaking out of tarmac or concrete surfaces and buried structures was of such low volume that it was not economical to recycle on site, and therefore was taken off site.

3.1.3 The following remediation works with a specific environmental element were carried out and are reported in detail as part of this report:

- Locate the former well feature in the eastern central parts of the site, treat in accordance with Environment Agency guidance, and introduce a suitable reinforcement (i.e. geo-grid) above this feature to minimise the possibility of any future instability at the surface of the site, caused by this feature.
- Demolition of existing electricity sub-station, and validation soil sampling beneath the floor slab to confirm absence of PCB contamination.
- Excavate reworked topsoil, Demolition Fill and other made ground from beneath the northern central part of the site (former Bramcote/Northfield School), which has been shown to contain asbestos fibres, PAH and TPH, and stockpile separately prior to disposal off-site or relocation beneath a suitably thick clean soil cover in an area that will not be disturbed by future works (i.e. landscape area). These soils should be covered by a suitable plastic membrane to prevent dust generation, and subject to asbestos quantification testing to determine its waste classification for disposal purposes, and/or its suitability for relocation beneath the site.
- Strip existing natural and reworked topsoil materials and relocate to stockpiles in accordance with DEFRA 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites' (2009).
- Placement of topsoil and subsoil in proposed landscaped and private garden areas where residual made ground is present in such areas.

3.1.4 Remediation and site preparatory works were carried between Spring 2018 and Summer 2022. The redevelopment was undertaken in a phased manner, with Phase 1 in the west progressing to Phase 4 in the east, as shown on Drawing No.30158-12 in Appendix A.

- 3.1.5 The works generally comprised the reuse of natural and reworked strata (i.e. topsoil) and did not require a Material Management Plan (MMP). However, the reuse of a small volume (<1,000 tonnes) of made ground in the latter stages of the works, was done under a U1 Waste Exemption Ref:WEX299896. A copy of the U1 Exemption is included in Appendix E.

3.2 Location and Treatment of Former Well Feature

- 3.2.1 A 'Well' was shown within the eastern central part of the site on the historical OS plans dated before 1961. Ground investigation has identified an approximate 1.5m diameter zone of infill comprising red orange cobbles of sandstone located broadly in the anticipated location of the former Well (Trench No.2).
- 3.2.2 The approximate location of the well was plotted on Drawing No.30158/4, and was centered at National Grid Reference: 341907E 399850N.
- 3.2.3 Consideration of the 'Proposed Site Layout', MCK Drawing No.16-075-0003_RevM, indicated that the possible location of the Well was located in the pavement area to the front of Plot No.73/74.
- 3.2.4 Further investigation to more accurately locate the former well was undertaken by ALM on Wednesday 27th March 2019. Excavations concentrated on the anticipated location centered at National Grid Reference: 341907E 399850N.
- 3.2.5 Ground conditions comprised approximately 300mm of topsoil overlying fine to medium sand, with occasional cobble of brick suggesting these strata were made ground. At a depth of approximately 1.2m large sandstone cobbles were included in arisings from the excavation, which upon more careful excavation were revealed to be part of a circular feature approximately 1.0m diameter (PLATE 7 in Appendix B).
- 3.2.6 Continued excavation recorded the absence of the structure below a depth of approximately 2.2m and groundwater seepage into the excavation at this depth. Soils at the base of the well were noted to be slightly organic, however, no visual or olfactory evidence of contamination was recorded.
- 3.2.7 A sample of the soils recovered from the base of the well (approx. depth 2.2m) was later submitted for laboratory chemical analysis to prove the absence of significant contamination (pH, metals, %TOC, speciated PAH's, speciated TPH and an asbestos screen). No elevated concentrations of contaminants were reported.
- 3.2.8 The excavation was backfilled with arisings in a controlled manner by 'patting' layers of infill into place with the excavator bucket to minimize potential for future settlement. The location of the feature was marked at the surface for future consideration by the earthworks contractor.

3.3 Electricity Sub Station

- 3.3.1 The former electricity sub station covered an area of approximately 5m x 3m (15m²) at the southeast corner of the former Northfield School, as shown on Drawing No.30158-2 in Appendix A.
- 3.3.2 Translation of the position of the former sub-station onto the 'Proposed Site Layout' (MCK Associates Ltd Drawing No.16-075-0003_Rev_M, see Appendix A) places the sub-station immediately to the west of a garage structure to the northwest of Plot No.83.
- 3.3.3 The sub station building was demolished to slab level by mid-2020. The concrete floor slab was broken up and excavated shortly after.

3.3.4 ALM attended site on Monday 23rd November 2020 to obtain a sample of soil from directly beneath the footprint of the former sub-station (PLATE 12 in Appendix B). The sample was scheduled for analysis of PCB's. No concentrations above the laboratory limits of detection were reported.

3.3.5 The results are presented in laboratory report ref:20/16545 Batch1 in Appendix C.

3.4 Excavation of Contaminated Soil\Fill

3.4.1 Reworked topsoil, demolition fill and cohesive made ground beneath the former Bramcote/Northfield Primary School in northern central parts of the site, was shown to contain asbestos fibres and localized elevated concentrations of PAH and TPH contamination. The area considered to be affected by contamination is shown on Drawing No.30158/10 in Appendix A.

3.4.2 Prior to any earthworks in the former Bramcote/Northfield Primary School area, the locations of TP106 and TP107, where asbestos fibres had previously been recorded, were revisited and soil samples taken from the same depths as the original samples where asbestos had been detected in the samples (PLATE 5 & PLATE 6 in Appendix B). Only one sample (TP106A S2 - 0.6m) detected the presence of asbestos fibres. Subsequent quantification of the asbestos within the sample determined <0.001% by weight.

3.4.3 The quantification of asbestos at <0.001% allowed the revision of the remediation strategy to recommend either removal and disposal of the made ground off-site or its retention beneath a minimum 600mm clean soil cover in private garden and landscaped areas, rather than the precautionary 1m clean soil cover previously recommended in the absence of any asbestos quantification.

3.4.4 In order to accommodate a suitably thick clean soil cover (600mm) above contaminated soil beneath the former Bramcote/Northfield Primary School area, a reduced level dig was undertaken in private gardens within this area. Private gardens to Plots No.54-55, 60-72 and 78-81 were determined to lie within the affected area, as shown on Drawing No.30158-13 in Appendix A.

3.4.5 Plots No.56 and 82 were immediately adjacent to the affected areas, but not within, and therefore warranted a watching brief during excavations. A very small area in the northwest corner of Plot No.83 was also within the affected area, however, this area was covered by a garage building, as shown on the 'Proposed Site Layout' (MCK Associates Ltd Drawing No.16-075-0003_Rev_M in Appendix A).

3.4.6 Soil arisings from the reduced level dig were relocated above other made ground in the northeast of the affected area, within an area of proposed public open space. An area of approximately 1,000m² covering the garden areas of affected plots, was excavated to a depth of approximately 400mm-500mm, therefore, approximately <500m³ of made ground was relocated.

3.4.7 The subsequent placement of clean soil cover in affected garden areas is discussed in Section 3.7 below.

3.5 Stripping of Topsoil

3.5.1 Reworked and natural topsoil was encountered across the site, to depths between 0.1m to 0.7m, but generally 0.3m thick, and generally comprised dark brown silty sand.

3.5.2 With the exception of reworked topsoil located within the former Bramcote/Northfield Primary School area of the site, all topsoil materials were stripped from the development areas prior to any earthworks, and stockpiled in designated areas.

- 3.5.3 Once stripped and placed in stockpiles, the topsoil from the various phases of the development were sampled and submitted for laboratory chemical analysis comprising; asbestos screen, pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC and speciated PAH, and Total Petroleum Hydrocarbon (TPH) on approximately 25% of samples. Samples were taken at a frequency of approximately 1no. sample per 250m³ of topsoil.
- 3.5.4 The results of the laboratory chemical analysis were compared against the CIEH/LQM 'Suitable for Use Levels' (S4UL) for residential development with home grown produce. With regard to lead, consideration is given to the DEFRA Category 4 Screening Level of 200mg/kg. With regard to phytotoxic determinands (copper and zinc), consideration was given to BS3882:2007 & BS8601:2013. Concentrations of water soluble boron were measured against former ICRL Guidance Note 59/83, second edition (1987).

Phase 1A Topsoil

- 3.5.5 Natural topsoil was striped from the northern half of the Phase 1 area (Phase 1A) in Spring 2018 (see Drawing No.30158-15 in Appendix A). ALM attended site on Thursday 5th July 2018 to obtain 18No. samples of topsoil stripped from approximately 50% of the Phase 1 development area (Phase 1A). The Phase 1A area covered approximately 25,000m² and topsoil is generally 300mm thick, however, topsoil was not stripped from an area covering approximately 4,000m² in the west of the development underlain by the Culverted Kirkby Brook. Therefore, it is estimated that approximately 6,300m³ of topsoil was present in the stockpiles at this time.
- 3.5.6 Topsoil was located in two stockpiles, a large stockpile along the northwest edge of Phase 1 (PLATE 1 in Appendix B), and a smaller stockpile located on the Plot 36-38 area (PLATE 2 in Appendix B), as shown on Drawing No.30158-14_Rev3 in Appendix A. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.
- 3.5.7 The 18no. samples of topsoil (TS1-TS18) were submitted for a suite of analysis comprising; asbestos screen, pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC and speciated PAH. 4No. of the samples were submitted for speciated TPH.
- 3.5.8 The results of the laboratory chemical analysis are included in Appendix C. None of the samples exhibited any concentrations of determinands above the chosen criteria.

Phase 1B Topsoil

- 3.5.9 ALM attended site on Wednesday 6th March 2019, and again on Tuesday 12th March 2019, to obtain 14no. samples of topsoil (TS19-TS32) stripped from the remaining part of the Phase 1 development area (Phase 1B). The Phase 1B area covers approximately 17,500m² and topsoil is generally 300mm thick. Therefore, it is estimated that approximately 5,250m³ of topsoil was present in the stockpiles in Phase 1B.
- 3.5.10 Topsoil in Phase 1B was located in two stockpiles, a large stockpile along the southwest edge of Phase 1, and a smaller stockpile was located near to the Plot 153-154 area, as shown on Drawing No.30158-14_Rev3 in Appendix A and PLATE 3 in Appendix B. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination. Selected Photos of the stockpiles are also included in Appendix B.
- 3.5.11 The 14no. samples of topsoil were submitted for a suite of analysis comprising; pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC and speciated PAH. A further 7No. samples were screened for asbestos, and 3No. samples were submitted for speciated TPH.

- 3.5.12 The results of the laboratory chemical analysis are included in Appendix C. None of the samples exhibited any concentrations of determinands above the chosen criteria. However, asbestos fibres were encountered in one sample (Topsoil 27) of topsoil stripped from the Phase 1B area. Quantification analysis of asbestos from the Topsoil 27 sample, identified <0.001% asbestos to be present in the sample.
- 3.5.13 ALM attended site on Wednesday 10th April 2019 to observe the excavation of soils from the Topsoil 27 sample location, and obtain further samples of topsoil from the area immediately surrounding the Topsoil 27 sample location, in order to confirm the adequate removal of impacted soils. Validation sampling comprised taking a sample from the base and north, south, east, and west, sidewalls of the excavation, and the submission of those samples for an asbestos screen test. The results of the laboratory chemical analysis are included in Appendix C. None of the validation samples exhibited the presence of asbestos.

Phase 2 Topsoil

- 3.5.14 ALM attended site on Wednesday 6th March 2019, to obtain 10no. samples of topsoil (TS33-TS42) stripped from the Phase 2 development area. The Phase 2 area covers approximately 8,500m² and topsoil is generally 300mm thick. Therefore, it is estimated that approximately 2,500m³ of topsoil was present in the stockpiles in Phase 2.
- 3.5.15 Topsoil in Phase 2 was located in one 'L' shaped stockpile, as shown on Drawing No.30158-14_Rev3 in Appendix A and PLATE 4 in Appendix B. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.
- 3.5.16 The 10no. samples of topsoil were submitted for a suite of analysis comprising; pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC, speciated PAH and asbestos screen, and 3No. samples were submitted for speciated TPH.
- 3.5.17 The results of the laboratory chemical analysis are included in Appendix C. None of the samples exhibited any concentrations of determinands above the chosen criteria. However, asbestos fibres were encountered in one sample (Topsoil 37) of topsoil stripped from the Phase 2 area. Quantification analysis of asbestos from the Topsoil 37 sample, identified <0.001% asbestos to be present in the sample.
- 3.5.18 ALM attended site on Wednesday 10th April 2019 to observe the excavation of soils from the Topsoil 37 sample location, and obtain further samples of topsoil from the area immediately surrounding the Topsoil 37 sample location, in order to confirm the adequate removal of impacted soils. Validation sampling comprised taking a sample from the base and north, south, east, and west, sidewalls of the excavation, and the submission of those samples for an asbestos screen test. The results of the laboratory chemical analysis are included in Appendix C. None of the validation samples exhibited the presence of asbestos.

Phase 3 (South) Topsoil

- 3.5.19 ALM attended site on Tuesday 21st January 2020, to obtain 10no. samples of topsoil (TS43-TS52) stripped from the southern part of Phase 3 development area. It was estimated that approximately 2,500m³ of topsoil was present in 2no. stockpiles in the southern part of the Phase 3 Area.
- 3.5.20 Topsoil in Phase 3 was located in 2no. stockpiles, as shown on Drawing No.30158-14_Rev3 in Appendix A and PLATE 8 in Appendix B. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.
- 3.5.21 The 10no. samples of topsoil were submitted for a suite of analysis comprising; pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC, speciated PAH and asbestos screen, and 3No. samples were submitted for speciated TPH.

- 3.5.22 The results of the laboratory chemical analysis are included in Appendix C. None of the samples exhibited any concentrations of determinands above the chosen criteria.

Phases 3 & 4 Topsoil

- 3.5.23 ALM attended site on Tuesday 21st November 2020, to obtain 18no. samples of topsoil (TS53-TS70) stripped from the northeast part of Phase 3 development area and the whole of the Phase 4 development area. It was estimated that approximately 4,500m³ of topsoil was present in 2no. stockpiles in the Phase 3/4 Area.
- 3.5.24 Topsoil in Phase 3/4 was located in 2no. stockpiles, as shown on Drawing No.30158-14_Rev3 in Appendix A and PLATE 9, PLATE 10 and PLATE 11 in Appendix B. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.
- 3.5.25 The 18no. samples of topsoil were submitted for a suite of analysis comprising; pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC, speciated PAH and asbestos screen, and 3No. samples were submitted for speciated TPH.
- 3.5.26 The results of the laboratory chemical analysis are included in Appendix C. None of the samples exhibited any concentrations of determinands above the chosen criteria.

3.6 Turnover of Made Ground

- 3.6.1 Wholesale turnover of made ground across the site, and particularly beneath central parts of the site, formerly occupied by buildings, was not undertaken. Instead, any relic structures were removed as encountered as the development works progressed.
- 3.6.2 In general, only low volumes of relic structures and oversized material arisings were recovered from beneath the development area. All relic structures and oversized material arisings were removed from site and not processed on site.

