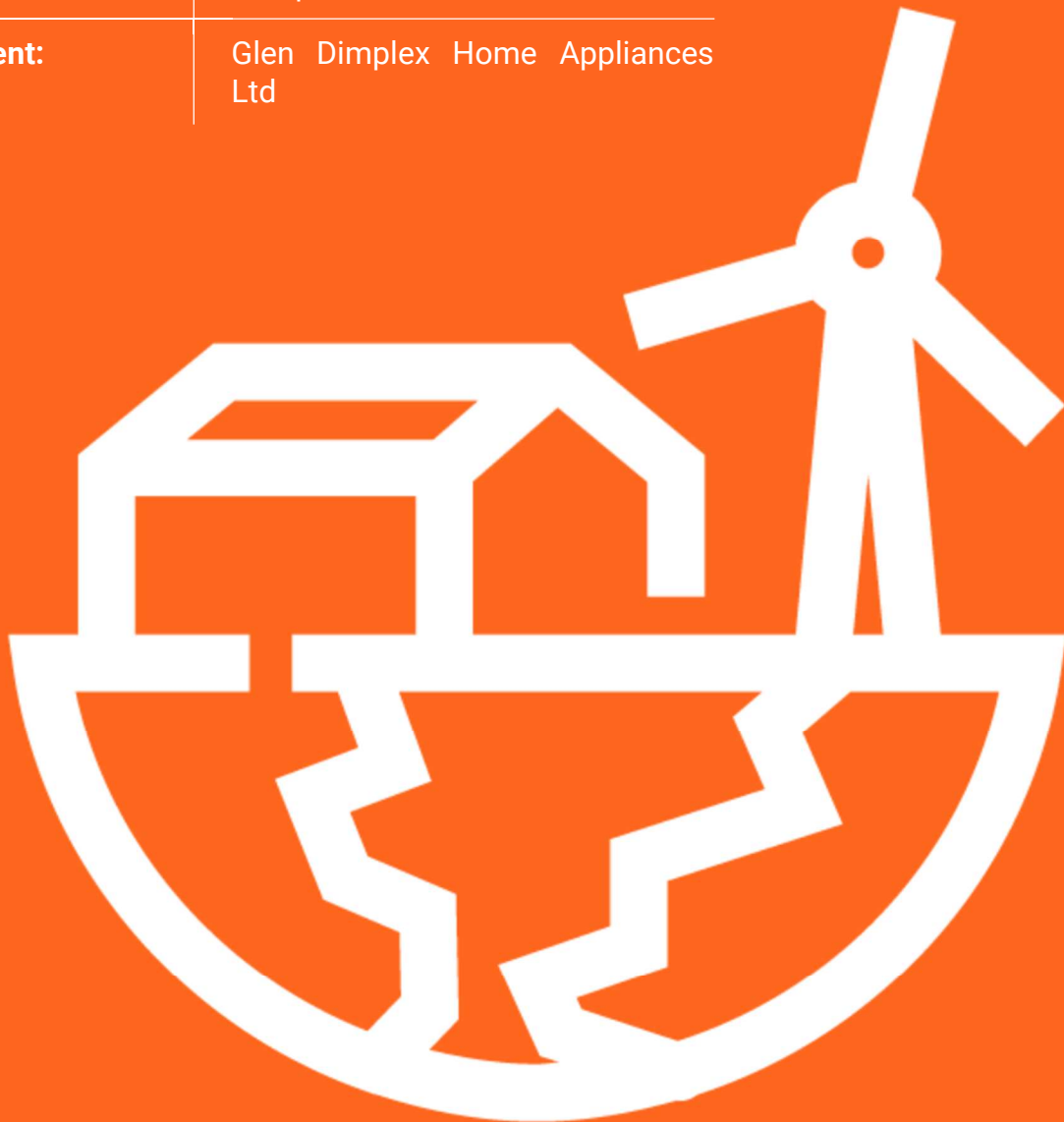


PHASE II GEOENVIRONMENTAL SITE ASSESSMENT

Site:	Glen Dimplex, Prescot
References:	17-500-R2-1
Date:	10 April 2025
Client:	Glen Dimplex Home Appliances Ltd





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QUALITY ASSURANCE

Report references	17-500-R2-1
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REV REF	DESCRIPTION	DATE
01	First issue	April 2025

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EXECUTIVE SUMMARY

SITE DESCRIPTION AND HISTORY

Site Address	Glen Dimplex Home Appliances Ltd, Stoney Lane, Rainhill, Prescott, L35 2XW
Grid Reference	E 348017 N 391531
Site Area	5.96 Ha.
Proposed Development	E3P understands that Glen Dimplex is considering the proposed sale of the former Glen Dimplex factory in Prescott for future redevelopment into low-rise residential housing with associated private gardens, roadways and associated infrastructure. At present, a proposed development plan has not been confirmed for the site.
Current Site Use	The site is an irregularly shaped parcel of land situated to the south of Stoney Lane in Rainhill, Prescott. The site is occupied by the Glen Dimplex Home Appliances manufacturing factory, which predominantly comprises a large factory structure with associated smaller buildings and infrastructure, including a gas governor to the north and two electricity substations to the west and south. Surrounding the main factory structure, a service road is present to the south and the west, connecting to Stoney Lane at the north. Whilst the site was active, the main factory structure was internally segmented into multiple smaller subsections pertaining to various elements of the manufacturing process. The area to the northwest of the factory pertains to the assembly area including freestanding, with the east of the factory pertaining to the press/technology area. Both the enamel area (southeast) and paint shop (northwest) noted all machinery remained in-situ and had not yet been deconstructed. Access was not granted into the Polystyrene Plant (north) or Aluminium Shop (northeast) at the time of investigation. An area of hardstanding car parking is also noted at the east of the site. At the time of the internal investigation, all site activities have ceased with only security personnel remaining permanently on-site. Small areas of soft cover landscaping (managed grasses) are noted at the north and east of the structure, with sporadic semi-mature trees towards the northern boundary.
Site History	Following a review of pertinent Ordnance Survey mapping circa 1850, the site appears to be utilised as vacant agricultural land with a small dwelling situated at the centre of the southern boundary. A roadway leading to the dwelling is running parallel to the southern boundary. A well is noted adjacent to the dwelling at the southern boundary. Several segmenting tree-lined field boundaries are present, with the site comprising seven smaller fields. Two small ponds are recorded; one situated at the northern boundary towards the east, with another pond situated towards the centre of the southern boundary. Historical mapping was unavailable between 1907 and 1925. However, records held by Heritage Gateway indicate that a factory had been developed on the site, and that it was being used as a Munitions Works during the First World War (1914-1918) and up until at least 1925 (potentially for the manufacturing of military-based explosives and propellants).



Site History Continued...

Minor changes were noted in the mapping with significant changes noted in mapping circa 1925, where the site was completely redeveloped and now comprises an Iron Foundry with associated railway sidings across the site. The works structures consisted of two large structures segmented by a railway siding traversing east to west through the centre of the site. Multiple small outbuildings were noted along the western sector of the main factory structure and the outbuilding situated to the south of the main factory structure is assumed to be associated with the railway sidings. Subsequent mapping circa 1927 identified minor compositional changes to the main factory structure with a tank situated towards the south.

Following mapping dated 1937, the site was renamed to Rainhill Stove works, with minor compositional changes to the structure noted. Records held by Heritage Gateway indicates the factory was repurposed as a Munitions Works during the Second World War (1939-1945), again potentially for the manufacturing of military-based explosives and propellants.

Alterations continued to the main factory structure identified in mapping circa 1954 with the main factory structures now recorded as one large structure, with the former segmenting sidings removed. Additional outbuildings were constructed towards the northeast of the site, with an electricity substation noted at the northwest of the main factory structure and a small pond noted at the southern boundary adjacent to the sidings towards the east.

Records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.

By 1978, all railway and tramway sidings were removed with a segmenting boundary noted at the eastern sector of the site, separating the area from the main works structure. It is assumed this is the construction of the car parking area.

Minor expansions of the main factory structure were noted in the following mapping, but predominantly the present-day composition was first noted in aerial imaging dated 2000.

ENVIRONMENTAL SETTING

Geology	Superficial Geology	Glacial Till (Majority of site) – CLAY, SAND, and GRAVEL Glaciofluvial Deposits (Southeast) – SAND and GRAVEL
	Bedrock Geology	Kinnerton Sandstone Formation (Majority of site) –SANDSTONE Chester Formation (East) - SANDSTONE



Geology <i>Continued...</i>	Faults	The nearest geological fault is located on-site (Cronton Fault) traversing northwest to southeast through the eastern sector of the site, with a downthrow to the east.
Geomorphology	Based on the initial geological assessment, a review of available topographic data and pertinent mapping, E3P has undertaken a preliminary geomorphological evaluation of the landform and its possible mechanism for formation. Based upon a review of historical mapping and topographical contours, it would appear that the placement and upfilling of material will have formed the current site level plateau prior to the construction of the historical development. It is possible that the historical level raising has resulted in a greater thickness of Made Ground overlying the natural glacial till and glaciofluvial deposits and potentially underwent earthworks to create a development platform for the main factory structure present	
Hydrogeology	A Secondary (undifferentiated) aquifer and Secondary A aquifer (East) has been recorded on-site in the superficial geology with a Principal aquifer in the bedrock geology. An active groundwater abstraction license is recorded within 50 m of the site located 16 m SE, pertaining to Elis UK Ltd and is used for laundry purposes.	
Hydrology	No surface water features are located within 100 m of the site boundary. Records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.	
Utility Locations	A full ground penetrating radar (GPR) and utility survey has been undertaken by Geo UK Ltd in March 2024 surrounding the main factory structure. The survey identified electricity cables surrounding the main factory structure and feeding into the two on-site electricity substations. Two gas governors and associated pipework were identified along the northern boundary and fed into a polystyrene manufacturing plant and the northwest corner of the main factory structure. Water and sewerage mains and telecommunication cables were also identified surrounding the main factory structure and feeding into the surrounding smaller structures. At the time of the intrusive ground investigation within the main factory structure, the gas governor and medium pressure gas mains connecting off Stoney Lane to the north had been disconnected. In addition, the electricity substation situated in the central southern part of the site is believed to have been disconnected. Fire hydrants have also been switched off by United Utilities, however, water mains remained live.	



Landfill Sites and Waste Sites	No landfill sites (current or historic) are located within 250 m of the site. The site has undergone significant historical development and ground working.
Radon	Radon Class 1 - less than 1% of homes are estimated to be at or above the Action Level. No radon protection measures required.
Unexploded Ordnance	Records held by Heritage Gateway indicate that the site had previously been used as Munitions Works during the First World War (1914-1918), up until at least 1925; and again, during the Second World War (1939-1945). Though the type of munitions manufactured at the site is currently unknown, given the operational years during the First and Second World Wars, there is the potential for military-based explosives and propellants to have been manufactured at the site. Based on the potential for the site being used as a Munitions Works, a Detailed UXO Risk Assessment has been prepared for the site. Evidence has been found to suggest that the factory on-site was utilised for the production of munitions during both WWI and WWII. However, no specific evidence detailing this activity or the types of munitions produced could be found during the production of this assessment. The production / use of live explosives was typically well documented, and it would be highly unusual for this to have occurred undocumented. Client provided information suggests that the factory may have been used for the production of ammunition boxes. The source of this information was discussions with site personnel and therefore cannot be verified; however, this is consistent with the site's historic usage as a sheet metal processing plant and would account for the lack of information available. Had the factory been utilised for the production of ordnance, there is the potential for any unwanted / superfluous items to be disposed of in nearby open ground. Areas of poorly maintained open ground were present in the north, south and east of the Site. It cannot be completely discounted that the disposal of potential ordnance present at the factory took place in these areas, given the lack of conclusive information available. However, in line with the ALARP principle (As Low As Reasonably Practicable) principle, no specific evidence of this occurring, or of ordnance ever being present at the factory, has been found, and as such a Low-Moderate Risk from UXO has been assessed.
Per- and Polyfluorinated Substances (PFAS/PFOS) and Perfluorooctanoic Acid (PFOA)	Due to current and/or historical processes on the site, the site has been identified to be at potential risk of PFAS/PFOS/PFOA contamination. Key areas of concern included the Enamel Area (southeast) and Paint Shop (northeast) due to the potential use of substances containing PFAS/PFOS/PFOA compounds during the operation of the factory.
Hazardous Installations	The following hazardous installations have been identified on-site which have the potential to affect the proposed development: two electricity substations, and gas governor. Whilst the gas governor has been fully disconnected from the main medium pressure gas source (off Stoney Lane), the electricity substation in the northwest part of site remains live. It is currently unknown whether the electricity substation in the central southern part of site remains live.



Hazardous Installations
Continued...

Manufacturing machinery and equipment have been partially removed from the main factory structure, however, some plant and machinery remains in the Enamel Area (southeast), Paint Shop (northeast), Press / Technology (central). It is assumed that these will be removed prior to the demolition of the main factory structure.

COAL MINING ASSESSMENT

Preliminary Assessment

The Mining Remediation Authority (MRA) search indicates the site is in an area that may be affected by ground instability attributed to coal mining.

The 1:63,360 plan for the site, which shows a geological fault (Cronton Fault) traversing northwest to southeast through the eastern sector of the site, with a downthrow to the east. No coal outcrops are recorded within an influencing distance to the site, with all known worked seams situated > 500 m to the west of the site within the Pennine Middle Coal Measures.

Based on a continuation of the current site use and the redevelopment of the site for residential end use, there is considered to be a low risk associated with coal mining activities.

PREVIOUS REPORTS

Multiple previous reports have been completed for the site:

- ✳ 17-500-R1-2 - Glen Dimplex, Prescott, Phase I and II Geoenvironmental Site Assessment, June 2024
- ✳ 17-500-L2-1 - Glen Dimplex, Prescott – Stage 1 Supplementary Site Investigation, October 2024
- ✳ 17-500-L3-2 - Glen Dimplex, Prescott – Controlled Waters Risk Assessment, November 2024.

A full summary of findings is provided in Section 2.

E3P GROUND INVESTIGATION

Ground Investigation Works

E3P has completed an intrusive ground investigation comprising:

- ✳ 12 x Shallow Sonic Boreholes
- ✳ 3 x Deep Sonic Boreholes
- ✳ Construction of environmental monitoring installations.

Ground Conditions

Made Ground

Made Ground deposits were encountered within all exploratory hole locations to depths of between 1.30 m and a maximum proven depth of 3.00 m bgl.

Made Ground deposits were generally noted to be deeper within the southernmost boreholes, including BH201, BH102, BH104, and BH112, which were noted to extend from ground level to between 2.00–3.00 m bgl.

All locations identified a layer of concrete within the upper 0.35 m bgl, with the exception of BH104, which recorded concrete to a depth of 2.10 m bgl.



**Ground
Conditions**
Continued...

Made Ground deposits beneath the concrete layers generally comprised of a black slightly sandy gravel with frequent cobbles. Gravel constitutes comprised of fine to coarse, very angular to subrounded asphalt, concrete, brick, mudstone and sandstone. Cobbles comprised of subangular asphalt and brick.

Voided ground was recorded beneath a suspended ground floor slab between 0.30–1.30 m bgl within BH110, located within the Assembly Area in the central part of site. The voided ground was only encountered within borehole BH110 during the intrusive investigation; no other areas were identified. However, the suspended floor slab and void space are believed to span a small proportion of the Assembly Area running east to west through the centre of the main factory structure, within the footprint of former railway sidings.

Superficial Deposits

Superficial deposits were encountered within all exploratory hole locations, with the deposits varying across the site. The most common stratum recorded was a dark reddish brown gravelly sandy CLAY with gravel of sandstone, mudstone, and instances of coal and rare shale. Deposits were typically first encountered between 1.00–2.00 m bgl, with the southernmost boreholes recording deeper superficial deposits. The maximum proven depth of superficial deposits was 13.50 m bgl, identified in BH201 towards the southern part of the main factory structure.

Typically, the CLAY was locally interbedded with lenses of a dark orange to brown very clayey fine to medium SAND between 2.00-9.00 m bgl. The lenses were more commonly thinly banded comprising <0.10 m in thickness.

A rare band of clayey very sandy GRAVEL interbedded within the CLAY was recorded in three exploratory hole locations situated towards the northeast of site (BH102, BH111, and BH203). The GRAVEL bands were encountered between 4.00-8.50 m bgl and comprised of gravel of mudstone and sandstone.

Bedrock

Instances of highly weathered SANDSTONE were recorded within several exploratory hole locations at depths between 5.00-7.30 m bgl, recovered as a reddish brown very gravelly very sandy CLAY with gravel of sandstone.

Competent sandstone bedrock was proven within four exploratory hole locations, with the shallowest proven depth encountered within BH203 towards the northwest of site at a depth of 8.00 m bgl. The bedrock dips towards the southwest of site, recorded at its deepest in BH201 at 13.50 m bgl. Due to poor to no recovery, detailed descriptions of the bedrock could not be undertaken.

Groundwater

Groundwater strikes were encountered in the majority of exploratory hole locations within both Made Ground, superficial, and bedrock stratum.

Generally, groundwater strikes recorded within the Made Ground were noted as seepages and were typically noted between 0.40–1.50 m bgl.



Ground Conditions <i>Continued...</i>	Groundwater strikes within the superficial deposits varied between seepages to moderate ingress water strikes at depths between 1.50–6.50 m bgl. The majority of groundwater strikes identified in the superficial deposits were noted to rise between 0.20–0.50 m bgl over a time period of 20 minutes. Groundwater within the bedrock was proven in three exploratory hole locations, ranging from 18.00 m bgl in BH203 towards the northwest of site, dipping deeper to 19.00 m bgl towards the northeast of site. These groundwater strikes were recorded as moderate ingress and rose between 1.50–2.50 m bgl over 20 minutes. Visual/Olfactory Evidence of Contamination Multiple instances of visual/olfactory evidence of contamination were identified predominantly comprising slag inclusions within the Made Ground deposits. Three instances of hydrocarbon odours were encountered within the Made Ground in BH106, BH109, and BH110 which are situated towards the centre of the main factory structure and in proximity to the former railway sidings.
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CONTAMINATED LAND ASSESSMENT

Potential Contamination Sources	Previous ground investigations have identified elevated concentrations of Trichloroethene (TCE), Dichloroethane variants (DCE), and Vinyl Chloride within the Made Ground and superficial deposits, primarily towards the southeast part of the main factory structure. The potential source of these contaminants was presumed to be the enamel slurry tank, situated within the Enamel Area (southeast), as well as other industrial processes carried out whilst the factory was still active. Historical site uses including the more recent use as an Oven Manufacturer presents a potential risk of PFAS//PFOS/PFOA compounds, which are potentially present within underlying stratum.
Human Health Risk Assessment	Elevated concentrations of heavy metalloids and non-volatile PAHs in exceedance of residential GACs have been identified within Made Ground across the footprint of the main factory structure, as well as an isolated occurrence within natural superficial deposits in the eastern part of the site. As the impacted soils are considered likely to be site-wide, a clean cover system will be required in any proposed areas of soft landscaping or private gardens in order to mitigate the risks to proposed end users via dermal contact and ingestion (PL1). A singular instance of trace asbestos chrysotile fibres (<0.001%) has been identified within shallow Made Ground deposits in BH108 (0.60 m bgl), situated within the Paint Shop area (northeast part of site). As the fabric of the main factory structure is known to contain asbestos containing materials, it is recommended that following the demolition process, validation samples of shallow Made Ground deposits should be taken in order to confirm no cross contamination has occurred. Validation samples are suggested within the vicinity of BH108 to confirm it is a localised hotspot with only trace fibres present and delineate the full extent of potential impact. Impacted materials should be managed in accordance with the Asbestos Risk Mitigation Conceptual Site Model (CSM).



Human Health Risk Assessment <i>Continued...</i>	No PFAS/PFOS/PFOA compounds have been identified within the Made Ground samples taken from within and surrounding the Enamel Area and Paint Shop, located in the eastern part of the site. Samples were submitted at varying depths to ensure representative results were provided for the assessment. As such, the overall risk to human health receptors posed from PFAS/PFOS/PFOA compounds is considered to be low. Elevated concentrations of TCE have been recorded in multiple locations across the site; thus, confirming previous assessments regarding the spatial extent of TCE impact. It should be noted that the largest concentrations of TCE were recorded in BH104 within the natural superficial deposits at 5.50 m bgl, with concentrations decreasing with distance away from BH104 and the enamel slurry tank. Therefore, it is deemed highly likely the enamel slurry tank is the primary source of TCE contamination. As TCE is classified as a dense non-aqueous phase liquid (DNAPL), it is assumed that the contamination originated from the enamel slurry tank, and that shallow superficial groundwater flow has resulted in the mobilisation of these compounds. This has subsequently facilitated the migration of TCE deeper into the superficial soil matrix through preferential granular stratum contained within the cohesive materials. Subsequently, TCE and its daughter products (DCE and Vinyl Chloride) have degraded and migrated laterally and vertically throughout deeper superficial deposits to a maximum proven depth of 5.50 m bgl (BH104). The supervised removal of the enamel slurry tank and immediate underlying materials is recommended in order to mitigate any further migration and subsequent degradation of TCE and daughter products into further areas of the site. Additional testing of deeper natural superficial deposits and surrounding materials is also recommended in order to determine the lateral and vertical extent and gradient of contamination surrounding the source, and form the basis of the remedial requirements.
Controlled Waters Risk Assessment	Elevated concentrations of heavy metalloids and VOCs have been identified in the submitted superficial and bedrock groundwater samples in comparison to both EQS and DWS threshold values. Typically, where elevated concentrations have been identified in groundwater samples, they are also recorded in chemical soil analysis proving an on-site source. Preferential pathways through interbedded granular stratum and consistent groundwater flow have resulted in the migration of contaminants from proven sources including the Made Ground and the enamel slurry tank. With regards to heavy metalloids, it is considered the impact is site wide and therefore a high risk is associated with contaminated groundwater migrating to the underground stream/culvert potentially underlying the site. The enamel slurry tank impact is assumed to be relatively localised to the south of the main factory structure, now proven to extend as far south as BH112, and present in BH101. Additional VOC compounds including Trichloromethane, Tetrachloroethane, and 1,1-Dichloropropane have been proven in BH106, BH107, and BH110, however an on-site source has not been identified in soil analysis. Due to the known historical site activities and the uses of the compounds, there is a high likelihood the source is on-site. Exceedances of TCE and daughter products were recorded within the bedrock aquifer in BH201, however these are thought to not be wholly representative of bedrock groundwater conditions. It is believed that the VOCs have not yet migrated down to the underlying bedrock Principal aquifer.



Controlled Waters Risk Assessment <i>Continued...</i>	The largest risk associated with the superficial groundwater mobilisation of contaminants is the underground stream/culvert potentially situated through the centre of the site. As its existence cannot be unproven, to remain conservative it is believed to still be present. Multiple exceedances above EQS threshold values have been recorded of heavy metalloids and VOCs, with proven preferential pathways of lateral and vertical migration through superficial groundwater mobilisation. Removal of the enamel slurry tank and subsequent treatment of superficial deposits is required to remove the risk posed to both the underlying bedrock Principal aquifer and underground stream/culvert. A Tier 3 Detailed Quantitative Risk Assessment (DQRA) for Controlled Waters is required to address the identified exceedances, model the fate and transport potential of the VOC impact, undertake a sensitivity assessment to the critical receptor and derive SSRT's for soil remediation.
Ground Gas Risk Assessment	Preliminary ground gas monitoring data suggests the site contains ground gas concentrations classified within Characteristic Situation 1 (CS1), therefore a low risk. However, a precautionary CS2 classification is recommended for impacted wells due to the majority of monitoring wells being recorded as flooding, therefore providing potentially skewed results. These include the elevated max flow rates identified in BH107 and BH110, and the elevated concentrations of CO2 above 5% V/V identified in BH101 and BH104. Further monitoring is required to confirm the potential presence or absence of elevated ground gases and clarify the final ground gas monitoring regime. Further consideration is also required in areas where elevated volatile contaminants have been identified within soils and groundwater across the southern boundary of the site. In these areas, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the impacted soils.
Potable Water Infrastructure	Based upon current site conditions, barrier pipe is likely to be required for a proposed residential development. However, post-remediation and enabling works ground conditions may be different from those identified during this phase of intrusive ground investigation. As such, a post-remediation UKWIR risk assessment will be required

GEOTECHNICAL ASSESSMENT

Underground obstructions & Subterranean Hazards	Due to the highly developed nature of the site, extensive underground obstructions have been identified during intrusive investigation works. The current factory structure and all associated substructures require demolition and grubbing out prior to the commencement of enabling works. Further obstructions were proven within the footprint of the main factory building, including extensive concrete layers, to a proven depth of 2.40m bgl in BH104, and a subfloor void of approximately 1.30m with a suspended concrete slab in the footprint of the former railway sidings in locality of BH110. The potential underground stream/culvert presents a potential underground obstruction through the centre of the site if proven to be present.
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Underground obstructions & Subterranean Hazards <i>Continued...</i>	As part of the process of creating a suitable platform for development, all subterranean obstructions will need to be excavated and removed beneath new structures and infrastructure. This will facilitate the construction of the proposed plots as intended.
Allowable Bearing Capacity	Due to the depth of Made Ground typically exceeding 2.00–2.50 m bgl, typically suitable materials for founding have been identified in excess of 3.00 m bgl within a gravelly sandy CLAY. At circa 3.00 m bgl, an ABC in excess of 80 kN/m² was recorded, with the exception of a reduced strength very sandy CLAY in BH112 of 53 kN/m². However, within five locations (BH103, BH105, BH107, BH111, BH202), suitable founding materials were identified at circa 2.00 m bgl, with an ABC exceeding 75kN/m². Soft CLAY deposits were identified in BH101 and BH105 at 2.00m and 3.00m bgl respectively. No loose granular deposits were identified during this phase of intrusive ground investigation. The SANDSTONE bedrock recorded with an ABC recorded in excess of 300 kN/m². Zoned foundation plans are suggested following confirmation of site layout and development levels.
Foundation Options	Several foundation options should be considered for low-rise housing based on confirmed soil mechanics, cost, and construction feasibility. In this instance, it is thought that the following foundation options for low-rise housing would be applicable: ✦ Driven piled foundations within areas of deep MADE GROUND exceeding 1.50 m bgl, reduced strength CLAY, variable ground conditions or potential tree influence; and, ✦ Ground improvement by Vibro Stone Columns to ensure the treatment achieves a suitable design ABC to support a doubly reinforced strip foundations or piled foundations within the footprint of the main factory structure and outbuildings
Foundation Near Trees	Foundation depths within the conjectured influence of former, existing or proposed trees will need to be dependent to ensure that structural loading bears within the underlying target founding stratum, which cannot be subject to volumetric instability associated with fluctuation in moisture content.
Heave Precautions Near Trees	Cohesive soils have been identified across the site and assessed as having a low volume change potential. As such, heave precautions will be required for foundations and floor slabs where cohesive soils are present within the conjectured zone of tree influence.
Building Floor Slabs	Ground-bearing floor slabs are not considered viable given the depths of Made Ground > 600 mm and shallow cohesive soils present across the site. A suspended floor slab is required



Soakaway Drainage	The Made Ground and underlying superficial deposits are cohesive in nature and impacted by volatile organic compounds which would preclude the use of infiltration drainage systems.
Sulphate Assessment	The majority of the samples submitted for testing confirmed that deposits can be classified within concrete classification DS-1 AC-1s. However, localised areas of elevated sulphates, classified as DS-2, AC-1s, and DS-3, AC-2s, are recorded in Made Ground deposits in BH105, BH108, and BH110 between 0.60 m bgl and 2.00 m bgl. Concrete design should be completed based upon these classifications.
Highway & Infrastructure Construction	Unsuitable materials comprising of loose fill have been identified beneath the footprint of the main factory structure. There is also the potential for unsuitable materials to be present within areas of infilled ponds. In areas where a proposed highway or infrastructure is to be constructed, remediation works will be required to ensure the site is engineered to a suitable geotechnical design specification.
CBR Design %	Granular soils can be re-engineered to ensure 5% within the subgrade during favourable climatic conditions. Natural clay soils will provide a CBR in the order 3-5% during drier climatic periods. However, if water is allowed to shed onto the formation, the CBR will reduce to <2%, which will require specialist engineering of the subgrade.
Enabling Earthworks & Settlement	Development levels are unknown at this time; however, cut-and-fill works may be required to prepare the development platform. The presence of variable and locally deep Made Ground represents a risk associated with long-term settlement within the Made Ground. As part of the detailed development design and due to the proposed development levels, earthworks surcharge, and infrastructure loading, the long-term settlement should be assessed. Where settlement is predicted to exceed permissible design criteria, ground engineering works will be required. As part of the earthworks design, materials should be assessed and characterised prior to re-use in the construction of upfill to a geotechnical design. All future earthworks should be completed in accordance with a Geotechnical Design Report (GDR) that will consider the ground model within the context of the potential for settlement induced by surcharge from earthworks, dynamic and permanent loading of the development and all known hazards.
Civil Engineering Excavations	Extensive obstructions are anticipated within the footprint of the main factory structure with known obstructions encountered within WS108 (north of the main factory structure). Further obstructions were proven within the footprint of the main factory building, including extensive concrete layers, to a proven depth of 2.40m bgl in BH104, and a subfloor void of approximately 1.00m with a suspended concrete slab in the footprint of the former railway sidings in locality of BH110. Towards the north of the site, shallow bedrock is present at depths between 3.00–5.00 m bgl. Within the footprint of the main factory structure, bedrock dips towards the south becoming deeper with the shallowest recorded depth of competent bedrock at 8.00 m bgl (BH203) towards the northwest of the main factory structure. Additional considerations may be required for plant if excavations are required in excess of 3.00m bgl towards the north of the site.



Civil Engineering Excavations <i>Continued...</i>	Dewatering may be required in any areas where reduced level digs extend past 2.00 m bgl due to identified shallow groundwater body.
Waste Characterisation	Any material that is to be disposed off-site should undergo assessment using Technical Guidance. WM3: <i>Waste Classification – Guidance on the classification and assessment of waste</i> . This can be done upon request and in line with the Environment Agency sampling frequencies.

RECOMMENDATIONS

Based on the findings of the Geoenvironmental site assessment and the various conclusions drawn, the following additional works are recommended to be completed in due course.

- ✦ Watching Brief / post-demolition investigation of previously inaccessible areas:
 - Removal of Enamel Slurry Tank to the southeast of the main factory structure;
 - Underground Stream/culvert beneath the central part of the main factory structure;
 - Voided ground beneath the central part of the main factory structure; and
 - Historically infilled ponds in centre south, southeast and northeast boundaries of the site.
- ✦ Tier 3 Controlled Waters Detailed Quantitative Risk Assessment (DQRA);
- ✦ Remediation and Enabling Works Strategy;
- ✦ Piling Risk Assessment;
- ✦ Plot-specific foundation schedule (upon receipt of the final development levels);
- ✦ Settlement Analysis for earthworks design;
- ✦ Geotechnical Design Report (GDR);
- ✦ Geotechnical Earthworks Specification; and,
- ✦ Ground Gas Protection Design Report (GPDR).



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APPENDIX I LIMITATIONS

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APPENDIX V PHOTOGRAPHS

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APPENDIX VII EXPLORATORY HOLE LOGS

APPENDIX VIII CHEMICAL TESTING RESULTS

APPENDIX IX GEOTECHNICAL TESTING RESULTS

APPENDIX X ORIGIN OF CHEMICAL ASSESSMENT CRITERIA

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DRAWING LIST

17-500-001 – Site Location Plan
17-500-003 – Historical Features Plan
17-500-004 – Site Features Plan
17-500-005 – Exploratory Hole Location Plan
17-500-006 – Depth of Made Ground Plan
17-500-010 – Human Health Conceptual Site Model
17-500-012 – Depth to Bedrock Plan
17-500-015 – Development Constraints Plan
17-500-018 – Groundwater Contamination Exceedances Plan
17-500-026 – Human Health Contamination Exceedances Plan
17-500-027 – Controlled Waters Conceptual Site Model
17-500-028 – Utility Survey Plan
17-500-031 – Ground Gas Conceptual Site Model
17-500-032 – Depth of Superficial Groundwater Plan
17-500-033 – Depth of Bedrock Groundwater Plan
17-500-034 /-035 /-036 – Cross Section Plan



1. INTRODUCTION

1.1. BACKGROUND

Glen Dimplex Home Appliances Ltd (the client) has commissioned E3P to undertake a Phase II Geoenvironmental Site Assessment at the Glen Dimplex factory, Stoney Lane, Whiston, Prescott, L35 2XW, specifically within the internal layout of the main factory structure.

This report is to be read in conjunction with the external ground investigation report; Report ref: 17-500-R1-2, Phase I and II Geoenvironmental Site Assessment, Glen Dimplex, Prescott, dated June 2024.

This report is required to determine potential contaminated land liabilities, remediation requirements and geotechnical engineering works that will be required as a part of the proposed development for a low-rise residential development.

1.2. PROPOSED DEVELOPMENT

At present, a proposed development plan has not been decided; however, it is assumed the redevelopment will comprise residential dwellings with associated private gardens, roadways, and associated infrastructure.

At the time of writing this report, the proposed development is potentially subject to change and will be updated following significant changes.

1.3. OBJECTIVES

The objectives of the geoenvironmental investigation are as follows:

- ✳ Review historical plans, geology, hydrogeology, site sensitivity, floodplain issues, mining records and any local authority available to complete a desk study in line with Environment Agency (EA) document Land Contamination: Risk Management (LCRM) (updated June 2023);
- ✳ Undertake a phase of sampling and analysis to provide an overview of the environmental issues identified;
- ✳ Assess the implications of any potential environmental risks, liabilities and development constraints associated with the site concerning the site's future use and off-site receptors;
- ✳ Assess the geotechnical information and provide recommendations concerning foundations, pavement construction and floor slabs;
- ✳ Assess the coal mining-related information and provide recommendations regarding any future treatment; and,
- ✳ Provide recommendations regarding future works required.



1.4. SCOPE OF WORKS

The scope of works includes the elements included in Table 1.1

Table 1.1 **Scope of Works**

Ground Investigation	 Design of suitable ground investigation.
	 Sonic Drilled boreholes with the construction of environmental monitoring installations.
	 Soil and groundwater sampling
Testing and Monitoring	 In-situ geotechnical testing
	 Chemical and geotechnical analysis
	 Groundwater monitoring
	 Ground gas monitoring
Assessment and Reporting	 Factual and interpretative reporting
	 Contamination risk assessment and conceptual site model
	 Geotechnical assessment and interpretation

1.5. LIMITATIONS

The limitations of this report are presented in APPENDIX I.

1.6. RISK CLASSIFICATION

The description of risk classification and the likely action required as set out in CIRIA C552 are included in APPENDIX III.

1.7. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed or with whom an assignment has been agreed. Should any third party wish to use or rely upon the report's contents, written approval must be sought from E3P; a charge may be levied against such consent.



2. PREVIOUS GROUND INVESTIGATIONS

Two phases of previous ground investigations have been completed externally to the main factory structure prior to the commencement of the internal investigation. Table 2.1 includes a summary of all reports completed to date regarding assessments completed.

Table 2.1 Previous Reports

AUTHOR	REFERENCE/TITLE	CLIENT	DATE
E3P	17-500-R1-2 – Glen Dimplex, Prescott, Phase I and II Geoenvironmental Site Assessment	Glen Dimplex Home Appliances	June 2024
	17-500-L2-1 – Glen Dimplex, Prescott – Stage 1 Supplementary Site Investigation		October 2024
	17-500-L3-2 – Glen Dimplex, Prescott – Controlled Waters Risk Assessment		November 2024

The key findings of the previous ground investigation reports are summarised below, and where necessary, data has been used to support the E3P geoenvironmental site assessment.

For the avoidance of any doubt, the E3P Geoenvironmental Site Assessment Reports should be read both as a precursor to and in conjunction with this document.

2.1. PRELIMINARY GROUND INVESTIGATION (REF: 17-500-R1-2)

- ✳ Preliminary ground investigation confined to external areas of site due to the active nature of the main factory structure.
- ✳ Both Made Ground and Superficial deposits were recorded within all boreholes completed.
- ✳ Shallow bedrock (<5.00 m bgl) was encountered in two locations towards the north of the site, deepening to >9.00 m bgl towards the south.
- ✳ Elevated concentrations of Arsenic, Lead and Nickel above residential (1% SOM) GACs were identified in the soil analysis contained within Made Ground deposits, predominantly towards the north of the site.
- ✳ Localised areas of elevated Trichloroethene (TCE), Dichloroethene (Cis 1,2-Dichloroethene, and Trans 1,2-Dichloroethene) (DCE), and Vinyl Chloride were identified within soils in three locations (WS101 to WS103) across the southern boundary of the site, directly to the south of the main factory structure.
- ✳ Widespread TCE), DCE (Cis 1,2-Dichloroethene, and Trans 1,2-Dichloroethene), and Vinyl Chloride contamination and localised heavy metal exceedances were identified in the groundwater analysis at the site.
- ✳ It is noted that where there were exceedances of VOCs in soils, exceedances in groundwater were often recorded. Therefore, it is considered likely that there is an on-site source of contamination which may be leaching across the site.



- ✳ Initial ground gas monitoring data classifies the site in variable categories, with the majority of site situated within Characteristic Situation 1 (CS1), and two areas noted as CS2. Due to known VOC impact within the soil deposits, precautionary CS2 measures were recommended.
- ✳ Based upon chemical soil analysis, barrier pipe is likely required for potable water supply.

2.2. STAGE 1 SUPPLEMENTARY SITE INVESTIGATION (REF: 17-500-L2-1)

- ✳ Supplementary investigation to determine the extent of the VOC impact identified within soils and groundwater during the preliminary ground investigation. Delineation exercise comprised the drilling shallow window sample probeholes at the farthest extents of site and chemical analysis of soils.
- ✳ Photoionisation Detector (PID) recorded elevated concentrations of volatile vapours contained in WS207, within the Made Ground deposits. A maximum concentration of volatile vapours recorded was 273 ppm after 2 minutes of monitoring.
- ✳ Elevated concentrations of Lead and Mercury were identified within shallow Made Ground deposits at the southeast and southwest of the site respectively. Further delineation sampling suggested that the Mercury is unlikely to be elemental.
- ✳ Marginal detections of TCE at the GAC threshold value were identified within WS208 towards the southwest of the site, in addition to elevated concentrations of 1,2,4 Trimethylbenzene contained within WS207 at 1.10 mg/kg.
- ✳ Loose SAND deposits were identified at WS208 (4.00 m bgl) and WS211 (5.00 m bgl) with very soft extremely low strength CLAY deposits identified in WS211 (2.00 m bgl). Additional geotechnical considerations are required within the vicinity of these areas regarding potential foundation design.

2.3. CONTROLLED WATERS RISK ASSESSMENT (REF: 17-500-L3-2)

- ✳ Stage 2 supplementary ground investigation, comprising the installation of two deep environmental monitoring wells into the underlying bedrock Principal Aquifer, chemical analysis of groundwater from within the bedrock, and overview of all groundwater monitoring and testing results to date.
- ✳ Elevated concentrations of Nickel, pH, TPH (C5-C7), TCE, DCE, and Vinyl Chloride were identified within submitted superficial groundwater analysis, exceeding Drinking Water Standards (DWS) threshold values. Elevated TCE, Cis 1,2 Dichloroethene, and Vinyl Chloride were identified site wide, however elevated TPH C5-C7, 1,1 Dichloroethene, and Trans 1,2 Dichloroethene were more localised.
- ✳ Elevated concentrations of Trichloromethane were identified within submitted bedrock groundwater samples. No other instances of elevated VOCs were identified within the submitted bedrock groundwater samples. As such, it is deemed the pathway is not complete and these compounds have not leached from superficial groundwater and contaminated the underlying bedrock.
- ✳ A plume of TCE, DCE variants, and Vinyl Chloride has been identified within shallow groundwater monitoring data, extending from WS107 towards the northwestern entrance of the site, through to CP102 towards the southeast of the factory. No groundwater samples were obtained from WS101, as the environmental monitoring well did not contain enough groundwater for laboratory testing. However, as exceedances of the known TCE, DCE variants, and Vinyl Chloride were identified within the soil testing, it is considered likely groundwater within the vicinity of WS101 will be contaminated with the aforementioned VOCs. It is noted that concentrations of VOCs were significantly higher in deeper groundwater monitoring wells, which suggests the plume is formed of DNAPL.