3.7 Placement of Soil Cover

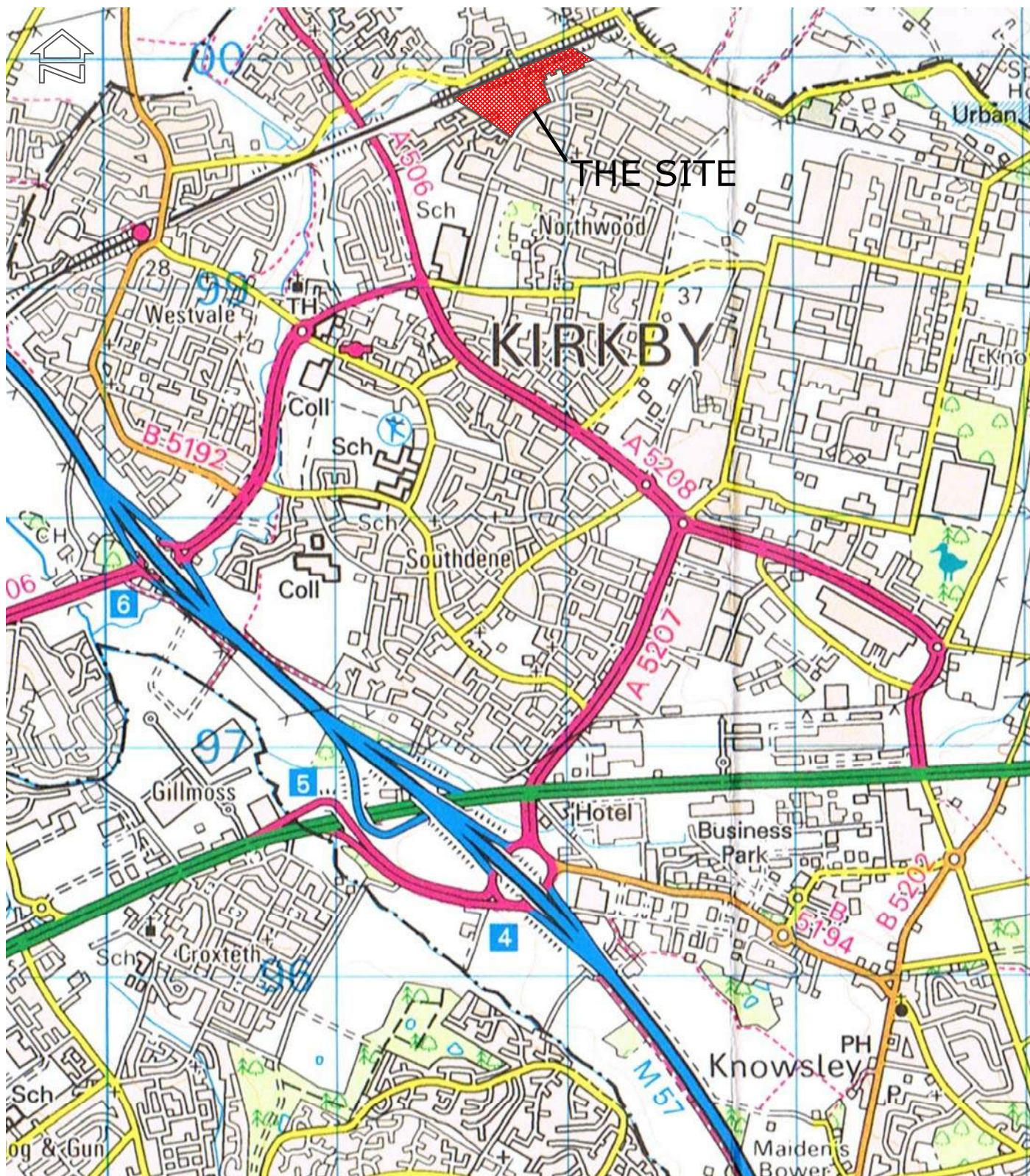
- 3.7.1 As discussed in Section 3.4 above, made ground containing trace concentrations (<0.001%) of asbestos fibres and localized elevated concentrations of PAH and TPH contamination was present beneath the former Bramcote/Northfield Primary School area of the site. These soils were considered suitable to be retained beneath buildings and/or a minimum 600mm clean soil cover, with basal high visibility membrane, in private gardens and landscaped areas of the development.
- 3.7.2 In order to accommodate a 600mm thick clean soil cover, a reduced level dig was undertaken in private gardens within this area. Private gardens to Plots No.54-55, 60-72 and 78-81 were determined to lie within the affected area, as shown on Drawing No.30158-12 in Appendix A.
- 3.7.3 The placement of clean soil cover in affected garden areas was reported in ALM Reports No.30158-CDV1 (Plots 54-55), 30158-CDV2 (Plots 69-72), 30158-CDV3 (Plots 78-81), copies of which are included in Appendix D.
- 3.7.4 Soil arisings from the reduced level dig were relocated above other made ground in the northeast of the affected area, within an area of proposed public open space. An area of approximately 1,000m² covering the garden areas of affected plots, was excavated to a depth of approximately 400mm-500mm, therefore, approximately <500m³ of made ground was relocated.
- 3.7.5 The placement of clean soil cover above contaminated made ground underlying the area of public open space to the north west of the affected plots was reported in ALM Report No.30158-CDV4 (Plots POS Area), a copy of which are included in Appendix D.

3.8 Unanticipated Contamination

- 3.8.1 No unanticipated grossly contaminated soil\fill was encountered during the development works, other than trace concentrations (<0.001%) of asbestos fibres locally recorded in 2no. of 70no. samples of topsoil stripped from the site.
- 3.8.2 The occurrence of these unforeseen contaminants is discussed in Section 3.5 above, and comprised the isolation, delineation and removal of these soils.

APPENDIX A

Drawings



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ALM Consult Limited
Paddock Business Centre 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire. WN8 9PL
T: 01695 213160 E: info@almconsult.co.uk

CLIENT

McDERMOTT HOMES LTD

JOB TITLE

ST KEVIN'S DRIVE, KIRKBY

DRAWING TITLE

SITE LOCATION PLAN

DRAWN BY

KL

SIGNATURE

DATE

13-10-2017

STATUS

FINAL

APPROVED

AA

SIGNATURE

DATE

13-10-2017

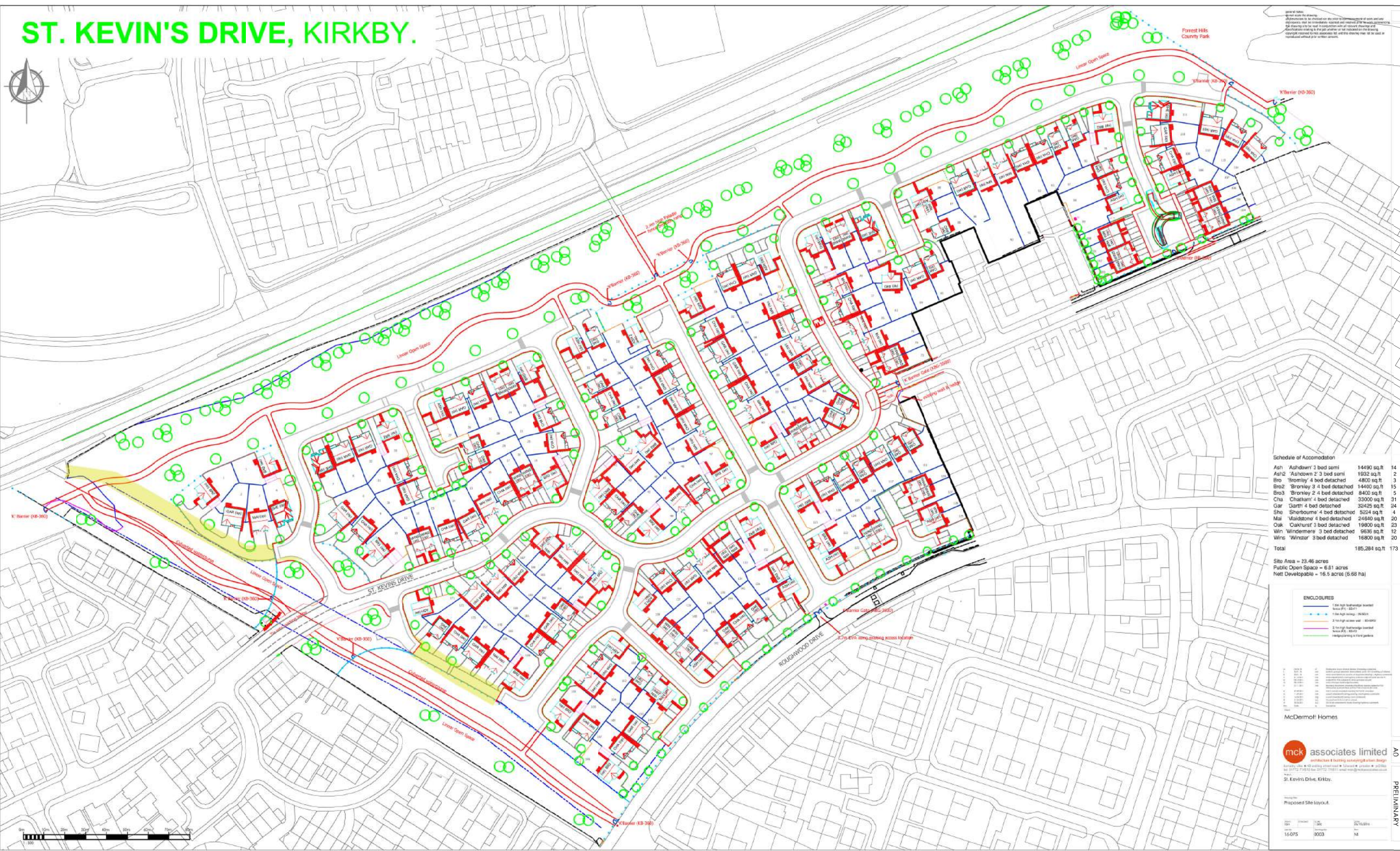
SCALE

NTS

DRG No.

30158-1

ST. KEVIN'S DRIVE, KIRKBY.



Notes:
1. This plan is a preliminary design and is subject to change without notice.
2. The plan is for information only and does not constitute an offer of any product or service.
3. The plan is not to be used for any other purpose without the written consent of the developer.
4. The plan is not to be used for any other purpose without the written consent of the developer.

Schedule of Accommodation		
Ash	Ashdown 3 bed semi	14490 sq.ft
Ash2	Ashdown 2 3 bed semi	1532 sq.ft
Bro	Bromley 4 bed detached	4800 sq.ft
Bro2	Bromley 3 4 bed detached	14400 sq.ft
Bro3	Bromley 2 4 bed detached	8400 sq.ft
Cha	Chatham 4 bed detached	33000 sq.ft
Gar	Garth 4 bed detached	32425 sq.ft
She	Sherbourne 4 bed detached	5224 sq.ft
Mai	Maidstone 4 bed detached	24640 sq.ft
Oak	Oakhurst 3 bed detached	19920 sq.ft
Win	Windsor 3 bed detached	9636 sq.ft
Win2	Windsor 3 bed detached	16800 sq.ft
Total		185,284 sq.ft

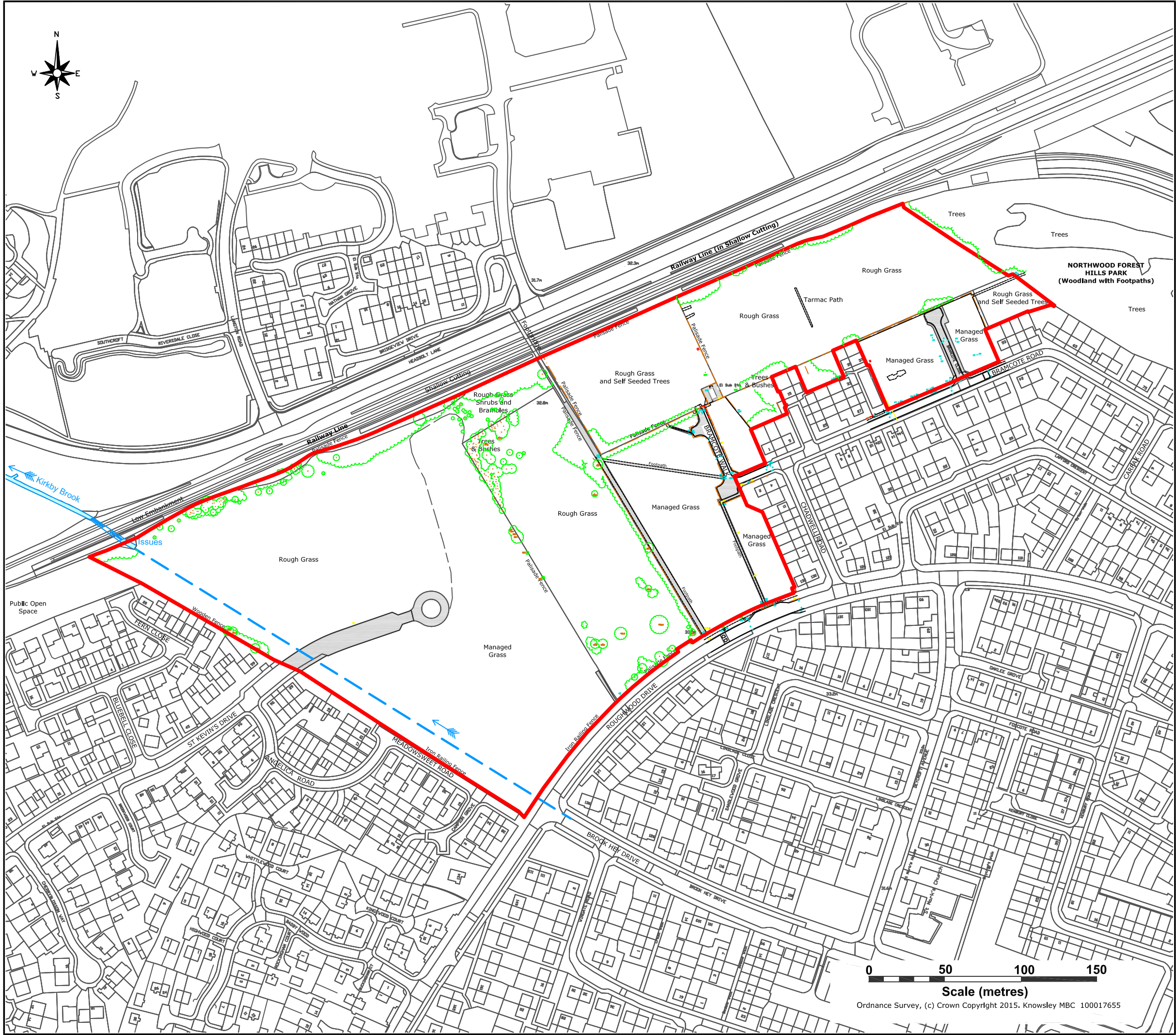
Site Area = 23.46 acres
Public Open Space = 6.81 acres
Nett Developable = 16.65 acres (6.68 ha)

- ENCLOSURES
- 1. 1m high featheredge board fence (P1) 100m
 - 2. 1.5m high featheredge board fence (P2) 100m
 - 3. 2m high featheredge board fence (P3) 100m
 - 4. 3m high featheredge board fence (P4) 100m
 - 5. 4m high featheredge board fence (P5) 100m
 - 6. 5m high featheredge board fence (P6) 100m
 - 7. 6m high featheredge board fence (P7) 100m
 - 8. 7m high featheredge board fence (P8) 100m
 - 9. 8m high featheredge board fence (P9) 100m
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 - 100. 99m high featheredge board fence (P100) 100m

McDermott Homes

mck associates limited

Architects & Planning Consultants
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- KEY**
- Approx. Site Boundary
 - Grassland
 - Paved Areas
 - Surface Water
 - Trees/Shrubs
 - Kirkby Brook Surface Water Culvert 2150mm diameter (indicative)

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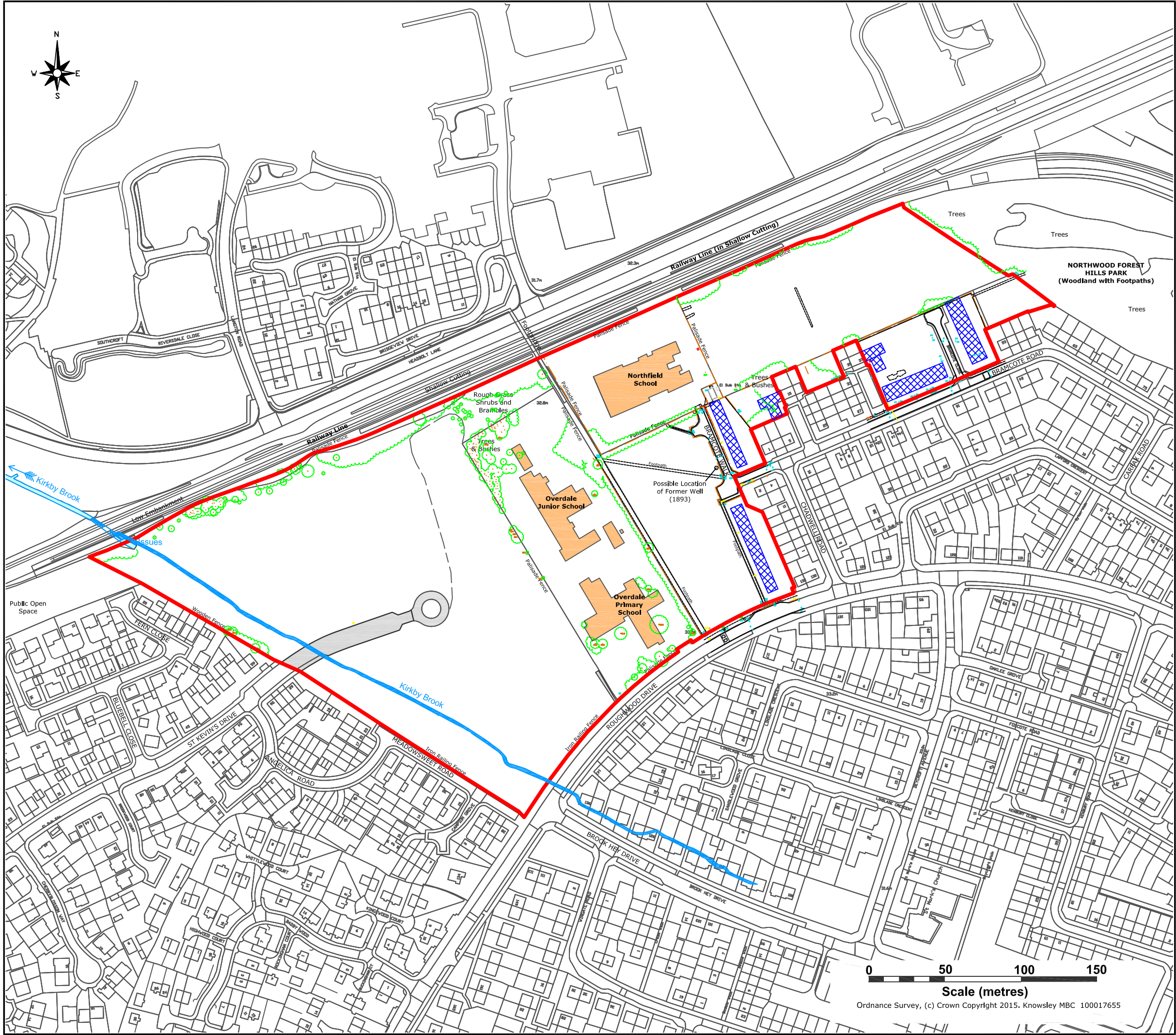


ST KEVIN'S DRIVE, KIRKBY

SITE FEATURES PLAN

FINAL

DRAWN BY KL	SIGNATURE	DATE 13/10/17
APPROVED AA	SIGNATURE	DATE 13/10/17
SCALE 1:2500@A3	DRG No. 30158-2	



KEY

- Approx. Site Boundary
- Former Course of Kirkby Brook
Shown on 1850-1955 OS Maps
- Former School Buildings
Shown on 1962-2006 OS Maps
- Former Residential Buildings
Shown on 1961 OS Maps

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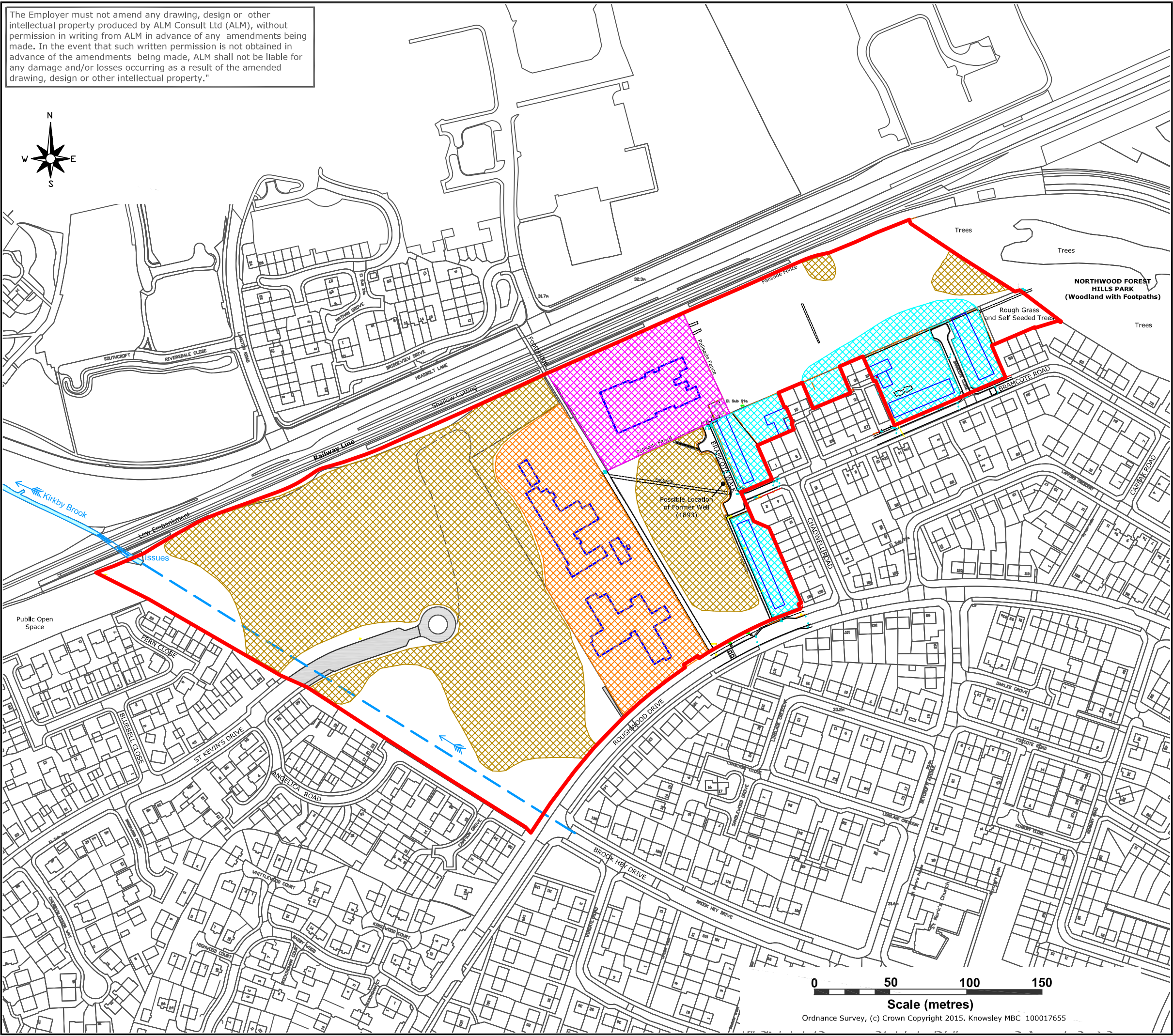
HISTORICAL SITE FEATURES PLAN

STATUS

FINAL

DRAWN BY		SIGNATURE		DATE	
KL				16/10/17	
APPROVED		SIGNATURE		DATE	
AA				16/10/17	
SCALE			DRG No.		
1:2500@A3			30158-4		

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- KEY**
- Approx. Site Boundary
 - Contaminated Soils (former Bramcote/Northfield School)
 - Approximate Area Underlain by Natural Topsoil
 - Approximate Area Underlain by Demolition Fill
 - Approximate Area Underlain by Granular Made Ground
 - Approximate Outline of Historic Buildings
 - Unshaded Areas Underlain by Reworked Topsoil Over Natural Strata, Culvert Backfill or Cohesive Made Ground



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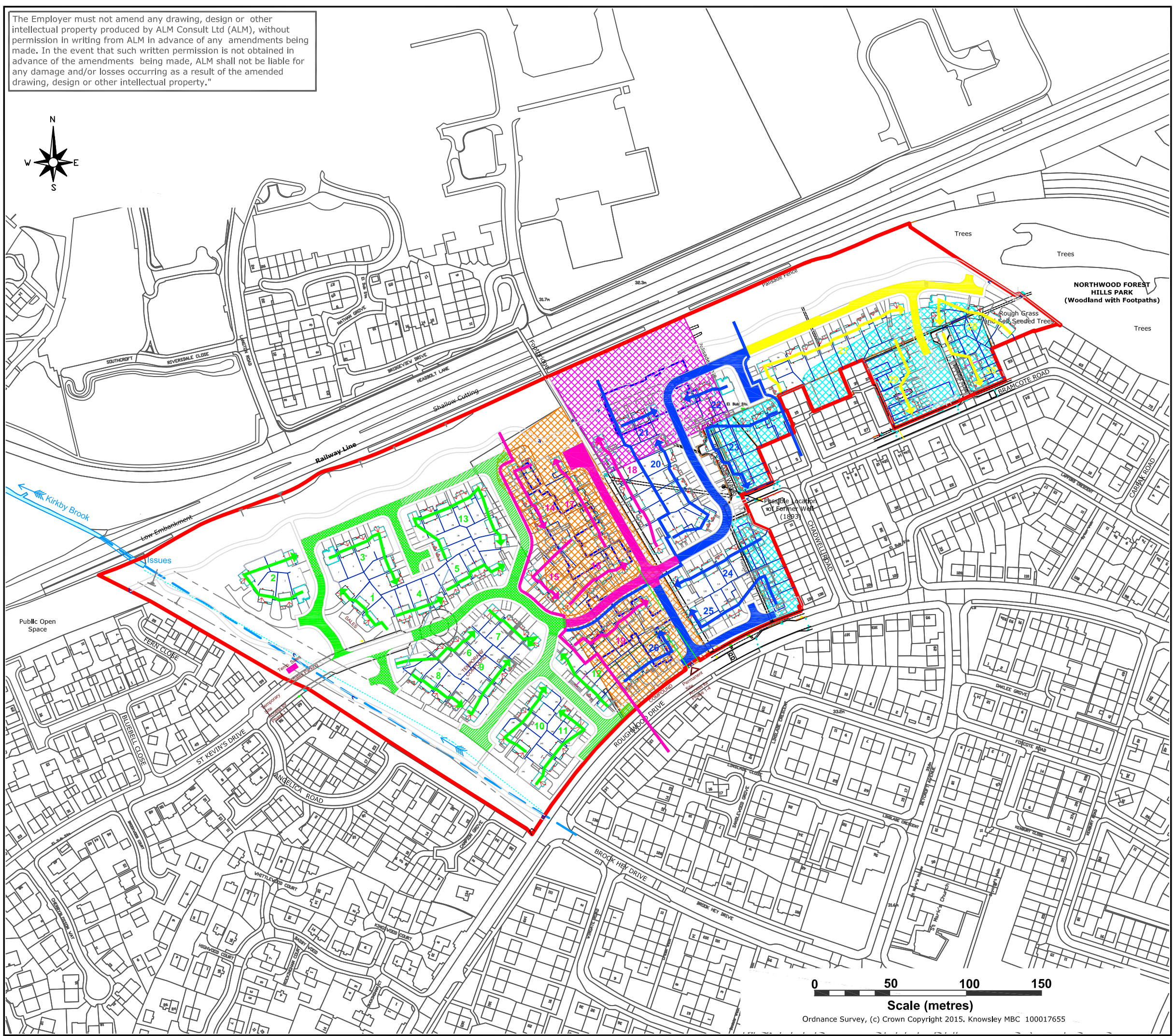
ST KEVIN'S DRIVE, KIRKBY

REMEDIATION ZONE PLAN

FINAL

DRAWN BY KL	SIGNATURE	DATE 09/11/17
APPROVED AA	SIGNATURE	DATE 09/11/17
SCALE 1:2500@A3	DRG No. 30158-10	

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KEY

- Approx. Site Boundary
- Contaminated Soils (former Bramcote/Northfield School)
To be Removed or Relocated beneath 1m Soil Cover*
(* if <0.001% asbestos)
- Approximate Area Underlain by Demolition Fill
Turnover Recommended to Screen Oversized Materials
- Approximate Area Underlain by Granular Made Ground
Turnover Recommended to Screen Oversized Materials
- Approximate Outline of Historic Buildings
Turnover Recommended to Remove Any Relic Structures
- Phase 1 Area (Feb 18 - Dec 19) - Unaffected by Known Contamination.
No Remediation Required
- Phase 2 Area (Dec 19 - Oct 20) - Plots 54-56 and Open Space Affected
by Contamination. Removal of Contamination and General Turnover of
Made Ground to Remove Relic Structures & Oversize Recommended.
- Phase 3 Area (Oct 20 - Dec 21) - Plots 69-72, 79-81, Roads, and Open
Space Affected by Contamination. Removal of Contamination and General
Turnover of Made Ground in South & East to Remove Relic Structures &
Oversize Recommended.
- Phase 4 Area (Dec 21 - Aug 22) - Unaffected by Known Contamination.
General Turnover of Made Ground to Remove Relic Structures &
Oversize Recommended.

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ALM Consult Limited
Paddock Business Centre, 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire. WN8 9PL
T: 01695 213160 E: info@almconsult.co.uk

CLIENT

McDermott
HOMES

JOB TITLE

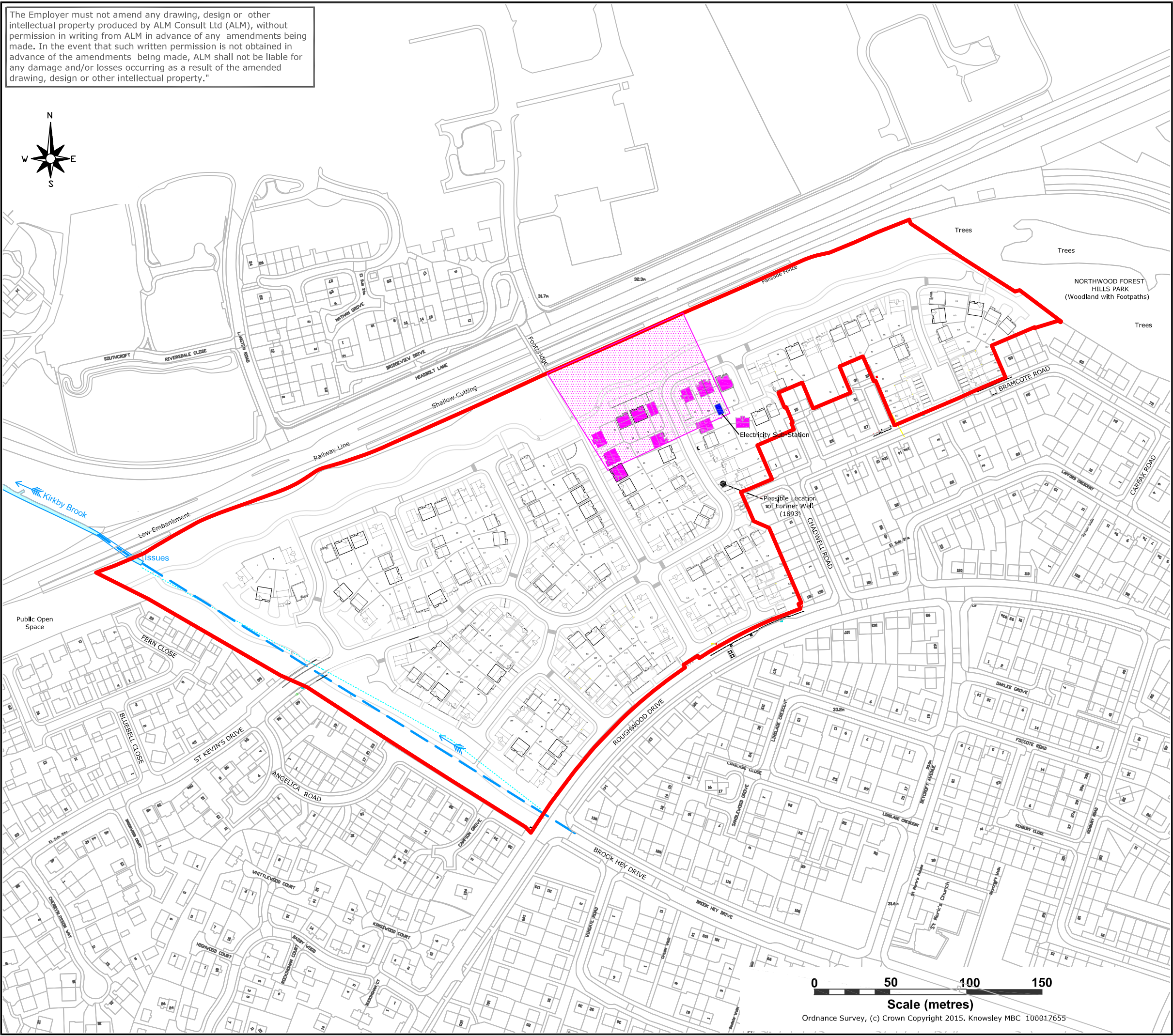
ST KEVIN'S DRIVE, KIRKBY

DRAWING TITLE

PHASED REMEDIATION ZONE PLAN

STATUS		
FINAL		
DRAWN BY	SIGNATURE	DATE
KL		16/04/18
APPROVED	SIGNATURE	DATE
AA		16/04/18
SCALE	DRG No.	
1:2500@A3	30158-12	

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KEY

Approx. Site Boundary

Contaminated Soils (former Bramcote/Northfield School)
Soils to be stripped from beneath private garden areas and subject to asbestos quantification testing. If <0.001% asbestos, soils may be retained beneath a 600mm clean soil cover, or if >0.001% asbestos, soil may be retained beneath a 1m clean soil cover, preferably beneath Public Open Space. If >0.1% asbestos, soils shall be exported from site as hazardous waste, to landfill.

Plots Affected by Contaminated Soils (former Bramcote/Northfield School) (See above)

Electricity Sub-Station - Soils immediately beneath the sub-station are to be tested for the presence of PCB contaminants following demolition.

Possible location of former 'Well' feature - to be further investigated following site clearance and disconnection of live services.

NOTE: No other remediation is required. Obstructions due to relic structures and/or oversized materials, may be dealt with on a plot by plot basis.

Advise regarding any unforeseen contamination or geotechnical hazards, should be sought from a suitably qualified consultant.