3. SITE WALKOVER & ANECDOTAL INFORMATION

3.1. DETAILED UNEXPLODED ORDNANCE REPORT (UXO)

Records held by Heritage Gateway indicated that the site had previously been used as Munitions Works during the First World War (1914-1918), up until at least 1925; and again, during the Second World War (1939-1945). Though the type of munitions manufactured at the site is currently unknown, given the operational years during the First and Second World Wars, there is the potential for military-based explosives and propellants to have been manufactured at the site.

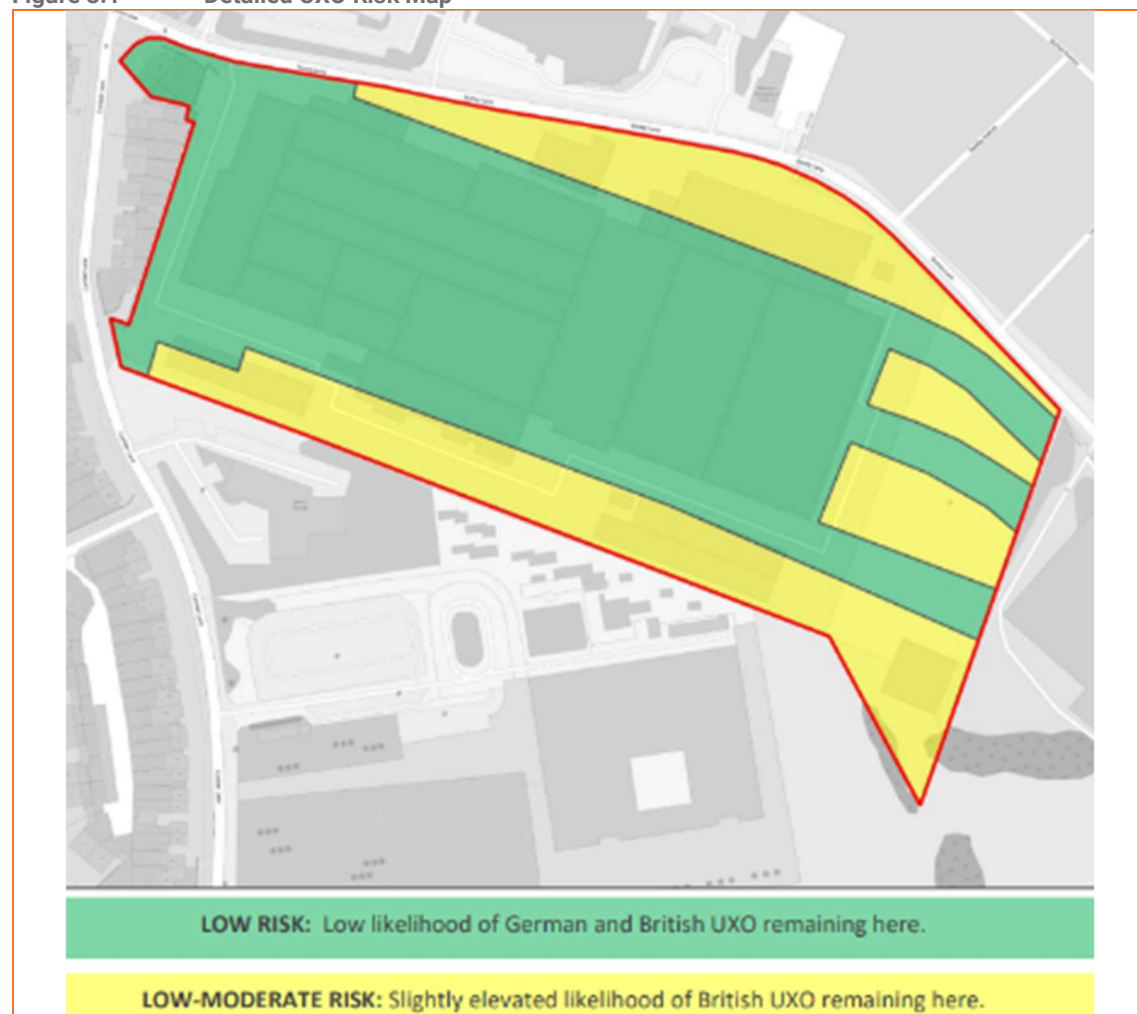
Based on the potential for the site being used as a Munitions Works, a Detailed UXO Risk Assessment has been prepared for the site, which is presented in APPENDIX VI (Brimstone, Ref: DRA-24-1792-GlenDimplexHomesAppliances, Prescott-E3PL230R), and is summarised below:

- ✳ Evidence has been found to suggest that the factory on-site was utilised for the production of munitions during both WWI and WWII. However, no specific evidence detailing this activity or the types of munitions produced could be found during the production of this assessment.
- ✳ The site is assessed as containing a Low risk from German UXB and a Low to Moderate Risk from Allied UXO. The areas surrounding the factory structure are noted to contain a higher moderate risk of British UXO, however these are noted to be likely present within the upper shallow 2.00 m bgl of ground deposits if present.
- ✳ The production / use of live explosives was typically well documented, and it would be highly unusual for this to have occurred undocumented. Client provided information suggests that the factory may have been used for the production of ammunition boxes. The source of this information was discussions with site personnel and therefore cannot be verified; however, this is consistent with the site's historic usage as a sheet metal processing plant and would account for the lack of information available.
- ✳ Had the factory been utilised for the production of ordnance, there is the potential for any unwanted / superfluous items to be disposed of in nearby open ground. Areas of poorly maintained open ground were present in the north, south and east of the Site. It cannot be completely discounted that the disposal of potential ordnance at the factory took place in these areas, given the lack of conclusive information available. However, in line with the ALARP principle (As Low As Reasonably Practicable), no specific evidence of this occurring, or of ordnance ever being present at the factory, has been found, and as such a Low-Moderate Risk from UXO has been assessed.

Based on this assessment, E3P considered it was no longer necessary to undertake testing of soils or groundwater for the presence of explosive compound and propellants.



Figure 3.1 Detailed UXO Risk Map



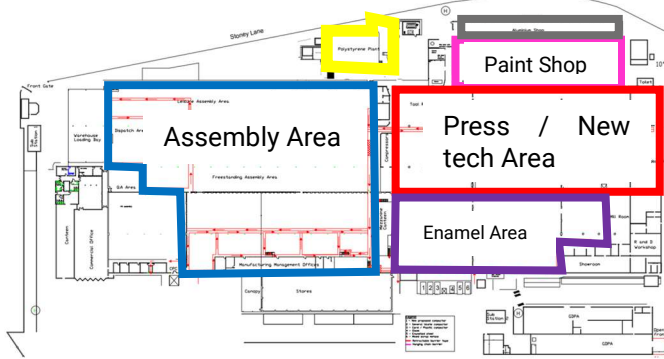


3.2. SITE WALKOVER (INTERNAL LAYOUT)

A site walkover of the internal layout of the main factory structure was completed by an E3P representative on 13th January 2025, with additional anecdotal historical building plans reviewed. The full details included in Table 3.1.

A site features plan is presented as Drawing 17-500-004 in APPENDIX IV, and site photographs are presented in APPENDIX V.

Table 3.1 Site Description

FEATURE	DESCRIPTION	PHOTOGRAPHIC EVIDENCE
Occupancy/Use	The site is an irregularly shaped parcel of land situated to the south of Stoney Lane in Rainhill, Prescott. The site is formerly occupied by the Glen Dimplex Home Appliances manufacturing factory, which predominantly comprises a large factory structure with associated smaller buildings and infrastructure, including a gas governor to the north and two electricity substations to the west and south. Surrounding the main factory structure, a service road is present to the south and the west, connecting to Stoney Lane at the north. Whilst the site was active, the main factory structure was internally segmented into multiple smaller subsections pertaining to various elements of the manufacturing process. The area highlighted in blue pertains to the assembly area including freestanding, with area to the right highlighted in red pertaining to the press/technology area. Both the enamel area (purple) and paint shop (pink) noted all machinery remained in-situ and had not yet been deconstructed. Access was not granted into the Polystyrene Plant (yellow) or Aluminum Shop (Grey) at the time of investigation. An area of hard standing car parking is also noted at the east of the site. At the time of the internal investigation, all site activities have ceased with only security personnel remaining permanently on-site.	 



FEATURE	DESCRIPTION	PHOTOGRAPHIC EVIDENCE
Occupancy/Use <i>Continued...</i>	Small areas of soft cover landscaping (managed grasses) are noted at the north and east of the structure, with sporadic semi-mature trees towards the northern boundary.	
Former Machine Pits	Within the former Press / New Tech Area in the northeast part of site, where pressing machines were formerly present, large rectangular shaped voids (machine pits) are present, approximately 1.50–2.00 m in depth from ground level. The voided areas contained visual evidence of oils and lubricants in the base and on the side walls where former pipework connected to the machines. This presents a potential source of Hydrocarbon and PAH contamination in the immediate vicinity and directly beneath the machine pits. However, the machine pits were noted to be encased in concrete, which appeared in a generally good condition with no visible evidence of cracks or fissures; this reduces the potential risk of contaminant migration into the underlying ground. Further assessment is required following demolition to determine if contaminant migration associated with the former machine pits has occurred.	
Relict Machines	Within the Enamel Area and Dispatch Area in the southeast and northwest parts of the site, respectively, relict machinery remained present. Both above ground and below ground features associated with the machinery were identified suggesting no partial deconstruction or removal of the machinery has been completed within these areas to date.	



FEATURE	DESCRIPTION	PHOTOGRAPHIC EVIDENCE
Relict Machines <i>Continued...</i>	Machinery associated with the construction of equipment, paint and lacquering, cleaning and priming, and subsequent movement were identified through the factory. Scarring surrounding the structures indicated below ground infrastructure are likely present. Above ground infrastructure including vents to outside the factory were still present connected to the machinery. Free standing machinery was present in the Strut/Robot area in the far eastern part of site, and compressors remained towards the centre of the factory, however, these were not operational at the time of the walkover.	 



FEATURE	DESCRIPTION	PHOTOGRAPHIC EVIDENCE
Suspended Ground Floor Slab and Void Space	Beneath part of the Assembly Area in the central part of site, a suspended ground floor slab was identified with voided ground of approximately 1.30 m in depth recorded beneath it. The ground floor slab appeared to be suspended by brick pillars at frequent intervals with metal pipelines running east to west at the base of the void space. The voided ground was only encountered within borehole BH110 during the intrusive investigation; no other areas were identified. However, the suspended floor slab and void space are believed to span a small proportion of the Assembly Area running east to west through the centre of the main factory structure, within the footprint of former railway sidings.	



FEATURE	DESCRIPTION	PHOTOGRAPHIC EVIDENCE
Anecdotal Historical Building Plans (Underground Stream / Culvert)	During the intrusive investigation, site staff provided access to historical building floorplans for review. Records held by the client indicated a potential underground stream was present running north to south across the center of the site (highlighted in blue), and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure (highlighted in purple). These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.	



4. E3P GROUND INVESTIGATION

4.1. GENERAL OVERVIEW

An intrusive ground investigation has been designed based on the findings of the desk study and previous ground investigations, with exploratory holes advanced to supplement further spatial coverage of the site, whilst targeting specific potential contaminant sources identified and summarised in the preliminary ground investigation report (Ref: 17-500-R1-2, dated June 2024). The investigation has also been used to collect further geotechnical information to assist in the design and construction of the proposed development.

Exploratory fieldwork was completed between 13th January and 29th January 2025. The works are summarised in Table 4.1.

4.2. LIMITATIONS OF INVESTIGATION

During the intrusive investigation completed within the main factory structure, all internal walls, doorways, and permanent building features including the ground floor slab and void space were present. Due to the drilling equipment utilised to complete the intrusive ground investigation, this resulted in the limitation of the spatial distribution of exploratory hole locations completed within the main factory structure.

Additionally, areas of now relict machinery, machine pits, and associated factory infrastructure remained present in areas of the building, as well as part of the site remaining active in the southwest part of the building. This further limited both the quantity and spatial distribution of the exploratory hole locations which could be completed during the intrusive ground investigation within the main factory structure.

4.3. SCOPE OF INVESTIGATION

A summary of the fieldwork completed are included in Table 4.1.

Table 4.1 **Summary of Fieldwork**

POTENTIAL SOURCE / RAIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
Investigation of Made Ground and Superficial Deposits and Potential Contamination within Superficial Groundwater	BH101	Sonic-drilled Boreholes	8.74	2.00–6.00
	BH102		8.50	3.00–8.00
	BH103		6.90	0.50–1.50
	BH104		7.75	2.50–5.00
	BH105		9.71	2.00–5.00
	BH106		3.68	1.00–2.00
	BH107		4.45	2.00–3.00
	BH108		6.79	0.60–1.60
	BH109		9.73	3.00–8.00



POTENTIAL SOURCE / RAIONALE	LOCATION HOLE	TYPE	MAXIMUM DEPTH (m bgl)	MONITORING WELLS RESPONSE ZONE (m bgl)
Investigation of Bedrock and Principal Aquifer Groundwater Conditions	BH110		7.02	3.00–5.00
	BH111		7.20	2.00–6.00
	BH112		10.75	4.00–8.00
	BH201	Sonic-drilled Boreholes	21.00	16.50–20.50
	BH202		20.00	15.00–20.00
	BH203		20.00	12.00–20.00

A series of sonic drilled boreholes were advanced to undertake in-situ detailed geotechnical testing, obtain environmental samples, screen for volatile vapours, and install dual groundwater and ground gas monitoring wells within Made Ground, Superficial, and Bedrock deposits whilst ensuring a suitable spatial distribution across the footprint of the main factory structure. Sonic drilling techniques were utilised in order to safeguard the underlying bedrock Principal aquifer and ensure no potential pathways for the migration of known contaminants was created (i.e. clean drilling techniques).

The sampling locations are illustrated in Drawing 17-500-005 (APPENDIX IV), with ground conditions encountered indicated on the exploratory hole logs, which are provided in APPENDIX VII.

Return visits were made to monitor installations for groundwater level and gas concentrations. In addition, all wells containing groundwater were purged and samples of groundwater recovered for chemical analysis.

4.4. INSITU STANDARD PENETRATION TEST (SPT)

In-situ geotechnical testing was conducted using the standard penetration test (SPT) and, where the ground is granular, a 60-degree cone (SPT(C)) was used instead of the sampling tube. The results are shown in the exploratory hole logs in APPENDIX VII and are discussed further in Section 7.0.

4.5. LABORATORY ANALYSIS

Selected soil samples were submitted for a range of chemical and geotechnical analysis, as summarised in Table 4.2.

Table 4.2 Summary of Laboratory Analysis

CHEMICAL ANALYSIS
✳ Metals; ✳ pH, total sulphate, water-soluble sulphate (2:1 extract); ✳ Sulphide; ✳ Cyanide; ✳ Phenols; ✳ Asbestos identification and quantification;



- ✧ Total Organic Carbon (TOC);
- ✧ Total and speciated polycyclic aromatic hydrocarbons (PAHs);
- ✧ Speciated and banded total petroleum hydrocarbons (TPHs);
- ✧ Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs);
- ✧ Per- and Poly-Fluorinated Substances (PFAS/PFOS); and,
- ✧ Perfluorooctanoic Acid (PFOA).

GEOTECHNICAL ANALYSIS

- ✧ Moisture content;
- ✧ Atterberg limits determinations;
- ✧ Particle Size Distribution Test (PSD);
- ✧ Single stage triaxial tests;
- ✧ Multi-stage Triaxial tests; and,
- ✧ Oedometer Consolidation tests.

4.6. STORAGE, PRESERVATION AND TRANSPORT OF SAMPLES

Measures taken to ensure the quality and integrity of the collected samples, from collection to receipt of the samples by the laboratory, are summarised in Table 4.3.

Table 4.3 Sample Integrity Information

SUBJECT	CHEMICAL SAMPLING	
Storage	Soil Glass jars supplied by the laboratory were used for the collection of soil samples to be analysed for a variety of suites, including VOCs. Plastic tubs were used to collect soil samples for PFAS/PFOS/PFOA testing.	Groundwater Glass vials supplied by the laboratory were used for the collection of samples to be analysed for a variety of suites, including VOCs. Samples to be tested for PFAS/PFOS/PFOA compounds were stored in laboratory-supplied HDPE bottles.
Preservation	Soil and groundwater sample containers were filled to minimise headspace prior to sealing and stored at a low temperature within cool boxes with cooling aids to minimise the loss of volatile contaminants and reduce microbial activity during the collection of samples. Cooling aids that may contain PFAS compounds (such as blue ice) were not utilised to prevent cross-contamination with samples.	
Sample Integrity	Dedicated disposable nitrile gloves were worn and changed between sample collections to prevent cross-contamination. Hand tools were decontaminated with PFAS free detergent and rinsed with	Groundwater samples were collected using dedicated plastic tubing, which was changed between monitoring well locations to prevent cross-contamination.



SUBJECT	CHEMICAL SAMPLING	
	PFAS free water between sampling events. PFAS free stationary was used to label all samples.	Interface probes were decontaminated with PFAS free detergent and rinsed with PFAS free water between monitoring wells. PFAS free stationary was used to label all samples.
Transport	Samples were stored and shipped in dedicated sample boxes provided by the laboratory. Sample details were recorded on the laboratory chain of custody form enclosed with the samples prior to dispatch. Scheduling information for the samples was confirmed with the laboratory via email.	

Chemical analysis has been undertaken by an accredited laboratory with the testing results summarised and discussed in Section 6 and the testing certificates included in APPENDIX VIII.

Geotechnical samples were collected as required per location immediately after excavation, labelled and sealed to minimise moisture loss. The geotechnical samples were collected and couriered by a dedicated courier to an accredited geotechnical testing laboratory. The testing results are summarised and discussed in Section 7 and the testing certificates included in APPENDIX IX.



5. GROUND AND GROUNDWATER CONDITIONS

5.1. SUMMARY OF GROUND CONDITIONS

The intrusive ground investigation generally confirms the published geology and identifies the strata set out in Table 5.1.

Table 5.1 Summary of Strata

HOLE	DEPTH TO STRATUM (m bgl)						
	MADE GROUND	Sandy CLAY	Gravelly CLAY	Sandy CLAY with pockets of GRAVEL	Sandy CLAY with pockets of SAND	Clayey SAND	BEDROCK
BH101	0.00–2.00	2.00–3.60	3.60–8.74	–	–	–	–
BH102	0.00–2.90	–	4.00–5.10	2.90–4.00 5.10–8.50	–	–	–
BH103	0.00–1.50	2.00–5.00	5.00–6.90	–	–	1.50–2.00	–
BH104	0.00–2.35	–	2.35–7.75	–	–	–	–
BH105	0.00–1.40	2.50–6.70	1.40–2.50 6.70–9.71	–	–	–	–
BH106	0.00–2.40	3.40–3.68	–	–	2.40–3.40	–	–
BH107	0.00–1.70	3.10–4.45	2.80–3.10	–	1.70–2.80	–	–
BH108	0.00–1.60	1.60–6.79	–	–	–	–	–
BH109	0.00–2.20	–	2.20–3.70 7.30–9.73	–	3.70–7.30	2.20–3.00	–
BH110	0.00–2.80	2.80–3.60	5.40–7.02	–	3.60–5.40	–	–
BH111	0.00–1.30	1.30–4.60	–	4.60–7.20	–	–	–
BH112	0.00–2.40	2.40–3.00	–	–	3.00–9.00	9.00–10.10	10.10–10.75
BH201	0.00–3.00	4.60–5.50	12.70–13.50	–	3.00–4.10	4.10–4.60 5.50–12.70	13.50–21.00
BH202	0.00–1.80	10.40–12.40	1.80–3.70	6.70–10.40	3.70–6.70	–	12.40–20.00
BH203	0.00–2.40	–	5.20–6.10	2.40–5.20	–	6.10–8.00	8.00–20.00

5.2. MADE GROUND

Made Ground deposits were encountered within all exploratory hole locations during the intrusive ground investigation, to depths of between 1.30 m and a maximum proven depth of 3.00 m bgl.

Made Ground deposits were generally noted to be deeper within the southernmost boreholes, including BH201, BH102, BH104, and BH112, and were noted to extend from ground level to between 2.00–3.00 m bgl.



All locations identified a layer of concrete within the upper 0.35 m bgl, with the exception of BH104, which recorded concrete to a depth of 2.10 m bgl.

Made Ground deposits beneath the concrete layers generally comprised of a black slightly sandy gravel with frequent cobbles. Gravel constitutes comprised of fine to coarse, very angular to subrounded asphalt, concrete, brick, mudstone and sandstone. Cobbles comprised of subangular asphalt and brick. It is assumed that this stratum forms part of the subbase for the main factory structure.

Voided ground was recorded beneath a suspended ground floor slab between 0.30–1.30 m bgl within BH110, located within the Assembly Area in the central part of site. The voided ground was only encountered within borehole BH110 during the intrusive investigation; no other areas were identified. However, the suspended floor slab and void space are believed to span a small proportion of the Assembly Area running east to west through the centre of the main factory structure, within the footprint of former railway sidings.

A Depth of Made Ground Plan is presented as Drawing 17-500-006 in APPENDIX IV.

5.3. SUPERFICIAL GEOLOGY

Superficial deposits were encountered within all exploratory hole locations, with the deposits varying across the site. The most common stratum recorded was a dark reddish brown gravelly sandy CLAY with gravel of sandstone, mudstone, and instances of coal and rare shale. Deposits were typically first encountered between 1.00–2.00 m bgl, with the southernmost boreholes recording deeper superficial deposits. The maximum proven depth of superficial deposits was 13.50 m bgl, identified in BH201 towards the southern part of the main factory structure.

Typically, the CLAY was locally interbedded with lenses of a dark orange to brown very clayey fine to medium SAND between 2.00–9.00 m bgl. The lenses were more commonly thinly banded comprising <0.10 m in thickness.

A rare band of clayey very sandy GRAVEL interbedded within the CLAY was recorded in three exploratory hole locations situated towards the northeast of site (BH102, BH111, and BH203). The GRAVEL bands were encountered between 4.00–8.50 m bgl and comprised of gravel of mudstone and sandstone.

5.4. BEDROCK GEOLOGY

Instances of highly weathered SANDSTONE were recorded within several exploratory hole locations at depths between 5.00–7.30 m bgl, recovered as a reddish brown very gravelly very sandy CLAY with gravel of sandstone.

Competent sandstone bedrock was proven within four exploratory hole locations, with the shallowest proven depth encountered within BH203 towards the northwest of site at a depth of 8.00 m bgl. The bedrock dips towards the southwest of site, recorded at its deepest in BH201 at 13.50 m bgl. Due to poor to no recovery, detailed descriptions of the bedrock could not be undertaken.

A Depth to Bedrock Plan is presented as Drawing 17-500-012 in APPENDIX IV.

5.5. GROUNDWATER

Groundwater strikes were encountered as seepages to moderate ingress. The depth of the water strikes is shown on the exploratory hole records in APPENDIX VII and are summarised in Table 5.2.



Table 5.2 Summary of Groundwater Strikes

LOCATION	DEPTH TO STRIKE (M BGL)	OBSERVATIONS
BH101	1.70	Seepage in Made Ground
BH102	5.50	Slow Ingress in CLAY
BH103	0.40	Seepage in Made Ground
BH104	2.10	Seepage in Made Ground
BH105	5.00	Slow Ingress in CLAY
BH106	0.50	Seepage in Made Ground
BH107	0.50	Seepage in Made Ground
BH107	1.50	
BH108	1.50	Seepage in Made Ground
BH109	6.00	Moderate Ingress in CLAY
BH111	5.00	Very Slow Ingress in CLAY
BH112	1.50	Seepage in Made Ground
BH112	6.50	Moderate Ingress in CLAY
BH201	18.50	Moderate Ingress in SANDSTONE
BH202	19.00	Moderate Ingress in SANDSTONE
BH203	18.00	Moderate Ingress in SANDSTONE

Monitoring was undertaken using an electronic dip meter and interface probe to record the depth to groundwater and the thickness of any free-phase hydrocarbon product, if present.

5.6. GEOLOGICAL CROSS-SECTIONS

Geological cross-sections are included in APPENDIX IV as Drawing 17-500-034, and snapshots are shown below in Figure 5.1 and Figure 5.2.

Figure 5.1 Geological Cross Section (Superficial Boreholes North-South)

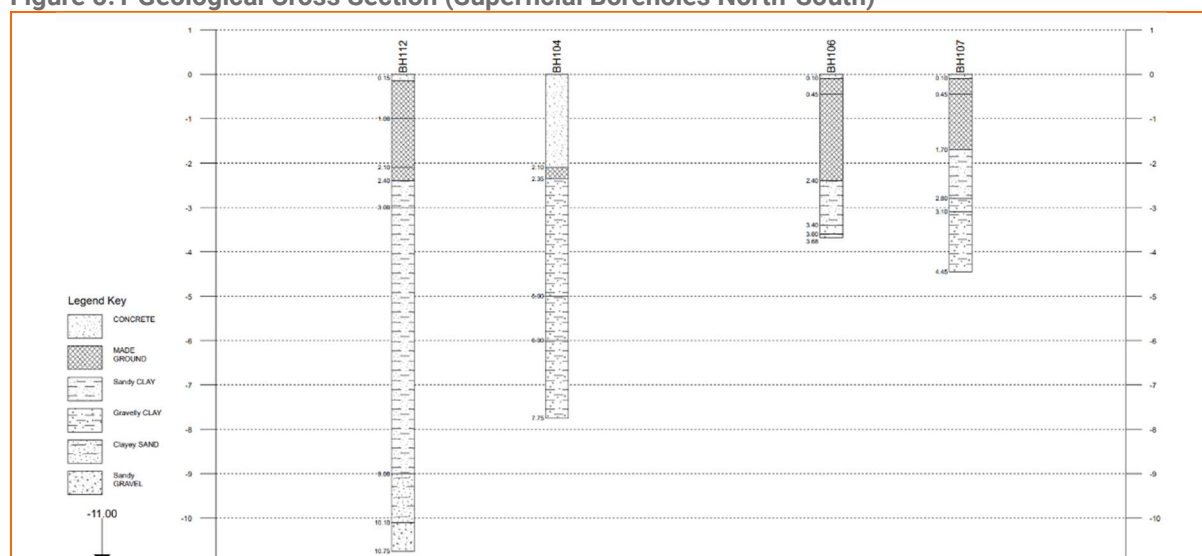




Figure 5.2 Geological Cross Section (Superficial Boreholes East-West)

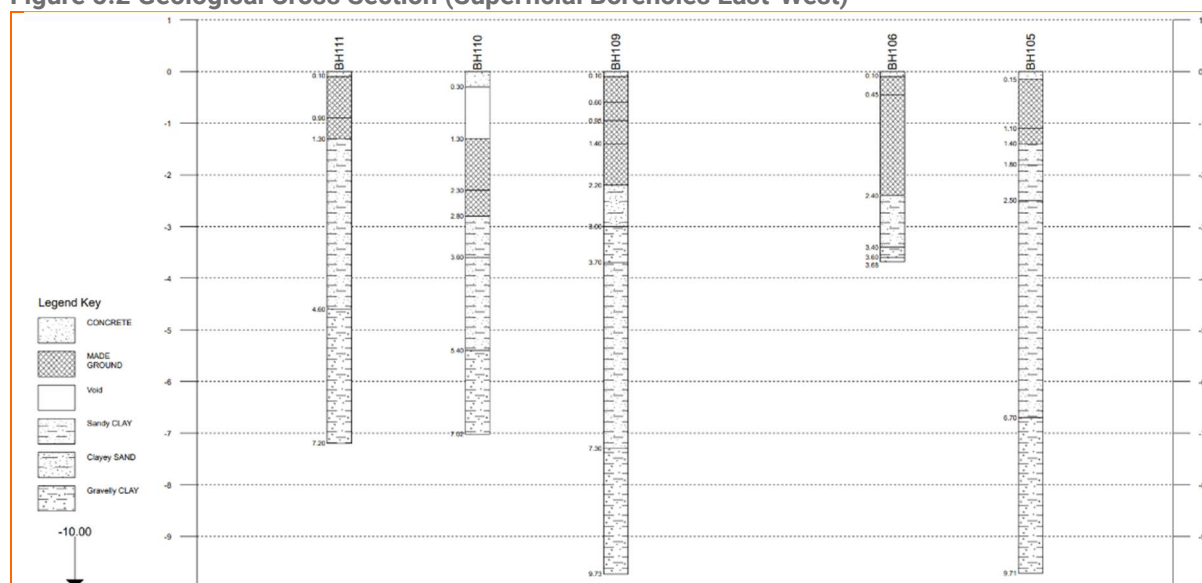
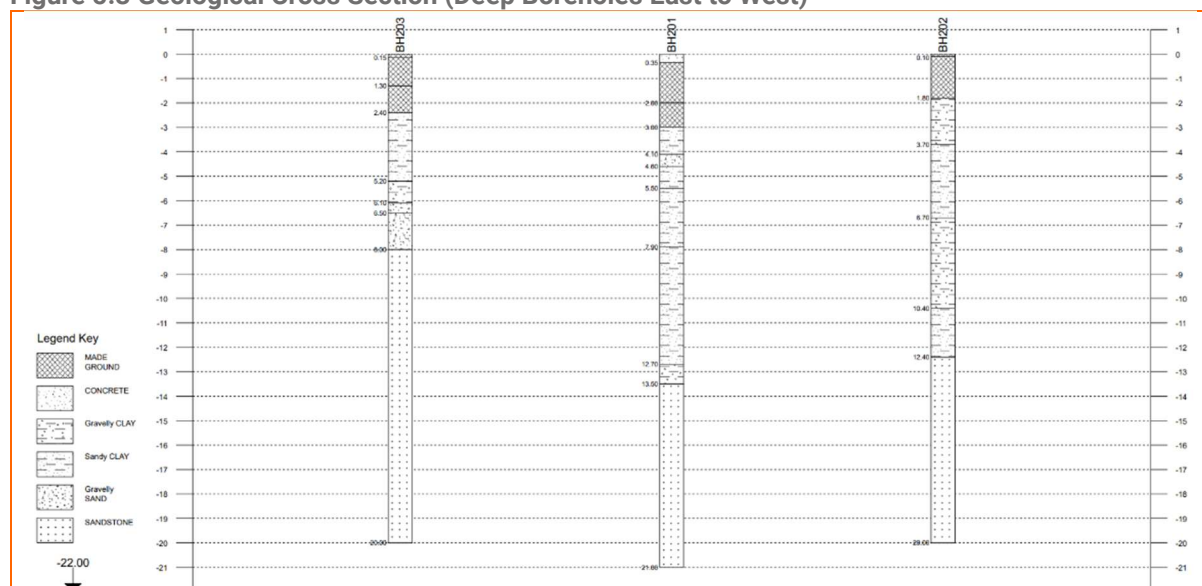


Figure 5.3 Geological Cross Section (Deep Boreholes East to West)



5.7. VISUAL AND OLFACTORY EVIDENCE OF CONTAMINATION

Visual and olfactory evidence of potential contamination has been identified during the intrusive ground investigation; these are summarised in Table 5.3.

Table 5.3 Summary of Visual and Olfactory Evidence of Contamination

LOCATION	DEPTH (m)	STRATUM	OBSERVATIONS
BH103	0.20–0.40	Made Ground	Organic Odour
BH105	0.15–1.10	Made Ground	Slag Inclusions
BH106	0.10–0.45	Made Ground	Slag and Ash Inclusions



LOCATION	DEPTH (m)	STRATUM	OBSERVATIONS
	0.45–2.40	Made Ground	Slight Hydrocarbon Odours
BH107	0.10–0.45	Made Ground	Slag Inclusions
BH109	0.95–1.40	Made Ground	Very Strong Hydrocarbon Odour
	1.40–2.20	Made Ground	Slight Hydrocarbon Odour
BH110	1.30–2.30	Made Ground	Slag and Ash Inclusions
BH111	0.10–0.90	Made Ground	Slag Inclusions
BH112	2.10–2.40	Made Ground	Slight Hydrocarbon Sheen
BH201	0.35–3.00	Made Ground	Slag Inclusions
BH203	0.15–1.30	Made Ground	Slag Inclusions

5.8. OBSTRUCTIONS

Obstructions were identified in several locations across the site, with their positions marked on the Development Constraints Plan (Drawing 17-500-015, APPENDIX IV) and summarised in Table 5.4.

Table 5.4 Summary of Obstructions

LOCATION	DEPTH (m)	STRATUM	OBSERVATIONS
BH104	0.00–2.10	Made Ground	Extensive Concrete
BH110	0.20–1.30	Made Ground	Voided Ground



6. TIER 2 QUALITATIVE CONTAMINATED LAND RISK ASSESSMENT

E3P has undertaken a Tier 2 qualitative land risk assessment with respect to human health, controlled waters and ground gas to determine if any potential contaminants within the underlying soils and groundwater pose an unacceptable level of risk to the identified receptors.

6.1. SAMPLE ANALYSIS POPULATION

Table 6.1 summarises the chemical analysis testing scheduled.

Table 6.1 Summary of Testing Schedule

TYPE OF SAMPLE	NUMBER OF SAMPLES	DETERMINANDS
Made Ground	15	Heavy Metals, Asbestos ID and Triggered Quantification, pH, TOC, PAHs, TPHs, VOCs, SVOCs
	6	PFAS, PFOS, PFOA
Natural Superficial Deposits	15	Heavy Metals, pH, TOC, PAHs, TPHs, VOCs, SVOCs

6.2. HUMAN HEALTH RISK ASSESSMENT

At Tier 2 stage, the long-term (chronic) human health toxicity of the soil has been assessed by comparing the on-site concentrations of organic and inorganic compounds with reference values published in LQM/CIEH S4UL (S4UL3267).

Where Tier 2 screening values are not provided by LQM, other screening values have been used, and these are referenced in Table 6.2.

The Tier 2 screening values for residential with plant uptake have been utilised for this assessment due to the proposed development being a residential end-use. To remain conservative at an early stage, the screening values based on a 1% SOM have been utilised for this assessment.

The results of the comparison have been summarised in Table 6.2.

Table 6.2 Summary of Inorganic and Hydrocarbon Toxicity Assessment for a Residential End Use (with plant uptake)

DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
Arsenic	mg/kg	37	30	39 97	BH105 (0.70 m) BH112 (2.00 m)	1	Further Action
Cadmium	mg/kg	11	30	4.4	N/A	1	No Further Assessment
Chromium (VI)	mg/kg	6.0	30	3.7	N/A	1	No Further Assessment
Lead	mg/kg	200*	30	430 440	BH108 (0.60 m) BH112 (2.00 m)	1	Further Action
Mercury	mg/kg	1.2	30	0.51	N/A	4	No Further Assessment
Nickel	mg/kg	130	30	830 160	BH105 (0.70 m) BH105 (2.60 m)	1	No Further Assessment



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
Selenium	mg/kg	250	30	3.7	N/A	1	No Further Assessment
Copper	mg/kg	2400	30	790	N/A	1	No Further Assessment
Zinc	mg/kg	3700	30	9200	BH112 (2.00 m)	1	Further Action
Cyanide – Total	mg/kg	791	30	2.4	N/A	1	No Further Assessment
Phenols – Total	mg/kg	120	30	2.0	N/A	1	No Further Assessment
Asbestos	mg/kg	NFD	30	Chrysotile Fibres	BH108 (0.60 m)	3	Further Action
Naphthalene	mg/kg	2.3	30	<0.50	N/A	4	No Further Assessment
Acenaphthylene	mg/kg	170	30	<0.50	N/A	2	No Further Assessment
Acenaphthene	mg/kg	210	30	<0.50	N/A	1	No Further Assessment
Fluorene	mg/kg	170	30	<0.50	N/A	1	No Further Assessment
Phenanthrene	mg/kg	95	30	6.4	N/A	2	No Further Assessment
Anthracene	mg/kg	2400	30	1.6	N/A	2	No Further Assessment
Fluoranthene	mg/kg	280	30	7.3	N/A	2	No Further Assessment
Pyrene	mg/kg	620	30	6.6	N/A	2	No Further Assessment
Benzo(a)anthracene	mg/kg	7.2	30	3.8	N/A	2	No Further Assessment
Chrysene	mg/kg	15	30	3.5	N/A	2	No Further Assessment
Benzo(b)fluoranthene	mg/kg	2.6	30	4.4	BH108 (0.60 m)	2	Further Action
Benzo(k)fluoranthene	mg/kg	77	30	1.6	N/A	2	No Further Assessment
Benzo(a)pyrene	mg/kg	2.2	30	3.5	BH108 (0.60 m)	2	Further Action
Indeno(123-cd)pyrene	mg/kg	27	30	2.1	N/A	2	No Further Assessment
Dibenzo(a,h)anthracene	mg/kg	0.24	30	0.85	BH108 (0.60 m)	2	Further Action
Benzo(ghi)perylene	mg/kg	320	30	2.6	N/A	2	No Further Assessment
TPH C6-C8 (aliphatic)*	mg/kg	100	30	<1.00	N/A	4	No Further Assessment
TPH C8-C10	mg/kg	27	30	3.70	N/A	4	No Further Assessment
TPH C10-C12	mg/kg	130	30	3.00	N/A	4	No Further Assessment
TPH C12-C16	mg/kg	1100	30	14	N/A	4	No Further Assessment
TPH C16-C21	mg/kg	260	30	47	N/A	1	No Further Assessment



DETERMINANT	UNIT	GAC	N	MC	LOC. OF EX	PL	ASSESSMENT
TPH C21-C35	mg/kg	1100	30	37	N/A	1	No Further Assessment
Trichloroethene (TCE)	mg/kg	0.016**	30	3.10 >10.00 0.069 0.028 0.15 0.18	BH104 (2.30 m) BH104 (5.50 m) BH105 (0.70 m) BH108 (0.60 m) BH201 (1.50 m) BH203 (4.00 m)	4	Further Action
Cis 1,2-Dichloroethene	mg/kg	0.11**	30	0.67	BH104 (5.50 m)	4	Further Action
Trans 1,2-Dichloroethene	mg/kg	0.19**	30	0.10	N/A	4	No Further Assessment
1,1-Dichloroethene	mg/kg	2.4**	30	0.048	N/A	4	No Further Assessment
Vinyl Chloride	mg/kg	0.00064 **	30	0.0055 0.013	BH104 (2.30 m) BH104 (5.50 m)	4	Further Action
Trichloromethane	mg/kg	0.91**	30	<1.0	N/A	4	No Further Action
Benzene	mg/kg	0.087**	30	0.002	N/A	4	No Further Action
Toluene	mg/kg	130**	30	0.0039	N/A	4	No Further Action
o-Xylene	mg/kg	60**	30	0.0014	N/A	4	No Further Action
Tetrachloroethene (PCE)	mg/kg	0.18**	30	0.0016	N/A	4	No Further Action
Per- and Poly-Fluoroalkyl Substances (PFAS/PFOS)	mg/kg	0.0076 ****	6	<0.0001	N/A	1	No Further Action
Perfluorinated Carboxylic Acids (PFCAs)	mg/kg	0.013 ****	6	<0.0001	N/A	1	No Further Action
Perfluorinated Sulfonic Acids (PFHxS)	mg/kg	0.0081 ****	6	<0.0001	N/A	1	No Further Action

Notes

PL1 = Soil ingestion and consumption of home grown vegetables, PL2 = Dermal contact and ingestion, PL3 = Fibre/dust inhalation; PL4 = Vapour/gas inhalation (indoor).

Abbreviations: GAC = general assessment criteria, N = number of samples, MC = maximum concentration; Loc of Ex = location of exceedance; PL = Contaminant pathway of that contaminant.

*The Tier 2 GAC for the hydrocarbon fraction is derived from the CIEH assessment for petroleum hydrocarbons Criteria Working Group (CWG) for both aliphatic and aromatic compounds. E3P has utilised the Tier 2 values for aliphatic compounds for the volatile and semi volatile fractions (C5-C12) and the Tier 2 values for aromatic compound for the non-volatile fractions (C12-C35). The comparison of a total (aliphatic/aromatic) compounds to an individual fraction is considered to be a conservative approach and satisfactory for the protection of human health.

**The Tier 2 GAC for has been taken from LQM S4ULs.

****The GAC has been taken from CIRIA C819 "Good Practice Guidance: Some per- and polyfluoroalkyl substances (PFAS) in soil and the water environment".

Referring to Table 6.2, the result of this direct comparison indicates that the data exceeds the screening criteria for a residential end use for the following contaminants:

Inorganics

- ☛ Arsenic;
- ☛ Lead;
- ☛ Nickel;
- ☛ Zinc;
- ☛ Asbestos;



- ✳ Benzo(b)fluoranthene;
- ✳ Benzo(a)pyrene; and,
- ✳ Dibenzo(a,h)anthracene.

Organics

- ✳ Trichloroethene (TCE);
- ✳ Cis 1,2 Dichloroethene; and,
- ✳ Vinyl Chloride.

6.2.1. EXPOSURE PATHWAYS

The main exposure pathways based on the Tier 2 exceedances are:

- ✳ Soil Ingestion and consumption of homegrown vegetables (PL1);
- ✳ Dermal contact and ingestion (PL2);
- ✳ Fibre/dust inhalation (PL3); and,
- ✳ Vapour/gas inhalation (indoor) (PL4).

6.2.2. HUMAN HEALTH RISK ASSESSMENT AND MITIGATION

Inorganic Heavy Metals & Non-Volatile PAHs

The identified elevated concentrations of inorganic heavy metals have primary exposure pathways related to dermal contact and ingestion of soils (PL2), and consumption of homegrown vegetables (PL1).

Elevated concentrations of Arsenic, Lead, Nickel, and Zinc were identified within Made Ground deposits in three locations, with the exception of Nickel, which was identified in the natural superficial deposits in BH105. The impacted boreholes are not limited to a singular area within the footprint of the main factory structure; therefore, suggesting the impact of heavy metalloids is site-wide and cannot be attributed to a singular process/operation of the factory.

Additionally, elevated concentrations of Benzo(b)fluoranthene, Benzo(a)pyrene, and Dibenzo(a,h)anthracene have been identified exceeding residential GACs within Made Ground deposits from BH108 (0.60 m). These present additional primary exposure pathways related to dermal contact and ingestion of soils (PL2) and consumption of homegrown vegetables (PL1).

The risk to chronic human health associated with the elevated concentrations of inorganic heavy metals and non-volatile PAHs can be mitigated through the installation of a suitable cover system in all proposed private gardens, landscaping and public open space (POS) to remove any potential for direct exposure to impacted soils.

The specific design and installation process for the appropriate cover systems will be clearly defined within the site remediation and enabling works strategy.

Asbestos

Asbestos in the form of loose chrysotile fibres has been identified within shallow granular Made Ground deposits in BH108, situated within the Paint Shop area (northeast part of site). Asbestos quantification

Impacted soils should be managed in accordance with the E3P Asbestos Risk Mitigation Conceptual Site Model shown in Figure 6.1.

Notes:

N.D. – None Detected

0.001% - Soils may contain $<0.001\%$ asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression).

0.1% - Soils at a depth of $>1.00\text{m}$ bgl may contain $<0.1\%$ asbestos using composite testing where they will be not likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with the Asbestos JIWG risk assessment tools.

Undefined – This will be dependent upon soils encountered during the earthworks, which may be placed at these depths to ensure no potential risk to human health.

The diagram illustrates a cross-section of a residential plot. At the top, a house is shown on a 'Plot'. Below the plot, there are three distinct soil layers. The top layer is labeled 'Front Garden' and contains 'N.D.' (None Detected) asbestos. The middle layer is labeled 'Adopted Highway' and contains '0.001%' asbestos. The bottom layer is labeled 'Rear Garden' and contains '0.1%' asbestos. A note indicates that 'Impacted soils require encapsulation and surveying' for the bottom layer. The diagram also shows a 'Plot' area with a 'Rear Garden' and a 'Front Garden'. The soil layers are shown at depths of 0.30m, 1.00m, and 2.00m. The asbestos concentrations are indicated in different layers: N.D. in the top layer, 0.001% in the layer below, and 0.1% in the layer below that.

Notes

ND None Direct

0.001% Soils may contain $<0.001\%$ asbestos using composite testing to ensure there is no potential risk to human health. This value is present within areas where there may be a short term low level exposure of soils containing trace asbestos fibres by construction workers where an appropriate level of asbestos management is employed (dust suppression)

0.1% Soils at a depth of $>1.00\text{ m}$ bgl may contain $<0.1\%$ asbestos using composite testing where they will not be likely to be disturbed in the future and will therefore be in an area of low sensitivity. Risk assessment completed in accordance with Asbestos JIWG risk assessment tools.

Undefined – this will be dependent upon soils encountered during earthworks, which may be placed at these depths to ensure no potential risk to human health.

Due to current and/or historical processes on the site, the site has been identified to be at potential risk of PFAS/PFOS/PFOA contamination. Key areas of concern included the Enamel Area (southwest) and Paint Shop (northwest) due to the potential use of substances containing PFAS/PFOS/PFOA compounds during the operation of the factory.

All samples returned with no recorded detections of PFAS/PFOS/PFOA exceeding the laboratory limit of detection (<0.1 µ/kg). As such, the overall risk to human health receptors posed from PFAS/PFOS/PFOA compounds is considered to be low.



Volatile Organic Contamination

Elevated Trichloroethene (TCE), Dichloroethene (Cis 1,2-Dichloroethene), and Vinyl Chloride have been identified exceeding residential GACs within soils in five locations (BH104, BH105, BH108, BH201, BH203) predominantly across the eastern and southern parts of the main factory structure, with a localised exceedance in BH203 in the northwest. It should be noted that multiple traces above the laboratory limit of detection were identified in BH101, BH103, BH105, and BH107 within both Made Ground and natural superficial deposits, however, these were not recorded above residential GACs.

It is noted that in BH104, where highest concentrations of TCE and Vinyl Chloride have been identified, is located in the Enamel Area, within the immediate vicinity of the enamel slurry tank in the southeast part of the main factory structure. As such, the enamel slurry tank is considered likely to be the primary source of these exceedances. It is noted that the highest elevated concentrations of TCE was reported within the natural superficial deposits at 5.50 m bgl, therefore suggesting the source has migrated vertically into the deeper natural CLAY deposits.

Both DCE (Cis 1,2-Dichloroethene) and Vinyl Chloride were only identified within BH104, with the former only recording exceedances against residential GACs within the natural superficial deposits. Concentrations above laboratory LOD were also recorded for 1,1-Dichloroethene and Trans 1,2-Dichloroethene in BH104, both in Made Ground and natural superficial deposits; however, these were not recorded above residential GACs.

These elevated concentrations present a primary exposure pathway linked to the potential volatilisation to indoor air risk (PL4), in addition to exposure pathways of dermal contact and ingestion of soils (PL2) and consumption of homegrown vegetables (PL1) within impacted areas.

Previous investigation completed at the perimeter of the factory identified elevated concentrations of TCE within the underlying Made Ground and natural superficial deposits at the following depths:

- ✳ WS101 at 1.30 m bgl (0.0069 mg/kg);
- ✳ WS102 at 0.90 m bgl (1.10 mg/kg);
- ✳ WS102 at 1.40 m bgl (0.04 mg/kg);
- ✳ WS103 at 0.80 m bgl (0.020 mg/kg); and
- ✳ WS103 at 1.60 m bgl (0.0081 mg/kg).

Upon review of the previously reported GAC threshold value for TCE, a new assessment has been made which has determined that WS101 at 1.30 m bgl and WS103 at 1.60 m bgl no longer exceed the residential GACs. However, elevated concentrations above the GAC have been identified in other strata within the same locations. Therefore, based upon findings within the internal factory footprint and given TCE is a DNAPL compound, the associated risk of concentrations contained within deeper superficial deposits is still considered high in these locations.

Trace instances of Tetrachloroethene (PCE) were identified in the natural superficial deposits in BH104 (5.50 m bgl); however, these were not recorded above residential GACs. Similarly, all elevated concentrations above laboratory LODs for BTEX were below the residential GACs. The overall risk posed from these particular VOCs is therefore considered to be low.



6.2.3. HUMAN HEALTH RISK ASSESSMENT SUMMARY

Elevated concentrations of heavy metalloids and non-volatile PAHs have been identified within Made Ground deposits across the footprint of the main factory structure, and as well as an isolated occurrence within natural superficial deposits in the eastern part of site. As impacted soils are considered likely to be site-wide, a clean cover system will be required in any proposed areas of soft landscaping or private gardens in order to mitigate the risk to proposed end-users via dermal contact and ingestion (PL1).

A singular instance of trace asbestos chrysotile fibres (<0.001%) has been identified within shallow Made Ground deposits in BH108 (0.60 m bgl). As the fabric of the main factory structure is known to contain asbestos containing materials, it is recommended that following the demolition process, validation samples of shallow Made Ground deposits should be taken in order to confirm no cross contamination has occurred. Validation samples are suggested within the vicinity of BH108 to confirm it is a localised hotspot with only trace fibres present and delineate the full extent of potential impact. Impacted materials should be managed in accordance with the Asbestos Risk Mitigation CSM.

No PFAS/PFOS/PFOA compounds have been identified within Made Ground samples taken from within and surrounding the Enamel Area and Paint Shop, located in the eastern part of site. As such, the overall risk to human health receptors posed from PFAS/PFOS/PFOA compounds is considered to be low.

Based upon the findings of both the preliminary ground investigation surrounding the perimeter of the main factory structure, and the data gathered from the intrusive ground investigation within the internal structure, the largest concentrations of TCE, DCE and Vinyl Chloride have been recorded within the Enamel Area, adjacent to the enamel slurry tank. Therefore, it is deemed highly likely that the enamel slurry tank is the primary source of TCE contamination.

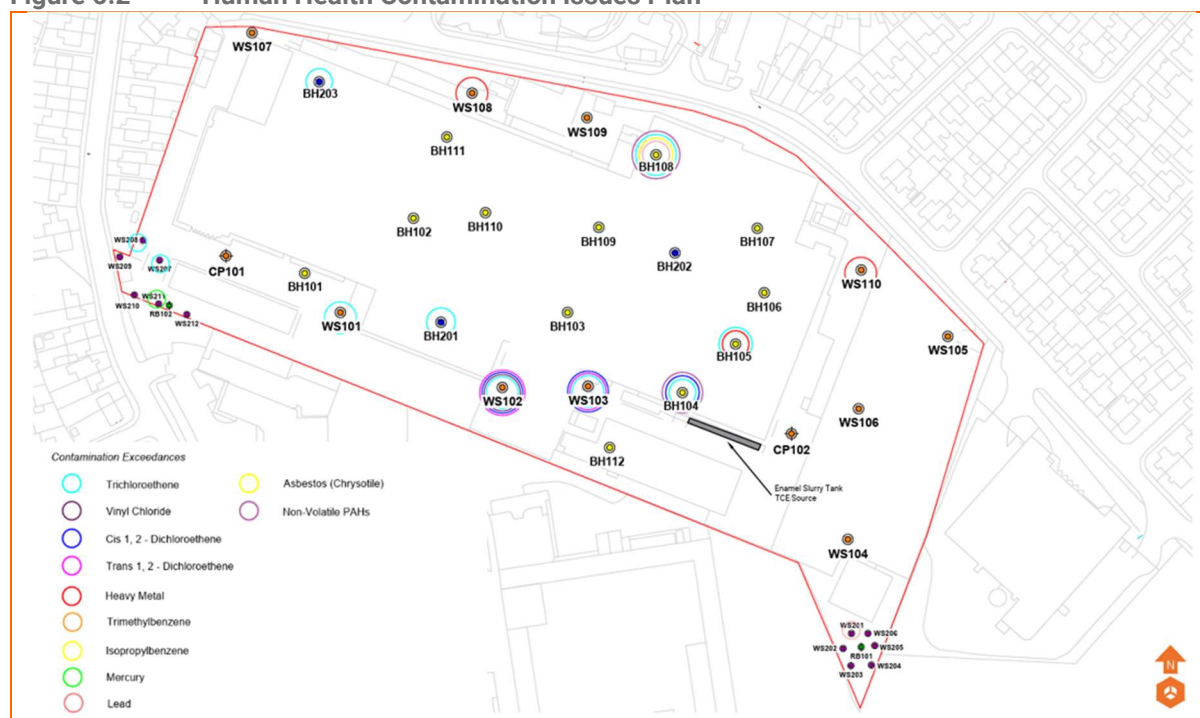
As TCE is classified as a dense non-aqueous phase liquid (DNAPL), it is assumed that the contamination originated from the enamel slurry tank, and that shallow superficial groundwater flow has resulted in the mobilisation of these compounds. This has subsequently facilitated the migration of TCE deeper into the superficial soil matrix through preferential granular stratum contained within the cohesive materials. Subsequently, TCE and its daughter products (DCE and Vinyl Chloride) have degraded and migrated laterally and vertically throughout deeper superficial deposits to a maximum proven depth of 5.50 m bgl (BH104).

The supervised removal of the enamel slurry tank and immediate underlying materials is recommended in order to mitigate any further migration and subsequent degradation of TCE and daughter products into further areas of the site. Additional testing of deeper natural superficial deposits and surrounding materials is also recommended in order to determine the lateral and vertical extent and gradient of contamination surrounding the source and form the basis of the remedial requirements.

All proposed mitigation measures should be confirmed within the Remediation and Enabling Works strategy.



Figure 6.2 Human Health Contamination Issues Plan



6.3. CONTROLLED WATERS RISK ASSESSMENT

6.3.1. CONTROLLED WATERS SENSITIVITY

E3P has undertaken a controlled waters risk assessment for the site based on the consideration of the conceptual site model and the sensitive receptors which are summarised in Table 6.3.

Table 6.3 Controlled Waters Conceptual Model and Sensitivity Profile

DISCUSSION	SENSITIVITY RATING
CONTAMINANT SOURCE	
Made Ground Heavy metal, VOC, and SVOC contamination have previously been identified within Made Ground infill materials, with the heavy metals recorded towards the north of site and VOCs identified extending across the southern part of site. Variable Made Ground with high-level (predominantly low-solubility in water; LQM/CIEH 2014) VOC impact is present throughout the Made Ground which has subsequently leached into underlying natural superficial deposits to a proven depth of 1.40 m bgl.	High
Oven Manufacturing Factory The oven manufacturing factory is situated in the centre of the site and a known enamel slurry tank is located towards the southeast of the site, adjacent to WS103. Due to the industrial usage of the site, significant potential sources of VOCs and SVOCs are anticipated which may leach into the underlying ground within areas of below ground tanks.	High
PATHWAY	
Vertical Migration The majority of the site is underlain by low permeability superficial deposits which will offer some protection to the underlying aquifer and inhibit vertical migration of	Low/Medium



DISCUSSION		SENSITIVITY RATING
any contaminants towards the underlying bedrock Principal aquifer. However, towards the north of the site, shallow bedrock (<5.00 m bgl) was encountered, therefore these areas are at increased risk of vertical migration as a sufficient clay aquitard is not present to afford protection to the underlying bedrock Principal aquifer.		
Lateral migration The majority of identified deposits consist of low permeability CLAY, therefore reducing the overall likelihood of lateral migration. However, the presence of granular stratus superimposed within low permeability CLAY deposits offers a potential preferential pathway for the lateral migration of contaminants.		Medium
RECEPTORS		
Aquifer Classification in Superficial Deposits	Secondary Undifferentiated aquifer and Secondary A aquifer (eastern sector)	Medium
Aquifer Classification in Bedrock	Principal aquifer	High
Groundwater Source Protection Zone or Drinking Water Safeguard Zone	The site is situated within a Source Protection Zone 3 – therefore the total area needed to support the abstraction or discharge from the protected groundwater source.	High
Distance to the closest Groundwater Abstraction Point	An active groundwater abstraction point located 16 m southeast of the site, pertaining to Elis UK Ltd and used for laundry purposes. This increases the sensitivity of the underlying aquifer.	High
Is the Site Located Within 50 m of a Surface Watercourse?	No surface watercourses are recorded within 50 m of the site boundary. However, records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.	High

SENSITIVITY RATING

In addition to above, E3P has developed a diagrammatic conceptual site model which considers the factors in Table 6.3. This is available as Drawing 17-500-027 and a snapshot is included in Figure 6.3.

The diagram illustrates a cross-section of a site with the following components:

- Geology Key:**
 - Made Ground (Grey)
 - Kinnerton Formation - Sandstone - Principal Bedrock (Light Blue)
 - Glacial Till Devensian (Light Blue)
 - Chester Formation - Principal Bedrock (Brown)
 - Glaciofluvial Deposits (Light Purple)
 - Assumed DNAPL Plume (TCE,DCE,Vinyl Chloride) (Dark Green)
- Sources:**
 - ① Heavy Metals and Non-volatile PAHs
 - ② Volatile Organic Compounds
 - ③ Enamel Slurry Tank (TCE,DCE,Vinyl Chloride)
 - ④ TPH C21-C35
 - Enamel Slurry Tank (Hatched Box)
- Pathways:**
 - Vertical / Lateral Migration (Red Arrow)
 - Assumed Superficial Groundwater Flow (Blue Arrow)
 - Taint Water Supply (Green Arrow)
- Receptors:**
 - ① Future End Users
 - ② Water Pipeline
 - ③ Groundwater
- Site Features:**
 - ① Future Site Users
 - ② Current Factory

The diagram shows a DNAPL plume originating from the Enamel Slurry Tank (Source ③) and migrating through the Kinnerton Sandstone and Glaciofluvial Deposits. The plume is shown as a dark green oval. The site is bounded by RB101 and RB102. The inset map shows the site's location within a larger urban context.

Due to the previously identified contamination identified within soils and shallow groundwater, this phase of intrusive ground investigation was designed to include monitoring wells installed within varying profiles of Made Ground deposits, superficial deposits and the deeper bedrock in order to identify the presence or absence of contaminants at various depths across the site, as well as form a base assessment of groundwater contamination within the superficial and bedrock aquifers.

Previous groundwater monitoring data indicated superficial groundwater was situated between 2.00–5.00 m bgl towards the southern part of site, and at depths >5.00 m bgl in the northern part of site, as boreholes were noted to be dry above 5.00 m bgl. Therefore, during this phase of intrusive ground investigation, monitoring wells targeting the superficial groundwater were installed at depths between 1.00–8.00 m bgl across the site.



Deep superficial groundwater monitoring wells with response zones extending down to 8.00 m bgl were installed within the central (BH109), western (BH102), and southern (BH112) parts of the main factory structure, whilst intermediary monitoring wells, with response zones typically situated between 1.00–6.00 m bgl, were installed within the remaining boreholes across the site. Two shallow boreholes (BH103 and BH108) were also installed within shallow Made Ground deposits in order to assess the potential for shallow ground gases. All monitoring well response zones were lined with a 200 mm geotextile membrane filter sock sleeve.

Three deep groundwater monitoring wells were installed in the southern (BH201), central (BH202), and northwestern (BH203) parts of the main factory structure, in order to ensure representative samples were obtained from the underlying bedrock Principal aquifer. To safeguard the underlying bedrock Principal aquifer and ensure no potential pathways for the migration of known contaminants was created, response zones were installed a minimum of 5.00 m below the boundary of the superficial deposits and sandstone bedrock, and an additional 5.00 m bentonite seal installed above the response zone to ensure the superficial deposits were fully screened off. This would also ensure that all samples obtained from the deep groundwater monitoring wells was truly representative of groundwater within the bedrock aquifer and allow for an assessment of the potential risk posed by known contaminants on-site.

BH201 was installed with a response zone situated between 16.50–20.50 m bgl; BH202 was installed with a response zone situated between 15.00–20.00 m bgl; and BH203 was installed with a response zone situated between 12.00–20.00 m bgl.

During the first monitoring period, completed approximately two weeks after the completion of the intrusive ground investigation, BH203 was recorded to have silted up to approximately 6.00 m bgl with no groundwater recorded during all three monitoring visits. Both BH201 and BH202 also experienced silting up to depths above the response zones (to 15.65 m bgl and 11.35 m bgl respectively). However, despite this, both monitoring wells recorded significant recharge of groundwater across all three monitoring visits.

Given that clean drilling techniques were utilised (i.e. sonic drilling), and the fact that the monitoring wells were fully sealed off above their respective response zones, it must be concluded that, despite the monitoring wells silting up above the response zones, there must be enough artesian pressure within the bedrock groundwater to dislodge silted materials compounded at the base of these two monitoring wells and allow for the accumulation of groundwater. Groundwater samples obtained from both BH201 and BH202 are therefore considered to be wholly representative of bedrock groundwater.

6.3.3. TIER 2 CONTROLLED WATERS RISK ASSESSMENT

The Tier 2 assessment in line with LCRM (2023) has included a comparison of groundwater samples to drinking water standards (DWS) and environmental quality standards (EQS).

DWS will be viewed as a priority given the pollutant linkage is with the underlying bedrock Principal Aquifer however where there are no regulatory guidance values for DWS, the EQS will be utilised in their absence.

EQS will also be assessed given the potential pollutant linkage with the underground stream/culvert, potentially located beneath the central part of the main factory structure.

Water samples were obtained utilising a low flow sampler to reduce the impact on analysis of suspended solids in the sample. Test results are presented in Table 6.4.



Table 6.4 Comparison of Groundwater Analysis with Tier 2 Screening Levels

DETERMINAND	UNIT	EQS AA 1,2	DWS 3,4	NO OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	ASSESSMENT
Heavy Metals							
Arsenic	µg/l	50	10	22	35	BH112 (Visit 2)	Further Assessment Required
Cadmium	µg/l	0.08-0.25	5	22	0.40 0.12 0.21 0.22	BH104 (Visit 2) BH112 (Visit 2) BH104 (Visit 3) BH112 (Visit 3)	Further Assessment Required
Chromium (III)	µg/l	4.7	50	22	6.7 17 19	BH107 (Visit 2) BH112 (Visit 2) BH112 (Visit 3)	Further Assessment Required
Copper	µg/l	1	2000	22	1.6 2.9 1.2 2.3 5.5 1.9 1.7 1.1 27 2.5 4.3 2.3 1.1 1.6 72 1.9	BH201 (Visit 1) BH202 (Visit 2) BH101 (Visit 2) BH102 (Visit 2) BH104 (Visit 2) BH107 (Visit 2) BH109 (Visit 2) BH110 (Visit 2) BH112 (Visit 2) BH202 (Visit 2) BH101 (Visit 3) BH102 (Visit 3) BH104 (Visit 3) BH107 (Visit 3) BH112 (Visit 3) BH202 (Visit 3)	Further Assessment Required
Total Cyanide	µg/l	1	50	22	<0.050	N/A	No Further Action
Lead	µg/l	1.2	10	22	16 25	BH112 (Visit 2) BH112 (Visit 3)	Further Assessment Required
Manganese (Dissolved)	µg/l	–	50	22	2100 590 620 1100 1800 180	BH201 (Visit 1) BH202 (Visit 1) BH101 (Visit 2) BH102 (Visit 2) BH104 (Visit 2) BH106 (Visit 2)	Further Assessment Required



DETERMINAND	UNIT	EQS AA 1,2	DWS 3,4	NO OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	ASSESSMENT
Manganese (Dissolved)	µg/l	–	50	22	590 530 150 2100 160 900 1600 2600 150 400 470 250 2200 500	BH109 (Visit 2) BH110 (Visit 2) BH112 (Visit 2) BH201 (Visit 2) BH202 (Visit 2) BH101 (Visit 3) BH102 (Visit 3) BH104 (Visit 3) BH106 (Visit 3) BH109 (Visit 3) BH110 (Visit 3) BH112 (Visit 3) BH201 (Visit 3) BH202 (Visit 3)	Further Assessment Required
Mercury	µg/l	–	1.0	22	0.16	N/A	No Further Action
Nickel	µg/l	4	20	22	5.1 16 110 9.2 5800 12 5.3 49 4.6 7.0 190 4200 4.5 74 12	BH201 (Visit 1) BH202 (Visit 1) BH101 (Visit 2) BH102 (Visit 2) BH104 (Visit 2) BH109 (Visit 2) BH110 (Visit 2) BH112 (Visit 2) BH201 (Visit 2) BH202 (Visit 2) BH101 (Visit 3) BH102 (Visit 3) BH104 (Visit 3) BH112 (Visit 3) BH202 (Visit 3)	Further Assessment Required
Selenium	µg/l	–	10	22	17 13	BH107 (Visit 2) BH107 (Visit 3)	Further Assessment Required
Zinc	µg/l	10.9	–	22	12 55	BH202 (Visit 1) BH101 (Visit 2)	Further Assessment Required



DETERMINAND	UNIT	EQS AA 1,2	DWS 3,4	NO OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	ASSESSMENT
Zinc	µg/l	10.9	–	22	16 65 25 35 13 89 34 11 42 20	BH102 (Visit 2) BH104 (Visit 2) BH109 (Visit 2) BH112 (Visit 2) BH202 (Visit 2) BH101 (Visit 3) BH104 (Visit 3) BH107 (Visit 3) BH112 (Visit 3) BH202 (Visit 3)	Further Assessment Required
pH	pH Units	6-9		22	9.1	BH112 (Visit 2)	Further Assessment Required
Polycyclic Aromatic Hydrocarbons							
Naphthalene	µg/l	2	10*	22	<0.50	N/A	No Further Action
Anthracene	µg/l	0.1		22	<0.50	N/A	No Further Action
Benzo (b) Fluoranthene	µg/l	0.00017*		22	<0.50	N/A	No Further Action
Benzo (k) Fluoranthene	µg/l	0.00017*		22	<0.50	N/A	No Further Action
Benzo(a) Pyrene	µg/l	0.00017*		22	<0.50	N/A	No Further Action
Indeno(123-cd)pyrene	µg/l	0.00017*		22	<0.50	N/A	No Further Action
Fluoranthene	µg/l	0.0063		22	<0.50	N/A	No Further Action
Benzo(ghi) Perylene	µg/l	1.7–4		22	<0.50	N/A	No Further Action
Aromatic Hydrocarbon							
TPH C5-C7 (Benzene)	µg/l	10	1	22	<0.10	N/A	No Further Action
TPH C7-C8 (Toluene)	µg/l	74	700	22	<0.10	N/A	No Further Action
TPH C8-C10 (Xylene)	µg/l	30	300	22	<0.10	N/A	No Further Action
TPH C10-C12 (Naphthalene)	µg/l	2	90	22	<0.10	N/A	No Further Action
TPH C12-C16	µg/l	-	90	22	<0.10	N/A	No Further Action
TPH C16-C35	µg/l	-	90	22	<0.10	N/A	No Further Action
Aliphatic Hydrocarbon							
TPH C5-C6	µg/l	–	10005	22	<0.10	N/A	No Further Action
TPH C6-C8	µg/l	–	10005	22	<0.10	N/A	No Further Action
TPH C8-C10	µg/l	–	300	22	<0.10	N/A	No Further Action
TPH C10-C12	µg/l	–	300	22	<0.10	N/A	No Further Action
TPH C12-C16	µg/l	–	300	22	<0.10	N/A	No Further Action



DETERMINAND	UNIT	EQS AA 1,2	DWS 3,4	NO OF GW SAMPLES	MAX CONC. IN GROUNDWATER	LOCATION OF EXCEEDANCE	ASSESSMENT
TPH C16-C21	µg/l	–	300**	22	<0.10	N/A	No Further Action
TPH C21-C35	µg/l	–	300**	22	3000	BH102 (Visit 2)	Further Assessment Required
Volatile Organic Compounds							
Tetrachloroethene	µg/l	0.4	10	22	1.9 5.7 3.7	BH201 (Visit 1) BH104 (Visit 2) BH201 (Visit 2)	Further Assessment Required
Trichlorobenzene	µg/l	0.4	–	22	<1.0	N/A	No Further Action
Trichloromethane	µg/l	2.5	300	22	3.2 3.6 4.3	BH202 (Visit 1) BH106 (Visit 2) BH107 (Visit 2)	Further Assessment Required
Carbon Tetrachloride (Tetrachloromethane)	µg/l	12	3	22	<1.0	N/A	No Further Action
1,2 Dichloropropane	µg/l	–	40	22	1.6	N/A	No Further Action
Trichloroethene (TCE)	µg/l	10	10	22	7300	BH201 (Visit 1)	Further Assessment Required
1,1-Dichloroethene	µg/l	–	50	22	53 86	BH201 (Visit 1) BH201 (Visit 2)	Further Assessment Required
Cis 1,2-Dichloroethene	µg/l	–	50	22	1000	BH201 (Visit 1)	Further Assessment Required
Trans 1,2-Dichloroethene	µg/l	–	50	22	260 160	BH201 (Visit 1) BH201 (Visit 2)	Further Assessment Required
Vinyl Chloride	µg/l	–	0.3	22	64 3.8 67	BH201 (Visit 1) BH112 (Visit 2) BH201 (Visit 2)	Further Assessment Required
PFAS/PFOS/PFOA							
per- and polyfluoroalkyl substances (PFAS/PFOS)	µg/l	–	0.01	9	<0.02	N/A	No Further Action
Perfluorinated sulfonic acids (PFHxS)	µg/l	36	0.01	9	<0.02	N/A	No Further Action



Solubility <0.01µg/l

AA – Annual Average

*Polyaromatic hydrocarbons (PAH) – Benzo(a)pyrene (BaP), Benzo(b)fluoranthene,

Benzo(k)fluoranthene, Benzo(g,h,i)-perylene and Indeno(1,2,3-cd)-pyrene. Benzo(a)pyrene can be considered as a marker for the other PAHs, hence only benzo(a)pyrene needs to be monitored for comparison with the biota EQS or the corresponding AA-EQS in water.

**There are no WHO Guideline Values for aliphatic fractions C16-C21 and C21-C35, therefore the guideline value for aliphatic fractions inclusive of C8-C16 (300µg/l) has been applied.

1. The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 (legislation.gov.uk)
2. The Water Supply (Water Quality) Regulation 2018 (legislation.gov.uk)
3. Guidelines for drinking-water quality, 4th edition, incorporating the 1st addendum (who.int)
4. CL:AIRE publishes Petroleum Hydrocarbons in Groundwater guidance (claire.co.uk)
5. A total TPH criteria of 1000 mg/kg will act as a surrogate criterion for remaining aliphatic and aromatic TPH fractions.



This comparison indicates that the data exceeds the EQS and DWS threshold values for the following inorganic compounds:

Table 6.5 Summary of Controlled Waters Risk Assessment

EXCEEDANCE OF EQS	EXCEEDANCE OF DWS	NO THRESHOLD VALUE
✱ Cadmium ✱ Chromium (Dissolved) ✱ Copper ✱ Lead ✱ Nickel ✱ Zinc ✱ pH ✱ Tetrachloroethene ✱ Trichloroethene	✱ Arsenic ✱ Manganese ✱ Lead (BH112, Visit 3 only) ✱ Nickel ✱ pH ✱ TPH C21–C35 ✱ Trichloroethene ✱ 1,1-Dichloroethene ✱ Vinyl Chloride	✱ Trichloromethane ✱ Cis 1,2-Dichloroethene ✱ Trans 1,2-Dichloroethene

In relation to the VOC exceedances, Table 6.6. provides a summary. Where multiple data from a singular well have been obtained, the largest concentration over the three visits has been recorded below.

Table 6.6 Summary of Maximum Elevated Contaminants in Groundwater

CONTAMINANT	CONTAMINANT SOURCE							
	BH101 (µG/L)	BH104 (µG/L)	BH106 (µG/L)	BH107 (µG/L)	BH110 (µG/L)	BH112 (µG/L)	BH201 (µG/L)	BH202 (µG/L)
Trichloroethene (TCE)	–	–	–	–	–	–	7300	–
1,1-Dichloroethene	–	–	–	–	–	–	86	–
Cis 1,2-Dichloroethene	–	–	–	–	–	–	1000	–
Trans 1,2-Dichloroethene	–	–	–	–	–	–	260	–
Vinyl Chloride	–	–	–	–	–	3.8	64	–
Trichloromethane	–	–	3.6	4.3	–	–	–	3.2
Tetrachloroethene	–	5.7	–	–	–	–	3.7	–

6.3.4. GEOCHEMICAL PARAMETER MONITORING

Prior to sampling, the geochemical properties of groundwater were recorded using a multiparameter sonde. The parameters recorded included temperature, pH, dissolved oxygen, turbidity and conductivity

A summary of the results is included in Table 6.7 and the monitoring certificates are included in APPENDIX XI.



Table 6.7 Summary of Multiparameter Sonde Monitoring Results

LOCATION	VISIT	WATER LEVEL	TEMP RANGE (°C)	PH	CONDUCTIVITY (µS/CM)	DISSOLVED OXYGEN RANGE
BH101	1	1.45	10.10–9.80	6.35–6.27	1289–1308	3.80–9.40
	2	1.53	7.40–6.80	6.10–6.13	911–922	4.20–7.90
	3	1.50	1.62–1.65	5.60–5.53	1145–1185	3.40–18.30
BH102	1	5.80	12.00–11.80	7.60–7.68	1686–1800	17.40–18.70
	2	5.75	10.30–10.60	7.77–7.81	1899–2005	22.10–25.90
	3	5.70	11.20–11.40	7.65–7.79	1963–2121	30.20–59.70
BH104	1	2.10	9.60–10.00	5.38–5.99	973–977	4.70–11.80
	2	2.05	7.30–8.40	6.00–6.24	693–1093	7.30–8.40
	3	2.60	9.30–9.40	6.56–6.59	1122–1135	16.20–22.40
BH106	1	1.28	8.40–8.90	8.00–8.01	1236–1342	14.60–23.50
	2	1.30	7.80–8.10	8.05–8.07	1030–1212	28.80–31.70
	3	1.30	8.80–8.90	7.94–7.96	1046–1530	14.40–33.60
BH107	1	1.43	7.20–9.00	9.88–10.27	1549–1644	26.00–36.40
	2	1.45	7.20–9.00	9.88–10.27	1549–1648	43.50–67.30
	3	1.42	6.20–8.10	10.12–10.13	1833–1843	31.70–40.40
BH109	1	2.28	10.90–11.60	7.21–7.30	627.30–652.60	5.00–10.10
	2	2.30	9.20–9.50	7.24–7.26	651.50–652.70	5.70–9.20
	3	2.40	9.90–11.10	7.27–7.29	646.7–655.6	7.80–11.60
BH110	1	3.00	8.20–8.70	7.39–7.41	1026–1038	8.20–8.70
	2	3.05	8.40–10.00	7.37–7.41	1013–1020	12.10–13.40
	3	3.00	5.00–8.90	7.40–7.41	1027–1046	9.70–15.70
BH112	1	2.40	8.70–9.30	9.12–9.13	4012–4031	1.70–7.30
	2	2.40	8.80–9.10	9.13–9.14	3913–9375	1.50–7.70
	3	3.35	8.00–8.70	8.95–9.00	4007–4111	6.00–17.60
BH201	1	4.54	9.70–9.90	7.09–7.10	1530–1540	9.90–9.70
	2	4.54	9.30–9.50	7.08–7.09	1548–1562	9.50–9.30
	3	4.45	10.30–11.00	7.09–7.10	1509–1517	3.50–9.30
BH202	1	6.88	11.10–11.40	7.07–7.19	853–874	21.60–32.20
	2	8.30	9.30–11.30	8.08–8.20	670.30–674.30	41.50–76.60
	3	7.90	9.20–10.00	7.34–7.35	758–761	9.20–29.00

Multiparameter sonde data indicates that the majority of pH ranged between 5.50–9.00, with all instances noted >9.00 in BH107, and during the first 2 visits for BH112.



Temperature ranges across the visits remained relatively consistent, with temperature changes generally recorded between 2°C.

Typically, dissolved oxygen levels ranged between 5.00–10.00 mg/l within shallow superficial groundwater. The deep bedrock groundwater (BH201 and BH202) differed greatly with much lower dissolved oxygen levels recorded in BH201 in comparison to BH202 during the first two visits. Both BH102 and BH107 contained comparatively highly dissolved oxygen concentrations in comparison to the remaining shallow boreholes with concentrations exceeding 20 mg/l. The majority of monitoring wells encountered a decrease in dissolved oxygen concentrations during the monitoring period, with some recording significant decreases whilst others stayed within a smaller range (<1.00 mg/l).

6.3.5. ASSESSMENT APPROACH FOR PFAS

GACs have not been developed by E3P in relation to PFAS compounds in soil and groundwater, so reference is made to the following regulatory and guidance threshold values to provide an initial assessment and discussion regarding the potential significance of measured PFAS concentrations.

Soil Screening Values (SSV's) for PFOS and PFOA have been published by the Environment Agency (Derivation and use of soil screening values for assessing ecological risks, Report – shARE id26, EA 2017) at 14 µg/kg Dry Weight (DW) and 22 µg/kg DW (normalised to 3.4% Soil Organic Matter (SOM)) based on secondary poisoning to bird and animals.

PFOS is a priority hazardous substance under the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and is listed as a ubiquitous, bio accumulative and toxic (uPBT) substance. As such, PFOS has a biota 5 based, inland surface water environmental quality standard (EQS) set to protect both human health and the environment. This biota-based EQS is used for assessment of chemical status and surface water body classification (UK Government, 2015) and is the sum of branched and linear PFOS isomers (total PFOS). At the time of writing, this is the only EQS for PFAS applicable in the UK. An annual average (AA) EQS in water is derived by back calculation from the biota EQS. The AA EQS for PFOS is 0.00065µg/l for freshwater. UK regulations also set out a maximum allowable concentration (MAC) for PFOS of 36µg/l for inland surface waters. The MAC is a threshold intended to protect the aquatic environment from short-term toxic effects; and,

The UK Drinking Water Inspectorate (DWI) published specific PFOS and PFOA guidance with regards to the 2016 Water Supply (Water Quality) Regulations (DWI, 2021). The guidance presents a multi-tiered risk approach for the protection of groundwater and presents representative screening values for PFOS and PFOA to assist water companies in fulfilling their statutory obligations. For this assessment Tier 2 and Tier 3 screening values have been considered. Tier 2 screening values, which are set at >0.001 µg/l for both PFOS and PFOA compounds, represent concentrations at which consultation with local authorities would be required and additional monitoring should be undertaken. Tier 3 values, set at >0.1µg/l for both PFOS and PFOA compounds, represent a “wholesomeness” value in drinking water, and is the concentration at which remedial measures should be undertaken if exceeded.

The screening criteria adopted for PFAS in groundwater are shown in Table 6.8.

Table 6.8 Screening Criteria for PFAS in Groundwater

SOURCE OF SCREENING VALUE	SCREENING VALUE (µg/l)
Annual average Environmental Quality Standard (AA-EQS) for inland surface water (total PFOS only)	0.00065
Maximum allowable concentration Environmental Quality Standard (MAC-EQS) for inland surface water (total PFOS only)	36
2021 UK Drinking Water Inspectorate (DWI) tier 2 guidance value – consult with local health	0.01



SOURCE OF SCREENING VALUE	SCREENING VALUE (µg/l)
professionals and monitor levels in drinking water	
2021 UK Drinking Water Inspectorate (DWI) tier 3 guidance value – put in place measures to reduce concentrations to below 0.1µg/l as soon as is practicable.	0.01

6.3.6. DISCUSSION OF CONTROLLED WATERS RISK ASSESSMENT

BACKGROUND

Historically, the site has been subjected to extensive infilling and a number of industrial uses including an Iron Foundry, and most recently an Oven Manufacturing Factory. Chemical by-products of manufacturing processes and compounds within the Made Ground may have subsequently leached down into underlying ground and contaminated groundwater both within Made Ground and natural superficial deposits.