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JOB TITLE

ST KEVIN'S DRIVE, KIRKBY

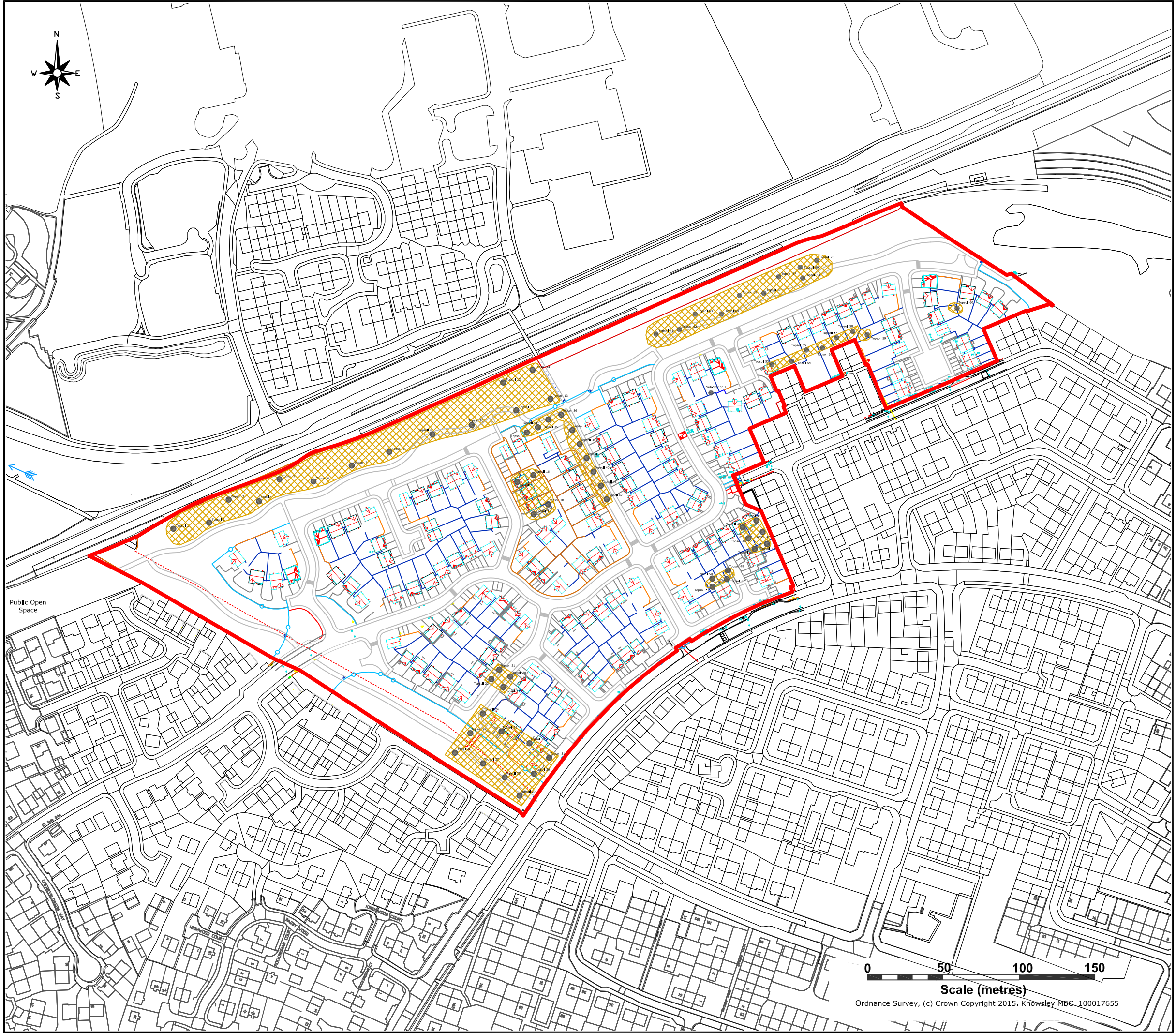
DRAWING TITLE

REMEDIATION ACTION PLAN

STATUS

FINAL

DRAWN BY	SIGNATURE	DATE
KL		18/04/18
APPROVED	SIGNATURE	DATE
AA		18/04/18
SCALE		DRG No.
1:2500@A3		30158-13



KEY

Approx. Site Boundary

Topsoil

Topsoil 1

Sample Location

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JOB TITLE

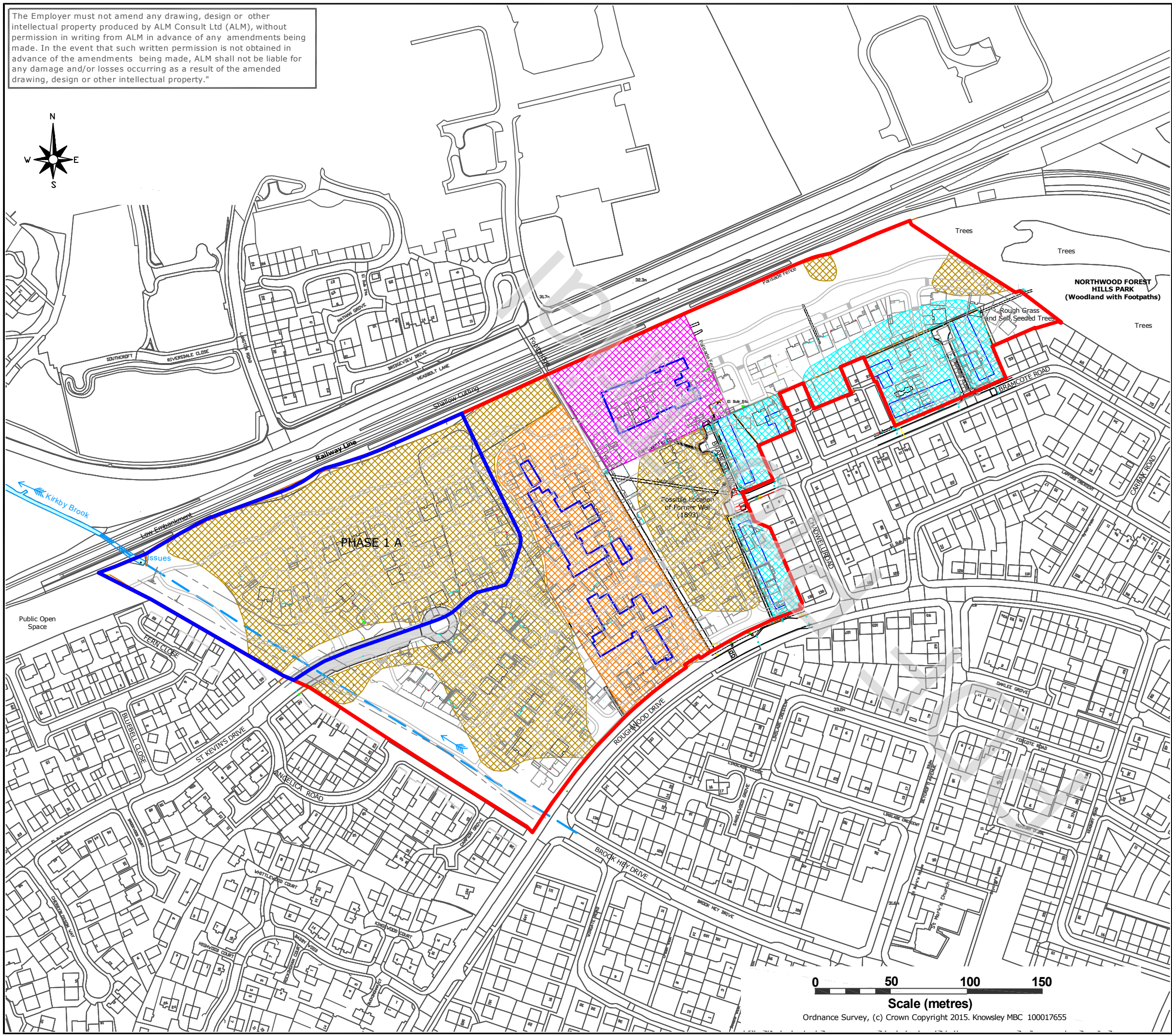
ST KEVIN'S DRIVE, KIRKBY

DRAWING TITLE

SAMPLE LOCATION PLAN

STATUS		FINAL	
DRAWN BY	SIGNATURE	DATE	
KL		14/12/20	
APPROVED	SIGNATURE	DATE	
AA		14/12/20	
SCALE		DRG No.	
1:2500@A3		30158-14_REV3	

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- KEY**
- Approx. Site Boundary
 - Approx. Phase 1A Boundary (@October 2018)
 - Contaminated Soils (former Bramcote/Northfield School)
 - Approximate Area Underlain by Natural Topsoil
 - Approximate Area Underlain by Demolition Fill
 - Approximate Area Underlain by Granular Made Ground
 - Approximate Outline of Historic Buildings
 - Unshaded Areas Underlain by Reworked Topsoil Over Natural Strata, Culvert Backfill or Cohesive Made Ground

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ALM Consult Limited
Paddock Business Centre, 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire. WN8 9PL
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ST KEVIN'S DRIVE, KIRKBY

REMEDATION ZONE PLAN
PHASE 1A DEVELOPMENT AREA

FINAL

DRAWN BY	SIGNATURE	DATE
KL		17/10/18
APPROVED	SIGNATURE	DATE
AA		17/10/18
SCALE	DRG No.	
1:2500@A3	30158-15	

APPENDIX B

Selected Photographs



PLATE 1: Topsoil stripped from the northern part of Phase 1.



PLATE 2: Smaller stockpile of Phase 1 topsoil.



PLATE 3: Topsoil stripped from the southern half of Phase 1.



PLATE 4: Topsoil stripped from the Phase 2 area.



PLATE 5: Supplementary sampling of made ground in TP106



PLATE 6: Supplementary sampling of made ground in TP107



PLATE 7: Well feature showing curved stonework of the former well.



PLATE 8: Topsoil stripped from the Phase 3 area.



PLATE 9: Large vegetated topsoil stockpile along north edge of Phase 4.



PLATE 10: Cross-section through the large Phase 4 topsoil stockpile.



PLATE 11: Topsoil stockpile along southern edge of Phase 4.



PLATE 12: Exposed surface at location of former Electricity Sub Station (near Plot 83).

APPENDIX C

Laboratory Chemical Analysis



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Keith Lyon
Date :	23rd July, 2018
Your reference :	30158
Our reference :	Test Report 18/10783 Batch 1
Location :	St Kevins Drive Kirkby
Date samples received :	7th July, 2018
Status :	Final report
Issue :	1

Eighteen samples were received for analysis on 7th July, 2018 of which eighteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon
JE Job No.: 18/10783

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	4	5	6	7	8	9	10	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 1	Topsoil 2	Topsoil 3	Topsoil 4	Topsoil 5	Topsoil 6	Topsoil 7	Topsoil 8	Topsoil 9	Topsoil 10			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	LOD/LOR	Units	Method No.
Arsenic #	4.9	6.1	4.8	5.6	5.3	7.2	6.3	5.4	5.9	4.6	<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	0.2	0.2	0.2	0.2	0.3	0.2	<0.1	0.2	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	177.2	170.8	192.2	146.9	128.7	161.4	159.7	126.1	155.1	135.5	<0.5	mg/kg	TM30/PM15
Copper #	17	23	19	29	25	29	28	21	35	21	<1	mg/kg	TM30/PM15
Lead #	28	37	27	36	44	42	39	24	45	22	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	18.4	16.2	15.8	15.6	17.6	18.6	22.1	26.8	16.4	30.0	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	0.6	0.6	0.6	0.9	0.9	0.8	0.8	0.6	0.8	<0.1	mg/kg	TM74/PM32
Zinc #	36	50	34	41	45	68	52	49	49	49	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.18	0.28	0.13	0.48	0.29	0.58	0.31	0.26	0.27	0.42	<0.03	mg/kg	TM4/PM8
Anthracene #	0.04	0.10	<0.04	0.06	0.06	0.17	0.07	0.06	<0.04	0.12	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	0.48	0.25	0.66	0.57	0.99	0.54	0.45	0.52	0.60	<0.03	mg/kg	TM4/PM8
Pyrene #	0.28	0.45	0.23	0.62	0.53	0.84	0.50	0.44	0.49	0.56	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.16	0.24	0.13	0.33	0.32	0.50	0.25	0.23	0.28	0.28	<0.06	mg/kg	TM4/PM8
Chrysene #	0.15	0.23	0.11	0.31	0.27	0.44	0.25	0.20	0.24	0.24	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.28	0.43	0.23	0.54	0.55	0.96	0.48	0.44	0.48	0.53	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.18	0.26	0.14	0.30	0.31	0.65	0.27	0.23	0.28	0.30	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.10	0.17	0.09	0.19	0.20	0.48	0.18	0.17	0.17	0.20	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.04	<0.04	0.05	0.05	0.12	<0.04	0.05	0.06	0.06	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	0.16	0.08	0.19	0.20	0.41	0.17	0.16	0.17	0.20	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.8	2.8	1.4	3.7	3.4	6.2	3.0	2.7	3.0	3.5	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.20	0.31	0.17	0.39	0.40	0.69	0.35	0.32	0.35	0.38	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	0.12	0.06	0.15	0.15	0.27	0.13	0.12	0.13	0.15	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	89	87	88	89	90	87	90	88	89	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	-	<4	-	-	-	<4	-	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	<19	-	-	-	<19	-	-	-	<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Client Name: ALM Consult Limited
 Reference: 30158
 Location: St Kevins Drive Kirkby
 Contact: Keith Lyon
 JE Job No.: 18/10783

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	11	12	13	14	15	16-17	18-19	20-21			Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 11	Topsoil 12	Topsoil 13	Topsoil 14	Topsoil 15	Topsoil 16	Topsoil 17	Topsoil 18					
Depth													
COC No / misc													
Containers	J	J	J	J	J	V	V	V					
Sample Date	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018			LOD/LOR	Units	Method No.
Arsenic #	8.4	8.4	20.3	6.6	4.9	6.6	6.4	5.0			<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2			<0.1	mg/kg	TM30/PM15
Chromium #	207.1	157.1	167.2	150.0	166.9	146.7	146.6	147.4			<0.5	mg/kg	TM30/PM15
Copper #	35	32	26	34	22	26	26	21			<1	mg/kg	TM30/PM15
Lead #	49	49	44	43	32	43	40	41			<5	mg/kg	TM30/PM15
Mercury #	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Nickel #	20.4	20.0	16.0	18.3	24.0	19.1	17.9	20.0			<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	0.7	0.8	0.9	0.8	0.7	0.8	0.6			<0.1	mg/kg	TM74/PM32
Zinc #	51	58	49	54	46	51	48	43			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.11	0.06	<0.05	0.08	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.06	<0.04	<0.04	0.05	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.41	0.85	0.52	0.37	0.88	0.36	0.21	0.24			<0.03	mg/kg	TM4/PM8
Anthracene #	0.12	0.21	0.12	0.09	0.20	0.06	0.07	0.05			<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.58	0.96	0.67	0.58	1.18	0.58	0.55	0.49			<0.03	mg/kg	TM4/PM8
Pyrene #	0.54	0.91	0.62	0.55	1.06	0.56	0.50	0.49			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.27	0.40	0.31	0.28	0.55	0.30	0.31	0.25			<0.06	mg/kg	TM4/PM8
Chrysene #	0.23	0.36	0.36	0.35	0.55	0.26	0.35	0.22			<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.46	0.74	0.57	0.56	0.88	0.51	0.64	0.56			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.29	0.38	0.33	0.31	0.49	0.34	0.34	0.31			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.17	0.27	0.21	0.21	0.32	0.21	0.21	0.20			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.05	0.06	0.05	0.04	0.08	0.05	0.05	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.17	0.27	0.20	0.22	0.33	0.20	0.21	0.21			<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.3	5.6	4.0	3.6	6.7	3.5	3.4	3.0			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.33	0.53	0.41	0.40	0.63	0.37	0.46	0.40			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.13	0.21	0.16	0.16	0.25	0.14	0.18	0.16			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	85	90	93	92	93	90	95	94			<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	-	-	-	<0.2	-	-	-			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	-	-	-	<4	-	-	-			<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	-	-	-	<7	-	-	-			<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	-	-	-	<7	-	-	-			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	-	-	-	<19	-	-	-			<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/10783	1	Topsoil 1		1	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 2		2	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 3		3	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 4		4	18/07/2018	General Description (Bulk Analysis)	soil/stones
					18/07/2018	Asbestos Fibres	NAD
					18/07/2018	Asbestos Fibres (2)	NAD
					18/07/2018	Asbestos ACM	NAD
					18/07/2018	Asbestos ACM (2)	NAD
					18/07/2018	Asbestos Type	NAD
					18/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 5		5	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 6		6	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/10783	1	Topsoil 7		7	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 8		8	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 9		9	18/07/2018	General Description (Bulk Analysis)	Soil/Stone
					18/07/2018	Asbestos Fibres	NAD
					18/07/2018	Asbestos Fibres (2)	NAD
					18/07/2018	Asbestos ACM	NAD
					18/07/2018	Asbestos ACM (2)	NAD
					18/07/2018	Asbestos Type	NAD
					18/07/2018	Asbestos Type (2)	NAD
					18/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 10		10	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 11		11	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 12		12	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 13		13	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 14		14	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 15		15	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/10783	1	Topsoil 15		15	19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 16		17	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 17		19	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 18		21	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD

Matrix : Solid

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10783

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/10783

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 18/10783

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes



Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Keith Lyon
Date :	19th March, 2019
Your reference :	30158
Our reference :	Test Report 19/3808 Batch 1
Location :	St Kevins Drive, Kirkby
Date samples received :	8th March, 2019
Status :	Final report
Issue :	1

Twenty eight samples were received for analysis on 8th March, 2019 of which twenty four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied. All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Paul Boden BSc
Senior Project Manager