The site is underlain by a mixed geology, generally cohesive clay in the south of the site with discrete areas of interbedded cohesive and granular materials towards the north, and southwest. The granular deposits will afford less protection to the underlying Principal aquifer in the bedrock in comparison to the remainder of the site, where generally clay deposits are anticipated to, or proven in excess of 5.00m in areas. Furthermore, towards the northwestern sector of the site, bedrock was encountered at lesser depths (<5.00 m bgl), further increasing the risk of vertical migration of compounds towards the underlying bedrock aquifer as cohesive materials are not present within suitable quantities to afford protection to the underlying aquifer.

The site is also situated within a Source Protection Zone 3, further increasing the sensitivity of the underlying aquifer. Overall, it is deemed the Principal Bedrock Aquifer is at a high risk to on-site contamination, as extensive sources of contamination and potential pathways (vertical migration) have been established.

No surface watercourses are recorded within 50 m of the site boundary. However, records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.

HEAVY METALLOIDS

Elevated concentrations of Arsenic, Cadmium, Chromium (III), Copper, Manganese, Lead, Nickel, and Zinc have been identified above EQS and/or DWS threshold values in various monitoring wells situated across the site, with the greatest concentrations most commonly identified within shallow superficial groundwater as opposed to the deeper bedrock groundwater.

Whilst concentrations of Cadmium and Chromium (III) are not recorded to exceed human health residential GACs, elevated concentrations for both compounds above EQS threshold values have been subsequently detected within groundwater analysis.



Chemical soil analysis has confirmed an on-site source of heavy metalloids being predominantly within Made Ground deposits, with soil exceedances noted to be site wide. Where exceedances have been recorded in groundwater, it is also present within soil analysis, thus confirming a complete source-pathway is present. Despite low solubility, the rising groundwater regime is most likely mobilising heavy metalloids from within the overlying Made Ground deposits. This is subsequently resulting in the migration of heavy metalloids both laterally and vertically via the preferential granular stratus superimposed within low permeability CLAY deposits into the underlying superficial groundwater.

With regards to the deeper bedrock groundwater, Copper, Nickel and Zinc are recorded to exceed EQS threshold values in BH201 and BH202. However, as these monitoring wells are assessing the Principal aquifer within the bedrock, DWS threshold values are considered to be the primary assessment criteria. When compared to DWS threshold values, no exceedances for Copper or Nickel are identified within BH201 or BH202. No DWS value exists for Zinc; however, given that the concentrations of Zinc in these boreholes were only marginally above the EQS threshold values, these are not considered to be a cause for concern.

Overall, when considering the overarching risk of heavy metalloid impact, the majority of risk is associated with the Made Ground deposits and shallow superficial groundwater; with the risk to the underlying Principal bedrock aquifer being considered to be low.

TRICHLOROETHENE (TCE), DICHLOROETHENE VARIANTS (DCE), AND VINYL CHLORIDE

Superficial Groundwater

Based upon the concentrations of Trichloroethene in soils within the immediate vicinity of the enamel slurry tank (BH104), it is deemed highly likely to be the primary source of the TCE contamination. In turn, the TCE is recorded to be migrating laterally and vertically via the preferential granular stratus superimposed within low permeability CLAY deposits. During migration, the degradation of TCE is occurring resulting in daughter products Dichloroethene, Cis 1,2-Dichloroethene, and Trans 1,2-Dichloroethene (DCE), and Vinyl Chloride being recorded within monitoring wells.

Concentrations of >10 mg/kg were identified within the soil analysis in natural superficial deposits (BH104) at a depth of 5.50 m bgl. This confirms superficial groundwater is mobilising compounds and creating a DNAPL plume of TCE contamination, which is migrating vertically into the deeper superficial soil horizons within the immediate vicinity of the enamel slurry tank. Concentrations of TCE were not recorded in groundwater samples submitted from BH104, which suggests that the TCE plume may have migrated further vertically and is situated at a depth >6.00 m bgl within the vicinity of BH104.

The monitoring well BH112, which was installed within the deeper superficial deposits between 4.00–8.00 m bgl, is situated approximately ~25 m south of the enamel slurry tank. Elevated concentrations of Cis 1,2-Dichloroethene, Trans 1,2-Dichloroethene and Vinyl Chloride have been identified within groundwater samples taken from this monitoring well. Given that no TCE was identified in soil or groundwater samples within BH112, it is assumed that only daughter products are migrating southwards towards BH112. Therefore, the main DNAPL plume and bulk of contamination is assumed to be trending east to west along the groundwater gradient beneath and surrounding the enamel slurry tank.

Bedrock Groundwater

Visit 1 and Visit 2 identified groundwater concentrations of TCE, 1,1-Dichloroethene, Cis 1,2-Dichloroethene, and Trans 1,2-Dichloroethene with higher concentrations identified during the initial visit. Soil samples illustrate TCE was recorded at concentration of 0.15 mg/kg in the Made Ground deposits of BH201, but not within the superficial deposits. TCE was detected at an elevated concentration of 7300 µg/l during the first monitoring visit, with concentrations subsequently dropping to 3.9 µg/l during the second visit, and below laboratory limit of detection during the third visit. This was



also the recorded trend for all three DCE variants in BH201 with highest concentrations identified during the first visit, before decreasing during the second visit, and falling below laboratory LOD during the third visit. Therefore, as the concentrations of compounds are not consistent throughout monitoring visits, the source is considered likely to be superficial and was temporarily introduced into BH201. Subsequent purging of the monitoring well for groundwater samples and subsequent groundwater recharge flushed the system, with no sustained contamination present within deeper groundwater.

As no elevated concentrations of TCE, DCE, or Vinyl Chloride were identified within groundwater from BH202 and the third round of monitoring data from BH201 mirroring those within BH202, it is considered unlikely that TCE contamination has yet reached the bedrock Principal Aquifer. As the deep monitoring well BH203 (northwest part of site) had silted up with no groundwater recorded prior to the first monitoring visit, no groundwater samples could be taken from this location. Therefore, at this present time, it cannot be confirmed whether the TCE contamination identified in soil analysis in the superficial deposits of BH203 (4.00 m bgl) has migrated. However, based upon the assumption that no contamination is present within BH201, and BH202, both of which are situated closer to the primary source (enamel slurry tank), the risk posed by TCE within bedrock groundwater in BH203 is marginally reduced. Furthermore, groundwater flow is assumed to flow away from BH203 towards the southwest, further reducing the overall risk posed from TCE presence in BH203.

OTHER VOLATILE ORGANIC COMPOUNDS

Trichloromethane

Trichloromethane concentrations have been identified in both shallow superficial (BH106 and BH107) and deeper bedrock (BH201) groundwater analysis. All three instances of Trichloromethane were recorded at similar concentrations, ranging from 3.2 µg/l (BH201) to 4.3 µg/l (BH107).

No traces of Trichloromethane were identified in soil analysis suggesting the source is contained within the groundwater rather than mobilised from a specific point source. No proven potential point source of Trichloromethane has been identified on-site, however known uses include solvents and use in medical grade fridges; therefore, a potential on-site source includes the historical factory use.

All three concentrations only occurred within a single sample in each location, with subsequent testing recording levels below laboratory LOD, suggesting the source is potentially not consistent. Therefore, there is a potential external source of Trichloromethane which is mobilised onto site through superficial and bedrock groundwater regimes.

Previous ground investigations and groundwater monitoring data identified low levels of Trichloromethane in RB102 towards the southwest of site, both at higher concentrations than identified beneath the main factory structure. This suggests the potential on-site source is located either towards the southern boundary of the site, or off-site towards the south.

Tetrachloroethene (PCE)

Tetrachloroethene (PCE) is a chlorinated solvent, often used in dry cleaning, metal degreasing, and paint removers.

Marginal detections of Tetrachloroethane were identified in BH104 (0.0016 mg/kg) in the soil analysis of superficial deposits. Subsequently during the second visit, a concentration of 5.7 µg/l was identified in BH104, suggesting a potential source within the immediate vicinity.

Concentrations were detected during the first visit at 1.9 µg/l and increasing to 3.7 µg/l during the second visit within BH201. However, both detections were noted at levels exceeding only EQS threshold values, therefore, the risk posed to the underlying bedrock Principal aquifer is reduced as levels fall below DWS threshold values. Furthermore, the third monitoring visit detected no concentrations



exceeding laboratory LODs, therefore suggesting similar to TCE, that the source is considered likely to be superficial and was temporarily introduced into BH201.

1,2 Dichloropropane

1,2 Dichloropropane is primarily a component in chlorinated solvents, paint stripper, and can also be produced as a by-product of the degradation of Tetrachloroethene (PCE).

No elevated levels of 1,2 Dichloropropane have been identified above laboratory LOD during soil chemical analysis, therefore an on-site point source cannot be confirmed. Concentrations were identified at 1.6 µg/l in BH110 only during visit 2, below the DWS screening level, with subsequent groundwater samples recording levels below laboratory LOD.

This singular concentration may be the result of the migration of PCE from BH104 and subsequently degrading within the superficial groundwater prior to reaching BH110, as the groundwater flows in a south-westerly direction. Additionally, there may be an unknown localised source contained within the superficial soils presently unknown, or an inconsistent off-site source resulting in the migration of small concentrations of 1,2 Dichloropropane through the site.

TPH C21-C35

A singular instance of elevated heavy-end hydrocarbons was identified in the groundwater sample submitted from BH102 during the second monitoring visit at a concentration of 3000 µg/l. No evidence of visual/olfactory indicators of hydrocarbon contamination was noted during the intrusive ground investigation within BH102, nor were any significantly elevated concentrations detected within Made Ground or natural superficial soil samples.

BH102 is situated in proximity to the former railway sidings, which were historically recorded trending east to west through the centre of the site. As fractions C21-C35 are often utilised in lubricants, waxes, and a source of petrochemicals (BTEX), there is a possibility that a localised source of hydrocarbons is present in the footprint of the former sidings. Whilst no exceedances were identified in the soil samples from BH110, the migration of compounds may be trending south, away from BH110 through the groundwater.

Due to the low solubility of fractions C21–C35, it is unlikely that the migration has occurred from a significant distance to the monitoring wells. Subsequent monitoring visit identified concentrations below the laboratory LOD, suggesting a temporary dislodging of the contaminant has occurred and subsequent recharge contains no concentrations above laboratory LOD.

CONTROLLED WATERS RECEPTORS

Principal Aquifer

The site is underlain by a Principal Aquifer, with bedrock levels recorded to be between 8.00 m (BH203) to 16.50 m bgl (BH201), dipping steeply southwest from the north. Presently, no active potable groundwater abstractions are recorded within 1 km of the site boundary, with the closest abstraction relating to the adjacent Laundry (Elis UK) situated 16 m southeast. The closest active groundwater abstraction point for Drinking, Cooking and Sanitary purposes is situated 1.83 km southeast of the site pertaining to Blundells Hill Golf Club.

When comparing groundwater samples obtained from bedrock monitoring wells (BH201, BH202), elevated concentrations of Manganese have been recorded exceeding DWS threshold values. As no DWS threshold value is available for Zinc, EQS threshold values have been utilised in its absence, and therefore all groundwater samples are also found to be exceeding for Zinc. However, given that the concentrations of Zinc in these boreholes were only marginally above the EQS threshold values, these are not considered to be a cause for concern.



Copper, Nickel and Tetrachloroethene were also found to be only exceeding EQS threshold values, therefore the risk posed by these compounds to underlying bedrock aquifer is significantly reduced.

Regarding TCE, DCE, and Vinyl Chloride identified in declining concentrations over visits 1 and 2, as the concentrations of compounds is not consistent throughout monitoring visits, the source is considered likely to be superficial and was temporarily introduced into BH201. Subsequent purging of the monitoring well for groundwater samples and subsequent groundwater recharge flushed the system, with no sustained contamination present in deeper groundwater. The third-round data set is therefore considered the most representative of actual bedrock groundwater conditions post-disturbance.

Based upon the assumption that the TCE, DCE, and Vinyl Chloride plume is situated at a depth >6.00 m bgl, towards BH201 where the risk is considered significantly greater due to its proximity to the enamel slurry tank, approximately 7.00 m of cohesive superficial deposits are recorded overlying the bedrock Principal aquifer. This cover decreases further north within BH202 to approximately 4.00 m bgl, and furthermore to <1.00 m bgl in BH203 in the northwest part of site. Cohesive deposits will assist in limiting the migration of compounds and will affording some protection to the underlying bedrock. However, it must be noted there are multiple instances of granular bands interbedded within the cohesive deposits facilitating the vertical and lateral migration of contaminants towards the aquifer.

Underground Stream / Culvert

Records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure and presents a potential pathway for shallow groundwater contamination.

Extensive site-wide heavy metalloid contamination has been identified in samples obtained from superficial groundwaters. Multiple instances of samples exceeding EQS threshold values have been identified, which pose a risk to the underground stream/culvert running through the centre of the site. Where identified in groundwater, soil chemical analysis shows a source either contained within the Made Ground, or in some instances in the natural superficial deposits.

Following the demolition of the main factory structure, a watching brief is recommended within the proposed footprint of the underground stream/culvert to identify potential indicators of soft alluvium deposits or organic materials, which could be indicative of the streams historical or current presence.

Volatile organic compounds have been identified in five boreholes, more commonly in BH104 and BH112 situated in close proximity to the enamel slurry tank. Concentrations of TCE were not recorded during the groundwater samples submitted, despite being in high concentration in soil analysis, suggesting the groundwater plume has migrated further vertically and is situated at a depth >6.00 m bgl in BH104. BH112 identified elevated concentrations of Cis 1,2-Dichloroethene (0.022 µg/l), Trans 1,2-Dichloroethene (1.0 µg/l), and Vinyl Chloride (3.8 µg/l). A singular elevated concentration of Cis 1,2-Dichloroethene was also identified in BH101 at a concentration of 6.7 µg/l, and Trans 1,2-Dichloroethene in BH104 at 38 µg/l.

The elevated concentration of Trans 1,2-Dichloroethene in BH104 correlates with the primary source of groundwater contamination deriving from the enamel slurry tank. As the VOC plume migrates further from the source, increased risk is posed to the underground stream/culvert running through the centre of the site. The underground stream/culvert presents a potential conduit for the extended lateral migration of contaminants across the site further towards the north and south of the site, if present.

Trichloromethane was identified in BH106 and BH107 at low concentrations during the second visit, however levels dropped below laboratory LOD during the third sample suggesting an inconsistent source that is potentially not site derived.



CONCLUSIONS

Exceedances of TCE and daughter products were recorded within the bedrock aquifer in BH201 in visits 1 and 2, however these are thought to not be wholly representative of bedrock groundwater conditions. The final visit following sufficient purging and recharge is believed to be more wholly representative of bedrock groundwater conditions, mirroring the initial assessment concluded in initial Controlled Waters Risk Assessment (Report Ref: 17-500-L4-2) that the VOCs have not yet migrated down into the underlying bedrock Principal aquifer.

The largest risk associated with the superficial groundwater mobilisation of contaminants is the underlying stream/culvert, potentially running through the centre of the site. As its existence cannot be verified at this time, to remain conservative, it must be assumed to still be present. Multiple exceedances above EQS threshold values have been recorded of heavy metalloids and VOCs, with proven preferential pathways of lateral and vertical migration through superficial groundwater mobilisation.

The superficial groundwater flow plan (Drawing 17-500-033) shows pockets of deeper groundwater levels present across the site. However, no clear gradient indicative of groundwater flow direction can be proven at this time. In general, the groundwater level is indicated to be between 52.00m AOD up to 60.00m AOD towards the northeast of the site.

The bedrock groundwater flow plan (Drawing 17-500-032) indicates the groundwater is much shallower towards the centre of the site, flowing generally southwest to northeast. It can be seen that groundwater levels range between 50.00 m AOD towards the southeast/southwest and 35.00 m AOD towards the centre.

The supervised removal of the enamel slurry tank and immediate underlying materials is recommended in order to mitigate any further migration and subsequent degradation of TCE and daughter products into further areas of the site. Following this, treatment of the superficial deposits is recommended in order to further reduce the source, ensure a complete pollutant pathway via preferential granular strata is no longer present and reduce the risk posed to both the underlying bedrock Principal aquifer and underground stream/culvert.

Given the sensitive nature of the site and the potential receptors (underlying bedrock principal aquifer and underground stream/culvert) and the fact that elevated concentrations of metalloid and volatile impacts have been identified within the superficial groundwater, a Tier 3 Detailed Quantitative Risk Assessment (DQRA) for Controlled Waters will be required to address the identified exceedances, model the fate and transport potential of the VOC impact, undertake a sensitivity assessment to the critical receptor and derive SSRT's for soil remediation.

The proposed residential development will require the treatment and removal of impacted materials which will further sever the pathways between future receptors and the source potential present on-site.

6.4. GROUND GAS RISK ASSESSMENT

6.4.1. RATIONALE

Hazardous ground gas qualitative risk assessment is based on a conceptual site model (CSM) similar to that used for soil and groundwater contamination sources (i.e., source-pathway-receptor pollutant linkages).

The risk can be assessed based on knowledge of the ground conditions and CSM and a measure of hazardous gas concentrations and gas flow at the site within monitoring standpipes.



6.4.1. SOURCES AND PATHWAYS OF GROUND GAS

Table 6.9 summarises the potential sources and pathways of ground gas within the context of the recorded site setting and proposed development.

Table 6.9 Identified Potential Sources of Ground Gas

SOURCE

Made Ground

Made Ground deposits were encountered within all exploratory hole locations to depths of between 0.00 m and in excess of 3.00 m bgl although, in general, Made Ground was encountered to a depth of less than 2.00 m bgl.

Hydrocarbon odours were noted within three locations, situated across the site within the Made Ground deposits. The depths the hydrocarbon odour was encountered ranged from 0.45–2.40 m bgl (BH106, BH109, BH112) and was typically noted within a reworked very gravelly clay with gravel of sandstone, mudstone, concrete, ash, and rare instances of slag.

Superficial Strata

Superficial deposits were encountered within all exploratory hole locations, with the superficial deposits varying across the site. The most common stratum recorded was a dark reddish brown gravelly sandy CLAY with gravel of sandstone, mudstone, and instances of coal and rare shale. Typically, the CLAY was locally interbedded with lenses of a dark orange to brown very clayey fine to medium SAND between 2.00–9.00 m bgl. The lenses of SAND provide a potential preferential pathway for ground gas migration.

A rare band of clayey very sandy GRAVEL interbedded within the CLAY was recorded in three exploratory hole locations situated towards the northeast of site (BH102, BH111, and BH203). The GRAVEL bands were encountered between 4.00–8.50 m bgl and were gravel of mudstone and sandstone. The bands of GRAVEL provide a potential preferential pathway for ground gas migration.

Bedrock Strata

The bedrock geology was encountered between 4.00–13.50 m bgl across all exploratory investigations and comprised of SANDSTONE.

The site is located within a Coal Mining Reporting Area, however not within a development high risk area. There are no mine entries, coal outcrops, past or probably shallow coal mine workings beneath or close to the site. The risk from underground coal workings is therefore considered to be very low and not further works are deemed to be required in relation to coal mining.

Landfill Sites

No landfill sites (current or historic) are located within 250 m of the site. The site has undergone significant historical development and ground working, the Made Ground associated with the landmark development may produce hazardous ground gases such as methane and carbon dioxide.

Other Gases

The BGS reports that the site is situated in Radon Class 1, and therefore radon protective measures are not necessary in the construction of new dwellings or extensions.

Three infilled ponds

Historically infilled ponds have been identified on-site, which present potential sources of organic deposits and thus hazardous ground gases. However, due to the age of historical infilling, they are not considered likely to present significant sources of ground gases.



Elevated concentrations of VOCs have been identified within soils and shallow groundwater, which presents a potential vapour risk.

6.4.2. MONITORING FREQUENCY

The CIRIA C665 guidance on gas risk assessment includes recommendations for periods frequencies for monitoring visits. These recommendations take into account the nature of the proposed development and the likely generation potential of the source.

The proposed development comprises private residential properties, which would be classified as a Type A development (high sensitivity) in accordance with BS8485:2015+A1:2019. However, it is considered that the likely generation potential of the identified gas sources (taking into account the likelihood of future increases in gas generation) would be best classified as moderate.

Therefore, within the context of the proposed residential end-use and ground gas generation potential, the gas assessment requires 12 visits over six months, with at least two sets of readings at low or falling atmospheric pressure.

6.4.3. GROUND GAS RISK ASSESSMENT METHODOLOGY

The potential impact on the development from ground gases has been assessed with reference to standards and guidelines published in:

- ✳ CIRIA Report 665 – Assessing risks posed by hazardous ground gases to buildings (2007).
- ✳ BS8485:2015+A1:2019 – Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings.
- ✳ CL: AIRE Publication “Good Practice for Risk Assessment for Coal Mine Gas Emissions” (October 2021)

BS8485 provides guidance on the level of gas protection requirements based upon the characteristic situation (CS) and the proposed development based on building type.

Therefore, in accordance with BS8485, based on the measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) shall be derived for each monitoring point, from which the site characteristic hazardous gas flow rate (Q_{hgs}), and then the Characteristic Situation (CS) can be determined.

The following equation should be utilised:

$$Q_{hg} = q \left(\frac{C_{hg}}{100} \right)$$

Where:

q is the measured flow rate (in litres per hour) of combined gases from the monitoring standpipe.

C_{hg} is the measured hazardous gas concentration (in percentage volume/volume).

The subsequent derived gas screening value (GSV) should be the maximum Q_{hg} (flow rate x concentration as a percentage volume) for all the monitoring events.

A ‘worst case check’ may be carried out using the maximum recorded flow in any hole with the maximum concentration in any hole with the maximum concentration in any hole to present the



plausible worst-case conditions. Adoption of the worst case Q_{hg} requires thorough justification and reference to the CSM.

The final derived GSV can then be used to characterise the site as summarised in Table 6.10.

Table 6.10 Site Characterisation by GSV (BS8485:2015+A1:2019)

CS	HAZARD POTENTIAL	GSV (L/HR) FOR METHANE AND CARBON DIOXIDE	ADDITIONAL FACTORS
CS1	Very Low	< 0.07	Typically, <1% methane concentration and <5% carbon dioxide concentration (otherwise consider an increase to CS2)
CS2	Low	< 0.70	Typical measured flow rate <70 l/h (otherwise consider an increase to CS3)
CS3	Moderate	< 3.5	N/A
CS4	Moderate to High	< 15	N/A
CS5	High	< 70	N/A
CS6	Very High	> 70	N/A

Notes

- 1) The CS is equivalent to the characteristic GSC in CIRIA C665.
- 2) The worst-case ground gas regime identified on the site, either methane or carbon dioxide, at the worst-case temporal conditions that the site may be expected to encounter should be considered.
- 3) Gas Screening Value is the Borehole Gas Volume Flow Rate, in litres per hour, multiplied by the concentration in the air stream of the particular gas being considered.
- 4) The Gas Screening Value thresholds should not generally be exceeded without the completion of a detailed ground gas risk assessment taking into account site-specific conditions.

It should be noted that in the first instance, this assessment has been carried out in accordance with BS8485:2015+A1(2019) and the thresholds given therein.

6.4.4. MONITORING FREQUENCY

Concentrations of methane (CH₄), carbon dioxide (CO₂) and oxygen (O₂) were measured using a calibrated infrared gas analyser (GFM435) with gas flow rates measured using an integrated flow meter.

Gas measurements were recorded for a minimum of 300 seconds (5 minutes) at each location, increasing to 600 seconds if elevated concentrations identified, at which points the maximum concentration of CH₄ and CO₂, together with the lowest concentration of O₂ were recorded.

In addition, concentrations of VOC gases were also measured using a Minirae 3000 Photo Ionisation Detector (PID) Monitor calibrated to Isobutylene.

The results of the ground gas monitoring are presented in Table 6.11.

In addition to the raw data, results for each individual standpipe have been assessed with reference to guidance provided in BS8485:2015+A1:2019. Based on the initial peak measured flow rates and hazardous gas concentrations, individual hazardous gas flow rates (Q_{hg}) have been derived for each monitoring point, from which an individual Characteristic Situation (CS) can be determined.

6.4.5. SUMMARY OF MONITORING RESULTS

Table 6.11 presents the ground gas and groundwater monitoring results to date.



Table 6.11 Summary of Ground Gas Monitoring Results

WELL	STRATA	DATE	CH ₄ PEAK (%V/V)	CH ₄ STEADY (%V/V)	CH ₄ Q _{hg} (l/hr)	CO ₂ PEAK (%V/V)	CO ₂ STEADY (%V/V)	CO ₂ Q _{hg} (l/hr)	O ₂ (%V/ V)	VOC PEAK (PPM)	VOC STEAD Y (PPM)	ATMOS (mb)	ATMOS. DYNAMIC	PEAK FLOW (l/hr)	STEADY FLOW (l/hr)	RESPONSE ZONE (m bgl)	DEPTH TO BASE (m bgl)	DEPTH TO WATER (m bgl)
BH101	CLAY	13/02/2025	0.1	0.1	0.0001	0.6	0.2	0.0006	20.0	0.00	0.00	1018	Steady	0.1	0.1	2.00– 6.00	5.84	1.58
		27/02/2025	0.1	0.1	0.0001	2.0	2.0	0.002	19.5	0.00	0.00	1013	Rising	0.1	0.1		5.84	1.49
		12/03/2025	0.1	0.1	0.0002	6.8	1.9	0.0136	19.3	0.00	0.00	998	Falling	0.2	0.1		5.84	1.63
BH102	CLAY	13/02/2025	0.1	0.1	0.0001	0.8	0.8	0.0008	17.4	0.00	0.00	1018	Steady	0.1	0.1	3.00– 8.00	6.97	5.81
		27/02/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	20.2	0.00	0.00	1013	Rising	0.1	0.1		6.97	5.84
		12/03/2025	0.1	0.1	0.0001	0.9	0.9	0.0009	18.0	0.00	0.00	998	Falling	0.1	0.1		6.97	5.64
BH103	Made Ground	13/02/2025	0.1	0.1	0.0001	0.9	0.8	0.0009	18.6	0.00	0.00	1018	Steady	0.1	0.1	0.50– 1.50	2.51	Dry
		27/02/2025	0.1	0.1	0.0001	1.5	1.3	0.0015	18.6	0.00	0.00	1013	Rising	0.1	0.1		2.51	Dry
		12/03/2025	0.2	0.2	0.0002	2.9	2.9	0.0029	16.6	0.00	0.00	998	Falling	0.1	0.1		2.51	Dry
BH104	CLAY	13/02/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	19.8	0.00	0.00	1018	Steady	0.1	0.1	2.50– 5.00	5.10	2.29
		27/02/2025	0.1	0.1	0.0001	5.0	5.0	0.0050	12.6	0.00	0.00	1013	Rising	0.1	0.1		5.10	2.73
		12/03/2025	0.1	0.1	0.0001	6.9	6.7	0.0069	7.80	0.00	0.00	998	Falling	0.1	0.1		5.10	2.64
BH105	CLAY	13/02/2025	0.1	0.1	0.0001	0.6	0.6	0.0006	14.4	0.00	0.00	1018	Steady	0.1	0.1	2.00– 5.00	5.06	Dry
		27/02/2025	0.1	0.1	0.0001	0.8	0.8	0.0008	10.8	0.00	0.00	1013	Rising	0.1	0.1		5.06	Dry
		12/03/2025	0.1	0.1	0.0001	0.8	0.8	0.0008	11.8	0.00	0.00	998	Falling	0.1	0.1		5.06	Dry
BH106	CLAY	13/02/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	19.6	0.00	0.00	1018	Steady	0.1	0.1	1.00– 2.00	2.14	1.46
		27/02/2025	0.1	0.1	0.0001	0.2	0.2	0.0002	19.0	0.00	0.00	1013	Rising	0.1	0.1		2.14	1.38
		12/03/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	0.00	0.00	998	Falling	0.1	0.1		2.14	1.35
BH107	CLAY	13/02/2025	0.1	0.1	0.0121	0.1	0.1	0.0121	19.7	0.00	0.00	1018	Steady	12.1	0.1	2.00– 3.00	3.05	1.84
		27/02/2025	0.1	0.1	0.0004	0.1	0.1	0.0004	19.8	0.00	0.00	1013	Rising	0.4	0.1		3.05	1.83
		12/03/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	19.2	0.00	0.00	998	Falling	0.1	0.1		3.05	1.46
BH108	Made Ground	13/02/2025	0.1	0.1	0.0001	0.8	0.8	0.0008	12.9	0.00	0.00	1018	Steady	0.1	0.1	0.60– 1.60	1.65	Dry
		27/02/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	0.00	0.00	1013	Rising	0.1	0.1		1.65	Dry
		12/03/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	20.3	0.00	0.00	998	Falling	0.1	0.1		1.65	Dry
BH109	CLAY	13/02/2025	0.1	0.1	0.0001	0.6	0.3	0.0006	19.8	0.00	0.00	1018	Steady	0.1	0.1	3.00– 8.00	5.82	2.46
		27/02/2025	0.1	0.1	0.0001	0.3	0.2	0.0003	20.1	0.00	0.00	1013	Rising	0.1	0.1		5.82	2.79
		12/03/2025	0.1	0.1	0.0004	1.2	0.3	0.0048	19.8	0.00	0.00	998	Falling	0.4	0.1		5.82	2.56
BH110	CLAY	13/02/2025	0.1	0.1	0.0961	0.4	0.4	0.3844	18.3	0.00	0.00	1018	Steady	96.1	0.1	3.00– 5.00	4.63	3.48
		27/02/2025	0.1	0.1	0.0001	0.6	0.6	0.0006	16.7	0.00	0.00	1013	Rising	0.1	0.1		4.63	3.13
		12/03/2025	0.1	0.1	0.0001	0.6	0.5	0.0006	18.3	0.00	0.00	998	Falling	0.1	0.1		5.82	3.02
BH111	CLAY	13/02/2025	0.1	0.1	0.0001	0.4	0.1	0.0004	20.1	0.00	0.00	1018	Steady	0.1	0.1	2.00– 6.00	5.29	4.62
		27/02/2025	0.1	0.1	0.0001	0.7	0.3	0.0007	19.1	0.00	0.00	1013	Rising	0.1	0.1		5.29	4.70
		12/03/2025	0.1	0.1	0.0001	1.5	0.5	0.0015	18.7	0.00	0.00	998	Falling	0.1	0.1		5.29	4.49
BH112	CLAY	13/02/2025	0.1	0.1	0.0001	0.1	0.1	0.0001	20.1	0.00	0.00	1018	Steady	0.1	0.1	4.00– 8.00	7.38	2.36
		27/02/2025	0.1	0.1	0.0002	0.1	0.1	0.0002	20.0	0.00	0.00	1013	Rising	0.2	0.2		7.38	3.71
		12/03/2025	0.1	0.1	0.0001	0.2	0.1	0.0002	20.1	0.00	0.00	998	Falling	0.1	0.1		7.38	3.76



Notes

CIRIA Characteristic Situation	Q_{hg}		
CS1	<0.07	Typical Max CO2 <5 % Typical Max CH4 <1 %	Values in BOLD exceed CS1 Thresholds
CS2	<0.7	Flow rate not to exceed 70 l/hr otherwise consider increase to CS3	Values in BLUE denote water above level of response zone (flooded)
CS3	<3.5		
CS4	<15	Quantitative Risk Assessment required to evaluate scope of protective measures	



6.4.6. GROUNDWATER

A well is classified as 'flooded' if less than 0.50 m of the response zone remains from the top of the depth to water in the borehole. Therefore, the water level within several of the monitoring wells was recorded to be above the top of the response zone (flooded) on a number of occasions, as summarised in Table 6.12, thus rendering some of the monitoring data unreliable.

Table 6.12 Flooded Monitoring Well Data

WELL	VISIT 1	VISIT 2	VISIT 3
BH101	Y	Y	Y
BH104	Y	Y	Y
BH106	Y	Y	Y
BH107	Y	Y	Y
BH109	Y	Y	Y
BH110	Y	Y	Y
BH112	Y	Y	Y

Flooded boreholes were typically those installed within deeper superficial deposits, which targeted the assumed superficial groundwater depths. Therefore, water levels within these monitoring wells are likely representative of superficial groundwater flow.

6.4.7. BAROMETRIC PRESSURE

Visit 1 was undertaken during a period of steady pressure, recorded to be 1008 m bar. Visit 2 was undertaken during a period of rising pressure, recorded to be 1013 m bar.

Visit 3 was undertaken during periods of falling low pressure, recorded to be 998 m bar.

Further monitoring visits should be undertaken during periods of high pressure, low pressure, and rising and falling pressure conditions to ensure data is representative.

6.4.8. GAS FLOW

Throughout the monitoring period, flow rates were predominantly recorded to be 0.1 l/hr (limit detection of the analyser). A singular instance of steady flow rates recorded at 0.2 l/hr was identified in BH112 during the second monitoring period.

Two instances of elevated peak flow readings were recorded during visit 1 for BH107 and BH110 which recorded 12.1 l/hr and 96.1 l/hr peak flow rates respectively. However, steady flow rates were recorded to be 0.1 l/hr for both boreholes suggesting the elevated flow rate was likely resultant from the high groundwater levels causing compression in the well with an initial release of compressed gas following monitoring.

6.4.9. GAS CONCENTRATIONS

The maximum methane value recorded within the monitoring wells was 0.1% v/v (limit of detection of the analyser). A singular instance of elevated methane recorded at 0.2% v/v was identified in BH103 during the third monitoring visit.



Carbon dioxide concentrations were typically recorded at concentrations ranging from 0.1% v/v to 2.9% v/v (BH103). Three instances where carbon dioxide concentrations were elevated and recorded at concentrations between 5.0% v/v and 6.9% v/v (BH104) were identified in both BH103 and BH104 wells. However, it should be noted that where elevated carbon dioxide concentrations were found the well was recorded as flooded, therefore presents unreliable data.

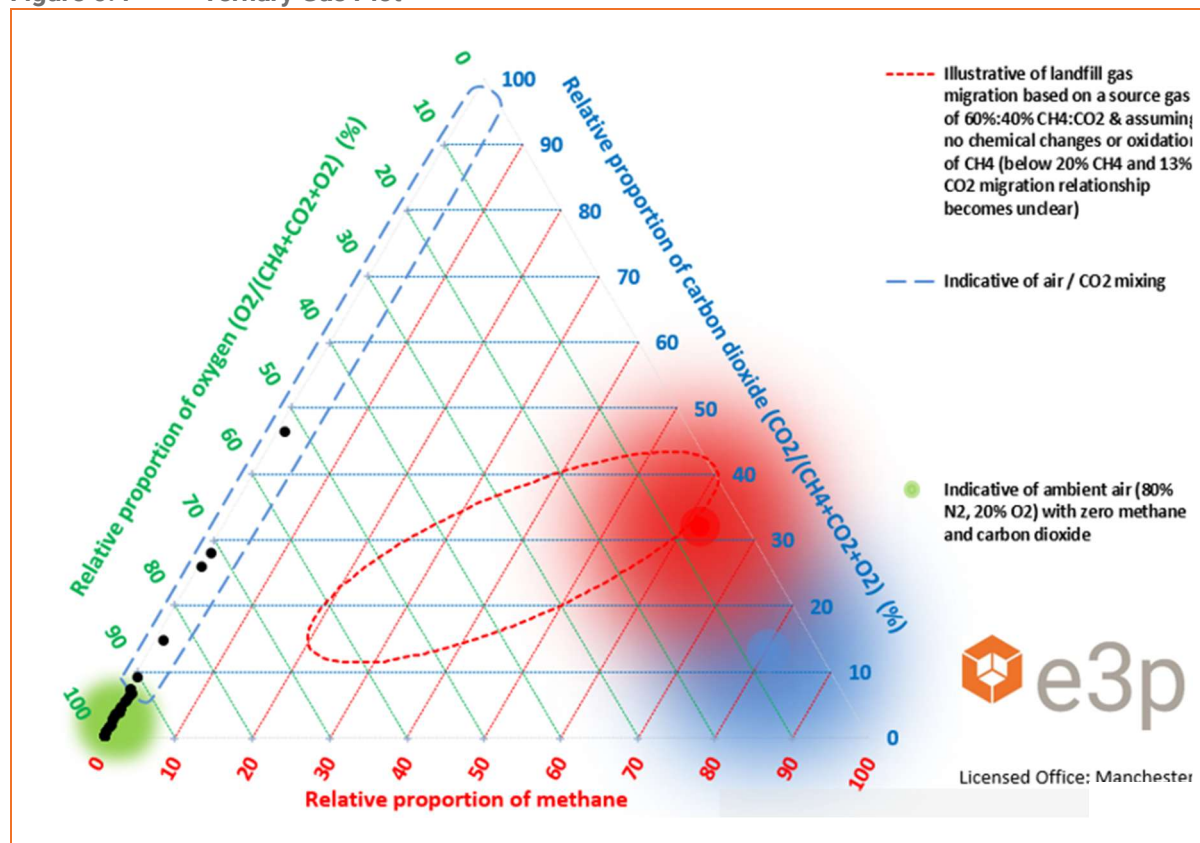
Monitoring data pertaining to volatile vapours report readings of 0.00 ppm within all of the monitoring wells.

6.4.1. TERNARY PLOT FOR GROUND GAS

A ternary gas plot is a triangular plot of three variables which equal 100%. They allow the composition of gas to be identified and can help to identify the potential source of gas. As carbon dioxide is present in natural soils (such as Glacial Till), this can lead to uncertainty about whether it is necessary to increase the gas regime. On this basis, a ternary plot has been used as an assessment tool for the gas monitoring data to identify if there is a true risk.

Figure 6.4 shows the ternary gas plot for the gas monitoring data.

Figure 6.4 Ternary Gas Plot



The ternary gas plot indicates the majority of the ground gas monitoring results have standard oxygen and generally low carbon dioxide concentrations with limited occasions of carbon dioxide concentrations above 5%, and no elevated methane, which is indicative of natural sources (green area on the ternary plot).

On three occasions within WS103, WS105 and WS107, elevated carbon dioxide and partially depleted oxygen were recorded, which could indicate organic material, Made Ground or organic contamination undergoing anaerobic degradation.



6.4.2. RADON RISK

All sites registered from 1st December 2022 onwards will have been assessed against the updated radon maps by NHBC and will be required to have radon protection measures installed in accordance with the updated mapping.

Figure 6.5 indicates that based on the less than 1% of homes affected area observed, the site falls under a Radon Potential Class of 1 within the User Guide for the HPA-BGS Joint Radon Potential Dataset for Great Britain (Ref: IR/11/044, dated 2011). A Radon potential class of 1 indicates that basic Radon Measures are not required in all new dwellings, as shown in Figure 6.5.

Figure 6.5 Radon Affected Area Potential Class

Radon Potential Class*	Is the property in a Radon Affected Area?	Additional information
1	No	The property is in a Lower probability radon area (less than 1% of homes are estimated to be at or above the Action Level). The property is not in a radon affected area.
2	Yes	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level). The property is in a radon affected area.
3	Yes	The property is in an Intermediate probability radon area (3 to 5% of homes are estimated to be at or above the Action Level). The property is in a radon affected area.
4	Yes	The property is in an Intermediate probability radon area (5 to 10% of homes are estimated to be at or above the Action Level). The property is in a radon affected area.
5	Yes	The property is in a Higher probability radon area (10 to 30% of homes are estimated to be at or above the Action Level). The property is in a radon affected area.
6	Yes	The property is in a Higher probability radon area (more than 30% of homes are estimated to be at or above the Action Level). The property is in a radon affected area.

*The Radon Potential Class number should not be included in answers.

Source: User Guide for the HPA-BGS Joint Radon Potential Dataset for Great Britain (Ref: IR/11/044, dated 2011)



Figure 6.6 Radon Affected Area Measures Required

Radon Potential Class*	What level of radon protective measures are required for new buildings in England and Wales?	What level of radon protective measures are required for new dwellings in Scotland?
1	None**	None**
2	None	Stage 1
3	Basic	Stage 1
4	Basic	Stage 1
5	Full	Stage 2
6	Full	Stage 2

*The Radon Potential Class number should not be included in answers.

** in 2008 HPA recommended that building regulations be amended to ensure that all new buildings, extensions etc. include basic radon protective measures. At the time of writing, relevant UK authorities were considering this advice.

6.4.3. CONCLUSION

The determined Characteristic Situation for each standpipe is presented in Table 6.13. This indicates that based on the peak flow rates the majority of the monitoring visits classify as Characteristic Situation (CS)1 – Very Low Gas Risk.

Table 6.13 Gas Profile and Location

WELL	MAX FLOW (l/hr)	MAX CH4 (%V/V)	MAX CH4 QHG (l/hr)	MAX CO2 (%V/V)	MAX CO2 QHG (l/hr)	CHARACTERISTIC SITUATION
BH101	0.2	0.1	0.0002	6.8	0.0136	CS2
BH102	0.1	0.1	0.0001	0.9	0.0009	CS1
BH103	0.1	0.2	0.0002	2.9	0.0029	CS1
BH104	0.1	0.1	0.0001	6.9	0.0069	CS2
BH105	0.1	0.1	0.0001	0.8	0.0008	CS1
BH106	0.1	0.1	0.0001	0.2	0.0002	CS1
BH107	12.1	0.1	0.0121	0.1	0.0121	CS2
BH108	0.1	0.1	0.0001	0.8	0.0008	CS1
BH109	0.4	0.1	0.0004	1.2	0.0048	CS1
BH110	96.1	0.1	0.0961	0.6	0.3844	CS2
BH111	0.1	0.1	0.0001	1.5	0.0015	CS1
BH112	0.2	0.1	0.0002	0.2	0.0002	CS1

Based upon the initial ground gas monitoring data, the majority of the site is classified within Characteristic Situation 1 (CS1) and therefore presents a very low gas risk.



However, a precautionary Characteristic Situation 2 (CS2) is recommended for impacted wells due to the majority of monitoring wells being recorded as flooded, therefore providing potentially skewed results. These include the elevated max flow rates (l/hr) identified in BH107 and BH110, and the elevated concentrations of CO₂ above 5% V/V identified in BH101 and BH104.

Further monitoring is required to confirm the potential presence or absence of elevated ground gases and clarify the final ground gas monitoring regime.

Further consideration is also required in areas where elevated volatile contaminants have been identified within soils and groundwater across the southern boundary of the site. In these areas, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the impacted soils.

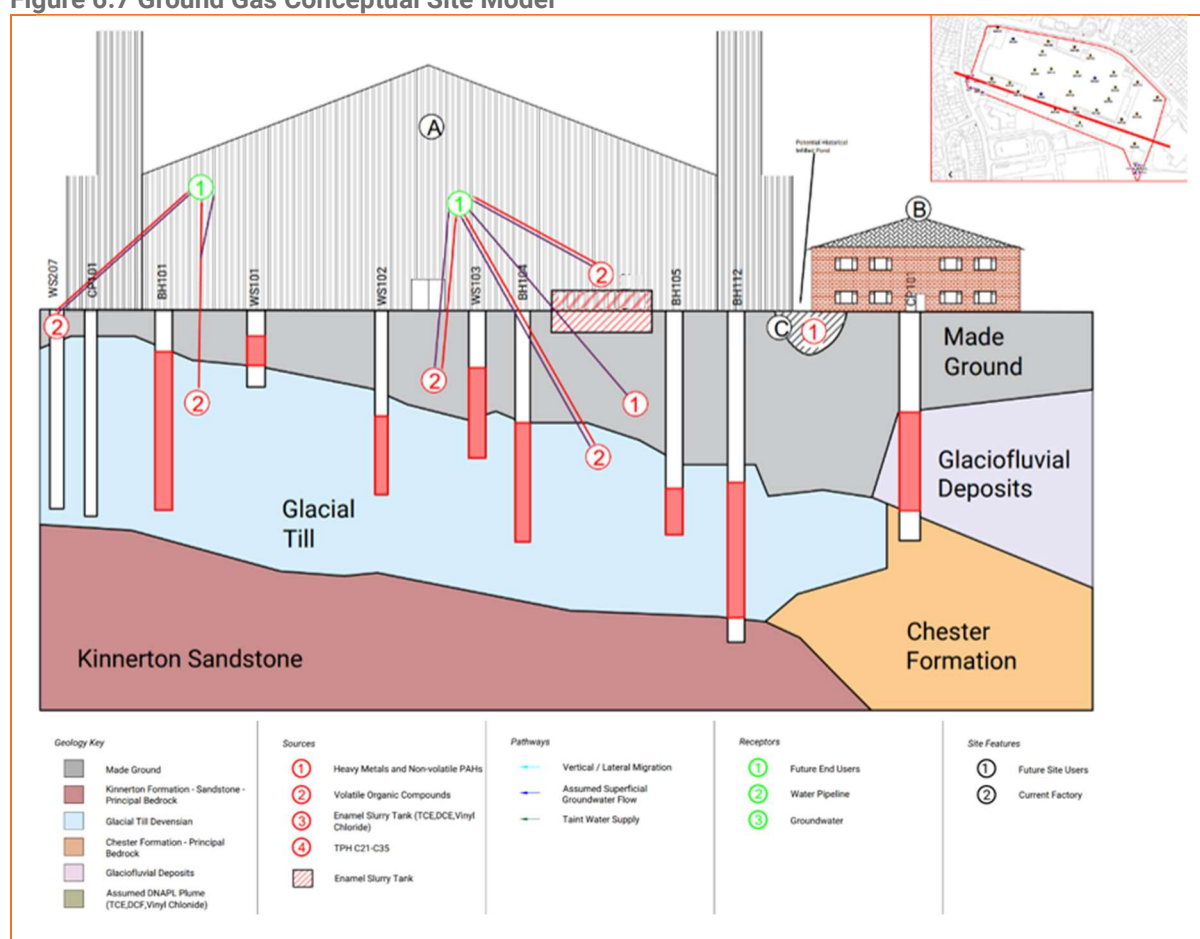
Following the completion of the full ground gas monitoring regime, an updated assessment on potential ground gas risks will be undertaken including both the initial and supplementary internal ground gas monitoring data.

It is recommended that the full ground gas assessment and recommended protection measures (if applicable) are agreed with the local authority prior to their adoption on-site. Furthermore, all protection measures adopted should be validated by a suitably qualified engineer.

A Radon Class 1 has been applied to the site, therefore no Radon protective measures are required in the construction of new residential dwellings.

A Gas Protection Design Report (GPDR) will be required to be read in conjunction with this report. This is suggested to be completed following a full assessment of ground gas monitoring data to ensure a representative assessment can be achieved.

Figure 6.7 Ground Gas Conceptual Site Model





6.5. POTABLE WATER SUPPLY

This section provides a summary of the ground investigation data with reference to the selection of potable water supply pipework. The assessment is made with reference to the UK Water Industry Research (UKWIR) publication "Guidance on the selection of Water Supply Pipes to be used in Brownfield Sites."

Table 6.14 Pipeline Selection Assessment

CONTAMINANT GROUP	PE THRESHOLD (mg/kg)	MAX CONCENTRATIONS AT CURRENT PIPELINE DEPTH (mg/kg)
Total VOC	0.5	0.069
Total BTEX And MTBE	0.1	0.0034
Total SVOCs (Excluding PAH and those substances marked with an *)	2	<1.0
EC5-EC10 Aliphatic and Aromatic Hydrocarbons	2	<1.0
EC10-EC16- Aliphatic and Aromatic Hydrocarbons	10	1.4
EC16-EC40 Aliphatic and Aromatic Hydrocarbons	500	192
Phenols (From SVOC Analysis) *	2	2.0
Cresols and Chlorinated Phenols (From SVOC Analysis)	2	<0.50
Ethers*	0.5	<0.50
Nitrobenzene*	0.5	N/A
Ketones*	0.5	N/A
Aldehydes*	0.5	N/A
Amines	Fail	<0.50
Other Considerations		
Are there any exceedances of the PE threshold outside of the pipeline depth?	Yes – Heavy Metals, Total Phenols, EC5-EC10, EC16-EC40 and VOCs were identified in concentrations exceeding PE threshold values. Exceedances were noted both above and below current pipeline depth, predominantly within BH103, BH104 and BH108.	
Is free product present in soil and groundwater?	No free phase product was identified during the intrusive ground investigation, however within the footprint of the machine pits, free phase products may be present, however it is currently unknown.	
Could hydrocarbon impact at greater depth than current pipeline depth be mobilised by rising groundwater levels?	Groundwater levels are recorded to be situated between approximately 2.00–8.00 m bgl within the superficial deposits, varying across the site. Minimal instances of hydrocarbon impact have been identified to date, however if present, the risk from groundwater flow mobilising	



	hydrocarbon contaminants is considered to be moderate.
Will soils impacted with above determinants likely be utilised elsewhere on-site?	Due to the identified VOC impact, it is unlikely that impacted soils are to be retained for re-use without appropriate treatment and subsequent assessment of suitability for retention.
Will soils be imported to site as part of any future earthworks?	Unknown – Due to the identified VOC impact across the site, soils may be required to replace unsuitable materials where excavations are required. This will be confirmed following completion of an earthwork's specification and proposed development plan and proposed levels.

Notes: pipeline depth normally between 0.75 m – 1.35 m

Based upon the above, and previous assessment of site conditions, barrier pipe is likely to be required for a proposed residential development. However, post-remediation and enabling works ground conditions may be different from those identified during this phase of intrusive ground investigation. As such, a post-remediation UKWIR risk assessment will be required.



6.6. DEVELOPED CONCENTPTUAL SITE MODEL

Following the completion of the intrusive ground investigation, chemical analysis and risk assessment, the developed CSM shown in Table 6.15 has been prepared for the site.

Table 6.15 Developed Conceptual Site Model

CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
HUMAN HEALTH		
Made Ground (Main Factory Structure) Metals (Arsenic, Lead, Nickel, Zinc) – encountered throughout the Made Ground beneath the main factory structure.	Accidental ingestion and/or dermal contact with contaminated soil and/or leachate. PL1/PL2 Inhalation of contaminated dust. PL3	Human Health – construction workers Human Health – end users

Discussion

The chemical data has identified exceedances of Arsenic, Lead, Nickel, and Zinc contained within the Made Ground deposits underlying the main factory structure. Based upon the long-standing historical use of the site comprising industrial factories in excess of 100 years, the source is likely derived from industrial processes completed on-site. A singular instance of Nickel was identified in natural superficial deposits in BH105 suggesting a deeper localised hotspot.

Proposed residential dwellings will require a clean cover system to sever potential pathway to proposed end-users, with all site personnel having a greater chance of coming into contact with contaminated soils, particularly during excavation and soil recovery works.

Likelihood: Likely	Severity: Medium	Level of Risk: Moderate
Enamel Slurry Tank VOCs (Trichloroethene (TCE), Cis 1,2-Dichloroethene, Vinyl Chloride) – predominantly encountered in southeast part of the site, with TCE proven to be widespread.	Inhalation of vapours. PL4 Migration through permeable strata and preferential pathways. PL5	Human Health – end users Human Health – Off-site receptors



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
Discussion Impacted soils and groundwater have been identified across the site, predominantly across the southeast part of the site adjacent to the enamel slurry tank. Highest concentrations of VOCs were identified in BH104, adjacent to the enamel slurry tank confirming this is the most likely source of the contaminants, which has subsequently migrated across the site. As TCE is a DNAPL compound, the increased risk is associated with deeper superficial deposits as rising groundwater is likely to have dislodged the plume resulting in the sinking of the compounds through the preferential granular pathways. Visual and olfactory evidence of contamination was limited during the intrusive ground investigation, however, due to the extent of potential contamination, a watching brief should be completed during remediation works to monitor the removal of the enamel slurry tank with samples taken directly beneath the base of the tank.		
Likelihood: Highly Likely	Severity: Severe	Level of Risk: Very High
Made Ground Asbestos (Asbestos containing materials (ACM) and loose fibres)	Inhalation (of fibres) Construction works disturbing bound material and releasing fibres. PL3	Human Health – construction workers, end land users, and users of adjacent sites
Discussion A singular instance of trace fibres has been identified in BH108 in shallow Made Ground deposits. Based upon soil testing completed to date, this is an isolated occurrence. However, as asbestos containing materials are known to be within the fabric of the main factory structure, additional testing is recommended following the completion of demolition works to ensure no cross contamination has occurred. Further testing of shallow Made Ground materials surrounding BH108 is recommended in order to understand the spatial extent of impacted materials. If proven to only be a localised instance, a hotspot removal of impacted material is recommended to mitigate the risk posed to site personnel and future site users.		
Likelihood: Likely	Severity: Medium	Level of Risk: Moderate
VOCs Trichloroethene (TCE), Cis 1,2-Dichloroethene, Vinyl Chloride—predominantly encountered	Ingestion of tainted water supply. PL7	Human Health – End users Water pipeline



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
southeast of the site, with TCE proven to be widespread.		

Discussion

Preliminary assessment denotes no major contamination is present within the assumed pipeline depth. However, significant contamination including VOC compounds are present beneath the pipeline depth, which presents a potential risk of mobilisation to potable water supply through rising groundwater. Therefore, it is assumed that barrier pipe will be required for the proposed residential development.

However, post-remediation and enabling works ground conditions may be different from those identified during this phase of intrusive ground investigation. As such, a post-remediation UKWIR risk assessment will be required.

Likelihood: Highly Likelihood	Severity: High	Level of Risk: Very High
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CONTROLLED WATERS

Made Ground Heavy Metalloids Enamel Slurry Tank (TCE, DCE, Vinyl Chloride) VOCs Trichloromethane	Contact with contaminated groundwater. PL2 Migration to the bedrock principal aquifer. PL5 Migration to Underground Stream/Culvert (Anecdotal). PL5	Human Health – site personnel Human Health – Consumer Aquatic ecosystems
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Discussion

Substantial contamination has been identified within the submitted groundwater samples, contained within the superficial deposits. Identified contamination includes heavy metalloids, TCE, DCE and Vinyl Chloride, and other VOCs previously not identified within chemical soil analysis. Based upon the identified heavy metalloid impact identified in the Made Ground deposits site wide, groundwater analysis confirms the migration of these compounds into the groundwater across the site is occurring. Heavy metalloid impact exceedances are primarily noted when compared to EQS thresholds, presenting a potential risk to the underground stream/culvert.



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
Initial assessments have concluded that VOC contamination has not yet migrated into the underlying bedrock Principal aquifer, and that it remains limited to within the superficial deposits. However, given the sensitive nature of the site and the potential receptors, a Tier 3 DQRA will be required to address the identified exceedances, model the fate and transport potential of the VOC impact, undertake a sensitivity assessment to the critical receptor and derive SSRT's for soil remediation.		

Likelihood:	Severity: Severe	Level of Risk: Very High
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GROUND GAS

Made Ground (<2.00 m bgl) Methane and Carbon Dioxide Enamel Slurry Tank VOCs	Inhalation of ground gas. PL4 Accumulation of ground gas in confined spaces (asphyxiation or explosion). PL4	Human Health – site personnel Human Health – end users Infrastructure and services
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Discussion

Based upon preliminary ground gas monitoring data, no significant sources of Methane or Carbon Dioxide have been recorded within the monitoring wells.

However, a precautionary Characteristic Situation 2 (CS2) is recommended for impacted wells due to the majority of monitoring wells being recorded as flooding, therefore providing potentially skewed results. These include the elevated max flow rates (l/hr) identified in BH107 and BH110, and the elevated concentrations of CO2 above 5% V/V identified in BH101 and BH104.

Further monitoring is required to confirm the potential presence or absence of elevated ground gases and clarify the final ground gas monitoring regime.

PID screening has not detected any volatile vapours during the intrusive ground investigation or ground gas monitoring. However, soil analysis has identified concentrations of TCE across the site, including significantly elevated concentrations of TCE within BH104. Additionally, concentrations above laboratory LOD and residential soil GACs have been identified of DCE and Vinyl Chloride in BH104. In these areas, vapour resistant membranes may be required to be installed during the build phase for any proposed buildings situated within the immediate vicinity of the impacted soils.

Likelihood: Highly Likely	Severity: High	Level of Risk: High
Radon	Inhalation of ground gas. PL4 Accumulation of ground gas in confined spaces (carcinogenic)	Human Health – site personnel Human Health – end users



CONTAMINANT SOURCE	MIGRATION PATHWAY	RECEPTOR
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Discussion

The site is classified within an area where less than 1% of homes are affected by Radon. No Radon protection measures are required in the proposed development of low-rise residential dwellings.

Likelihood: Unlikely	Severity: Minor	Level of Risk: Very Low
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INFRASTRUCTURE AND DEVELOPMENT

Made Ground Sulphates	Sulphate attack on concrete. PL6	Building concrete
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Discussion

The majority of the site is classified as DS-1, AC-1s. However, localised areas of elevated sulphates, classified as DS-2, AC-1s, and DS-3, AC-2s, are recorded in Made Ground deposits in BH105, BH108, and BH110 between 0.60 m bgl and 2.00 m bgl. All concrete should be designed based in accordance with these classifications.

Likelihood: Low Likelihood	Severity: Mild	Level of Risk: Low
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Made Ground Phytotoxic contaminants	Direct contact (plant uptake). PL8	Flora
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Discussion

Based upon the current site conditions and site-wide contamination present, there is a likely probability of contamination been taken up by flora in areas of proposed soft landscaping/gardens.

Proposed residential dwellings will require a clean cover system to sever potential pathway to proposed end-users.

Likelihood: Likely	Severity: Medium	Level of Risk: Moderate
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Main Exposure Pathways

PL1 = Soil Ingestion, PL2 = Dermal Contact and Ingestion, PL3 = Dust Inhalation, PL4 = Vapour/Gas Inhalation, PL5 = Vertical/Lateral Migration, PL6 = Corrosion of Concrete, PL7 = Tainting of Water Supply, PL8 = Uptake by Plants



FROM CIRA 552 (2001)		RISK ASSESSMENT MATRIX			
		Consequence			
		SEVERE	MEDIUM	MILD	MINOR
Probability	HIGH LIKELIHOOD	Very High	High	Moderate	Moderate / Low
	LIKELY	High	Moderate	Moderate / Low	Low
	LOW LIKELIHOOD	Moderate	Moderate/ Low	Low	Very Low
	UNLIKELY	Moderate / Low	Low	Very Low	Very Low



7. GEOTECHNICAL ASSESSMENT

7.1. SOIL CONSISTENCY

Undrained shear strength values were measured using laboratory undrained triaxial tests. Results of the tests are presented in Table 7.1 and Table 7.2, respectively, which indicate the clay soils to vary between stiff and very stiff. Strength test data is generally consistent with the field descriptions of the aforementioned soils. The full results can be found in APPENDIX IX.

Results of the standard penetration tests, including undrained shear strengths derived from SPTs are included in Table 7.3.

Table 7.1 Summary of Undrained Shear Strength in Triaxial Compression – Laboratory

LOCATION	SAMPLE DEPTH (m)	LAB DESCRIPTION	UNDRAINED SHEAR STRENGTH (kN/m ²)	CONSISTENCY
BH201	4.00–4.45	Brown silty slightly sandy slightly gravelly CLAY	241	Very Stiff
BH202	6.00–6.45	Brown silty slightly sandy slightly gravelly CLAY	294	Very Stiff

Table 7.2 Summary of Multistage Undrained Shear Strength in Triaxial Compression – Laboratory

LOCATION	SAMPLE DEPTH (m)	LAB DESCRIPTION	TEST NO.	UNDRAINED SHEAR STRENGTH (kN/m ²)	CONSISTENCY
BH101	4.00–4.45	Brown silty slightly sandy slightly gravelly CLAY	1	225	Very Stiff
			2	234	Very Stiff
			3	240	Very Stiff
BH102	6.00–6.45	Brown silty slightly sandy slightly gravelly CLAY	1	317	Very Stiff
			2	330	Very Stiff
			3	344	Very Stiff
BH105	3.00–3.45	Brown silty slightly sandy slightly gravelly CLAY	1	13	Soft
			2	14	Soft
			3	16	Soft
BH106	3.10–3.50	Brown silty slightly sandy slightly gravelly CLAY	1	63	Stiff
			2	69	Stiff
			3	77	Stiff
BH108	2.00–2.45	Brown silty slightly sandy slightly gravelly CLAY	1	242	Very Stiff
			2	257	Very Stiff
			3	301	Very Stiff
BH109	4.00–4.45	Brown silty slightly sandy slightly gravelly CLAY	1	337	Very Stiff
			2	346	Very Stiff
			3	358	Very Stiff
BH110	4.00–4.45	Brown silty slightly sandy slightly gravelly CLAY	1	358	Very Stiff
			2	359	Very Stiff
			3	393	Very Stiff



Table 7.3 Standard/Cone Penetration Test Results

LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH101	1.20	MADE GROUND	2	1.96	Very Loose	N/A	N/A	N/A	19.62
BH101	2.00	Very sandy CLAY with lenses of very clayey SAND	4	3.65	N/A	Very low strength	Soft	18.27	37.56
BH101	3.00		9	7.83	N/A	Low strength	Firm	39.13	80.46
BH101	5.00	Gravelly CLAY	29	24.06	N/A	High strength	Very Stiff	120.30	247.33
BH101	6.50		42	34.29	N/A	Very high strength	Very Stiff	171.44	352.48
BH101	8.00		50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
BH101	8.50		50	40.40	N/A	Very high strength	Very Stiff	202.00	415.32
BH102	1.20	MADE GROUND	4	3.92	Very Loose	N/A	N/A	N/A	39.25
BH102	2.00		9	8.22	Loose	N/A	N/A	N/A	82.22
BH102	3.00	Gravelly very sandy CLAY with pockets of very sandy GRAVEL	12	10.44	N/A	Medium strength	Stiff	52.18	107.28
BH102	4.00	Gravelly CLAY	24	20.28	N/A	High strength	Very Stiff	101.38	208.44
BH102	6.50	Gravelly very sandy CLAY with pockets of very sandy clayey GRAVEL	50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
BH102	8.00		50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
BH103	1.20	MADE GROUND	12	11.77	Medium Dense	N/A	N/A	N/A	117.75



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH103	2.00	Slightly gravelly silty sandy CLAY	17	15.53	N/A	High strength	Very Stiff	77.65	159.65
BH103	4.00	Silty gravelly very sandy CLAY	26	21.97	N/A	High strength	Very Stiff	109.83	225.81
BH103	5.00	Sandy very gravelly CLAY	50	41.48	N/A	Very high strength	Very Stiff	207.41	426.43
BH103	6.50		50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
BH103	6.80		50	40.73	N/A	Very high strength	Very Stiff	203.66	418.72
BH104	3.00	Silty sandy gravelly CLAY	21	18.26	N/A	High strength	Very Stiff	91.31	187.74
BH104	5.00	Slightly gravelly CLAY	25	20.74	N/A	High strength	Very Stiff	103.70	213.21
BH104	6.50	Very stiff reddish brown sandy very gravelly CLAY.	50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
BH104	7.50		50	40.56	N/A	Very high strength	Very Stiff	202.82	417.00
BH105	1.20	MADE GROUND	2	1.96	Very Loose	N/A	N/A	N/A	19.62
BH105	2.00	Sandy CLAY	9	8.22	N/A	Medium strength	Stiff	41.11	84.52
BH105	4.00	Slightly gravelly very sandy CLAY	11	9.29	N/A	Medium strength	Stiff	46.47	95.54
BH105	5.00	Slightly gravelly very sandy	21	17.42	N/A	High strength	Very Stiff	87.11	179.10
BH105	6.50		41	33.47	N/A	Very high strength	Very Stiff	167.36	344.09



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
		CLAY with rare cobbles							
BH105	8.00	Very gravelly CLAY	50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
BH105	9.50		50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
BH106	1.20	MADE GROUND	10	9.81	Loose	N/A	N/A	N/A	98.12
BH106	2.00		16	14.62	Medium Dense	N/A	N/A	N/A	146.17
BH106	3.00	Slightly gravelly very sandy CLAY with frequent lenses of very clayey SAND	33	28.70	N/A	High strength	Very Stiff	143.49	295.02
BH106	3.60	Gravelly very sandy CLAY	50	42.66	N/A	Very high strength	Very Stiff	213.32	438.59
BH107	1.20	MADE GROUND	3	2.94	Very Loose	N/A	N/A	N/A	29.44
BH107	2.00	Slightly gravelly very sandy CLAY with frequent lenses of very clayey SAND	15	13.70	N/A	Medium strength	Stiff	68.52	140.87
BH107	4.00	Gravelly very sandy CLAY	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25
BH108	1.00	MADE GROUND	4	4.03	Loose	N/A	N/A	N/A	40.33
BH108	3.00		23	20.00	N/A	High strength	Very Stiff	100.01	205.62



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH108	5.00	Gravelly very sandy CLAY	43	35.67	N/A	Very high strength	Very Stiff	178.37	366.73
BH108	6.50		50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
BH109	1.20	MADE GROUND	2	1.96	Very Loose	N/A	N/A	N/A	19.62
BH109	2.00		5	4.57	Loose	N/A	N/A	N/A	45.68
BH109	3.00	Sandy gravelly CLAY	9	7.83	N/A	Low strength	Firm	39.13	80.46
BH109	4.00	Very sandy CLAY with frequent lenses of very clayey SAND	12	10.14	N/A	Medium strength	Stiff	50.69	104.22
BH109	5.00		24	19.91	N/A	High strength	Very Stiff	99.55	204.68
BH109	6.50		31	25.31	N/A	High strength	Very Stiff	126.54	260.17
BH109	8.00	Gravelly very sandy CLAY.	50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
BH109	9.50		50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
BH110	2.00	MADE GROUND	9	8.22	Loose	N/A	N/A	N/A	82.22
BH110	3.00	Very sandy CLAY	11	9.57	N/A	Medium strength	Stiff	47.83	98.34
BH110	5.00	Slightly gravelly very sandy CLAY with frequent lenses of very clayey SAND	26	21.57	N/A	High strength	Very Stiff	107.85	221.74
BH110	6.50	Gravelly CLAY	50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH110	6.90		50	40.70	N/A	Very high strength	Very Stiff	203.52	418.44
BH111	1.20	MADE GROUND	5	4.91	Loose	N/A	N/A	N/A	49.06
BH111	2.00	Very sandy CLAY	8	7.31	N/A	Low strength	Firm	36.54	75.13
BH111	3.00		13	11.31	N/A	Medium strength	Stiff	56.53	116.22
BH111	5.00	Slightly sandy very gravelly CLAY with frequent bands of slightly clayey very sandy GRAVEL	29	24.06	N/A	High strength	Very Stiff	120.30	247.33
BH111	6.50		50	40.82	N/A	Very high strength	Very Stiff	204.10	419.62
BH111	7.00		50	40.68	N/A	Very high strength	Very Stiff	203.39	418.17
BH112	1.20		5	4.91	Loose	N/A	N/A	N/A	49.06
BH112	2.00	MADE GROUND	4	3.65	Very Loose	N/A	N/A	N/A	36.54
BH112	3.00	Gravelly very sandy CLAY with occasional bands of clayey SAND	6	5.22	N/A	Low strength	Firm	26.09	53.64
BH112	4.00		9	7.60	N/A	Low strength	Firm	38.02	78.17
BH112	8.00		32	25.90	N/A	High strength	Very Stiff	129.51	266.28
BH112	9.50	Very clayey SAND	50	40.30	Dense	N/A	N/A	N/A	402.97
BH112	10.50	Very sandy GRAVEL	50	39.45	Dense	N/A	N/A	N/A	394.46
BH201	1.20	MADE GROUND	8	7.85	Loose	N/A	N/A	N/A	78.50
BH201	2.00		9	8.22	Loose	N/A	N/A	N/A	82.22
BH201	3.00	Slightly gravelly very sandy CLAY with	19	16.52	N/A	High strength	Very Stiff	82.62	169.86



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
		frequent lenses of very clayey SAND							
BH201	5.00	Sandy CLAY	23	19.08	N/A	High strength	Very Stiff	95.41	196.16
BH201	6.50	Very sandy CLAY with	39	31.84	N/A	Very high strength	Very Stiff	159.20	327.31
BH201	8.00	frequent lenses of very clayey SAND	50	40.47	N/A	Very high strength	Very Stiff	202.37	416.07
BH201	9.50	Gravelly very sandy CLAY with frequent lenses of clayey very gravelly SAND	50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
BH202	1.2	MADE GROUND	11	10.79	Medium Dense	N/A	N/A	N/A	107.94
BH202	2	Slightly sandy gravelly CLAY	13	11.88	N/A	Medium strength	Stiff	59.38	122.09
BH202	3	Slightly sandy gravelly CLAY	14	12.18	N/A	Medium strength	Stiff	60.88	125.16
BH202	4	Slightly gravelly	18	15.21	N/A	High strength	Very Stiff	76.04	156.33
BH202	5	very sandy CLAY with occasional lenses of very clayey SAND	20	16.59	N/A	High strength	Very Stiff	82.96	170.57
BH202	8.00		24	19.43	N/A	High strength	Very Stiff	97.14	199.71



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH202	9.50	Brown slightly sandy very gravelly CLAY with occasional bands of clayey very sandy GRAVEL.	50	40.30	N/A	Very high strength	Very Stiff	201.48	414.25
BH202	11.00	Light reddish brown very sandy CLAY.	50	38.67	N/A	Very high strength	Very Stiff	193.34	397.51
BH202	12.50	SANDSTONE	50	36.53	Dense	N/A	N/A	N/A	365.31
BH202	14.00		50	34.64	Dense	N/A	N/A	N/A	346.36
BH202	15.50		50	32.93	Dense	N/A	N/A	N/A	329.34
BH202	17.00		50	31.39	Dense	N/A	N/A	N/A	313.89
BH203	1.20	MADE GROUND	8	7.85	Loose	N/A	N/A	N/A	78.50
BH203	2.00		10	9.14	Loose	N/A	N/A	N/A	91.35
BH203	3.00	Gravelly very sandy CLAY with frequent lenses of clayey very sandy GRAVEL	43	37.40	N/A	Very high strength	Very Stiff	186.98	384.42
BH203	4.00	Gravelly very sandy CLAY with frequent lenses of clayey very sandy GRAVEL	50	42.24	N/A	Very high strength	Very Stiff	211.21	434.25



LOCATION	DEPTH (m bgl)	MATERIAL FIELD DESCRIPTION	CPT/SPT " N" VALUE	CORRECTED " N" VALUE (N1)60	TERZAGHI & PECK RELATIVE DENSITY (SANDS)	EUROCODE SOIL STRENGTH	CONSISTENCY (BS 5930)	TERZAGHI & PECK APPROXIMATE UNDRAINED SHEAR STRENGTH (kN/m ²)	ALLOWABLE BEARING CAPACITY (kN/m ²)*
BH203	5.00	Gravelly very sandy CLAY with frequent lenses of clayey very sandy GRAVEL	50	41.48	N/A	Very high strength	Very Stiff	207.41	426.43



7.2. CONSOLIDATION

Three undisturbed samples of Glacial Till were submitted for oedometer analysis. The results are provided in Table 7.4. The full results can be found in APPENDIX IX.

Table 7.4 Oedometer Consolidation Results

LOCATION	DEPTH (m)	SAMPLE TYPE	MOISTURE CONTENT (%)	OEDOMETER CONSOLIDATION		
				PRESSURE RANGE (kPa)	Mv (m ² /year)	Cv (m ² /year)
BH104	4.00–4.45	U100	13.8	0–85	0.29	17.34
				85–170	0.20	15.34
				170–340	0.13	6.86
				340–680	0.08	3.44
				680–85	0.02	–
BH107	3.00–3.45	U100	13.8	0–85	0.29	16.77
				85–170	0.20	14.86
				170–340	0.13	6.06
				340–680	0.08	3.33
				680–85	0.02	–
BH111	4.00–4.45	U100	10.2	0–85	0.49	16.85
				85–170	0.12	9.26
				170–340	0.06	15.23
				340–680	0.03	13.64
				680–85	0.01	–

When considered at over-burned pressure with an additional load of 85 kPa the coefficient of volume compressibility (Mv) ranged from 0.29 m²/MN up to 0.49 m²/MN. The material is considered to have predominantly medium compressibility, with a single instance of high compressibility (BH111). When additional load increases to 170 kPa, the coefficient of volume compressibility decreases to 0.12 m²/MN up to 0.20 m²/MN, which is considered to be medium compressibility.

The rate at which settlement is likely to occur is determined by the coefficient (Cv). As shown in Table 7.4, the coefficient ranges from 3.33 m²/yr to 17.34 m²/yr. The rate at which settlement will occur is increased by the presence of sand within the Glacial Till and it is likely that settlement will occur over a period of years.

7.3. PARTICLE SIZE DISTRIBUTION

Particle Size Distribution Tests have been undertaken on selected samples of material via wet sieve to obtain information on the soil fractions. The results are included in Table 7.5. The full results can be found in APPENDIX IX.

Table 7.5 Summary of Particle Size Distribution Test Results

LOCATION	DEPTH (m)	SOIL FRACTION (%)				ADVISED GRADING SPECIFICATION
		COBBLES	GRAVEL	SAND	SILT/CLAY	
BH103	3.50–4.50 (Natural)	0	11	29	60	2A/2B
BH201	3.00–4.00 (Natural)	0	9	23	68	2A/2B
BH202	4.00–5.00 (Natural)	0	8	29	63	2A/2B



The samples confirm the materials are predominantly cohesive in nature, with a percentage of granular sand ranging between 23–29%.

All tested materials are classified as 2A/2B, in relation to the Specification for Highways Work (SHW). This classification should be considered during the design and earthworks for any proposed highway areas in the proposed development.

7.4. SOIL INFILTRATION

Based upon the intrusive ground investigations and surrounding geology it is considered the significant volumes of low permeable CLAY deposits on the site, extensive depths of Made Ground and VOC contamination likely preclude the use of soakaway drainage for the proposed development.

However, the application of soakaway drainage will ultimately be dependent on the specific requirements of the development. All soakaways should be designed in accordance with BRE Special Digest 365 – *Soakaway Design*.

7.5. SOIL PLASTICITY

The Atterberg limits determinations, summarised in Table 7.6, confirm the findings of the previous phase of intrusive ground investigation, and shows the clay to be of low plasticity. The full results can be found in APPENDIX IX.

Table 7.6 Summary of Plasticity Index Test Results

LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
BH101	2.00– 2.45	10.9	10	22	12	85	10.20	Low
BH102	4.00– 4.45	10.6	11	23	12	88	10.56	Low
BH103	2.00– 2.45	12.9	12	25	13	89	11.57	Low
BH104	3.00– 3.45	20.6	14	21	7	84	5.88	Low
BH105	5.00– 5.45	10.3	10	21	11	92	10.12	Low
BH106	3.60– 3.70	11.9	12	23	11	87	9.57	Low
BH107	2.00– 2.45	15.4	12	25	13	85	11.05	Low
BH108	3.00– 3.45	16.4	13	28	15	96	14.04	Low
BH109	2.00– 2.45	16.8	14	22	8	89	7.12	Low
BH110	3.00– 3.45	12.6	11	23	12	94	11.28	Low
BH111	2.00– 2.45	10.1	11	25	14	89	11.62	Low
BH112	5.00– 5.45	14.6	12	24	12	88	10.56	Low



LOCATION	DEPTH (m)	NATURAL MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	PASSING 425µm SIEVE (%)	MODIFIED PLASTICITY INDEX	NHBC VOLUME CHANGE POTENTIAL
BH201	4.00– 4.45	10.3	11	23	12	80	9.60	Low
BH203	4.00– 4.45	12.1	10	21	11	87	9.57	Low

The results of the Atterberg limits testing confirmed that the soils would be deemed to be “Low Volume Change Potential” in accordance with the classification system utilised by the LABC / NHBC industry guidance.

7.6. PH AND SULPHATE

Chemical analyses for pH and soluble sulphate content contained in APPENDIX VIII (summarised in Table 7.7), shows that the soils at the site generally meet Class DS-1, Aggressive Chemical Environment for Concrete Classification (ACEC) AC-1s in accordance with BRE *Special Digest 1* (2005).

Elevated sulphate concentrations meeting Class DS-2, AC-2s were noted within the Made Ground deposits in BH105 at 0.70 m bgl and BH110 at 2.00 m bgl. Elevated sulphate concentrations meeting Class DS-3, AC-2s were also noted within the Made Ground deposits in BH108 at 1.70 m bgl.

Table 7.7 Summary of pH and Sulphate Data

LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
BH101	1.80	<0.010	7.8	DS-1, AC-1s
BH101	2.90	<0.010	7.2	DS-1, AC-1s
BH102	0.50	0.22	6.3	DS-1, AC-1s
BH102	3.20	<0.010	7.6	DS-1, AC-1s
BH103	0.50	0.35	7.7	DS-1, AC-1s
BH103	3.50	0.041	7.6	DS-1, AC-1s
BH104	2.30	<0.010	8.4	DS-1, AC-1s
BH104	5.50	<0.010	7.8	DS-1, AC-1s
BH105	0.70	0.78	7.7	DS-2, AC-1s
BH105	2.60	<0.010	7.6	DS-1, AC-1s
BH106	0.80	0.14	9.6	DS-1, AC-1s
BH106	2.60	<0.010	8.3	DS-1, AC-1s
BH107	1.00	0.083	8.3	DS-1, AC-1s
BH107	2.40	0.035	8.5	DS-1, AC-1s
BH108	0.60	1.70	8.1	DS-3, AC-2s
BH108	1.80	<0.010	8.6	DS-1, AC-1s
BH109	1.00	0.031	8.0	DS-1, AC-1s
BH109	2.40	<0.010	7.8	DS-1, AC-1s
BH110	2.00	0.83	7.6	DS-2, AC-1s
BH110	3.20	0.023	7.7	DS-1, AC-1s
BH111	1.00	0.042	7.4	DS-1, AC-1s
BH111	3.60	<0.010	7.7	DS-1, AC-1s
BH112	2.00	<0.010	8.2	DS-1, AC-1s
BH112	4.40	<0.010	9.8	DS-1, AC-1s
BH201	1.50	0.28	7.6	DS-1, AC-1s
BH201	3.60	<0.010	7.1	DS-1, AC-1s



LOCATION	DEPTH (m)	SO ₄ IN 2:1 WATER/SOIL (g/l)	pH VALUE	CLASSIFICATION
BH202	0.90	0.016	7.6	DS-1, AC-1s
BH202	2.6	0.099	7.3	DS-1, AC-1s
BH203	1.9	0.17	7.0	DS-1, AC-1s
BH203	4.0	0.21	8.3	DS-1, AC-1s

7.6.1. HIGHWAYS AND CONCRETE

MCHW Series 600 provides a criteria of 1500 mg/l for water-soluble sulphate within 500 mm of any concrete surface. A second criteria of 300 mg/l is given with respect to soils within 500 mm of steel structures.

7.7. GROUNDWATER

Table 7.8 Summary of Groundwater Strikes

LOCATION	DEPTH (m bgl)	DESCRIPTION OF STRIKE	STRATA	EVIDENCE OF CONTAMINATION
Ground Investigation Water Strike Information				
BH101	1.70	Seepage	Made Ground	No
BH102	5.50	Slow Ingress	CLAY	No
BH103	0.40	Seepage	Made Ground	No
BH104	2.10	Seepage	Made Ground	No
BH105	5.00	Slow Ingress	CLAY	No
BH106	0.50	Seepage	Made Ground	No
BH107	0.50	Seepage	Made Ground	No
BH107	1.50	Seepage	Made Ground	No
BH108	1.50	Seepage	Made Ground	No
BH109	6.00	Moderate Ingress	CLAY	No
BH111	5.00	Very Slow Ingress	CLAY	No
BH112	1.50	Seepage	Made Ground	No
BH112	6.50	Moderate Ingress	CLAY	No
BH201	18.50	Moderate Ingress	SANDSTONE	No
BH202	19.00	Moderate Ingress	SANDSTONE	No
BH203	18.00	Moderate Ingress	SANDSTONE	No
Groundwater Monitoring Summary from Installations				
LOCATION	DEPTH TO WATER RANGE [MONITORING WELL] (m bgl)	PERIOD OF MONITORING	WEATHER CONDITIONS DURING MONITORING	COMMENTS
BH101	1.49–1.58	February to March	Overcast & Frost	Clear – No odours or evidence of contamination
BH102	5.64–5.81			
BH103	DRY			
BH104	2.29–2.64			
BH105	DRY			
BH106	1.35–1.46			
BH107	1.46–1.84			
BH108	DRY			
BH109	2.46–2.79			
BH110	3.02–3.48			
BH111	4.49–4.70			
BH112	2.36–3.76			
BH201	4.45–4.54			



LOCATION	DEPTH (m bgl)	DESCRIPTION OF STRIKE	STRATA	EVIDENCE OF CONTAMINATION
BH202	6.88–8.30			

Based upon water strikes encountered during the intrusive ground investigation and subsequent groundwater monitoring data, two waterbodies are recorded to underly the site, situated within the superficial deposits between 3.00–6.50 m bgl becoming deeper towards the south of the site and within the sandstone bedrock between 18.00–19.00 m bgl. It is assumed that the groundwater flows in a northeasterly direction, becoming deeper towards the southwest of the site, dipping with the bedrock.