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
JE Job No.: 19/3808

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	5	7	9	10	11	12	13	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 19	Topsoil 20	Topsoil 21	Topsoil 23	Topsoil 25	Topsoil 27	Topsoil 28	Topsoil 29	Topsoil 30	Topsoil 31			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	LOD/LOR	Units	Method No.
Arsenic #	8.7	6.2	7.4	6.4	5.8	NDP	4.1	6.4	6.8	4.8	<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	0.2	0.3	0.2	0.2	NDP	0.1	0.6	0.2	0.2	<0.1	mg/kg	TM30/PM15
Chromium #	142.2	28.8	171.8	135.1	136.9	NDP	133.9	139.8	33.5	138.3	<0.5	mg/kg	TM30/PM15
Copper #	40	25	27	36	30	NDP	17	30	26	23	<1	mg/kg	TM30/PM15
Lead #	54	37	40	45	41	NDP	21	41	35	32	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	NDP	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	21.1	12.8	16.2	15.2	14.3	NDP	18.9	15.1	12.0	12.2	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	NDP	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	0.5	0.6	0.4	0.5	NDP	0.4	0.6	0.5	0.4	<0.1	mg/kg	TM74/PM32
Zinc #	66	41	47	50	57	NDP	28	49	37	44	<5	mg/kg	TM30/PM15
Arsenic	-	-	-	-	-	6.3	-	-	-	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	-	-	-	-	0.3	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	-	16.0	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	-	32	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	-	46	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	-	<0.1	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	-	12.4	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	-	<1	-	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	-	-	0.6	-	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	-	-	55	-	-	-	-	<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.61	0.32	0.33	0.41	0.47	0.55	0.31	0.35	0.39	0.28	<0.03	mg/kg	TM4/PM8
Anthracene #	0.13	0.06	0.06	0.08	0.17	0.13	0.06	0.08	0.10	0.06	<0.04	mg/kg	TM4/PM8
Fluoranthene #	1.28	0.49	0.61	0.76	1.58	1.15	0.35	0.68	0.69	0.54	<0.03	mg/kg	TM4/PM8
Pyrene #	1.13	0.47	0.61	0.70	1.43	1.08	0.34	0.64	0.63	0.52	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.63	0.33	0.40	0.41	0.95	0.68	0.19	0.41	0.36	0.38	<0.06	mg/kg	TM4/PM8
Chrysene #	0.71	0.29	0.35	0.43	0.91	0.70	0.20	0.42	0.40	0.34	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	1.20	0.46	0.54	0.66	1.64	1.21	0.28	0.70	0.61	0.57	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.61	0.24	0.29	0.36	0.90	0.68	0.14	0.37	0.32	0.28	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.38	0.15	0.19	0.23	0.50	0.37	0.09	0.21	0.21	0.19	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.11	0.05	0.06	0.06	0.14	0.13	<0.04	0.08	0.06	0.06	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.40	0.18	0.22	0.24	0.51	0.41	0.11	0.23	0.22	0.20	<0.04	mg/kg	TM4/PM8
PAH 16 Total	7.3	3.0	3.7	4.3	9.2	7.1	2.1	4.2	4.0	3.4	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.86	0.33	0.39	0.48	1.18	0.87	0.20	0.50	0.44	0.41	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.34	0.13	0.15	0.18	0.46	0.34	0.08	0.20	0.17	0.16	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	102	99	104	101	104	103	102	104	99	102	<0	%	TM4/PM8

Client Name: ALM Consult Limited
 Reference: 30158
 Location: St Kevins Drive, Kirkby
 Contact: Keith Lyon
 JE Job No.: 19/3808

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	5	7	9	10	11	12	13	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 19	Topsoil 20	Topsoil 21	Topsoil 23	Topsoil 25	Topsoil 27	Topsoil 28	Topsoil 29	Topsoil 30	Topsoil 31			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	-	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	-	<4	-	<4	-	-	<4	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	-	<7	-	<7	-	-	<7	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	-	69	-	<7	-	-	<7	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	69	-	<19	-	-	<19	-	-	<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-	-	<0.1	-	<0.1	-	-	<0.1	-	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	-	<0.2	-	<0.2	-	-	<0.2	-	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	-	<4	-	<4	-	-	<4	-	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	-	10	-	28	-	-	11	-	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	-	87	-	87	-	-	62	-	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	-	97	-	115	-	-	73	-	-	<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-35)	-	-	166	-	115	-	-	73	-	-	<38	mg/kg	TM5/PM8/PM16
MTBE #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
Benzene #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
Toluene #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
Ethylbenzene #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
m/p-Xylene #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
o-Xylene #	-	-	<5	-	<5	-	-	<5	-	-	<5	ug/kg	TM31/PM12
Natural Moisture Content	19.8	17.8	21.1	19.4	17.9	27.6	17.4	20.6	21.5	18.1	<0.1	%	PM4/PM0
Total Organic Carbon #	3.41	2.08	1.77	1.55	1.87	NDP	1.35	1.97	1.89	1.41	<0.02	%	TM21/PM24
pH #	6.37	7.09	6.75	6.39	7.97	7.97	7.12	6.30	7.12	6.49	<0.01	pH units	TM73/PM11

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
JE Job No.: 19/3808

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	15	16	17	18	19	20	21	22	23	24	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 33	Topsoil 34	Topsoil 35	Topsoil 36	Topsoil 37	Topsoil 38	Topsoil 39	Topsoil 40	Topsoil 41	Topsoil 42			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	LOD/LOR	Units	Method No.
Arsenic #	6.1	9.9	7.3	6.7	NDP	9.6	11.0	10.4	14.1	14.6	<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	0.3	0.3	0.2	NDP	0.4	0.2	0.2	0.2	0.4	<0.1	mg/kg	TM30/PM15
Chromium #	115.6	131.3	124.0	123.5	NDP	91.0	111.8	118.2	146.5	100.6	<0.5	mg/kg	TM30/PM15
Copper #	27	43	32	41	NDP	32	25	37	51	40	<1	mg/kg	TM30/PM15
Lead #	42	65	49	50	NDP	88	45	66	252	118	<5	mg/kg	TM30/PM15
Mercury #	<0.1	0.2	<0.1	<0.1	NDP	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	13.9	21.5	18.0	14.4	NDP	24.9	26.5	19.0	17.1	18.4	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	NDP	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.6	0.8	0.7	0.6	NDP	1.0	0.8	0.9	0.7	1.1	<0.1	mg/kg	TM74/PM32
Zinc #	52	89	65	84	NDP	133	75	94	116	157	<5	mg/kg	TM30/PM15
Arsenic	-	-	-	-	12.9	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Cadmium	-	-	-	-	0.2	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Chromium	-	-	-	-	12.3	-	-	-	-	-	<0.5	mg/kg	TM30/PM62
Copper	-	-	-	-	33	-	-	-	-	-	<1	mg/kg	TM30/PM62
Lead	-	-	-	-	52	-	-	-	-	-	<5	mg/kg	TM30/PM62
Mercury	-	-	-	-	0.2	-	-	-	-	-	<0.1	mg/kg	TM30/PM62
Nickel	-	-	-	-	10.3	-	-	-	-	-	<0.7	mg/kg	TM30/PM62
Selenium	-	-	-	-	<1	-	-	-	-	-	<1	mg/kg	TM30/PM62
Water Soluble Boron	-	-	-	-	0.5	-	-	-	-	-	<0.1	mg/kg	TM74/PM61
Zinc	-	-	-	-	85	-	-	-	-	-	<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #	<0.04	0.66	0.64	0.12	0.07	0.08	0.06	<0.04	<0.04	0.13	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	1.08	0.06	<0.03	0.05	0.06	0.17	<0.03	<0.03	0.06	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.94	2.25	0.30	0.17	0.33	0.10	0.07	0.07	0.43	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	2.02	1.71	0.17	0.12	0.28	0.13	<0.04	<0.04	0.39	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.25	5.89	10.38	0.98	1.16	2.40	1.28	0.52	0.66	5.32	<0.03	mg/kg	TM4/PM8
Anthracene #	0.06	2.20	2.17	0.15	0.27	0.45	0.28	0.12	0.16	1.45	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.47	3.98	7.92	0.88	1.81	2.97	1.76	1.06	1.27	7.76	<0.03	mg/kg	TM4/PM8
Pyrene #	0.47	3.12	7.81	0.89	1.79	2.58	1.74	1.07	1.28	6.46	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.30	1.55	2.98	0.46	1.03	1.34	0.86	0.59	0.71	3.51	<0.06	mg/kg	TM4/PM8
Chrysene #	0.31	1.41	3.36	0.55	1.03	1.36	0.91	0.64	0.74	3.81	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.58	2.52	4.62	0.83	2.28	2.45	1.63	1.20	1.38	6.24	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.33	1.37	2.75	0.45	1.35	1.38	0.95	0.69	0.79	3.48	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.22	0.84	1.46	0.28	0.85	0.84	0.59	0.44	0.53	1.93	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.06	0.20	0.36	0.08	0.21	0.25	0.16	0.12	0.12	0.58	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.22	0.80	1.58	0.32	0.92	0.91	0.66	0.48	0.55	1.87	<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.3	28.6	50.1	6.5	13.1	17.7	11.3	7.0	8.3	43.4	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.42	1.81	3.33	0.60	1.64	1.76	1.17	0.86	0.99	4.49	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.16	0.71	1.29	0.23	0.64	0.69	0.46	0.34	0.39	1.75	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	102	102	101	102	83	102	104	100	101	97	<0	%	TM4/PM8

Please include all sections of this report if it is reproduced

Client Name: ALM Consult Limited
 Reference: 30158
 Location: St Kevins Drive, Kirkby
 Contact: Keith Lyon
 JE Job No.: 19/3808

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	15	16	17	18	19	20	21	22	23	24	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 33	Topsoil 34	Topsoil 35	Topsoil 36	Topsoil 37	Topsoil 38	Topsoil 39	Topsoil 40	Topsoil 41	Topsoil 42			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019	06/03/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	08/03/2019	LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	-	-	-	<4	-	-	-	<4	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	-	-	-	<7	-	-	-	<7	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	-	-	-	<7	-	-	-	<7	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	-	-	-	<19	-	-	-	<19	-	<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	-	-	-	<4	-	-	-	<4	-	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	-	-	-	15	-	-	-	22	-	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	51	-	-	-	167	-	-	-	128	-	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	51	-	-	-	182	-	-	-	150	-	<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-35)	51	-	-	-	182	-	-	-	150	-	<38	mg/kg	TM5/PM8/PM16
MTBE #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
Benzene #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
Toluene #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
o-Xylene #	<5	-	-	-	<5	-	-	-	<5	-	<5	ug/kg	TM31/PM12
Natural Moisture Content	20.6	16.5	16.1	15.3	18.3	18.3	19.7	18.8	19.6	17.5	<0.1	%	PM4/PM0
Total Organic Carbon #	1.75	2.38	2.19	1.35	NDP	2.08	1.05	1.61	1.54	2.42	<0.02	%	TM21/PM24
pH #	7.79	8.13	8.05	8.28	8.33	8.31	8.35	8.27	8.27	8.43	<0.01	pH units	TM73/PM11

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3808	1	Topsoil 19		1	14/03/2019	General Description (Bulk Analysis)	Soil/Stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 21		3	14/03/2019	General Description (Bulk Analysis)	Soil/Stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 23		5	14/03/2019	General Description (Bulk Analysis)	Soil/Stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 25		7	14/03/2019	General Description (Bulk Analysis)	Soil/Stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 27		9	14/03/2019	General Description (Bulk Analysis)	soil-stones
					14/03/2019	Asbestos Fibres	Free Fibres
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	Amosite
					14/03/2019	Asbestos Level Screen	less than 0.1%
19/3808	1	Topsoil 29		11	14/03/2019	General Description (Bulk Analysis)	soil-stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 31		13	14/03/2019	General Description (Bulk Analysis)	soil-stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3808	1	Topsoil 31		13	14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 33		15	14/03/2019	General Description (Bulk Analysis)	soil-stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 34		16	14/03/2019	General Description (Bulk Analysis)	Soil/Stone
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 35		17	14/03/2019	General Description (Bulk Analysis)	Soil/Stone
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 36		18	14/03/2019	General Description (Bulk Analysis)	Soil/Stone
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 37		19	14/03/2019	General Description (Bulk Analysis)	Soil/Stone
					14/03/2019	Asbestos Fibres	Fibre Bundles
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	Chrysotile
					14/03/2019	Asbestos Level Screen	less than 0.1%
19/3808	1	Topsoil 38		20	14/03/2019	General Description (Bulk Analysis)	soil.stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 39		21	14/03/2019	General Description (Bulk Analysis)	soil.stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 40		22	14/03/2019	General Description (Bulk Analysis)	soil.stones
					14/03/2019	Asbestos Fibres	NAD
					14/03/2019	Asbestos ACM	NAD
					14/03/2019	Asbestos Type	NAD
					14/03/2019	Asbestos Level Screen	NAD
19/3808	1	Topsoil 41		23	14/03/2019	General Description (Bulk Analysis)	soil.stones
					14/03/2019	Asbestos Fibres	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

[illegible]

Matrix : Solid

[illegible]

Client Name: ALM Consult Limited

Reference: 30158

Location: St Kevins Drive, Kirkby

Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3808

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/3808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

JE Job No: 19/3808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM61	As received solid samples are extracted with hot water in a 20:1 ratio of water to soil ready for analysis by ICP.			AR	Yes



Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Keith Lyon
Date :	26th March, 2019
Your reference :	30158
Our reference :	Test Report 19/3808 Batch 1 Schedule B
Location :	St Kevins Drive, Kirkby
Date samples received :	8th March, 2019
Status :	Final report
Issue :	1

Twenty eight samples were received for analysis on 8th March, 2019 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

[illegible]

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/3808

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

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Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/3808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM131	Quantification of Asbestos Fibres and ACM, based on HSG248 and SCA method.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	Yes



Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention : Keith Lyon
Date : 26th March, 2019
Your reference : 30158
Our reference : Test Report 19/4234 Batch 1
Location : St Kevins Drive, Kirkby
Date samples received : 14th March, 2019
Status : Final report
Issue : 1

Four samples were received for analysis on 14th March, 2019 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Please see attached notes for all abbreviations and acronyms

Client Name: ALM Consult Limited

Reference: 30158

Location: St Kevins Drive, Kirkby

Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/4234

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/4234

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes



Exova Jones Environmental

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Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Keith Lyon
Date :	24th April, 2019
Your reference :	30158
Our reference :	Test Report 19/5987 Batch 1
Location :	St. Kevins Drive Kirkby
Date samples received :	11th April, 2019
Status :	Final report
Issue :	1

Eleven samples were received for analysis on 11th April, 2019 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Please see attached notes for all abbreviations and acronyms

Please see attached notes for all abbreviations and acronyms

Client Name: ALM Consult Limited
Reference: 30158
Location: St. Kevins Drive Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/5987	1	S27 N		1	16/04/2019	General Description (Bulk Analysis)	soil/stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S27 S		2	16/04/2019	General Description (Bulk Analysis)	soil-stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S27 E		3	16/04/2019	General Description (Bulk Analysis)	soil-stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S27 W		4	16/04/2019	General Description (Bulk Analysis)	soil.stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S27 Base		5	16/04/2019	General Description (Bulk Analysis)	soil.stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S37 N		6	16/04/2019	General Description (Bulk Analysis)	soil-stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD
					16/04/2019	Asbestos Type	NAD
					16/04/2019	Asbestos Level Screen	NAD
19/5987	1	S37 S		7	16/04/2019	General Description (Bulk Analysis)	soil-stones
					16/04/2019	Asbestos Fibres	NAD
					16/04/2019	Asbestos ACM	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St. Kevins Drive Kirkby
Contact: Keith Lyon

[illegible]

Client Name: ALM Consult Limited
Reference: 30158
Location: St. Kevins Drive Kirkby
Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 19/5987

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 19/5987

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 19/5987

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL



Attention : Keith Lyon
Date : 28th January, 2020
Your reference : 30158
Our reference : Test Report 20/934 Batch 1
Location : St Kevins Drive Kirby
Date samples received : 22nd January, 2020
Status : Final report
Issue : 1

Fourteen samples were received for analysis on 22nd January, 2020 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Simon Gomery BSc
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirby
Contact: Keith Lyon
EMT Job No: 20/934