Perched water strikes were noted within the Made Ground deposits between 0.50–2.00 m bgl across the site, however, are not thought to be indicative of significant groundwater.

7.8. SITE PREPARATION

Our assessment has been based on the fact that the site will be cleared and any obstructions below areas of proposed development stripped in accordance with Series 200 of the *Manual of Contract Document for Highway Works (MCHW)*. This should include the following:

- ✳ Demolition of all existing buildings and removal of all concrete hardstanding.
- ✳ Redundant services should be sealed off and grubbed out and replaced with suitable compacted engineered fill.
- ✳ Buried structures and old foundations have been encountered on-site. These should be excavated from below the proposed development footprint with the resulting void backfilled.
- ✳ Removal of above ground storage tanks (ASTs) and underground storage tanks (USTs).

7.9. FOUNDATION CONDITIONS AND ASSESSMENT OF POTENTIAL BEARING CAPACITIES

In due consideration of the identified ground conditions, in-situ and laboratory geotechnical testing, E3P has undertaken an assessment of the safe allowable bearing capacity (ABC) within the underlying natural stratum to assist in the detailed design of foundations and infrastructure and determine the target founding stratum. The results of this assessment are summarised in Table 7.9.



Table 7.9 Summary of ABC

COHESIVE SOILS			
DESCRIPTION	DEPTH (RANGE M BGL)	UNDRAINED SHEAR STRENGTH (CU) (KN/M ²)	ALLOWABLE BEARING CAPACITY (KN/M ²)
Firm to very stiff CLAY	2.00–2.45	36.54–77.65	75.13–159.65
Firm sandy CLAY (BH101, BH109, BH112)	3.00–3.45	26.09–39.13	53.64–80.46
Stiff to very stiff CLAY	3.00–3.60	47.83–213.32	98.34–438.59
Firm to very stiff CLAY	4.00–4.45	38.02–211.21	78.17–434.25
	5.00–9.45	87.11–207.41	179.10–426.43
Soft CLAY (BH101)	2.00–2.45	18.27	37.56
Soft CLAY (BH105)	3.00–3.45	13–16	–
GRANULAR SOILS			
DESCRIPTION	DEPTH (RANGE M BGL)	RELATIVE DENSITY	ALLOWABLE BEARING CAPACITY (KN/M ²)
SANDSTONE	12.50–17.00	Dense	313.89–365.31

Due to the depth of Made Ground typically exceeding 2.00–2.50 m bgl, typically suitable materials for founding have been identified in excess of 3.00 m bgl within a gravelly sandy CLAY. At circa 3.00 m bgl, an ABC in excess of 80 kN/m² was recorded, with the exception of a reduced strength very sandy CLAY in BH112 of 53 kN/m².

However, within five locations (BH103, BH105, BH107, BH111, BH202), suitable founding materials were identified at circa 2.00 m bgl, with an ABC exceeding 75kN/m².

Soft CLAY deposits were identified in BH101 and BH105 at 2.00m and 3.00m bgl respectively.

No loose granular deposits were identified during this phase of intrusive ground investigation.

The Sandstone bedrock was first recorded between 5.00–12.50m bgl with an ABC recorded in excess of 300 kN/m².

7.10. FOUNDATION OPTIONS APPRAISAL

Based on the assessment of the relative undrained shear strength, relative in-situ densities and corresponding safe allowable bearing capacity, the following recommendations have been developed for the site of the potential foundation solutions that may be adopted for the future residential development. The suitable target founding stratum has been identified as the underlying firm to very stiff glacial clays.

To enable a detailed appraisal, Figure 7.1 below identifies key constraints and considerations with respect to the foundation recommendations.

Site Features

	Significant Concrete Floor Slabs and Engineered Fill (Anticipated)		Suspended Floor Slab		Loose Granular Deposits
	Earthing Mat		Former Railway Obstructions		Thick Concrete
	High Voltage Electricity Substation (11Kv)		Potential Underground Culvert		Electrical Substation
	Known Asbestos Sheet Roofing		Cronon Geological Fault		Highly Compressible Material
	Unknown Potential UST		Soft Clay		
	Foul Services				
	Telecommunication Services (Below Ground)				
	Community Water Services				
	Active Electricity Cables				

Within the footprint of the main factory structure, there are areas of variable ground conditions that will preclude the use of a shallow spread foundation. Therefore, consideration should be given to the use of Ground Improvement by Vibro Stone Column to ensure the treatment achieves a suitable design ABC to support a doubly reinforced strip foundation.

Table 7.10 **Ground Improvement Design Risk Matrix**

RISK ITEM	COMMENT	PASS/FAIL
Soft clay with an undrained shear strength less than 30 kN/m ²	CLAY soils are generally firm to very stiff with Cu > 80 kN. Isolated areas of softer clay soils were encountered with Cu > 30 kN/m ² in BH101 (2.00m bgl), BH105 (3.00m bgl) and BH112 (3.00m bgl), however it is considered that these will either be piled or soft material excavated to remove the deposits.	PASS
Ground with peat layers close to foundation level or the base of the stone column, or where intermediate layers of peat are thicker than 200 mm, either as a single layer or the sum of the thickness of individual layers throughout the length of the stone column	No peat or highly organic deposits have been identified during this phase of intrusive ground investigation. However, three historical infilled ponds have been identified on-site which may contain peat layers within the immediate vicinity. If present, it is considered that these materials will be excavated to remove the deposits.	PASS



RISK ITEM	COMMENT	PASS/FAIL
Voided filled ground, e.g. old water tanks, pottery, glass bottles, concrete rubble or brick fill of unsuitable grading	Due to the age of the main factory structure, it is likely to contain areas of infilled materials to unsuitable grading. Following demolition works, further investigation is recommended in any areas identified as previously voided ground.	PASS – upon completion of further investigation
Loose or non-engineered fill not previously subject to rising fluctuating water levels saturation	Loose fill has been identified at multiple locations underlying the main factory structure. Furthermore, groundwater levels are known to fluctuate throughout the superficial deposits and may potentially rise up through the stratum. Further geotechnical analysis and classification of non-engineered fill beneath the main factory structure is recommended.	PASS – upon completion of further investigation
Filled ground still settling or expected to settle under its own weight or due to the effects of surcharging/upfilling where there is a high organic content or where decay is continuing	None identified – the site was historically filled in excess of 100 years ago with a mixture fill material. It is considered that the material has consolidated under self-weight settlement.	PASS
Fill, containing degradable material where organic material forms more than 15% of fill by volume	None identified.	PASS
Clays with a plasticity index greater than 40%	None identified.	PASS
Highly sensitive soils liable to collapse or remoulding	None identified.	PASS
Cohesive soils with trees in influencing distance	Plots where tree influence has been modelled and will either be subject to a piled or mass trench-fill solution.	PASS
Overall Risk Rating and Suitability for Vibratory Ground Improvement		PASS – upon completion of further investigation

It is advisable to consult with geotechnical engineers and foundation specialists who can assess the specific ground conditions and design an appropriate Vibro Stone Column system to meet the project's requirements. They will consider factors such as soil composition, depth, and spacing of the stone columns to ensure effective ground improvement and proper load distribution for the strip foundation.

Foundation depths should take account of the presence of existing and proposed trees, with foundations deepened locally to mitigate the potential for volumetric instability attributed to fluctuations in moisture content, in accordance with the requirement of NHBC standards.

It is recommended that at working drawing stage a foundation schedule is prepared for the development taking account of the physical change of natural clay soils and the current/proposal locations of trees.



At this time, it is not possible to accurately define the foundation types due to the absence of a detailed tree survey and final development levels, however, based on our extensive experience of similar sites, we would anticipate that the final foundation solution would be a combination of the following:

- ✳ Driven piled foundations within areas of deep MADE GROUND exceeding 1.50 m bgl, reduced strength CLAY, variable ground conditions or potential tree influence; and,
- ✳ Ground improvement by Vibro Stone Columns to ensure the treatment achieves a suitable design ABC to support a doubly reinforced strip foundations or piled foundations within the footprint of the main factory structure and outbuildings.

7.11. GROUND FLOOR SLABS

Current building control regulations that where infilled ground is present to depths in excess of 600 mm, or where the substratum is variable in terms of the structure and settlement potential, or where clay soils are present within the influence of existing or proposed trees, a suspended floor slab is required.

In this instance, it is considered that for the majority of substructures, the underlying stratum would have in excess of 600 mm of infill and, as such, a suspended floor slab will be required.

Where a cast in-situ suspended slab is utilised with no subfloor void, appropriate compressible material (heave precautions) will be required in the construction of the substructure.

In clay soils allowance should be made in the design for heave. This must be incorporate either a clear void of a specified minimum depth under the suspended floor, or a proprietary compressible material/void former below the underside of the floor construction.

Ground bearing slabs should not be used in ground conditions where heave can occur or where the foundation depth is greater than 1.50 m. Under these circumstances, a suspended floor construction should be used.

7.12. SETTLEMENT

The site has been appraised through desk-based information and ground investigation data in order to inform geotechnical risk where possible. Table 7.11 below has been formulated to determine if settlement risks are required to be further appraised. Where any item is determined to be appraised a settlement appraisal for the site should be prepared upon receipt of development levels and layout.

Table 7.11 Summary of Geotechnical Information for Settlement

RISK	COMMENT	ASSESSMENT
Site is located in an area deemed to be at Risk from Ground Dissolution from desk-based information	The site is a low-risk area of ground dissolution based on BGS data searches.	No Further Assessment
Site is in an area where geology is reported as having a compressible risk from desk-based information	The majority of tested materials concluded a medium compressibility. However, BH111 at 4.00 m bgl recorded a high compressibility in the oedometer test.	Further Assessment Required
Do historical maps indicate relic excavation features such as opencast or ponds that have been infilled.	Three small ponds are recorded to have been infilled towards the centre south, southeast and northeast boundaries of the	No Further Assessment



RISK	COMMENT	ASSESSMENT
	site. The location of these has not yet been proven, however, if present, these were infilled in excess of 50 years. Therefore, it is considered likely any infilled materials will have settled under self-weight.	
Has the site been proven to be underlain by anthropogenic materials to an unknown specification?	Filled ground is recorded across the site to a maximum proven depth of 3.00 m bgl. Following demolition, additional geotechnical sampling of the Made Ground is recommended in order to determine specification and assess suitability for potential re-use on-site.	Further Assessment Required
Have oedometers and/or ground conditions reported compressible stratum on-site?	In BH111, a high compressibility was identified during the initial load of 85 kPa. Subsequent loadings identified a medium compressibility. All other tested materials were classified as medium to low.	Further Assessment Required
Have High walls been identified on-site that could result in differential settlement?	No high walls have been identified on-site.	No Further Assessment
Has any evidence been observed on-site indicating settlement (non-structural assessment)	No features indicative of settlement issues have been identified during site visits.	No Further Assessment
Is voided ground present beneath the site?	Voided ground is present running through the centre of the main factory structure in the footprint of the former railway sidings, comprising a 1.30 m deep void beneath the concrete slab.	Further Assessment Required
Is the site in an area where a mobile groundwater regime is present in influencing distance of foundations and infrastructure?	Groundwater flow is identified at depths between 2.00–8.00 m bgl within the superficial deposits. As piled foundations or VSC is likely required due to greater depths of Made Ground precluding the use of shallow foundation solutions, groundwater regime may present a potential issue.	Further Assessment Required
Will the site be subject to changes in site levels that may induce heave or settlement?	Following demolition works and removal of relict substructures and features, site levels may be altered. The proposed development plan and levels are currently unknown. Additional consideration is	Further Assessment Required



RISK	COMMENT	ASSESSMENT
	required if significant changes in site levels are required.	

The site has been appraised as having a potential future settlement risk. In order to determine the level of risk and appropriate mitigation options a detailed settlement appraisal is required for the site. This does not form a part of the structural engineers settlement calculations associated with the sub structure however loadings will need to be considered for surcharging both static and variable pressures.

IMMEDIATE SETTLEMENT

This is the near instantaneous response of the ground due to the application of the load.

The magnitude of ground movement associated with this is a function of the characteristics of the ground as well as the magnitude of the load.

As this form of settlement occurs during the construction process, the contribution from immediate settlement will not be given any further consideration by E3P.

PRIMARY, CONSOLIDATION SETTLEMENT

This is the response of the ground due to the closing up of voids, typically water-filled.

The magnitude of ground movement associated with this is a function of the characteristics of the ground as well as the magnitude of the load.

The rate at which primary settlement occurs is related directly to the permeability of the ground. Primary settlement typically provides the largest individual contribution to the magnitude of overall ground movement.

The profile of settlement against time can be described by a polynomial regression and is typically plotted on a log-time vs settlement graph and forms a curve, which flattens as consolidation nears completion.

SECONDARY, CREEP SETTLEMENT

This is the long-term slow response of the ground to changes in stress.

The magnitude of movement due to creep is not governed by the magnitude of stress applied but is a function of the characteristics of the ground.

The rate at which creep settlement occurs can be described by a logarithmic regression and forms a straight line when plotted on a log time vs settlement graph.

A change in stress, including a variation on water levels, can instigate a new phase of creep movements.

Given the potential for future settlement detailed geotechnical modelling will be required across the site to determine the level of risk associated with the redevelopment of the site.



7.13. HEAVE PRECAUTIONS

The site has been proven to be underlain by clay soils which are susceptible to volumetric instability due to fluctuations in moisture content, particularly within influencing distance of trees as per the NHBC/LABC conjectures zones of influence.

The clay has been determined as being of low volume change potential. Table 7.12 shows where heave precautions are required for a trench fill, pier and beam and pile and beam foundation types which are in the zone of influence of trees which are to remain or be removed.

Deepening of foundations and heave precautions should be considered in the detailed design.

Table 7.12 Position of Heave Precautions

SITUATION	TRENCH FILL	PIER AND BEAM	PILE AND BEAM
External trench fill and pier foundations. Unless the NHBC is satisfied that the soil is not desiccated compressible material should be provided	Inside faces of external wall foundations deeper than 1.50 m, based on the appropriate tree height.	All faces of pier foundations deeper than 1.50 m, based on the appropriate tree height.	N/A
External ground beams. Unless NHBC is satisfied that the soil is not desiccated, compressible material or void formers should be provided	N/A	Inside faces	Inside faces
Internal trench fill foundations and ground beams. Compressible material required:	No	No	No
External and internal ground beams. Compressible material, void former or void should be provided to the underside of:	N/A	All	All
Heave precautions required for proposed trees where the soil is not desiccated:	No	No	No

Note: Information taken from NHBC Standards 2024, Chapter 4.2, Table 8 – Position of heave precautions

A summary of heave precautions is presented in Table 7.13.



Table 7.13 Summary of Heave Precautions

VOLUME CHANGE POTENTIAL	VOID DIMENSION AGAINST SIDE OF FOUNDATION AND GROUND BEAM	VOID DIMENSION UNDERGROUND BEAMS, AND SUSPENDED IN-SITU CONCRETE GROUND FLOOR	VOID DIMENSION UNDER SUSPENDED PRECAST CONCRETE AND TIMBER FLOORS (1)
High	35 mm	150 mm	300 mm
Medium	25 mm	100 mm	250 mm
Low	0 mm	50 mm	200 mm

In addition to the requirements of the 'Drainage' sections, drainage near trees should incorporate additional provisions. Where there is a volume change potential within the ground, the provisions include:

- ✳ Increased falls to cater for any ground movement.
- ✳ Deeper and wider backfill of granular material.
- ✳ A drainage system that is capable of movement should heave and shrinkage occur.
- ✳ Drainage pipes should not be encased in concrete.
- ✳ Additional clearance is required where drains pass through the structure of a building to allow for additional movement.

7.14. HIGHWAYS CONSTRUCTION

Unsuitable materials comprising of loose fill have been identified beneath the footprint of the main factory structure. There is also the potential for unsuitable materials to be present within areas of infilled ponds.

A programme of remediation and enabling works will be required to remediate the proposed road subgrade in accordance with the requirements of the Manual of Contract Documents for Highway Works Volume 1 Specification For Highway Works (Series 600-Earthworks) for a method compaction.

7.15. DRAINAGE

Where loose or soft materials have been identified at drainage levels, there will need to be consideration for the use of reinforced pipe bedding.

Shrinkage and heave of clay soils can affect pipelines. To protect against the effects of heave, drainage should be designed:

- ✳ To take account of potential ground movement as shown in Table 7.13, including where pipes and services pass through substructure walls or foundations.
- ✳ With gradients which may need to be steeper.
- ✳ To use alternative means of catering for the movement when sufficient falls cannot be provided, for example, by deepening the excavation and laying pipework on a granular bedding of suitable thickness to reduce the extent of potential movement.



Table 7.13 Potential Ground Movement for Drainage

VOLUME CHANGE POTENTIAL	HIGH	MEDIUM	LOW
Potential Ground Movement	150 mm	100 mm	50 mm

7.16. EXCAVATIONS

Site observations indicated that excavations should be feasible in the near surface with normal plant; however, obstructions were identified in the near surface, including former foundations and former floor slabs. It is anticipated that any obstructions will be grubbed out during the reduced-level dig for the substructure works.

However, due to the depth and variability of the Made Ground and the likelihood of trench collapse, it is considered that all excavations are supported or battered back in accordance with guidance contained in CIRIA R97.

If local pumping of groundwater is required during the advancement of excavations for the proposed foundations then consideration should be given to the potential for dewatering gravels in the surrounding areas that may cause structural damage to building substructures in close proximity to the site.

Table 7.14 Civil Engineering Excavation Risk Matrix

RISK ITEM	PRESENT	COMMENT
Running Sand	Unlikely	Running sands have not been identified on-site, however mechanically excavated trial pits are suggested in areas of granular deposits to confirm no running sands are present.
Water Ingress to Excavation	Likely	Substantial groundwater flow has been identified between 2.00–8.00 m bgl. Reduced level digs to depths in excess of 2.00 m bgl may present a risk of water ingress into excavations. Dewatering mitigation measures may be required.
Shallow Bedrock	Likely (North)	Towards the north of the site, shallow bedrock is present at depths between 3.00–5.00 m bgl. Within the footprint of the main factory structure, bedrock dips towards the south becoming deeper with the shallowest recorded depth of competent bedrock at 8.00 m bgl (BH203) towards the northwest of the main factory structure.

7.17. CONSTRUCTION ACTIVITY AND INSPECTION

The following activities and inspections should be incorporated into the site works:

- ✳ Due to the variability of the soils at the site, it is recommended that sufficient allowance is made for the inspection of formations and sub formations to foundations and pavement construction.
- ✳ Excavations where access is required should be subject to a risk assessment from a competent person and, where appropriate, mitigation measures such as benching back the sides or use of support system in accordance with CIRIA R97 should be utilised.
- ✳ It is considered that dewatering may be required, especially following periods of heavy rainfall. Removal of surface water and water withing trenches should be possible with conventional sump pumping. Discharge of any water should be agreed with the relevant regulatory body and be



undertaken under a trade effluent discharge, where required. Measures to remove silt and suspended solids may be required, and consideration should be given to provision of space for settling tanks or an attenuation pond.

- ✳ Where access to confined spaces is required, appropriate mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.
- ✳ The presence of potential contamination and mitigation measures should be addressed within the construction stage health and safety plan. Particular account should be taken of the gas results.
- ✳ The presence of potential contamination and mitigation measures should be addressed as part of the construction stage health and safety plan and should include measures to design out the risk, reduce their impact and finally, to include the use of personnel protective equipment (PPE).



7.18. DEVELOPED GEOTECHNICAL RISK REGISTER

POTENTIAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Remediation of contaminated soils	All	TBC	Extensive sources of VOCs have been identified within Made Ground and natural superficial deposits in both soil and groundwater analysis, with the primary source highly likely to be the enamel slurry tank to the southeast of the main factory structure. Due to the extensive impact identified, a supervised removal and/or treatment is required to mitigate further spread across the site. Further instances of heavy metalloid contamination was identified within Made Ground deposits across the footprint of the main factory structure, which may require removal prior to the construction. A remediation strategy and detailed quantitative risk assessment (DQRA) is required to assess the overarching risk posed and mitigation measures required to prepare the site for residential development.
Bedrock	North	~15	Towards the north of the site, shallow bedrock is present at depths between 3.00–5.00 m bgl. Within the footprint of the factory structure, bedrock dips towards the south becoming deeper with the shallowest recorded depth of competent bedrock at 8.00 m bgl (BH203) towards the northwest of the main factory structure. However, bedrock is considered likely to be deep enough not to significantly impede excavations and earthworks prior to the development.



POTENTIAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Obstructions	All	100	The site has been subject to significant historical development with all above ground structures still present. Further extensive potential subsurface obstructions including relict foundations, voided ground/suspended sub floor void associated with railway/tramway sidings and slabs remain. Concrete is recorded at depths between 0.10–0.35 m bgl thickness within the factory, with additional concrete and asphalt present externally at similar depths.
Artificially levelled and filled platforms	All	100	The site appears to have been levelled and artificially backfilled.
Drainage Invert levels	All	100	Loose Made Ground materials have been identified at drainage levels. Where loose or soft materials have been identified at drainage levels, there will need to be consideration for the use of reinforced pipe bedding.
Volume Change Potential Clay	On-site	80	The site is likely to be underlain by predominantly cohesive soils. The assessment of volume change potential denoted all tested soils are of low volume change potential. Heave precautions should be designed in accordance with the identified volume change potential.



POTENTIAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Running Sands	N/A	N/A	Running sands have not been identified on-site, and due to the majority of deposits comprising cohesive the overall risk is considered low.
Concrete Design	All	100	The majority of deposits are classified within DS-1, AC-1s, with a discrete areas classified as DS-2, AC1s and DS-3, AC-2s within Made Ground deposits in in BH105, BH108, and BH110 between 0.60 m bgl and 2.00 m bgl. All concrete should be designed in accordance with this classification.
Low-Permeability Ground	On-site	100	The majority of site comprises of low permeability CLAY deposits, with known VOC impact which precludes the use of soakaway drainage infrastructure.
Abnormal Foundation Solutions	On-Site	100	Due to the extensive Made Ground deposits at depths exceeding 1.50 m bgl, abnormal foundation solutions are likely required across the site. An earthworks specification is suggested to confirm the required groundworks required to prepare the site for residential development.
Areas Not Investigated	On-Site	~15	Following demolition and grubbing out of all relict structures and substructures on-site are suggested to improve the spatial distribution within the footprint and surrounding the main factory structure. Areas include the underground stream/culvert, voided ground beneath the central part of site, and historically infilled ponds.



POTENTIAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Surface Water Features	Centre	<5	Records held by the client indicated a potential underground stream was present running north to south across the centre of the site, and that the stream was to be diverted through a purpose-built culvert running along the eastern edge of the main factory structure. These records can be dated to approximately the 1950's-1960's based on the layout of the main factory structure and the presence of railway sidings on-site. However, no evidence to suggest the stream diversion was completed have been made available, with site personnel unable to confirm the presence or absence of the stream/culvert. As such, it must be assumed that the underground stream may be present beneath the central part of the main factory structure, and presents a potential pathway for shallow groundwater contamination.
Historically Infilled Pond	South	<5	Three small historical infilled ponds were recorded towards the centre south, southeast and northeast boundaries of the site, which were infilled approximately 52 years ago (southeast) and over 100 years ago (centre south and northeast). The historical infilled ponds present potential geotechnical risk associated with soft clay, silts and potentially peat deposits within the footprint. A small outbuilding structure was present where the infilled pond to the southeast was, and therefore could not be investigated; further investigation following demolition is recommended.



POTENTIAL CONSTRAINT	LOCATION ON-SITE	ESTIMATED AREA OF SITE AT RISK (%)	ASSESSMENT AND MITIGATION
Consolidation & Settlement	On-site	TBC	The presence of variable historical Made Ground represent an unacceptable risk associated with the consolidation of materials that could induce unacceptable settlement to structures and infrastructure. A detailed settlement analysis will be required as part of a Geotechnical Design Report.
Enabling Earthworks	On-Site	100	All proposed earthworks will need to be designed by a suitably qualified geotechnical engineer in accordance with NHBC Chapter 4.6. The earthworks design will incorporate a Geotechnical Specification for Earthworks that will define protocols to ensure no unacceptable future risk.



7.19. FURTHER WORK

Based on the findings of the intrusive ground investigation, the following additional works are recommended to be completed in due course:

- ✧ Watching Brief / post-demolition investigation of previously inaccessible areas:
 - Removal of Enamel Slurry Tank to the southeast of the main factory structure;
 - Underground Stream/culvert beneath the central part of the main factory structure;
 - Voided ground beneath the central part of the main factory structure; and
 - Historically infilled ponds in centre south, southeast and northeast boundaries of the site.
- ✧ Tier 3 Controlled Waters Detailed Quantitative Risk Assessment (DQRA);
- ✧ Remediation and Enabling Works Strategy;
- ✧ Piling Risk Assessment;
- ✧ Plot-specific foundation schedule (upon receipt of the final development levels);
- ✧ Settlement Analysis for earthworks design;
- ✧ Geotechnical Design Report (GDR);
- ✧ Geotechnical Earthworks Specification; and,
- ✧ Ground Gas Protection Design Report (GPDR).

END OF REPORT

Appendix I: Limitations





GENERAL

This report and any associated works (together comprising the "Services") were compiled and carried out by E3P for the client (as present in Section 1) under the E3P "Terms of Business" or with those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed and outlined in the body of the report.

Unless explicitly agreed otherwise, in writing, this report has been prepared under E3P Standard Terms and Business as included within our proposal to the Client.

Project-specific appointment documents may be agreed upon at our discretion and a charge may be levied for both the time to review and finalise appointment documents and also for associated changes to the appointment terms. E3P reserves the right to amend the fee should any changes to the appointment terms create an increased risk to E3P.

The report needs to be considered in light of the proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

PHASE 1 GEOENVIRONMENTAL AND PRELIMINARY RISK ASSESSMENTS

Coverage: This section covers reports with the following titles or combination of titles: Phase 1; Desktop Study; Geoenvironmental Assessment; Development Appraisal; Preliminary Environmental Risk Assessment; Constraints Report; Due Diligence Report; Geotechnical Development Review; Environmental Statement; Environmental Chapter; Baseline Environmental Assessment; Project Scope Summary Report (PSSR), Program Environmental Impact Report (PEIR), Geotechnical Development Risk Register; Agricultural Land Assessment; Mineral Safeguarding Assessment; Desk Top Coal Mining Risk Assessment; Hydrogeological Appraisal; Construction Environmental Management Plan; and Site Water Management Plan.

The works undertaken to prepare this report comprised a study of available and easily documented information from a variety of sources (including the Client), together with (where appropriate) a brief walkover inspection of the Site and correspondence with relevant authorities and other interested parties. Due to the short timescales associated with these projects' responses may not have been received from all parties. E3P cannot be held responsible for any disclosures that are provided post-production of our report and will not automatically update our report.

The opinions given in this report have been dictated by the finite data on which they are based and are relevant only for the purpose for which the report was commissioned. The information reviewed should not be considered exhaustive and has been accepted in good faith as providing true and representative data pertaining to site conditions. Should additional information become available which may affect the opinions expressed in this report, E3P reserves the right to review such information and, if warranted, to modify the opinions accordingly.

It should be noted that any risks identified in this report are perceived risks based on the information reviewed. Actual risks can only be assessed following intrusive investigations of the site.

Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and does not constitute or replace full and proper surveys completed by suitably qualified and experienced specialists in these fields.

E3P does not warrant work/data undertaken/provided by others.



INTRUSIVE INVESTIGATION REPORTS

Coverage: The following report titles (or combination) may cover this category of work: Geoenvironmental Site Investigation; Geotechnical Assessment; GIR (Ground Investigation Reports); Preliminary Environmental And Geotechnical Risk Assessment; Preliminary Summary; Coal Mining Risk Assessment, Ground Gas Addendum; and, Geotechnical Risk Register.

The investigation has been undertaken to provide information concerning either:

- The type and degree of contamination present at the site in order to allow a generic quantitative risk assessment to be undertaken; or
- Information on the soil properties present at the site to allow for geotechnical development constraints to be considered.

The scope of the investigation was selected on the basis of the specific development and land use scenario proposed by the Client and may be inappropriate to another form of development or scheme. If the development layout was not known at the time of the investigation the report findings may need revisiting once the development layout is confirmed.

Unless otherwise specified in the scope of works, any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (intrusive and sample locations etc) annotated on-site plans are not drawn to scale but are centred over the approximate location. Such features should not be used for setting out and should be considered indicative only.

For contamination purposes, the objectives of the investigation are limited to establishing the risks associated with potential contamination sources with the potential to cause harm to human health, building materials, the environment (including adjacent land), or controlled waters.

For geotechnical investigations, the purpose is to broadly consider potential development constraints associated with the physical property of the soils underlying the site within the context of the proposed future or continued use of the site, as stated within the report.

The amount of exploratory work, soil property testing and chemical testing undertaken has necessarily been restricted by various factors which may include accessibility, the presence of services; existing buildings; current site usage or short timescales. The exploratory holes completed assess only a small percentage of the area in relation to the overall size of the Site, and as such can only provide a general indication of conditions.

The number of sampling points and the methods of sampling and testing do not preclude the possible existence of contamination where concentrations may be significantly higher than those actually encountered or ground conditions that vary from those identified. In addition, there may be exceptional ground conditions elsewhere on the site which have not been disclosed by this investigation and which have therefore not been taken into account in this report

The inspection, testing and monitoring records relate specifically to the investigation points and the timeframe that the works were undertaken. They will also be limited by the techniques employed. As part of this assessment, E3P has used reasonable skill and care to extrapolate conditions between these points based on assumptions to develop our interpretation and conclusions.

The assumption made in forming our conclusions is that the ground and groundwater conditions (both chemically and physically) are the same as have been encountered during the works undertaken at the specific points of investigation and at the time of the investigation.

Conditions can change between investigation points both spatially and over time and these interpretations should therefore be considered indicative. The assessment of extreme weather events and their impact on ground conditions is not within the scope of E3P's work

The risk assessment and opinions provided are based on currently available guidance relating to acceptable contamination concentrations; no liability can be accepted for the retrospective effects of



any future changes or amendments to these values. Specific assumptions associated with the risk assessment process have been outlined within the body or associated appendix of the report.

Additional investigations may be required in order to satisfy relevant planning conditions or to resolve any engineering and environmental issues.

Where soil contamination concentrations recorded as part of this investigation are used for commentary on the potential waste classification of soils for disposal purposes, these should be classed as indicative only. Due consideration should be given to the variability of contaminant concentrations taken from targeted samples versus bulk excavated soils and the potential variability of contaminant concentrations between sampling locations. Where major waste disposal operations are considered, targeted waste classification investigations should be designed and the waste classification and any subsequent disposal option agreed upon with licenced subcontractors and/or the relevant regulators.

The results of the asbestos testing are factually reported and interpretation is given as to how this relates to the previous use of the site, the types of ground encountered and site conceptualisation. This does not however constitute a formal asbestos assessment. These results should be treated cautiously and should not be relied upon to provide detailed and representative information on the delineation, type and extent of bulk ACMs and/or trace loose asbestos fibres within the soil matrix at the site.

If costs have been included in relation to additional site works, and/or site remediation works these must be considered as indicative only and must be confirmed by a qualified quantity surveyor.

EUROCODE 7: GEOTECHNICAL DESIGN

On 1st April 2010, BS EN 1997-1:2004 (Eurocode 7: Geotechnical Design – Part 1) became the mandatory baseline standard for geotechnical ground investigations.

In terms of geotechnical design for foundations, slopes, retaining walls and earthworks, EC7 sets guidance on design procedures including specific guidance on the numbers and spacings of boreholes for geotechnical design, there are limits to methods of ground investigation and the quality of data obtained and there are also prescriptive methods of assessing soil strengths and methods of design. Unless otherwise explicitly stated, the work has not been undertaken in accordance with EC7. A standard geotechnical interpretative report will not meet the requirements of the Geotechnical Design Report (GDR) under Eurocode 7. The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. The report is likely to represent a Ground Investigation Report (GIR) under the Eurocode 7 guidance.

DETAILED QUANTITATIVE RISK ASSESSMENTS AND REMEDIATION AND ENABLING WORK STRATEGY REPORTS

These reports build upon previous report versions and associated notes. The scope of the investigation, further testing and monitoring and associated risk assessments were selected based on the specific development and land use scenario proposed by the Client and may not be appropriate to another form of development or scheme layout. The risk assessment and opinions provided are based on currently available approaches in the generation of Site Specific Assessment Criteria relating to contamination concentrations and are not considered to represent a risk in a specific land use scenario to a specific receptor. No liability can be accepted for the retrospective effects of any future changes or amendments to these values, associated models or associated guidance.

The outputs of the Detailed Quantitative Risk Assessments are based upon the manipulation of standard risk assessment models. These are our interpretation of the risk assessment criteria.

Before adoption on-site, assessment criteria will need to be discussed and agreed upon with the Regulatory Authorities prior to adoption on-site. The regulatory discussion and engagement process



may result in an alternative interpretation being determined and agreed. The process and timescales associated with the Regulatory Authority engagement are not within the control of E3P. All costs and programmes presented as a result of this process should be validated by a quantity surveyor and should be presumed to be indicative.

E3P does not accept liability for any subcontract work that has not been completed in strict accordance with an approved E3P Remediation and Enabling Works Strategy.

GEOTECHNICAL DESIGN REPORT (GDR)

The GDR can only be prepared following confirmation of all structural loads and serviceability requirements. All the relevant information needs to be provided to allow for a GDR to be produced.

MONITORING (INCLUDING REMEDIATION MONITORING REPORTS AND BUILD PHASE MITIGATION)

These reports are factual and comprise monitoring, normally groundwater and ground gas and data provided by contractors as part of earthworks or remedial works.

The data is presented and will be compared with assessment criteria.

Appendix II: Glossary





ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
MRA	Mining Remediation Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme
MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million



km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)	SSRT	Site Specific Remediation Target
PSD	Particle Size Distribution	DD	Dry Density
CL:AI RE	Contaminated Land: Applications in Real Environments	Mc	Moisture Content
ρ	Bulk Density	GPR	Ground Penetrating Radar
NDP	Nuclear Density Probe	FFL	Finished Floor Level
LEL	Lower Explosive Limit	UKWIR	UK Water Industry Research
CIRIA	Construction Industry Research and Information Association	LOD	Limit of Detection
PFAS	Per- and Poly-Fluorinated Substances	PFOA	Perfluorooctanoic Acid

Appendix III: CIRIA 552

Risk Classification





CIRIA C552;2001 – Classification of Consequence

CLASSIFICATION	CATEGORY	DEFINITION
SEVERE	Humans	Short-term (acute) risk to human health likely to result in “significant harm” as defined by the Environmental Protection Act 1990, Part 2a
	Controlled Water	Short-term risk of pollution of sensitive water resource
	Property	Catastrophic damage to buildings/property
	Ecology	Short-term risk to a particular ecosystem or organism forming part of such ecosystem
MEDIUM	Humans	Chronic damage to human health (“significant harm” as defined in DEFRA, 2006)
	Controlled Waters	Pollution of sensitive water resources
	Ecological Systems	Significant change in a particular ecosystem or organism forming part of such ecosystem
	Humans	Chronic damage to human health (“significant harm” as defined in DEFRA, 2006)
MILD	Controlled Waters	Pollution of non-sensitive water resources
	Property	Significant damage to buildings, structures, crops and services (“significant harm” as defined in DEFRA, 2006) and damage to sensitive buildings/structures and services
	Ecological Systems	Damage to the environment
MINOR	Humans	Non-permanent health effects to human health that are easily prevented by the use of PPE
	Property	Easily repairable effects of damage to buildings, structures and services
	Financial / Project	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve



CIRIA 552:2001 Classification of Probability

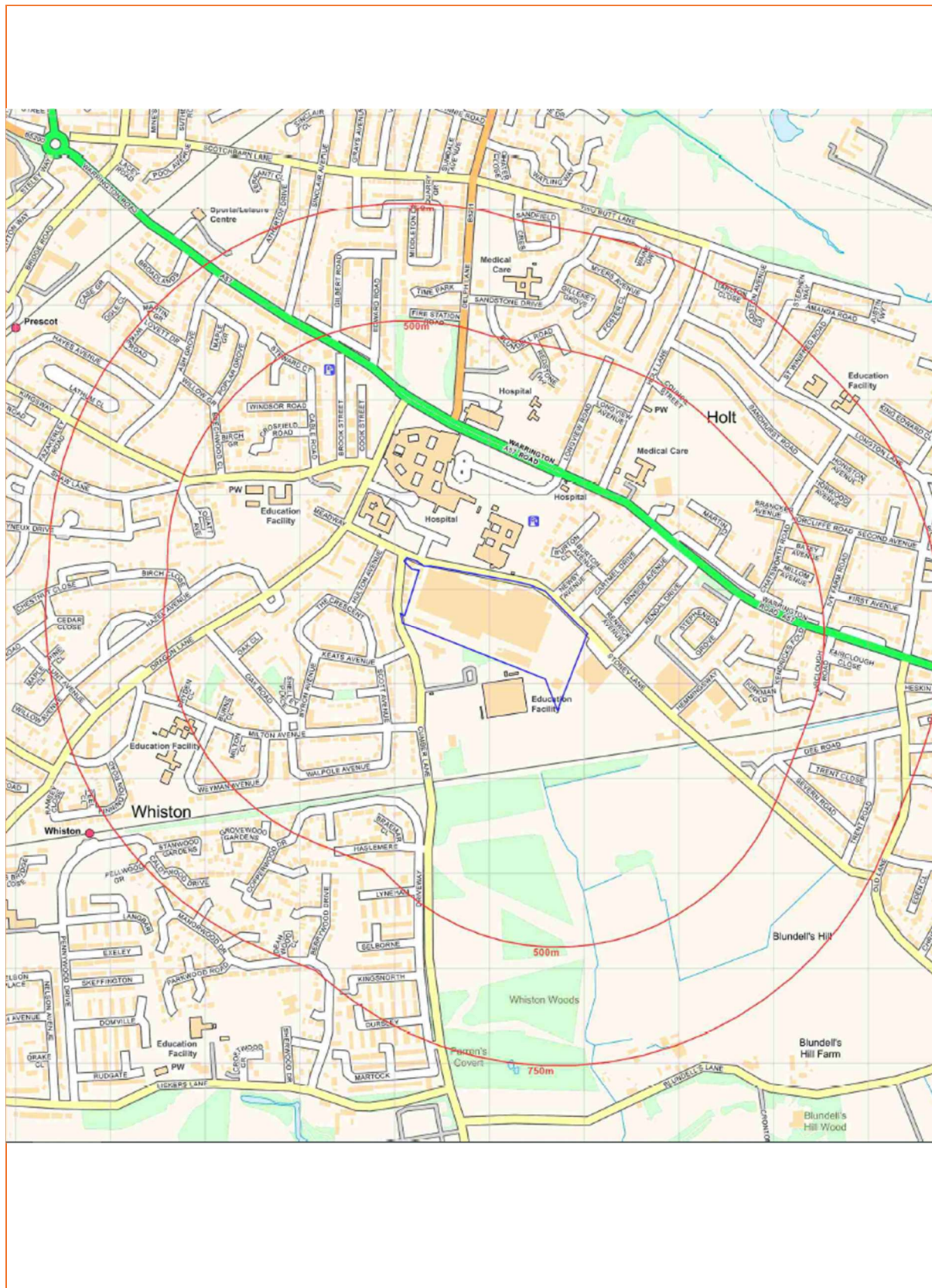
RISK	DEFINITION
LOW	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property.
LOW MODERATE	There are unlikely to be significant contaminated land liabilities/geotechnical constraints associated with the property with regard to the proposed use. However, minor issues may require further consideration in the event of future redevelopment of the Site.
MODERATE	Some potential contaminated land liabilities/geotechnical constraints are likely to affect the property as a result of historical and/or current activities. The risks identified are unlikely to pose an immediate significant issue but the purchaser/developer may wish to make further enquiries of the vendor or undertake further environmental improvements. Redevelopment of the Site will likely require further site investigation.
MODERATE HIGH	Some potentially significant contaminated land liabilities/geotechnical constraints have been identified at the property that requires further assessment, including intrusive ground investigations.
HIGH	Significant potential contaminated land liabilities/geotechnical constraints have been identified at the property. Further assessment including intrusive ground investigation will be required to determine the level of risk and associated liability.