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 43	TOPSOIL 44	TOPSOIL 45	TOPSOIL 46	TOPSOIL 47	TOPSOIL 48	TOPSOIL 49	TOPSOIL 50	TOPSOIL 51	TOPSOIL 52			
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	LOD/LOR	Units	Method No.
Arsenic [#]	7.2	9.6	7.7	6.6	7.2	8.3	6.5	4.3	5.9	8.2	<0.5	mg/kg	TM30/PM15
Cadmium [#]	0.2	0.3	0.2	0.2	0.3	0.2	0.1	<0.1	0.2	0.2	<0.1	mg/kg	TM30/PM15
Chromium [#]	85.2	158.5	163.6	110.6	149.3	176.0	127.5	127.5	119.3	152.5	<0.5	mg/kg	TM30/PM15
Copper [#]	31	34	31	26	33	48	34	17	29	26	<1	mg/kg	TM30/PM15
Lead [#]	56	62	53	49	58	188	49	30	79	44	<5	mg/kg	TM30/PM15
Mercury [#]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel [#]	15.3	17.4	18.9	28.9	17.5	30.3	16.3	12.9	46.9	15.4	<0.7	mg/kg	TM30/PM15
Selenium [#]	<1	<1	<1	<1	<1	1	1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron [#]	0.6	0.8	0.7	0.6	0.7	0.8	0.6	0.4	1.3	0.6	<0.1	mg/kg	TM74/PM32
Zinc [#]	80	86	79	76	85	104	60	39	76	71	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene [#]	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.12	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene [#]	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.07	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene [#]	0.09	0.18	0.43	0.29	0.21	0.25	0.63	0.14	0.32	0.25	<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	0.07	0.12	<0.04	0.05	0.13	<0.04	0.08	0.05	<0.04	mg/kg	TM4/PM8
Fluoranthene [#]	0.15	0.33	0.62	0.70	0.31	0.41	0.73	0.23	0.55	0.42	<0.03	mg/kg	TM4/PM8
Pyrene [#]	0.15	0.32	0.54	1.03	0.30	0.39	0.63	0.21	0.51	0.41	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	0.11	0.22	0.30	0.35	0.19	0.22	0.32	0.14	0.29	0.24	<0.06	mg/kg	TM4/PM8
Chrysene [#]	0.10	0.21	0.40	0.35	0.19	0.23	0.42	0.12	0.29	0.24	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene [#]	0.15	0.35	0.54	0.56	0.33	0.39	0.54	0.21	0.53	0.39	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	0.09	0.19	0.26	0.26	0.19	0.25	0.26	0.12	0.28	0.23	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.06	0.15	0.20	0.14	0.11	0.17	0.21	0.08	0.20	0.15	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	0.05	<0.04	<0.04	<0.04	0.06	<0.04	0.05	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	0.07	0.16	0.22	0.17	0.14	0.20	0.23	0.10	0.24	0.18	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.0	2.1	3.6	4.0	2.0	2.6	4.3	1.4	3.5	2.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.11	0.25	0.39	0.40	0.24	0.28	0.39	0.15	0.38	0.28	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.04	0.10	0.15	0.16	0.09	0.11	0.15	0.06	0.15	0.11	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	97	93	92	93	94	89	97	95	98	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 [#]	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 [#]	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 [#]	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 [#]	-	-	<4	-	-	-	<4	-	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 [#]	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 [#]	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	<19	-	-	-	<19	-	-	-	<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirby
Contact: Keith Lyon
EMT Job No: 20/934

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 43	TOPSOIL 44	TOPSOIL 45	TOPSOIL 46	TOPSOIL 47	TOPSOIL 48	TOPSOIL 49	TOPSOIL 50	TOPSOIL 51	TOPSOIL 52			
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020	21/01/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	22/01/2020	LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM11
>EC7-EC8 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM11
>EC8-EC10 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM11
>EC10-EC12 #	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	mg/kg	TM5/PM8/PM11
>EC12-EC16 #	-	-	<4	-	-	-	<4	-	-	-	<4	mg/kg	TM5/PM8/PM11
>EC16-EC21 #	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM11
>EC21-EC35 #	-	-	17	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM11
Total aromatics C5-35 #	-	-	<19	-	-	-	<19	-	-	-	<19	mg/kg	TM5/PM8/PM11/PM12/PM13/PM14/PM15/PM16/PM17/PM18/PM19/PM20/PM21/PM22/PM23/PM24/PM25/PM26/PM27/PM28/PM29/PM30/PM31/PM32/PM33/PM34/PM35/PM36/PM37/PM38/PM39/PM40/PM41/PM42/PM43/PM44/PM45/PM46/PM47/PM48/PM49/PM50/PM51/PM52/PM53/PM54/PM55/PM56/PM57/PM58/PM59/PM60/PM61/PM62/PM63/PM64/PM65/PM66/PM67/PM68/PM69/PM70/PM71/PM72/PM73/PM74/PM75/PM76/PM77/PM78/PM79/PM80/PM81/PM82/PM83/PM84/PM85/PM86/PM87/PM88/PM89/PM90/PM91/PM92/PM93/PM94/PM95/PM96/PM97/PM98/PM99/PM100/PM101/PM102/PM103/PM104/PM105/PM106/PM107/PM108/PM109/PM110/PM111/PM112/PM113/PM114/PM115/PM116/PM117/PM118/PM119/PM120/PM121/PM122/PM123/PM124/PM125/PM126/PM127/PM128/PM129/PM130/PM131/PM132/PM133/PM134/PM135/PM136/PM137/PM138/PM139/PM140/PM141/PM142/PM143/PM144/PM145/PM146/PM147/PM148/PM149/PM150/PM151/PM152/PM153/PM154/PM155/PM156/PM157/PM158/PM159/PM160/PM161/PM162/PM163/PM164/PM165/PM166/PM167/PM168/PM169/PM170/PM171/PM172/PM173/PM174/PM175/PM176/PM177/PM178/PM179/PM180/PM181/PM182/PM183/PM184/PM185/PM186/PM187/PM188/PM189/PM190/PM191/PM192/PM193/PM194/PM195/PM196/PM197/PM198/PM199/PM200/PM201/PM202/PM203/PM204/PM205/PM206/PM207/PM208/PM209/PM210/PM211/PM212/PM213/PM214/PM215/PM216/PM217/PM218/PM219/PM220/PM221/PM222/PM223/PM224/PM225/PM226/PM227/PM228/PM229/PM230/PM231/PM232/PM233/PM234/PM235/PM236/PM237/PM238/PM239/PM240/PM241/PM242/PM243/PM244/PM245/PM246/PM247/PM248/PM249/PM250/PM251/PM252/PM253/PM254/PM255/PM256/PM257/PM258/PM259/PM260/PM261/PM262/PM263/PM264/PM265/PM266/PM267/PM268/PM269/PM270/PM271/PM272/PM273/PM274/PM275/PM276/PM277/PM278/PM279/PM280/PM281/PM282/PM283/PM284/PM285/PM286/PM287/PM288/PM289/PM290/PM291/PM292/PM293/PM294/PM295/PM296/PM297/PM298/PM299/PM300/PM301/PM302/PM303/PM304/PM305/PM306/PM307/PM308/PM309/PM310/PM311/PM312/PM313/PM314/PM315/PM316/PM317/PM318/PM319/PM320/PM321/PM322/PM323/PM324/PM325/PM326/PM327/PM328/PM329/PM330/PM331/PM332/PM333/PM334/PM335/PM336/PM337/PM338/PM339/PM340/PM341/PM342/PM343/PM344/PM345/PM346/PM347/PM348/PM349/PM350/PM351/PM352/PM353/PM354/PM355/PM356/PM357/PM358/PM359/PM360/PM361/PM362/PM363/PM364/PM365/PM366/PM367/PM368/PM369/PM370/PM371/PM372/PM373/PM374/PM375/PM376/PM377/PM378/PM379/PM380/PM381/PM382/PM383/PM384/PM385/PM386/PM387/PM388/PM389/PM390/PM391/PM392/PM393/PM394/PM395/PM396/PM397/PM398/PM399/PM400/PM401/PM402/PM403/PM404/PM405/PM406/PM407/PM408/PM409/PM410/PM411/PM412/PM413/PM414/PM415/PM416/PM417/PM418/PM419/PM420/PM421/PM422/PM423/PM424/PM425/PM426/PM427/PM428/PM429/PM430/PM431/PM432/PM433/PM434/PM435/PM436/PM437/PM438/PM439/PM440/PM441/PM442/PM443/PM444/PM445/PM446/PM447/PM448/PM449/PM450/PM451/PM452/PM453/PM454/PM455/PM456/PM457/PM458/PM459/PM460/PM461/PM462/PM463/PM464/PM465/PM466/PM467/PM468/PM469/PM470/

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirby
Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/934

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/934

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 20/934

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL



Attention :	Keith Lyon
Date :	7th December, 2020
Your reference :	30158
Our reference :	Test Report 20/16545 Batch 1
Location :	St Kevins Drive, Kirkby
Date samples received :	25th November, 2020
Status :	Final report
Issue :	1

Nineteen samples were received for analysis on 25th November, 2020 of which nineteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Paul Boden BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 53	TOPSOIL 54	TOPSOIL 55	TOPSOIL 56	TOPSOIL 57	TOPSOIL 58	TOPSOIL 59	TOPSOIL 60	TOPSOIL 61	TOPSOIL 62			
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	LOD/LOR	Units	Method No.
Arsenic #	7.1	6.6	7.8	5.7	6.9	9.7	8.2	7.0	7.0	8.7	<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	<0.1	mg/kg	TM30/PM15
Chromium #	75.5	27.9	76.3	69.9	79.4	82.4	29.2	39.2	74.2	70.4	<0.5	mg/kg	TM30/PM15
Copper #	31	28	34	23	23	23	25	26	27	31	<1	mg/kg	TM30/PM15
Lead #	51	53	135	55	47	54	37	42	53	66	<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1	0.2	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	11.8	11.4	11.8	10.3	12.0	14.1	13.8	15.9	12.7	13.4	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	0.3	0.4	0.5	0.3	0.5	0.4	0.6	0.5	0.5	<0.1	mg/kg	TM74/PM32
Zinc #	70	63	75	59	59	51	52	69	59	66	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.20 ^{AA}	<0.04	<0.04	<0.04	<0.20 ^{AA}	<0.04	<0.04	<0.04	<0.20 ^{AA}	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.15 ^{AA}	<0.03	<0.03	<0.03	<0.15 ^{AA}	<0.03	<0.03	<0.03	<0.15 ^{AA}	<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.06	<0.25 ^{AA}	<0.05	<0.05	<0.05	<0.25 ^{AA}	<0.05	<0.05	<0.05	<0.25 ^{AA}	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.20 ^{AA}	<0.04	<0.04	<0.04	<0.20 ^{AA}	<0.04	<0.04	<0.04	<0.20 ^{AA}	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.53	1.31 ^{AA}	0.15	0.21	0.14	<0.15 ^{AA}	0.11	0.11	0.20	0.44 ^{AA}	<0.03	mg/kg	TM4/PM8
Anthracene #	0.14	0.39 ^{AA}	<0.04	0.14	<0.04	<0.20 ^{AA}	<0.04	<0.04	0.06	<0.20 ^{AA}	<0.04	mg/kg	TM4/PM8
Fluoranthene #	1.17	2.74 ^{AA}	0.29	1.46	0.30	0.32 ^{AA}	0.24	0.21	0.43	0.71 ^{AA}	<0.03	mg/kg	TM4/PM8
Pyrene #	1.05	2.38 ^{AA}	0.27	1.36	0.29	0.30 ^{AA}	0.24	0.19	0.39	0.65 ^{AA}	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.58	1.29 ^{AA}	0.18	1.25	0.20	<0.30 ^{AA}	0.17	0.15	0.25	0.39 ^{AA}	<0.06	mg/kg	TM4/PM8
Chrysene #	0.63	1.25 ^{AA}	0.19	0.89	0.21	0.18 ^{AA}	0.18	0.15	0.27	0.41 ^{AA}	<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	1.07	2.06 ^{AA}	0.32	1.53	0.37	<0.35 ^{AA}	0.31	0.25	0.47	0.68 ^{AA}	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.60	1.22 ^{AA}	0.18	0.83	0.20	<0.20 ^{AA}	0.18	0.13	0.26	0.39 ^{AA}	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.39	0.87 ^{AA}	0.11	0.46	0.14	<0.20 ^{AA}	0.13	0.10	0.17	0.27 ^{AA}	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.07	<0.20 ^{AA}	<0.04	0.08	<0.04	<0.20 ^{AA}	<0.04	<0.04	<0.04	<0.20 ^{AA}	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.37	0.74 ^{AA}	0.12	0.40	0.14	<0.20 ^{AA}	0.13	0.10	0.18	0.25 ^{AA}	<0.04	mg/kg	TM4/PM8
PAH 16 Total	6.7	14.3 ^{AA}	1.8	8.6	2.0	<3.0 ^{AA}	1.7	1.4	2.7	4.2 ^{AA}	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.77	1.48 ^{AA}	0.23	1.10	0.27	<0.25 ^{AA}	0.22	0.18	0.34	0.49 ^{AA}	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.30	0.58 ^{AA}	0.09	0.43	0.10	<0.10 ^{AA}	0.09	0.07	0.13	0.19 ^{AA}	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	85	81 ^{AA}	86	83	86	83 ^{AA}	86	86	87	82 ^{AA}	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	<4	-	-	-	<4	-	-	-	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	<7	-	-	-	<7	-	-	-	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	<7	-	-	-	<7	-	-	-	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	<19	-	-	-	<19	-	-	-	<19	<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 53	TOPSOIL 54	TOPSOIL 55	TOPSOIL 56	TOPSOIL 57	TOPSOIL 58	TOPSOIL 59	TOPSOIL 60	TOPSOIL 61	TOPSOIL 62			
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	J T	J T			
Sample Date	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 #	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	<4	-	-	-	<4	-	-	-	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	<7	-	-	-	<7	-	-	-	16	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	46	-	-	-	<7	-	-	-	84	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	46	-	-	-	<19	-	-	-	100	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35)	-	46	-	-	-	<38	-	-	-	100	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
MTBE #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
Benzene #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
Toluene #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
Ethylbenzene #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
o-Xylene #	-	<5	-	-	-	<5	-	-	-	<5	<5	ug/kg	TM36/PM12
PCB 77	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 81	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 105	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 114	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 118	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 123	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 126	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 156	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 157	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 167	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 169	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 189	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
Total 12 PCBs	-	-	-	-	-	-	-	-	-	-	<60	ug/kg	TM17/PM8
PCB 28 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	-	-	-	-	<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	-	-	-	-	<35	ug/kg	TM17/PM8
Natural Moisture Content	16.8	16.0	17.3	17.1	16.1	15.6	19.6	20.9	19.5	17.8	<0.1	%	PM4/PM0
Total Organic Carbon #	2.73	1.77	2.13	1.55	1.78	1.47	3.24	2.61	2.29	2.41	<0.02	%	TM21/PM24

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38		Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 63	TOPSOIL 64	TOPSOIL 65	TOPSOIL 66	TOPSOIL 67	TOPSOIL 68	TOPSOIL 69	TOPSOIL 70	SUB-STATION 1				
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	V J				
Sample Date	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020		LOD/LOR	Units	Method No.
Arsenic #	7.7	7.5	8.4	9.1	6.3	7.7	7.5	5.9	-		<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	0.2	0.2	0.2	0.2	0.3	0.6	0.2	-		<0.1	mg/kg	TM30/PM15
Chromium #	28.6	32.4	80.7	151.7	76.3	72.1	25.3	93.0	-		<0.5	mg/kg	TM30/PM15
Copper #	33	31	31	35	25	38	30	33	-		<1	mg/kg	TM30/PM15
Lead #	88	44	53	53	40	50	62	43	-		<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	<0.1	-		<0.1	mg/kg	TM30/PM15
Nickel #	11.2	13.3	14.8	19.5	12.6	18.3	12.1	22.7	-		<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1	-		<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	0.4	0.6	0.6	0.4	0.5	0.4	0.4	-		<0.1	mg/kg	TM74/PM32
Zinc #	59	45	56	60	71	67	64	53	-		<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.20 _{AA}	<0.04	<0.04	<0.04	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.15 _{AA}	<0.03	<0.03	<0.03	<0.15 _{AA}	-		<0.03	mg/kg	TM4/PM8
Acenaphthene #	0.07	0.14	<0.05	<0.25 _{AA}	<0.05	<0.05	<0.05	<0.25 _{AA}	-		<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.08	<0.04	<0.20 _{AA}	<0.04	<0.04	<0.04	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.69	1.13	0.32	0.25 _{AA}	0.46	0.32	0.30	0.19 _{AA}	-		<0.03	mg/kg	TM4/PM8
Anthracene #	0.16	0.22	0.07	<0.20 _{AA}	0.11	0.09	0.08	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Fluoranthene #	1.34	1.24	0.56	0.54 _{AA}	0.72	0.75	0.64	0.40 _{AA}	-		<0.03	mg/kg	TM4/PM8
Pyrene #	1.29	1.23	0.54	0.49 _{AA}	0.70	0.68	0.60	0.36 _{AA}	-		<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.68	0.53	0.32	<0.30 _{AA}	0.39	0.37	0.38	<0.30 _{AA}	-		<0.06	mg/kg	TM4/PM8
Chrysene #	0.70	0.54	0.33	0.33 _{AA}	0.43	0.40	0.37	0.24 _{AA}	-		<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	1.19	0.88	0.55	0.58 _{AA}	0.60	0.74	0.71	<0.35 _{AA}	-		<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.74	0.54	0.30	0.32 _{AA}	0.34	0.43	0.38	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.46	0.32	0.21	0.25 _{AA}	0.23	0.27	0.25	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.08	0.06	0.05	<0.20 _{AA}	0.05	0.06	0.05	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.48	0.34	0.21	<0.20 _{AA}	0.22	0.25	0.28	<0.20 _{AA}	-		<0.04	mg/kg	TM4/PM8
PAH 16 Total	7.9	7.3	3.5	<3.0 _{AA}	4.3	4.4	4.0	<3.0 _{AA}	-		<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.86	0.63	0.40	0.42 _{AA}	0.43	0.53	0.51	<0.25 _{AA}	-		<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.33	0.25	0.15	0.16 _{AA}	0.17	0.21	0.20	<0.10 _{AA}	-		<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	88	83	88	81 _{AA}	83	84	85	82 _{AA}	-		<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	-	-	<0.2	-	-	-	<0.2	-		<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	-	-	<4	-	-	-	<4	-		<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	-	-	<7	-	-	-	<7	-		<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	-	-	<7	-	-	-	<7	-		<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	-	<19	-	-	-	<19	-		<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	37-38		Please see attached notes for all abbreviations and acronyms		
Sample ID	TOPSOIL 63	TOPSOIL 64	TOPSOIL 65	TOPSOIL 66	TOPSOIL 67	TOPSOIL 68	TOPSOIL 69	TOPSOIL 70	SUB-STATION 1				
Depth													
COC No / misc													
Containers	J T	J T	J T	J T	J T	J T	J T	J T	V J				
Sample Date	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020	23/11/2020				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020	25/11/2020		LOD/LOR	Units	Method No.
TPH CWG													
Aromatics													
>C5-EC7 #	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	-	-	-	<0.1	-	-	-	<0.1	-		<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	-	-	-	<0.2	-	-	-	<0.2	-		<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	-	-	-	<4	-	-	-	<4	-		<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	-	-	-	12	-	-	-	8	-		<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	-	-	-	75	-	-	-	59	-		<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	-	-	-	87	-	-	-	67	-		<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	-	-	-	87	-	-	-	67	-		<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
Benzene #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
Toluene #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
Ethylbenzene #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
m/p-Xylene #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
o-Xylene #	-	-	-	<5	-	-	-	<5	-		<5	ug/kg	TM36/PM12
PCB 77	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 81	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 105	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 114	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 118	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 123	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 126	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 156	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 157	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 167	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 169	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 189	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
Total 12 PCBs	-	-	-	-	-	-	-	-	<60		<60	ug/kg	TM17/PM8
PCB 28 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	-	-	<5		<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	-	-	<35		<35	ug/kg	TM17/PM8
Natural Moisture Content	20.6	17.0	17.1	19.0	22.0	18.7	20.2	18.5	14.8		<0.1	%	PM4/PM0
Total Organic Carbon #	1.92	2.75	2.52	3.47	1.88	3.05	2.19	3.26	-		<0.02	%	TM21/PM24

Element Materials Technology

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon
EMT Job No: 20/16545

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/16545	1	TOPSOIL 53		2	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 54		4	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 55		6	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 56		8	02/12/2020	General Description (Bulk Analysis)	soil.stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 57		10	02/12/2020	General Description (Bulk Analysis)	soil.stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 58		12	02/12/2020	General Description (Bulk Analysis)	soil.stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 59		14	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/16545	1	TOPSOIL 59		14	02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 60		16	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 61		18	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 62		20	03/12/2020	General Description (Bulk Analysis)	Soil/Stones
					03/12/2020	Asbestos Fibres	NAD
					03/12/2020	Asbestos ACM	NAD
					03/12/2020	Asbestos Type	NAD
					03/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 63		22	02/12/2020	General Description (Bulk Analysis)	soil.stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 64		24	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 65		26	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 66		28	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 67		30	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD
					02/12/2020	Asbestos ACM	NAD
					02/12/2020	Asbestos Type	NAD
					02/12/2020	Asbestos Level Screen	NAD
20/16545	1	TOPSOIL 68		32	02/12/2020	General Description (Bulk Analysis)	soil/stones
					02/12/2020	Asbestos Fibres	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive, Kirkby
Contact: Keith Lyon

[illegible]

Client Name: ALM Consult Limited

Reference: 30158

Location: St Kevins Drive, Kirkby

Contact: Keith Lyon

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/16545

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution

EMT Job No: 20/16545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC/FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes

EMT Job No: 20/16545

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

APPENDIX D

Cover Depth Validation Reports (CDV1-4)

ST KEVIN'S DRIVE, KIRKBY
VALIDATION OF SOIL COVER DEPTHS
(Plots No. 54-55)

Prepared for
McDERMOTT HOMES LTD



ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire WN8 9PL

T: 01695 213160
F: 01695 567275
E: info@almconsult.co.uk

ST KEVIN'S DRIVE, KIRKBY VERIFICATION OF SOIL COVER DEPTHS

ALM Consult Limited (ALM) carried out a site visit on Tuesday 3rd November 2020, to verify cover depths in the rear gardens of Plots No.54-55 at the McDermott Homes development at St Kevin's Drive, Kirkby.

Verification of cover depth consisted of the excavation of hand dug pits, penetrating the soil cover, and the inspection of the resulting void, in rear garden areas of the plots. A location plan showing the location of inspection pit / inspection location is presented as Drawing No. 30158-CDV1 in Appendix A.

The site has been subject to previous phases of desk study and intrusive ground investigation, undertaken by ESG and CCG in the eastern half of the site (2015) and western half of the site (2016) respectively. The previous studies were re-presented along with a supplementary phase of ground investigation, undertaken by ALM in 2017, and reported in ALM Report No.30158-1. The ground investigations identified the presence of traces of asbestos fibres, and localised slightly elevated concentrations of PAH and TPH in made ground beneath the former Bramcote/Northfield Primary School in northern central parts of the site.

ALM Report No.30158-2 Rev A 'Remediation Strategy for land off St Kevin's Drive, Kirkby', date November 2017, recommended either the removal of asbestos impacted made ground or it's retention beneath a 1m thick clean soil cover, due to no asbestos quantification tests being undertaken on the asbestos impacted soils. ALM Letter Ref: 30158-016, dated 24th February 2020, details the results of further soil analysis demonstrating a concentration of <0.001% asbestos in made ground, and recommends soils may be retained beneath a 600m thick clean soil cover. Comments received from Knowsley Council (dated 27th April 2020) in a response regarding an application to discharge Planning Condition 7 – Contaminated Land, indicate a requirement for a membrane to be placed beneath the clean soil cover system.

To prove that the criteria had been met, an ALM Engineer inspected the soil cover, and took photographs of the inspection pits (See Appendix B). Photographs of membrane installation at the base of the cover system, have been provided by the groundworker. In Plots No.54-55 a minimum of 600mm of soil cover had been placed either above made ground, or as replacement for removed made ground. The depth of clean soil cover encountered in the rear gardens of selected plots, is summarised in Table A below.

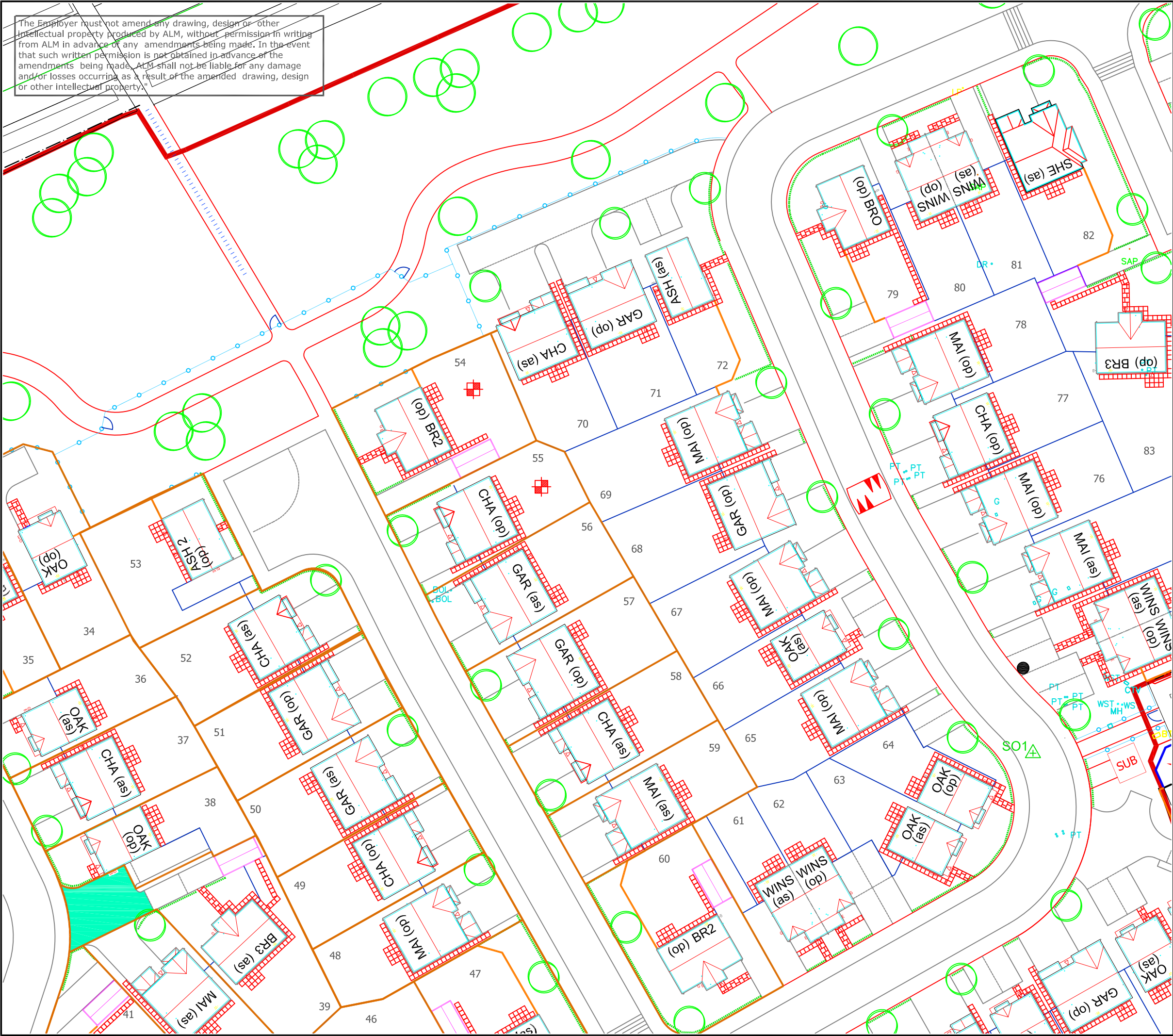
Topsoil material placed in Plots No.54-55 was won from Phase 1 and Phase 2 of the development. Subsoil placed in rear gardens of Plots No.54-55 comprised natural sand arisings from beneath Phase 1 and Phase 2 of the development. Chemical analyses confirming the chemical suitability of the topsoil and subsoil for use in private gardens at the development, are presented in Appendix C.

Table A: Clean Cover Verification Depths

Plot No.	Subsoil (mm)	Topsoil (mm)	Total Thickness (mm)
54	400	250	650
55	400	265	665

APPENDIX A
INSPECTION PIT LOCATION PLAN

The Employer must not amend any drawing, design or other intellectual property produced by ALM, without permission in writing from ALM in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, ALM shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or other intellectual property.



KEY

INSPECTION PIT / INSPECTION LOCATION

DEVELOPMENT LAYOUT TAKEN FROM MCK ASSOCIATES LTD "PROPOSED SITE LAYOUT", DRAWING NO.16-075-0003 REV M, DATED OCTOBER 2016



ALM Consult Limited
Paddock Business Centre, 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire. WN8 9PL
T: 01695 213160 E: info@almconsult.co.uk

CLIENT		
McDERMOTT HOMES		
JOB TITLE		
ST KEVINS DRIVE, KIRKBY		
DRAWING TITLE		
COVER DEPTH INSPECTION LOCATION PLAN		
STATUS		
FINAL		
DRAWN BY	SIGNATURE	DATE
KL		04-11-20
APPROVED	SIGNATURE	DATE
AA		04-11-20
SCALE	DRG No.	
1:500@A3	30158-CDV1	

APPENDIX B
PHOTOGRAPHIC RECORD



PLATE 1: Overview of inspection in Plot No.54



PLATE 2: Depth of soil cover in Plot No.54 (>650mm)



PLATE 3: Placement of membrane beneath clean soil cover in Plot No.54



PLATE 4: Overview of inspection of Plot No.55



PLATE 5: Depth of soil cover in Plot No.55 (665mm)



PLATE 6: Placement of membrane beneath clean soil cover in Plot No.55

APPENDIX C

CHEMICAL ANALYSIS

TOPSOIL

25th July 2018

30158/012

Mr Mark Wilkinson
Technical Director
McDermott Homes Ltd
Jupiter House
1 Mercury Rise
Altham Business Park
Altham
BB5 5BY

Dear Mark

Topsoil Validation – St Kevin's Drive, Kirkby

Please find attached copies of the laboratory test results for topsoil recently stripped and stockpiled from part of the Phase 1 topsoil strip.

ALM attended site on Thursday 5th July 2018 to obtain 18No. samples of topsoil stripped from approximately 50% of the Phase 1 development area. It is estimated that approximately 6,750m³ of topsoil is present in the stockpiles.

Topsoil was located in two stockpiles, a large stockpile along the northwest edge of Phase 1, and a smaller stockpile was located on the Plot 36-38 area. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.

A plan showing the extent of the stockpiles and the location of samples collected, is presented as Drawing No. 30158-14, a copy of which is attached.

Selected Photos of the stockpiles are also attached.

Laboratory Analysis:

The 18No. samples of topsoil were submitted for a suite of analysis comprising; asbestos screen, pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC and speciated PAH. A further 4No. samples were submitted for speciated TPH.

The results of the laboratory chemical analysis were compared against the CIEH/LQM 'Suitable for Use Levels' (S4UL) for residential development with home grown produce. With regard to lead, consideration is given to the DEFRA Category 4 Screening Level of 200mg/kg. With regard to phytotoxic determinands (copper and zinc), consideration is given to BS3882:2007 & BS8601:2013. Concentrations of water soluble boron have been measured against former ICRC Guidance Note 59/83, second edition (1987).

None of the samples exhibited any asbestos content or any concentrations of determinands above the chosen criteria.



Therefore, ALM consider the topsoil currently stripped and temporarily stockpiled at the site, to be suitable for use as topsoil within the proposed development.

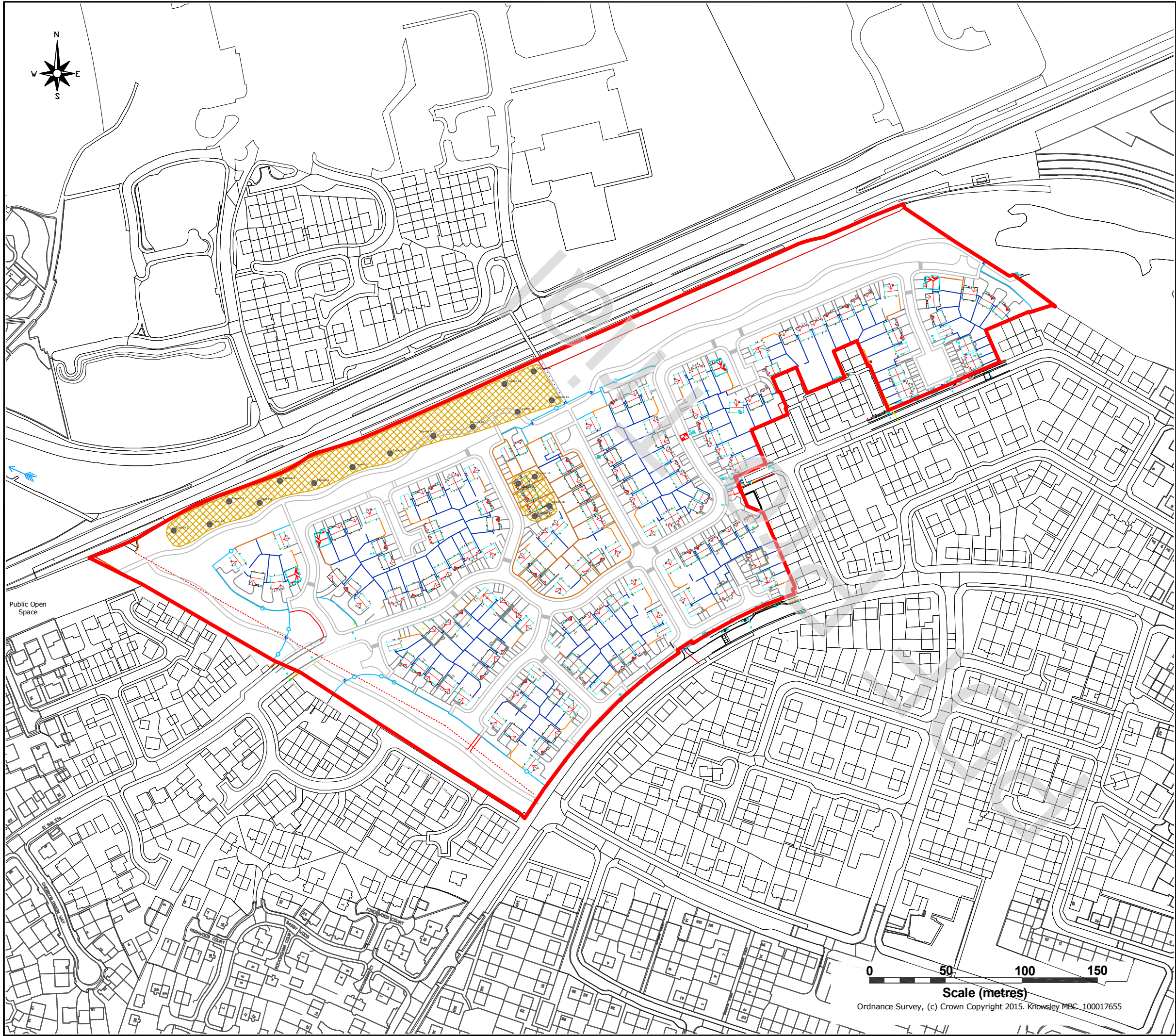
If you require any further information, please contact me.

Yours sincerely

A handwritten signature in black ink, reading 'Keith Lyon'. The signature is fluid and cursive.

Keith Lyon
Director
ALM Consult Ltd

Enc. Drawing No.30158-14 'Sample Location Plan'
Selected Photographs
Laboratory Chemical Analysis



KEY

- Approx. Site Boundary
- Topsoil
- Topsoil 1
- Sample Location

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ALM Consult Limited
Paddock Business Centre, 2 Paddock Road,
West Pimbo, Skelmersdale, Lancashire. WN8 9PL
T: 01695 213160 E: info@almconsult.co.uk

CLIENT



JOB TITLE

ST KEVIN'S DRIVE, KIRKBY

DRAWING TITLE

SAMPLE LOCATION PLAN

STATUS

FINAL

DRAWN BY

KL

SIGNATURE

DATE

16/07/18

APPROVED

AA

SIGNATURE

DATE

16/07/18

SCALE

1:2500@A3

DRG No.

30158-14



PLATE 1: Overview of larger elongate topsoil stockpile in the northwest.



PLATE 2: View of smaller topsoil stockpile above Plots 36-38.



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

ALM Consult Limited
Paddock Business Centre
2 Paddock Road
West Pimbo
Skelmersdale
Lancashire
WN8 9PL

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Keith Lyon
Date :	23rd July, 2018
Your reference :	30158
Our reference :	Test Report 18/10783 Batch 1
Location :	St Kevins Drive Kirkby
Date samples received :	7th July, 2018
Status :	Final report
Issue :	1

Eighteen samples were received for analysis on 7th July, 2018 of which eighteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: ALM Consult Limited
 Reference: 30158
 Location: St Kevins Drive Kirkby
 Contact: Keith Lyon
 JE Job No.: 18/10783

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1	2	3	4	5	6	7	8	9	10	Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 1	Topsoil 2	Topsoil 3	Topsoil 4	Topsoil 5	Topsoil 6	Topsoil 7	Topsoil 8	Topsoil 9	Topsoil 10			
Depth													
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	LOD/LOR	Units	Method No.
Arsenic #	4.9	6.1	4.8	5.6	5.3	7.2	6.3	5.4	5.9	4.6	<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	0.2	0.2	0.2	0.2	0.3	0.2	<0.1	0.2	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	177.2	170.8	192.2	146.9	128.7	161.4	159.7	126.1	155.1	135.5	<0.5	mg/kg	TM30/PM15
Copper #	17	23	19	29	25	29	28	21	35	21	<1	mg/kg	TM30/PM15
Lead #	28	37	27	36	44	42	39	24	45	22	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	18.4	16.2	15.8	15.6	17.6	18.6	22.1	26.8	16.4	30.0	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.5	0.6	0.6	0.6	0.9	0.9	0.8	0.8	0.6	0.8	<0.1	mg/kg	TM74/PM32
Zinc #	36	50	34	41	45	68	52	49	49	49	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.18	0.28	0.13	0.48	0.29	0.58	0.31	0.26	0.27	0.42	<0.03	mg/kg	TM4/PM8
Anthracene #	0.04	0.10	<0.04	0.06	0.06	0.17	0.07	0.06	<0.04	0.12	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.30	0.48	0.25	0.66	0.57	0.99	0.54	0.45	0.52	0.60	<0.03	mg/kg	TM4/PM8
Pyrene #	0.28	0.45	0.23	0.62	0.53	0.84	0.50	0.44	0.49	0.56	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.16	0.24	0.13	0.33	0.32	0.50	0.25	0.23	0.28	0.28	<0.06	mg/kg	TM4/PM8
Chrysene #	0.15	0.23	0.11	0.31	0.27	0.44	0.25	0.20	0.24	0.24	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.28	0.43	0.23	0.54	0.55	0.96	0.48	0.44	0.48	0.53	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.18	0.26	0.14	0.30	0.31	0.65	0.27	0.23	0.28	0.30	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.10	0.17	0.09	0.19	0.20	0.48	0.18	0.17	0.17	0.20	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	0.04	<0.04	0.05	0.05	0.12	<0.04	0.05	0.06	0.06	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	0.16	0.08	0.19	0.20	0.41	0.17	0.16	0.17	0.20	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.8	2.8	1.4	3.7	3.4	6.2	3.0	2.7	3.0	3.5	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.20	0.31	0.17	0.39	0.40	0.69	0.35	0.32	0.35	0.38	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	0.12	0.06	0.15	0.15	0.27	0.13	0.12	0.13	0.15	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	89	87	88	89	90	87	90	88	89	<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C6-C8 #	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C8-C10	-	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	mg/kg	TM36/PM12
>C10-C12 #	-	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	-	-	<4	-	-	-	<4	-	-	-	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	-	-	<7	-	-	-	<7	-	-	-	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	-	-	<19	-	-	-	<19	-	-	-	<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Client Name: ALM Consult Limited
 Reference: 30158
 Location: St Kevins Drive Kirkby
 Contact: Keith Lyon
 JE Job No.: 18/10783

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	11	12	13	14	15	16-17	18-19	20-21			Please see attached notes for all abbreviations and acronyms		
Sample ID	Topsoil 11	Topsoil 12	Topsoil 13	Topsoil 14	Topsoil 15	Topsoil 16	Topsoil 17	Topsoil 18					
Depth													
COC No / misc													
Containers	J	J	J	J	J	V	V	V					
Sample Date	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018	05/07/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018	07/07/2018			LOD/LOR	Units	Method No.
Arsenic #	8.4	8.4	20.3	6.6	4.9	6.6	6.4	5.0			<0.5	mg/kg	TM30/PM15
Cadmium #	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2			<0.1	mg/kg	TM30/PM15
Chromium #	207.1	157.1	167.2	150.0	166.9	146.7	146.6	147.4			<0.5	mg/kg	TM30/PM15
Copper #	35	32	26	34	22	26	26	21			<1	mg/kg	TM30/PM15
Lead #	49	49	44	43	32	43	40	41			<5	mg/kg	TM30/PM15
Mercury #	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Nickel #	20.4	20.0	16.0	18.3	24.0	19.1	17.9	20.0			<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.9	0.7	0.8	0.9	0.8	0.7	0.8	0.6			<0.1	mg/kg	TM74/PM32
Zinc #	51	58	49	54	46	51	48	43			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	0.11	0.06	<0.05	0.08	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.06	<0.04	<0.04	0.05	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.41	0.85	0.52	0.37	0.88	0.36	0.21	0.24			<0.03	mg/kg	TM4/PM8
Anthracene #	0.12	0.21	0.12	0.09	0.20	0.06	0.07	0.05			<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.58	0.96	0.67	0.58	1.18	0.58	0.55	0.49			<0.03	mg/kg	TM4/PM8
Pyrene #	0.54	0.91	0.62	0.55	1.06	0.56	0.50	0.49			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.27	0.40	0.31	0.28	0.55	0.30	0.31	0.25			<0.06	mg/kg	TM4/PM8
Chrysene #	0.23	0.36	0.36	0.35	0.55	0.26	0.35	0.22			<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.46	0.74	0.57	0.56	0.88	0.51	0.64	0.56			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.29	0.38	0.33	0.31	0.49	0.34	0.34	0.31			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.17	0.27	0.21	0.21	0.32	0.21	0.21	0.20			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.05	0.06	0.05	0.04	0.08	0.05	0.05	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.17	0.27	0.20	0.22	0.33	0.20	0.21	0.21			<0.04	mg/kg	TM4/PM8
PAH 16 Total	3.3	5.6	4.0	3.6	6.7	3.5	3.4	3.0			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.33	0.53	0.41	0.40	0.63	0.37	0.46	0.40			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.13	0.21	0.16	0.16	0.25	0.14	0.18	0.16			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	85	90	93	92	93	90	95	94			<0	%	TM4/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	-	-	-	<0.1	-	-	-			<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	-	-	-	<0.2	-	-	-			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	-	-	-	<4	-	-	-			<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	-	-	-	<7	-	-	-			<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	-	-	-	<7	-	-	-			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	-	-	-	<19	-	-	-			<19	mg/kg	TM5/PM8/PM16/PM12/PM15

Please see attached notes for all abbreviations and acronyms

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/10783	1	Topsoil 1		1	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 2		2	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 3		3	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 4		4	18/07/2018	General Description (Bulk Analysis)	soil/stones
					18/07/2018	Asbestos Fibres	NAD
					18/07/2018	Asbestos Fibres (2)	NAD
					18/07/2018	Asbestos ACM	NAD
					18/07/2018	Asbestos ACM (2)	NAD
					18/07/2018	Asbestos Type	NAD
					18/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 5		5	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 6		6	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/10783	1	Topsoil 7		7	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 8		8	19/07/2018	General Description (Bulk Analysis)	soil-stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 9		9	18/07/2018	General Description (Bulk Analysis)	Soil/Stone
					18/07/2018	Asbestos Fibres	NAD
					18/07/2018	Asbestos Fibres (2)	NAD
					18/07/2018	Asbestos ACM	NAD
					18/07/2018	Asbestos ACM (2)	NAD
					18/07/2018	Asbestos Type	NAD
					18/07/2018	Asbestos Type (2)	NAD
					18/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 10		10	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 11		11	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 12		12	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 13		13	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 14		14	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD
					19/07/2018	Asbestos ACM	NAD
					19/07/2018	Asbestos Type	NAD
					19/07/2018	Asbestos Level Screen	NAD
18/10783	1	Topsoil 15		15	19/07/2018	General Description (Bulk Analysis)	Soil/Stones
					19/07/2018	Asbestos Fibres	NAD

Client Name: ALM Consult Limited
Reference: 30158
Location: St Kevins Drive Kirkby
Contact: Keith Lyon

[illegible]

Matrix : Solid

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10783

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 18/10783

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

JE Job No: 18/10783

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes

10th May 2019

30158/014

Mr Mark Wilkinson
Technical Director
McDermott Homes Ltd
Jupiter House
1 Mercury Rise
Altham Business Park
Altham
BB5 5BY

Dear Mark

Preliminary Validation of Site Preparatory Works – Phase 1B, St Kevin's Drive, Kirkby

Further to the issue of our 'Geo-environmental Appraisal of land off St Kevin's Drive, Kirkby' (ALM Report No.30158-1, dated November 2017) and our 'Remediation Strategy for land off St Kevin's Drive, Kirkby' (ALM Report No.30158-2, dated November 2017), ALM understand that development works in Phase 1B of the proposed development are now underway, and the developer requires an interim verification report to assist with the partial discharge of planning conditions relating to the Phase 1B part of the site.

The extent of the Phase 1B development area is shown on ALM Drawing No.30158-15_Rev1 in Appendix A.

Background

The ALM Consult Ltd (ALM) Geo-environmental Appraisal Report identified natural topsoil, reworked topsoil, demolition rubble, granular made ground across the site. The approximate extents of the different soil types are shown on ALM Drawing No.30158-10 in Appendix A.

The presence of made ground across the site is coincident with the historical presence of former buildings. The former Overdale Junior and Infant Schools were present in the central part of the site from the 1950's, with fields in the west noted as playing fields. It is these playing fields which comprise the Phase 1 development area, which the Phase 1B area forms part of. Elsewhere across the site, the former Bramcote / Northfield Primary school was present in northern central parts of the site from the early 1970's, with associated playing fields in the east, and residential dwellings were present within much of the eastern/south-eastern boundary of the site from the 1950's. Historical site features are shown on ALM Drawing No.30158-4 in Appendix A.

Laboratory chemical analysis has determined that there is no significant contamination in natural and reworked topsoil, or made ground across the site, with regard to a residential end use with plant uptake, with the exception of topsoil and made ground in the former Bramcote / Northfield Primary School area of the site, where asbestos fibres and some elevated concentrations of PAH and TPH have been recorded. The extent of the area affected by soil contamination is shown on ALM Drawing No.30158-11 in Appendix A.



No significant soil contamination was identified in the Phase 1B development area. Summary Tables of laboratory chemical analysis, extracted from the ground investigation report, are included in Appendix D. Exploratory Hole Locations are shown on Drawing No. 30158-6 in Appendix A.

There is an estimated 25,000m³ of topsoil to be stripped from the surface of the site as part of the redevelopment works, with an approximately equal quantity of natural and reworked topsoil anticipated. 12No. samples of natural topsoil and 18No. samples of reworked topsoil were submitted for laboratory chemical analysis as part of ground investigation works, the results of which are included in ALM Report No.30158-1.

Initial recommendations for additional laboratory chemical analysis following stripping of the topsoil, comprised a further 20No. samples, giving a frequency of 1 sample per 500m³ of topsoil. However, consultation with Knowsley Metropolitan Borough Council (Ref:17/00201/FUL, see Appendix C), suggested a testing frequency of 1 sample per 250m³ of topsoil be adopted.

Verification of Phase 1B Development Area

No significant soil contamination has previously been identified in the Phase 1 development area, and no unforeseen made ground or contamination has been encountered during the stripping of topsoil from the surface in the Phase 1B development area. Therefore, no ground remediation measures were required in order to render the site suitable for residential occupation. However, in accordance with Remediation Strategy and subsequent recommendations from the Local Authority, additional topsoil testing was undertaken to confirm the suitability of site won topsoil for re-use within the proposed development.

ALM attended site on Wednesday 6th March, and again on Tuesday 12th March 2019, to obtain 18No. samples of topsoil stripped from the remaining part of the Phase 1 development area (Phase 1B). The Phase 1B area covers approximately 17,500m² and topsoil is generally 300mm thick. Therefore, it is estimated that approximately 5,250m³ of topsoil was present in the stockpiles in Phase 1B.

Topsoil in Phase 1B was located in two stockpiles, a large stockpile along the southwest edge of Phase 1, and a smaller stockpile was located near to the Plot 153-154 area, as shown on Drawing No.30158-14_Rev1 in Appendix A. The topsoil appeared to a dark brown sandy silt, with no visual or olfactory evidence of contamination.

Selected Photos of the stockpiles are also included in Appendix B.

The 14No. samples of topsoil were submitted for a suite of analysis comprising; pH, metals (As, water sol.B, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn), %TOC and speciated PAH. A further 7No. samples were screened for asbestos, and 3No. samples were submitted for speciated TPH.

The results of the laboratory chemical analysis were compared against the CIEH/LQM 'Suitable for Use Levels' (S4UL) for residential development with home grown produce. With regard to lead, consideration is given to the DEFRA Category 4 Screening Level of 200mg/kg. With regard to phytotoxic determinands (copper and zinc), consideration was given to BS3882:2007 & BS8601:2013. Concentrations of water soluble boron were measured against former ICRC Guidance Note 59/83, second edition (1987).



The results of the laboratory chemical analysis are included in Appendix D. None of the samples exhibited any concentrations of determinands above the chosen criteria. However, asbestos fibres were encountered in one sample (Topsoil 27) of topsoil stripped from the Phase 1B area. Quantification analysis of asbestos from the Topsoil 27 sample, identified <0.001% asbestos to be present in the sample.

ALM attended site on Wednesday 10th April 2019 to observe the excavation of soils from the Topsoil 27 sample location, and obtain further samples of topsoil from the area immediately surrounding the Topsoil 27 sample location, in order to confirm the adequate removal of impacted soils. Validation sampling comprised taking a sample from the base and north, south, east, and west, sidewalls of the excavation, and the submission of those samples for an asbestos screen test. The results of the laboratory chemical analysis are included in Appendix D. None of the samples exhibited the presence of asbestos.

When considered alongside the 12No. samples of natural topsoil already tested in order to characterise the natural topsoil at the site as part of the ground investigation, and the 18No. samples of topsoil tested from the Phase 1A development area, a sample frequency of 1 sample per 262m³ is achieved for the data set, which is very close to the desired frequency of 1 sample per 250m³.

It should be noted that the overall sample frequency arising from continued sampling of stripped topsoil from other parts of the site, will be similar or better than that already undertaken, and the desired frequency across the whole site will be achieved.

ALM consider the topsoil stripped from the surface of the site, is suitable for use as topsoil within the proposed development. The topsoil has been, and should continue to be re-used to provide a minimum 150mm soil cover in private gardens, which will provide a growing medium for plants, although a greater thickness may be used.

We hope that this provides sufficient validation of the preparatory works undertaken to date in the Phase 1B development area. If you require any further information, please contact me.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Keith Lyon'. The signature is fluid and cursive, with the first name 'Keith' and the last name 'Lyon' clearly distinguishable.

Keith Lyon
Director
ALM Consult Ltd

- Appendix A - Drawings
- Appendix B - Selected Photographs
- Appendix C - Correspondence
- Appendix D - Laboratory Chemical Analysis