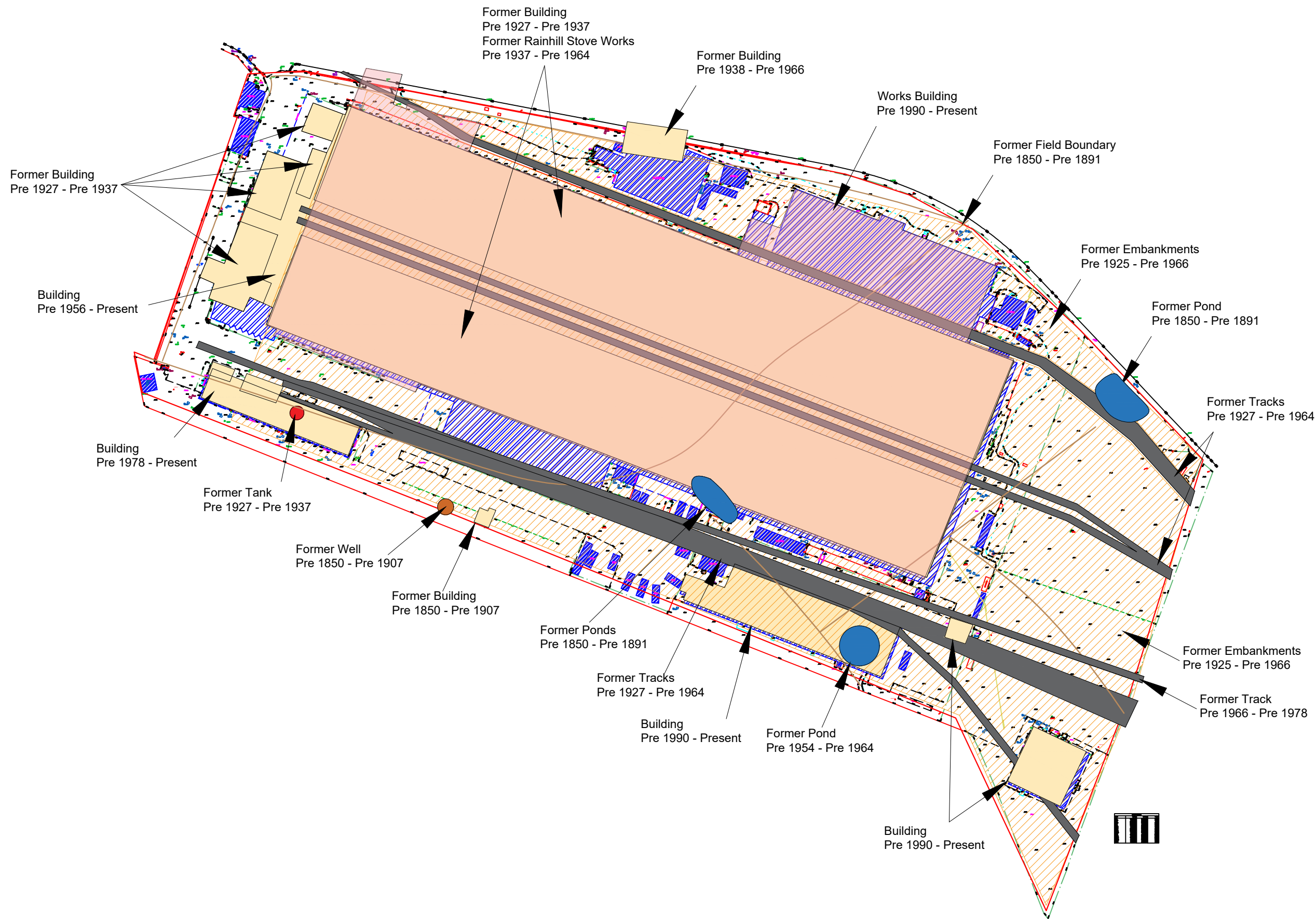
Appendix IV: Drawings





DRAWING 17-500-001 – Site Location Plan





Historical Features

- Former/Present Buildings
- Former Tank
- Former Ponds
- Former Tracks
- Works
- Former Well

Notes:

P1	REVC	17.05.2024	EB	MW	MW
P1	REVB	13.05.2024	EB	ID	MW
P1	REVA	05.03.2024	OW	MW	BH
Phase	Issue	Date	Drawn	Checked	PM

Client:

Glen Dimplex

Job Title:

Prescott

Job No:

17-500

Drawing No:

003

Date:

17.05.2024

Scale:

NTS@ A3

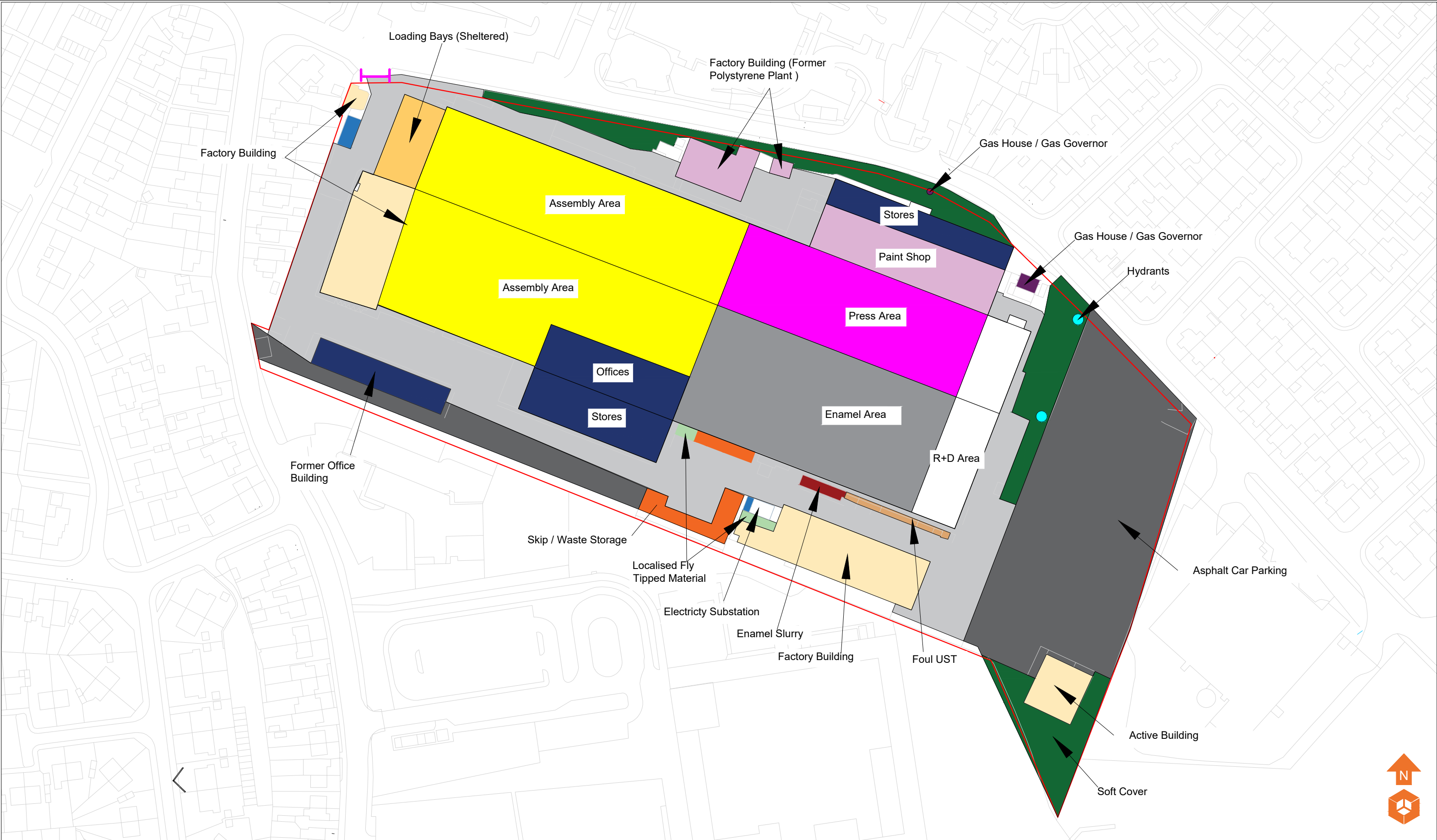
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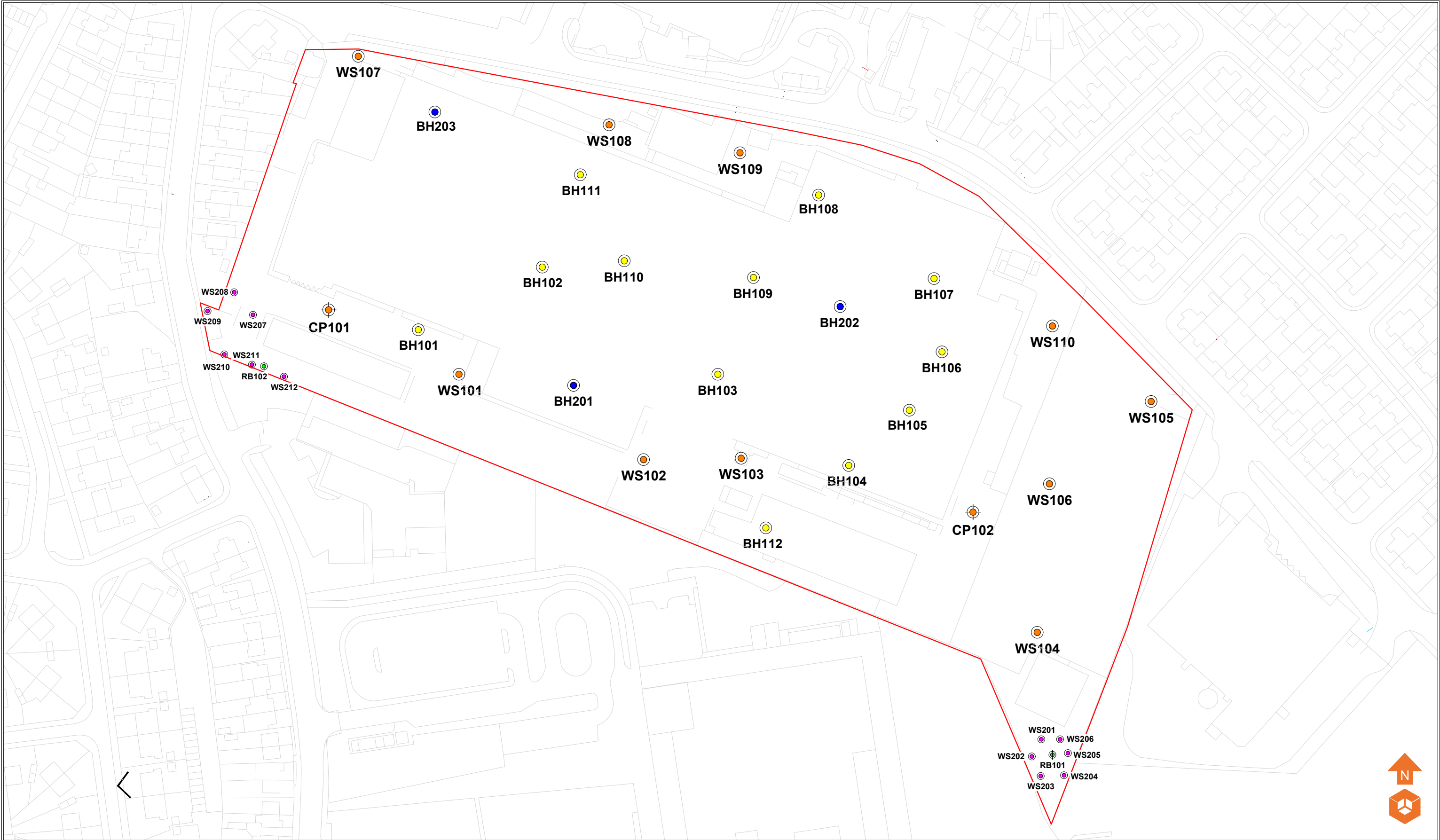


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Site Features Factory Building (Active) Loading Bays (Sheltered) Skip / Waste Storage Vacant Buildings Asphalt Car Parking Concrete Roadways Electricity Substation (active) Hydrants Gas House / Gas Governor Soft Cover Enamel Slurry UST Localised Fly Tipped Material Foul UST Site Entrance (Security Manned) Assembly Area Press Area Enamel Area Paint Shop Office / Stores	Notes:						Client: Glen Dimplex		Job No: 17-500	Date: 21.03.2025	e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk																									
									Drawing No: 004	Scale: NTS@ A3																										
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P1	REVB	13.05.2024	EB	ID	MW																															
P1	REVA	22.03.2024	EB	MW	MW																															
Phase	Issue	Date	Drawn	Checked	PM																															



- Location Symbols
- Approximate Window Sample Borehole Location (E3P February 2024)
 - Approximate Cable Percussive Borehole Location (E3P February 2024)
 - Approximate Window Sample Borehole Location (WS200 Series)
 - Approximate Rotary Borehole Location
 - Approximate Borehole Location (BH100 Series)
 - Approximate Borehole Location (BH200 Series)

Notes:

P1	REVD	05.02.2025	OW	ID	MW
P1	REVC	07.10.2024	OW	ID	MW
P1	REVB	13.05.2024	EB	ID	MW
P1	REVA	22.03.2024	EB	ID	MW
Phase	Issue	Date	Drawn	Checked	PM

Client:

Glen Dimplex

Job Title:

Prescott

Job No:

17-500

Drawing No:

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Date:

05.02.2025

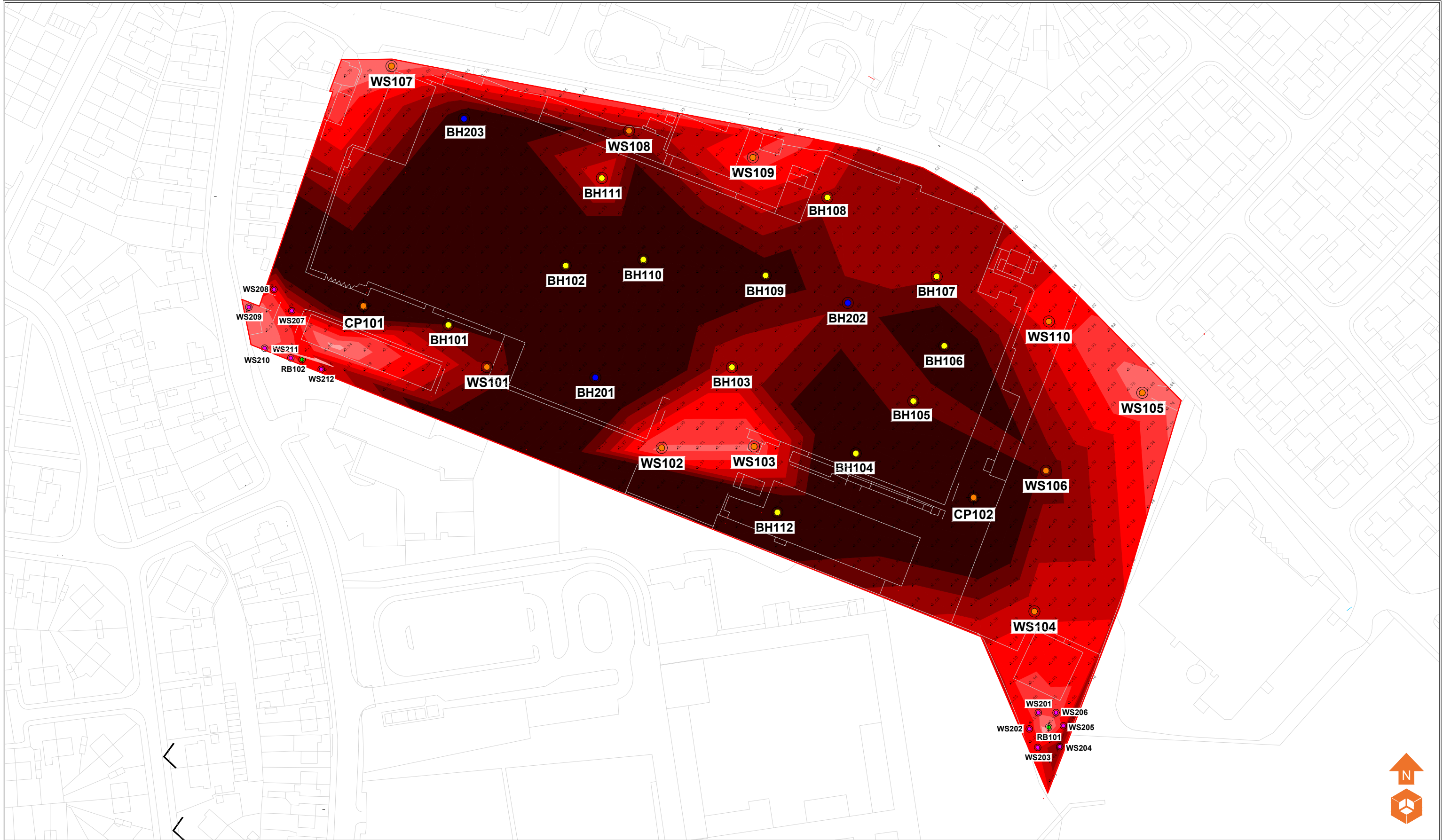
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- Approximate Window Sample Borehole Location (E3P February 2024)
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 - Approximate Window Sample Borehole Location (WS200 Series)
 - Approximate Rotary Borehole Location
 - Approximate Borehole Location (BH100 Series)
 - Approximate Borehole Location (BH200 Series)

- Made Ground Depth (m)**
- Depth of Made Ground 0.50 - 0.74m
 - Depth of Made Ground 0.75 - 0.99m
 - Depth of Made Ground 1.00 - 1.24m
 - Depth of Made Ground 1.25 - 1.49m
 - Depth of Made Ground 1.50 - 1.74m
 - Depth of Made Ground 1.75 - 1.99m
 - Depth of Made Ground >2.00m

Notes:

P1	REVE	05.02.2025	OW	ID	MW
P1	REVD	03.10.2024	OW	MW	MW
P1	REVC	21.05.2024	OW	MW	MW
P1	REVB	13.05.2024	EB	ID	MW
P1	REVA	25.03.2024	EB	ID	MW
Phase	Issue	Date	Drawn	Checked	PM

Client:

Glen Dimplex

Job Title:

Prescott

Job No:
17-500

Drawing No:
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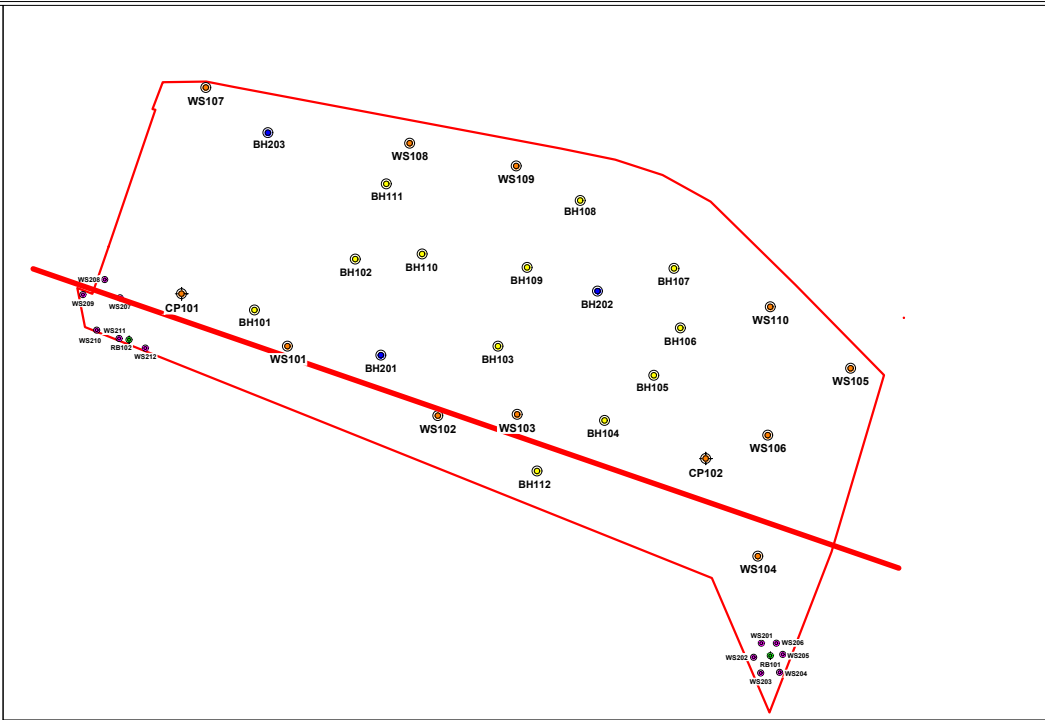
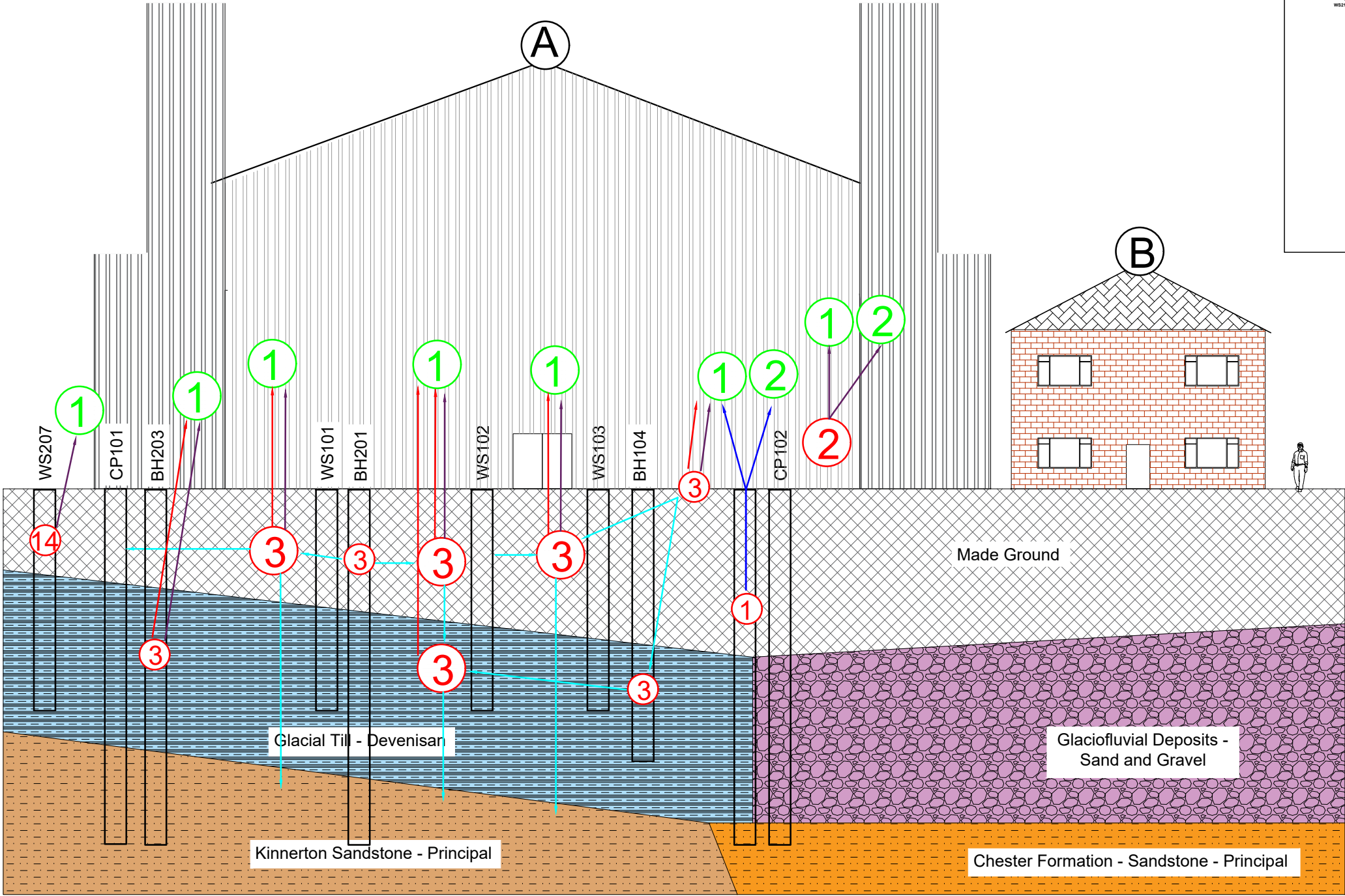
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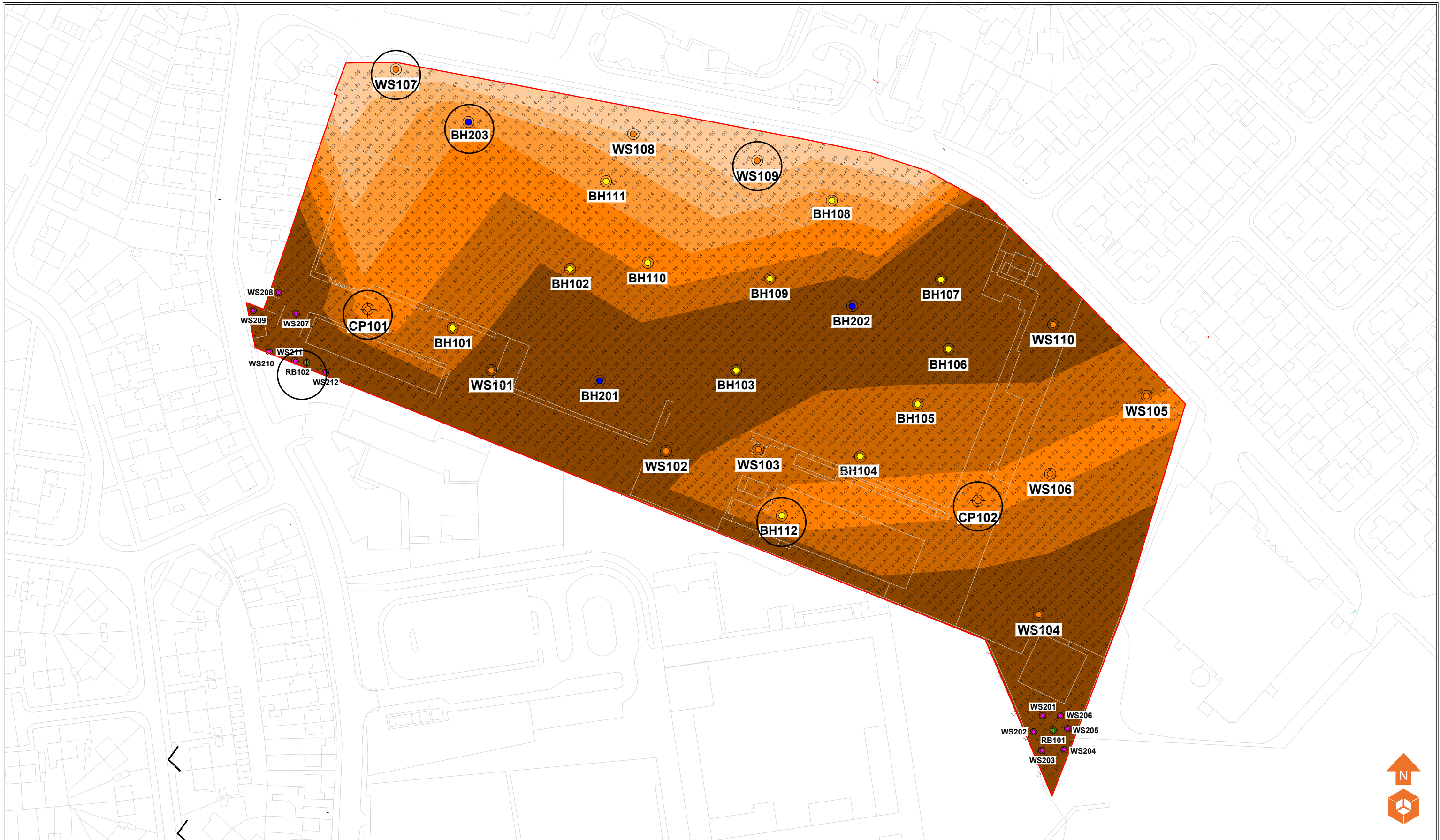


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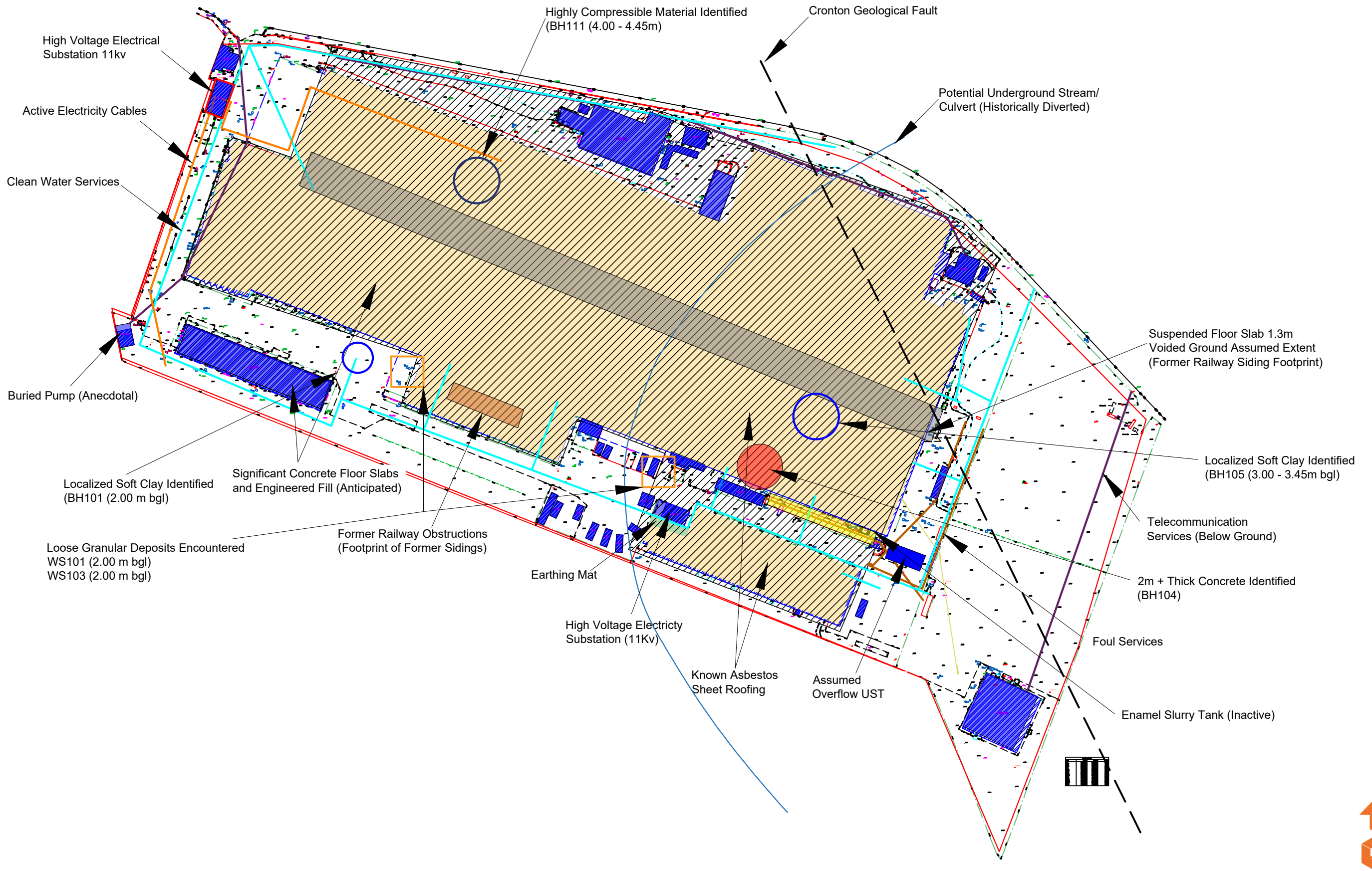
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Geology Key  Made Ground  Glacial Till - Devensian  Glaciofluvial Deposits - Sand and Gravel  Kinnerton Sandstone - Principal  Chester Formation - Sandstone - Principal	Sources ① Heavy Metals (Arsenic, Lead, Nickel) ② Asbestos Fibres ③ Enamel Slurry Tank (Trichlorethene, Cis 1,2 - Dichloroethene, Trans 1, 2 - Dichloroethene, Vinyl Chloride) ④ Volatile Organic Compounds	Pathways  Vertical / Lateral Migration  Volatile Vapour  Inhalation / Accumulation  Dermal Contact Ingestion	Receptors ① Future End Users ② Site Personnel / Groundworkers	Site Features A Factory (Present) B Future Residential Development C Enamel Slurry Tank	Notes:	Client: Glen Dimplex	Job No: 17-500	Date: 21.03.2025	 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk	
							Drawing No: 010	Scale: NTS		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.
	P1 P1 Phase	REVB REVA Issue	21.03.2025 13.05.2024 Date	TG EB Drawn	ID ID Checked	MW MW PM	Job Title: Prescott	Drawing Title: Human Health Conceptual Site Model		



Location Symbols		Bedrock Depth (m)		Notes:		Client:		Job No:		Date:		 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk																																				
 WS241 Approximate Window Sample Borehole Location (E3P February 2024)	 CP241 Approximate Cable Percussive Borehole Location (E3P February 2024)	 WS200 Approximate Window Sample Borehole Location (WS200 Series)	 RS200 Approximate Rotary Borehole Location	 BH100 Approximate Borehole Location (BH100 Series)	 BH200 Approximate Borehole Location (BH200 Series)		Glen Dimplex	17-500	27.03.2025																																							
								Drawing No:	Scale:	Job Title:		Drawing Title:		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.																																		
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P1	REVD	11.02.2025	OW	ID	MW																																											
P1	REVC	07.10.2024	OW	ID	MW																																											
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P1	REVA	25.03.2024	EB	ID	MW																																											
Phase	Issue	Date	Drawn	Checked	PM																																											



Site Features

	Significant Concrete Floor Slabs and Engineered Fill (Anticipated)		Suspended Floor Slab		Loose Granular Deposits
	Earthing Mat		Former Railway Obstructions		Thick Concrete
	High Voltage Electricity Substation (11Kv)		Potential Underground Culvert		Cronton Geological Fault
	Known Asbestos Sheet Roofing		Highly Compressible Material		Soft Clay
	Unknown Potential UST				
	Foul Services				
	Telecommunication Services (Below Ground)				
	Community Water Services				
	Active Electricity Cables				

Notes:

P1	REVD	27.03.2025	TG	ID	MW
P1	REVC	05.02.2025	OW	ID	MW
P1	REVB	13.05.2024	EB	ID	MW
P1	REVA	25.03.2024	EB	MW	MW
Phase	Issue	Date	Drawn	Checked	PM

Client:

Glen Dimplex

Job Title:

Prescott

Job No:

17-500

Date:

27.03.2025

Drawing No:

015

Scale:

NTS@ A3

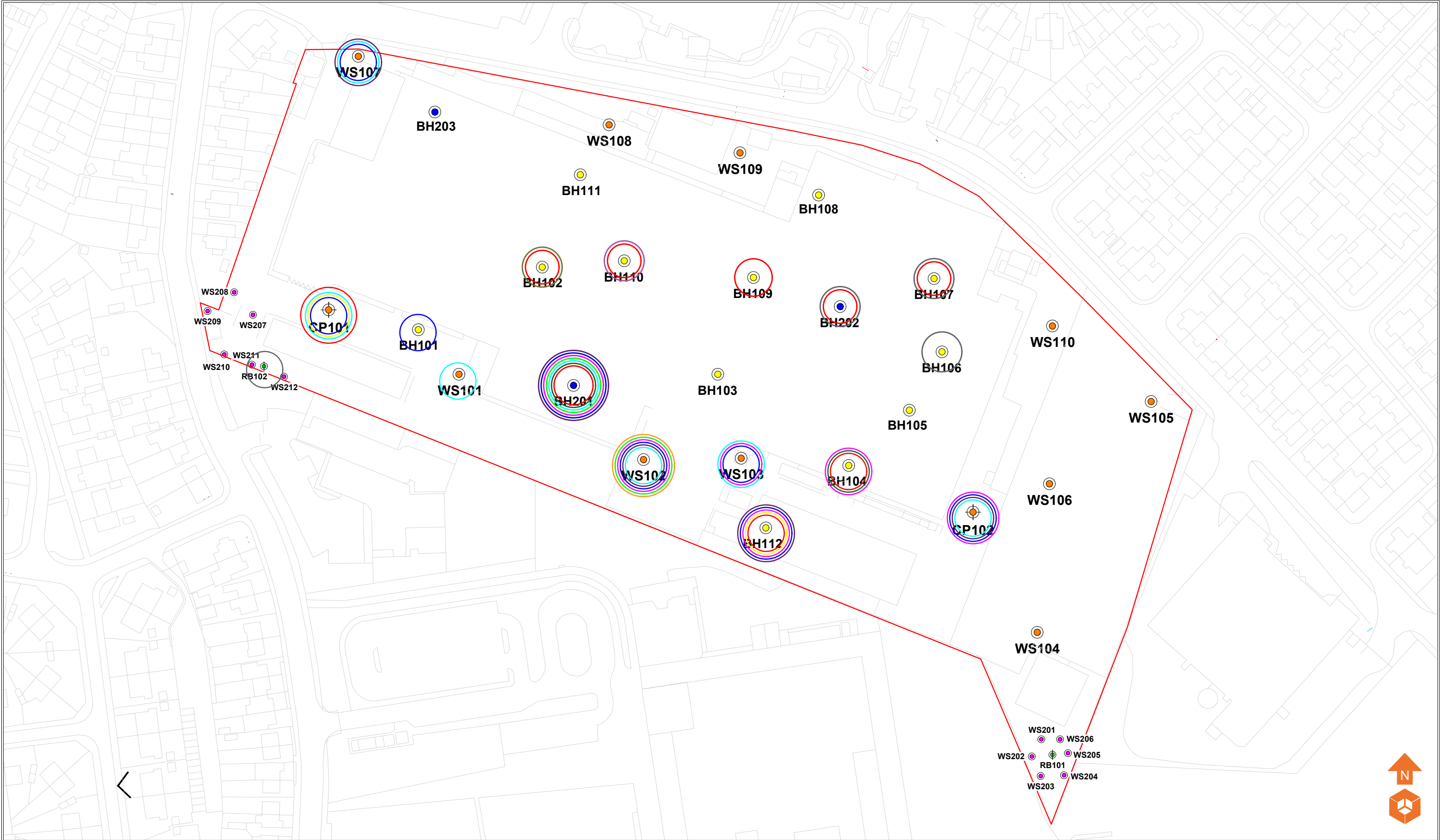
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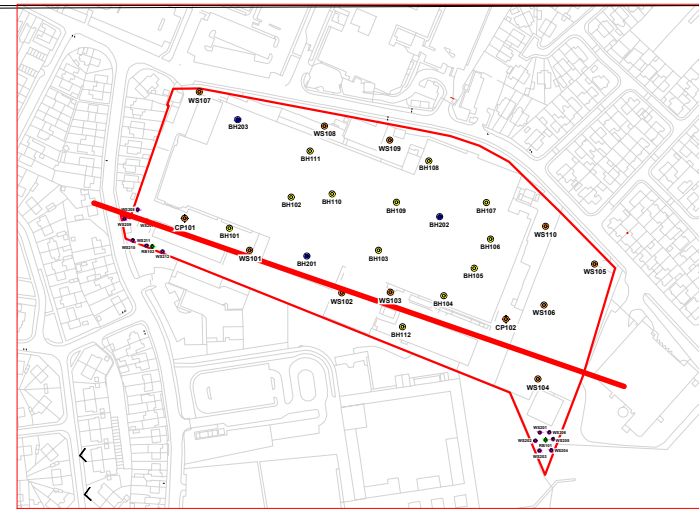
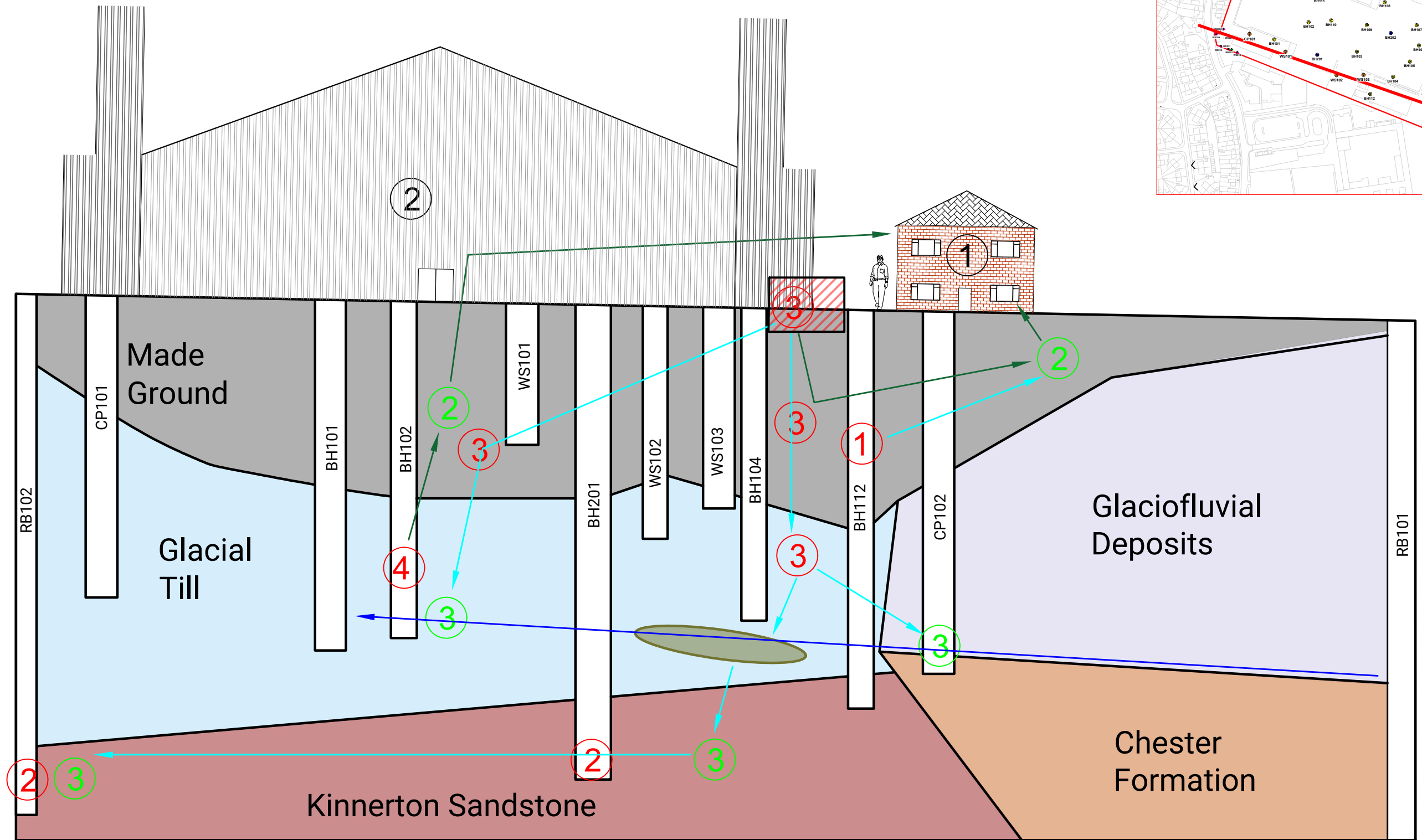


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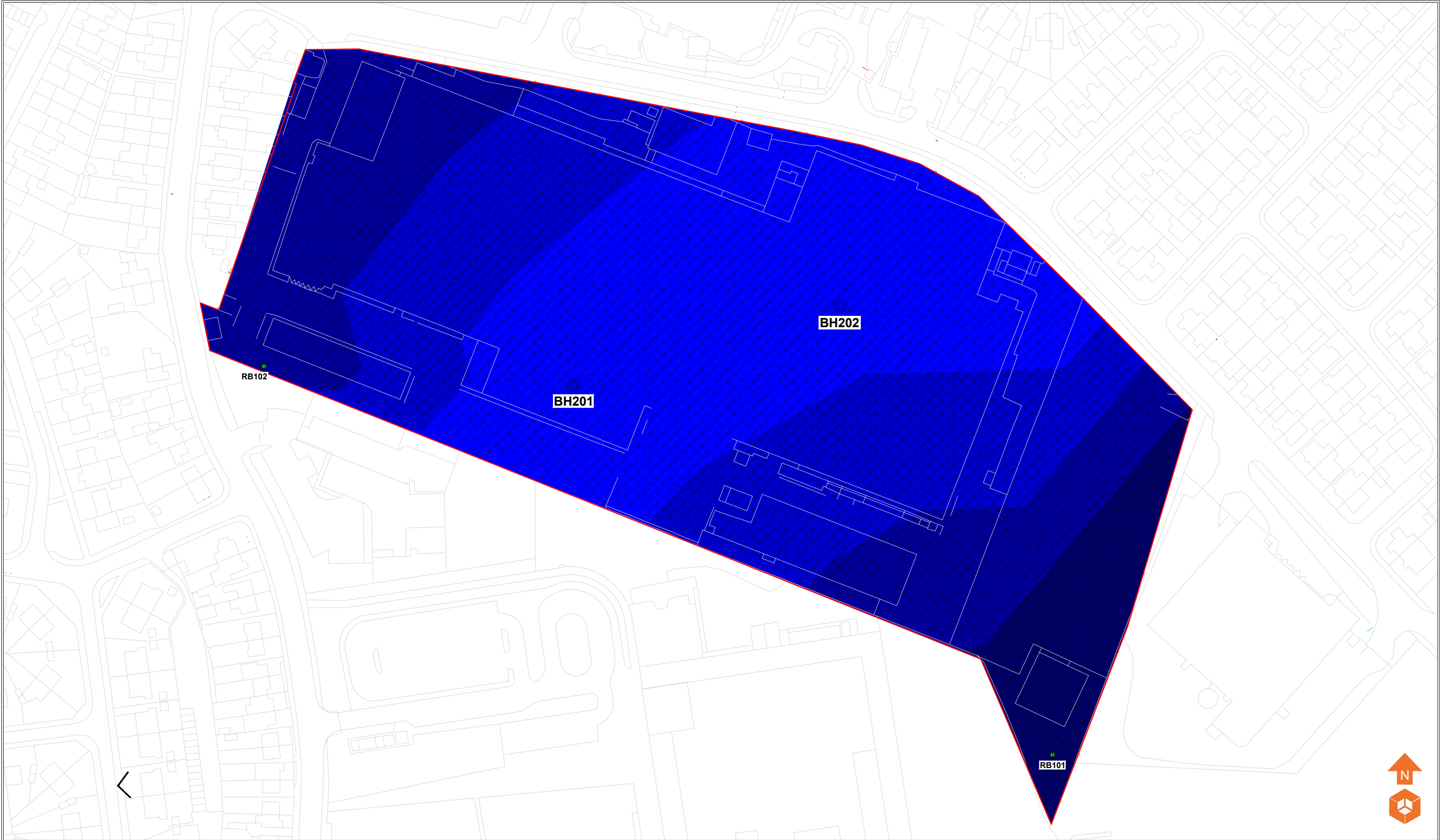
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Location Symbols			Contamination Exceedances			Notes:						Client:		Job No:		Date:		 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk																															
WS200 Approximate Window Sample Borehole Location (E3P February 2024) CP161 Approximate Cable Percussive Borehole Location (E3P February 2024) WS200 Approximate Window Sample Borehole Location (WS200 Series) RE100 Approximate Rotary Borehole Location BH100 Approximate Borehole Location (BH100 Series) BH200 Approximate Borehole Location (BH200 Series)			 Trichloroethene  Vinyl Chloride  Cis 1, 2 - Dichloroethene  Trans 1, 2 - Dichloroethene  1 - 1 Dichloroethene  Benzene  pH  Heavy Metals  Trichloromethane  TPH C21-C35  Tetrachloroethene  1,2 Dichloropropane			<table><tr><td>P1</td><td>REVD</td><td>21.03.2025</td><td>TG</td><td>ID</td><td>MW</td></tr><tr><td>P1</td><td>REVC</td><td>12.11.2024</td><td>TG</td><td>ID</td><td>MW</td></tr><tr><td>P1</td><td>REVB</td><td>21.05.2024</td><td>OW</td><td>ID</td><td>MW</td></tr><tr><td>P1</td><td>REVA</td><td>13.05.2024</td><td>EB</td><td>ID</td><td>MW</td></tr><tr><td>Phase</td><td>Issue</td><td>Date</td><td>Drawn</td><td>Checked</td><td>PM</td></tr></table>						P1	REVD	21.03.2025	TG	ID	MW			P1	REVC	12.11.2024	TG	ID	MW	P1	REVB	21.05.2024	OW	ID	MW	P1	REVA	13.05.2024	EB	ID	MW	Phase	Issue	Date	Drawn	Checked	PM	Glen Dimplex		Job Title:		Drawing No:	
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Geology Key Made Ground Kinnerton Formation - Sandstone - Principal Bedrock Glacial Till Devensian Chester Formation - Principal Bedrock Glaciofluvial Deposits Assumed DNAPL Plume (TCE,DCE,Vinyl Chloride)	Sources ① Heavy Metals and Non-volatile PAHs ② Volatile Organic Compounds ③ Enamel Slurry Tank (TCE,DCE,Vinyl Chloride) ④ TPH C21-C35 Enamel Slurry Tank	Pathways Vertical / Lateral Migration Assumed Superficial Groundwater Flow Taint Water Supply	Receptors ① Future End Users ② Water Pipeline ③ Groundwater	Site Features ① Future Site Users ② Current Factory	Notes:	Client:	Job No:	Date:	Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk
						Glen Dimplex	17-500	21.03.2025	
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							027	NTS	
						Job Title:	Drawing Title:		
						Prescott	Controlled Waters Conceptual Site Model		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.



Location Symbols

 Approximate Rotary Borehole Location

 Approximate Borehole Location (BH200 Series)

Groundwater Depth (m AOD)

 Depth of Groundwater 35.00 - 39.99m

 Depth of Groundwater 40.00 - 44.99m

 Depth of Groundwater 45.00 - 49.99m

 Depth of Groundwater >50.00m

Notes:

P1	REVA	21.03.2025	TG	ID	MW
Phase	Issue	Date	Drawn	Checked	PM

Client:

Glen Dimplex

Job Title:

Prescott

Job No:

17-500

Drawing No:

032

Date:

21.03.2025

Scale:

NTS @ A3

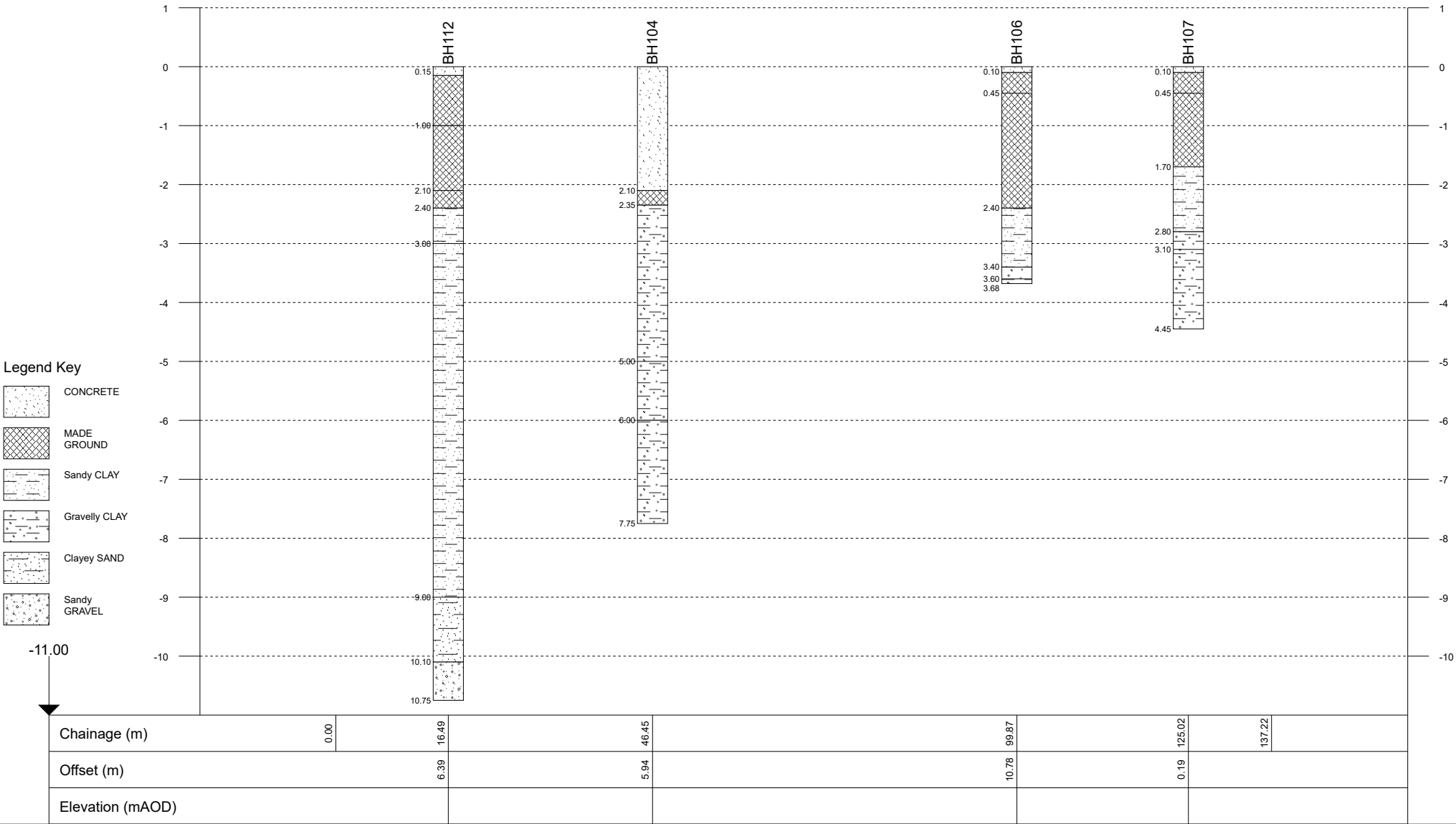


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Partnership Ltd
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Website: www.e3p.co.uk

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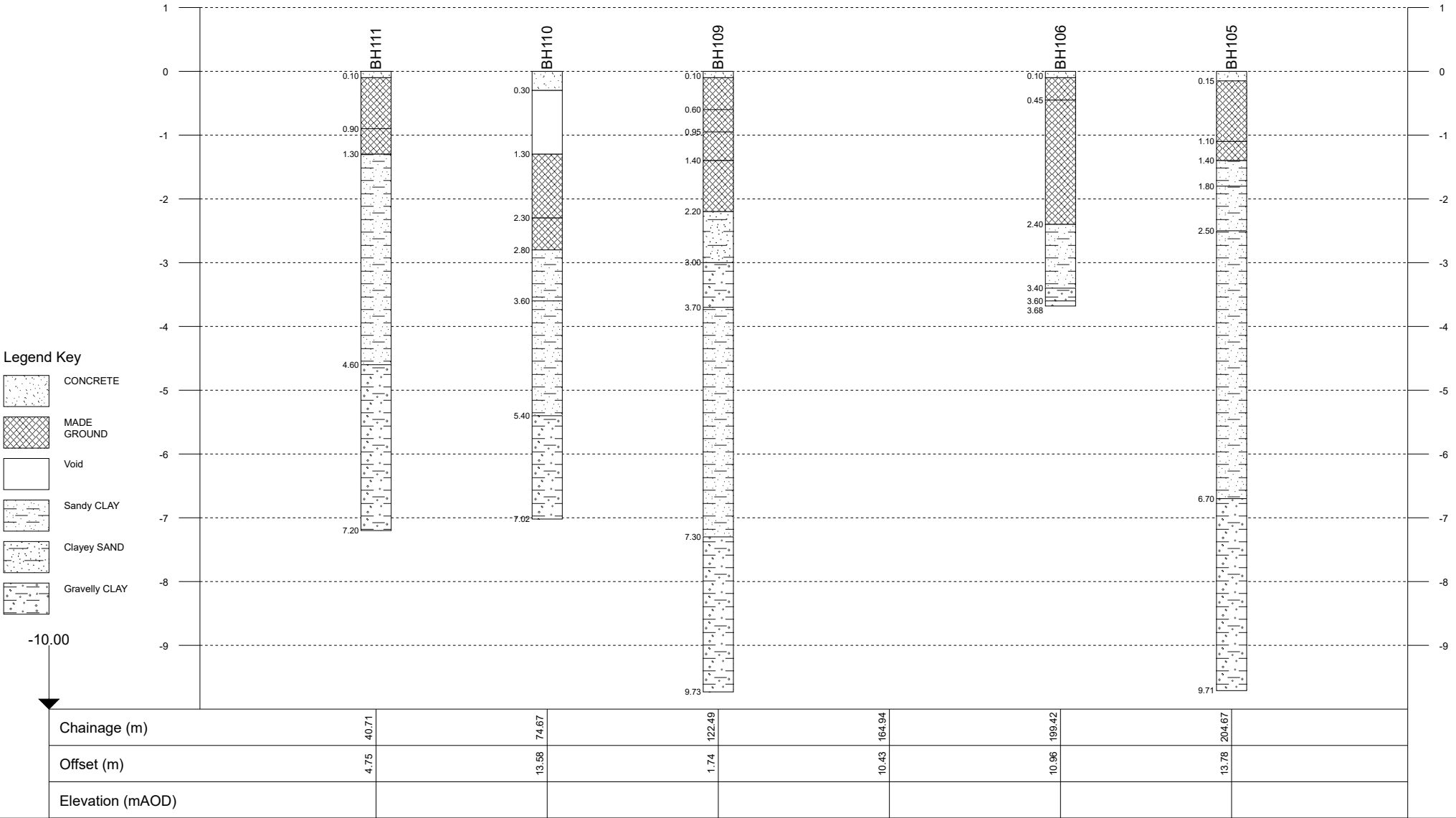
Project Id: 17-500
Project Title: Glen Dimplex
Location: Prescot
Client: Glen Dimplex Homes Appliances Ltd

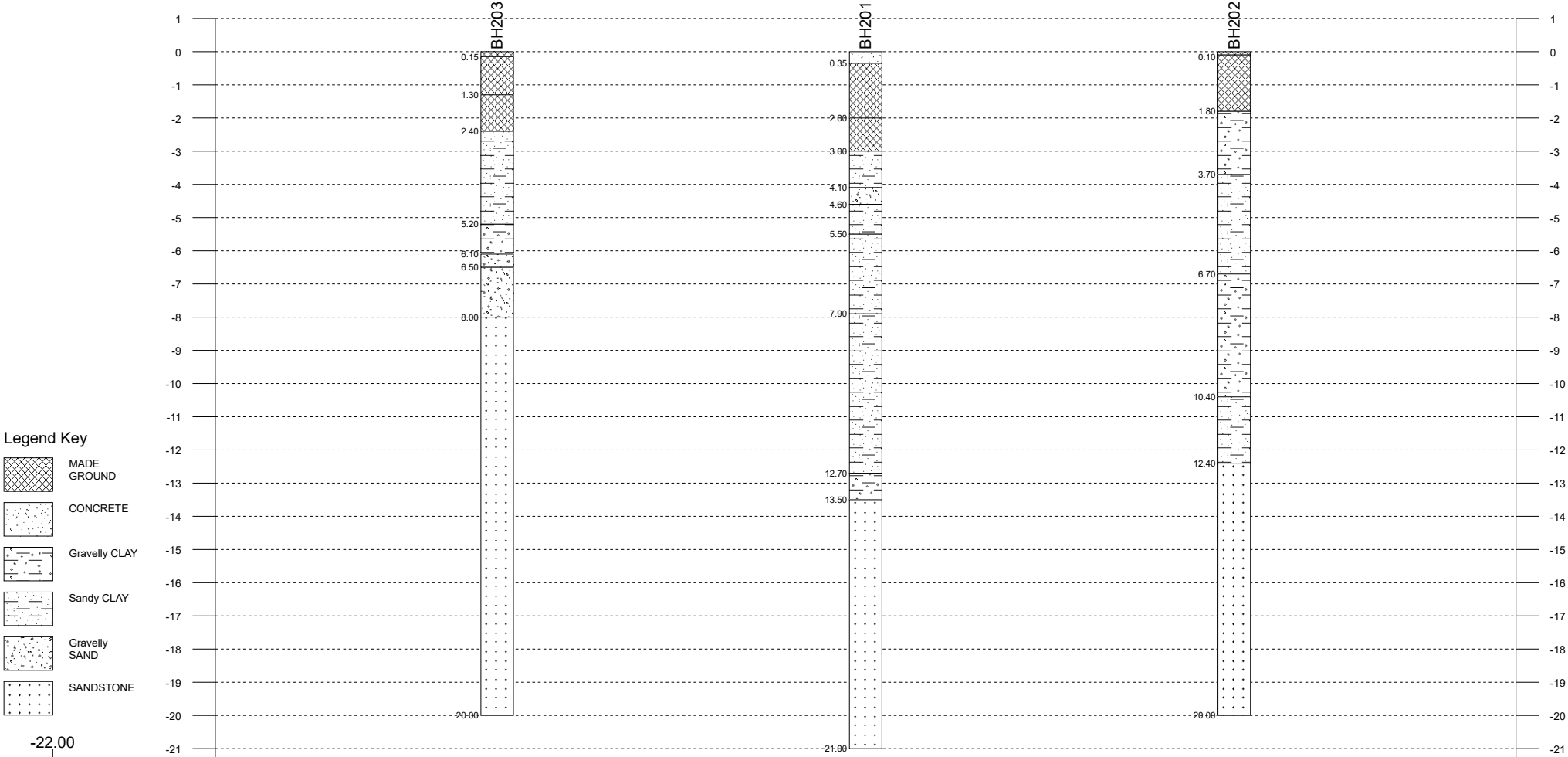
Title: 17-500-034 - Superficial Boreholes North to South
Vertical Scale: 1:92
Horizontal Scale: 1:795
Engineer:



Project Id: 17500
Project Title: Glen Dimplex
Location: Prescot
Client: Glen Dimplex Homes Appliances Ltd

Title: 17-500-035 - Superficial Boreholes East to West
Vertical Scale: 1:85
Horizontal Scale: Not to scale
Engineer:





-22.00

Chainage (m)	2.72	115.70	226.63
Offset (m)	0.26	1.02	0.21
Elevation (mAOD)			

Appendix V: Photographs





PLATE 01 Enamel Area Machinery



PLATE 02 Former Weighbridge





PLATE 03 Former Assembly/Offices Area (Southwest)



PLATE 04 Former Aluminium Shop (North)





PLATE 05 'Fluid Clean' Machinery (Adjacent to Paint Shop)



Appendix VI: Detailed Unexploded Ordnance (UXO) Assessment





If



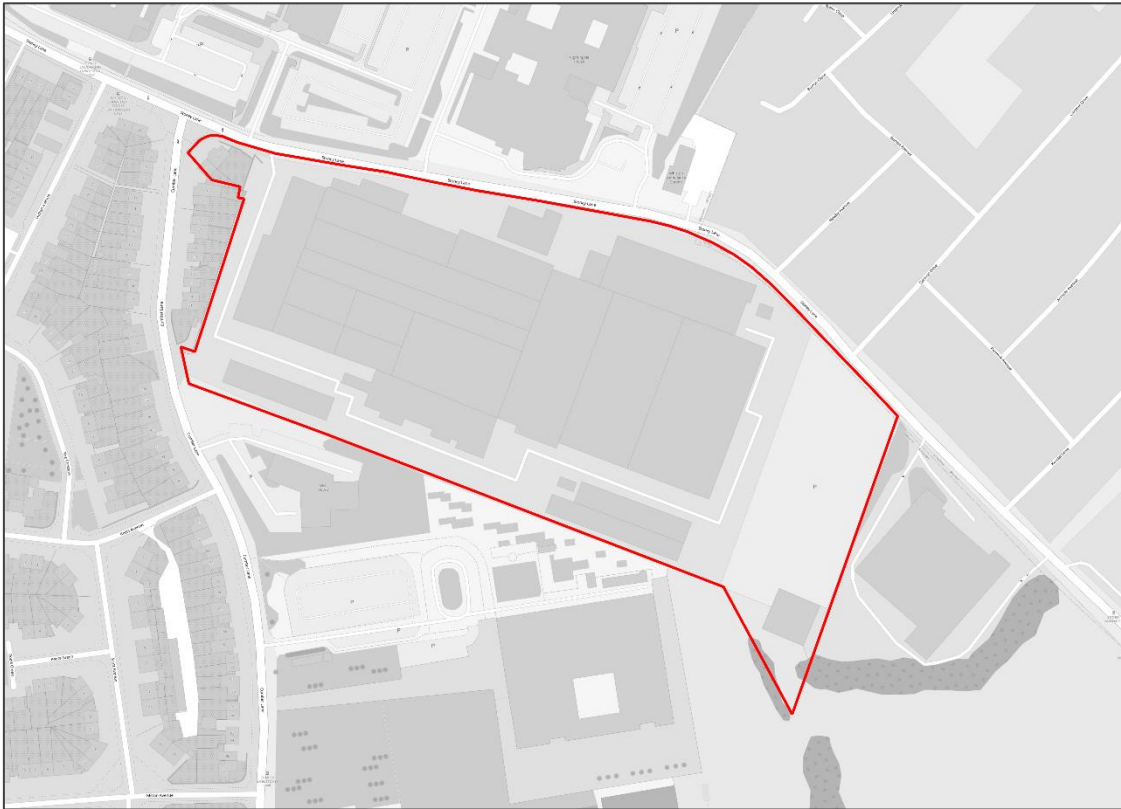
BRIMSTONE

**DETAILED UXO
RISK ASSESSMENT**



STAGE 2 DETAILED UXO RISK ASSESSMENT

Client:	E3P		
Project Ref:	E3PL230R		
Site Name:	Glen Dimplex Homes Appliances, Prescott		
Report Ref:	DRA-24-1792-GlenDimplexHomesAppliances,Prescot-E3PL230R		
Revision:	0		
Status:	Final		
Date:	23 rd December 2024		
Author:	Will Slack	Project Researcher	will.slack@brimstoneuxo.com
Reviewed By:	Chris Birch	Research Training Coordinator	chris.birch@brimstoneuxo.com
Authorised By:	Aaron Florence	Managing Director	





EXECUTIVE SUMMARY

RESULT: Brimstone concludes that unexploded ordnance (UXO) poses a **LOW** and **LOW-MODERATE RISK** to the proposed works.

THE SITE: The Site (approximately centred on the National Grid Ref: SJ 47997 91544) is located in Whiston, within the county of Lancashire, approximately 800m north-east of Whiston railway station. The Site is bound to the north by Stoney Lane, to the west by a commercial structure on Stoney Lane, to the south by mature vegetation and a hardstanding car park, and to the west by residential structures and associated garden areas on Cumber Lane.

The majority of the Site comprises the Glen Dimplex appliances factory, a two to three storey industrial structure present in the centre of the Site. A number of smaller structures, between one and two storeys, are present along the western, southern, and south-eastern Site boundaries. The majority of the remainder of the Site comprises hardstanding, with small areas of mature vegetation present in the north and south-east.

THE PROPOSED WORKS: SI works are proposed, comprising 15 sonic drilled boreholes, 12 shallow boreholes to between 5-10m bgl, and three deep boreholes into the bedrock to 20m bgl.

At the time of writing, Brimstone was not aware of any proposed development works taking place on Site.

UXO RISK ASSESSMENT:

German UXO:

- During WWII, the Site was located within the Rural District of Whiston, which experienced 9.5 bombs / 1,000 acres, a low bombing density. A large electrical engineering plant, approximately 1km north-west of the Site, was identified as a primary target by the Luftwaffe. It is also entirely possible that the industrial structure on Site provided an easily identifiable target of opportunity.
- County wide records covering Lancashire were consulted, and only three bombing incidents within a 1km radius of the Site were identified, accounting for two incendiary bombs, one unexploded high explosive bomb, and one unexploded anti-aircraft shell. The closest of these incidents, the HE UXB, occurred approximately 230m south-west of the Site. No anecdotal evidence suggesting the factory sustained significant bomb damage could be found; substantial damage to factories is typically well documented in online sources / histories.
- Furthermore, no evidence of significant bomb damage is visible on Site in post-WWII aerial photography. Light coloured roofing is visible to the large structure on Site; whilst this could feasibly be the result of repairs due to bomb damage, the roofing has been replaced in an organised fashion, and the design of the roofing has changed. Combined with the lack of recorded bombing in the area, this is considered more likely to have been planned redevelopment. Had this been the result of bomb damage, it is still thought likely that a UXB entry hole to the hardstanding floor of the factory beneath would have been instantly recognisable. No cratering is visible to the open ground on Site; however, these areas do appear poorly maintained, potentially masking evidence of bomb damage.
- In addition, the Site is considered likely to have experienced a frequent level of access throughout WWII. The factory on Site likely remained in use throughout and may have employed a team of fire watchers / ARP personnel responsible for recording and reporting bombing incidents. It is also possible that specific post-raid checks took place for unexploded / delayed action bombs, to ensure work at the factory could continue safely. This is especially pertinent in the areas occupied by railway tracks, which were often earmarked for such checks.

- However, areas of open, undeveloped ground are present around the periphery of the factory, particularly in the north, south and between the railway lines in the east. These areas appear poorly maintained in post-WWII aerial photography, and it cannot be assumed that these areas experienced a frequent level of access throughout WWII. It is therefore more likely that a UXB strike to these areas could potentially have occurred unrecorded as opposed to the areas of the Site occupied by structures / infrastructure. However, given the lack of bombing recorded in the Site area, this is not considered a significantly likely scenario.
- In summary, no evidence of the Site being affected by German bombing has been found. The Site is also anticipated to have experienced a high level of access and monitor, provided by employees of the factory on Site, which appears to have been active throughout WWII. It is therefore considered unlikely that a UXB could have landed on Site unnoticed and unrecorded. As such, a **Low Risk** from German UXBs has been assessed on Site.

British / Allied UXO:

- Evidence has been found to suggest that the factory on Site was utilised for the production of munitions during both WWI and WWII. However, no specific evidence detailing this activity or the types of munitions produced could be found during the production of this assessment. The production / use of live explosives was typically well documented, and it would be highly unusual for this to have occurred undocumented. Client provided information suggests that the factory may have been used for the production of ammunition boxes. The source of this information was discussions with Site personnel and therefore cannot be verified; however, this is consistent with the Site's historic usage as a sheet metal processing plant and would account for the lack of information available.
- However, had the factory been utilised for the production of ordnance, there is the potential for any unwanted / superfluous items to be disposed of in nearby open ground. Such an occurrence was not uncommon at facilities used for the production of ordnance, such as ROF Rotherwas in Herefordshire, where mortar shells have been encountered on multiple occasions. Areas of poorly maintained open ground were present in the north, south and east of the Site. It cannot be completely discounted that the disposal of potential ordnance present at the factory took place in these areas, given the lack of conclusive information available. However, in line with the ALARP principle, no specific evidence of this occurring, or of ordnance ever being present at the factory, has been found, and as such a **Low-Moderate Risk** from Allied UXO has been assessed.
- It should be noted that Allied UXO is typically encountered at very shallow (<1m bgl) and shallow (1-2m bgl) depths. Therefore, the risk can be considered mitigated within any ground which has been disturbed to these depths post-WWII.
- 20 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. Luftwaffe activity was infrequent over the wider area and therefore these guns would not have expended a vast quantity of ammunition. Consequently, it is unlikely (although still possible) that an unexploded AA shell struck the Site, potentially penetrating to a shallow depth within the areas of open ground on Site. Given the lack of Luftwaffe activity in the area, this risk is considered analogous with that of German UXBs, and a **Low Risk** has been assessed.

Likelihood of UXO Remaining and UXO Encounter:

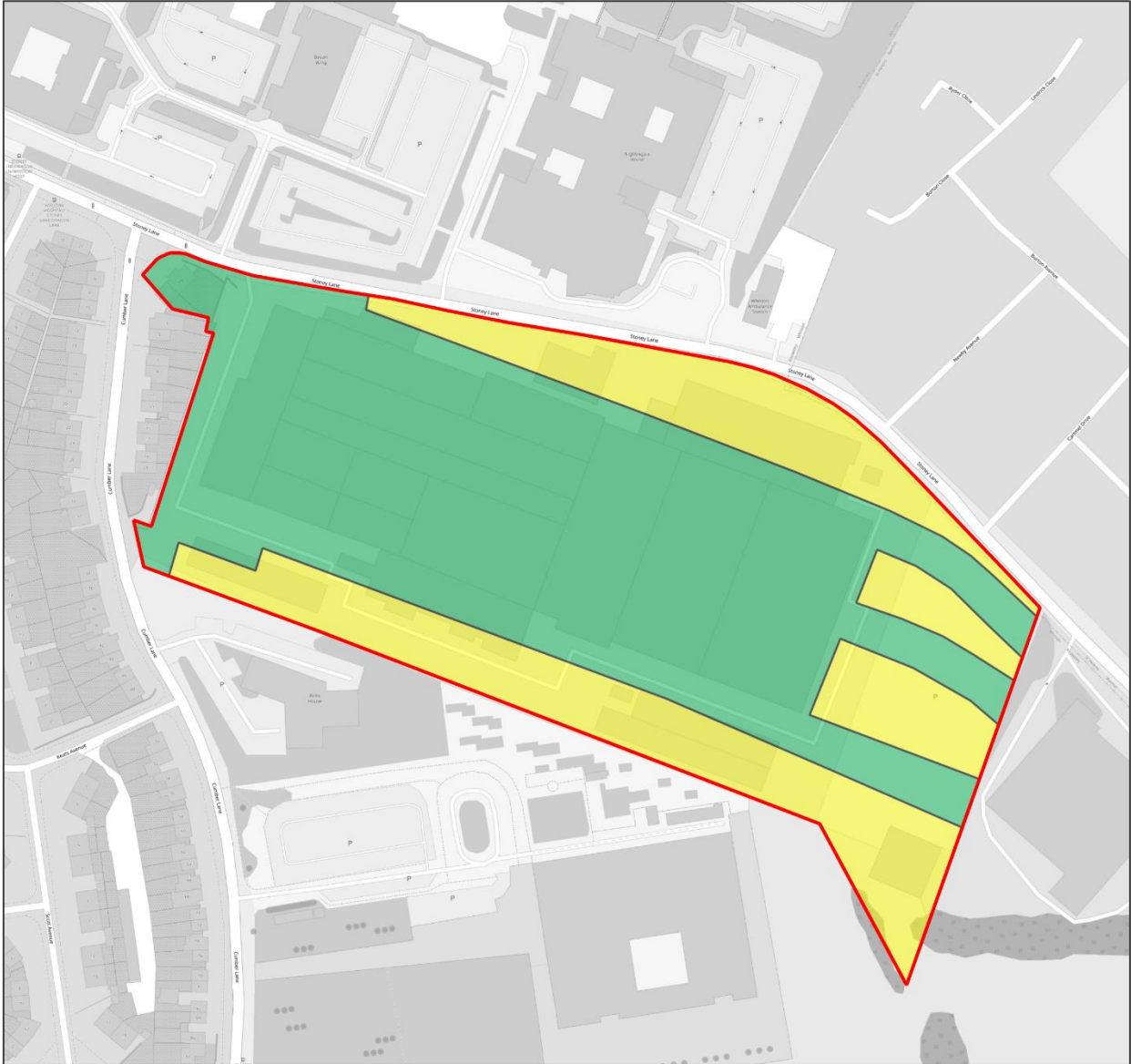
- The risk associated with any deep buried German UXBs will likely have been mitigated in the locations of deep excavations throughout the Site, outside the footprint of the factory. The risk associated with any very shallow or shallow buried Allied UXO will have been mitigated with the clearing of pre-WWII structures / railway lines, the construction of additional structures / extensions and the subsequent laying of hardstanding on previously undeveloped ground.

- Please note, the risk of a UXO encounter can be considered mitigated in the exact locations and down to the exact depths of any post-WWII intrusive works.

RECOMMENDED RISK MITIGATION MEASURES: The measures detailed below are recommended to mitigate the risk to ALARP level.

Risk Mitigation Measure	Recommendation
UXO Safety Awareness Briefings	Prior to all intrusive works commencing.

Risk Map



LOW RISK: Low likelihood of German and British UXO remaining here.

LOW-MODERATE RISK: Slightly elevated likelihood of British UXO remaining here.



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QUALITY POLICY

Brimstone Site Investigation Ltd, known as Brimstone, is committed to the delivery of unexploded ordnance (UXO) risk mitigation services, including safe removal and disposal of explosive ordnance, in the UK and overseas. Since our incorporation in 2016 it has been our goal to provide unsurpassed and unbiased UXO risk mitigation services. Brimstone is a client-centric organisation, with the aim to provide the client the services they need, to the agreed requirement, in accordance with national and international standards or standard operating procedures.

We are committed to providing a safe, cost-effective, and quality service, underpinned by our core values:

- **Integrity:** We are unwavering in our commitment to providing pristine, unbiased counsel and superior services. Our ethical compass guides every interaction, ensuring we maintain the highest standards of conduct in all our endeavours.
- **Professionalism:** We embody professionalism at every level, conducting our business with unparalleled excellence. Our commitment to quality guarantees top-tier service and a seamless experience for every client.
- **Knowledge:** We are devoted to perpetual growth, consistently expanding our expertise to stay at the forefront of industry innovation and strategy. Our thirst for knowledge ensures we are equipped to lead and succeed in an evolving marketplace.
- **Innovation:** We champion innovation, continuously advancing our services and processes. Our pursuit of inventive strategies and pioneering solutions ensures we not only meet but exceed the evolving needs of our clients and the industry.

We are committed to the applicable requirements of the ISO 9001:2015 standards. We set and review quality monitoring objectives using the plan, do, check, act cycle to measure the performance of our quality management system. Brimstone wholly endorses the ethos of 'continual improvement efforts' and allocates resources to meet this requirement.

This policy applies to the whole of the Brimstone services and involves all personnel including the managing director. All personnel are responsible for helping manage quality, seeking improvement through constant review, and by encouraging supplier and subcontractor involvement. We are committed to achieving customer satisfaction using quality procedures, which will be operated to meet or exceed the applicable requirements of ISO 9001.



Aaron Florence
Founder and Managing Director
Brimstone Site Investigation Ltd.

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1 INTRODUCTION

1.1 Background

E3P (the Client) has commissioned Brimstone to carry out a Stage 2 Detailed Unexploded Ordnance Risk Assessment (DRA) of the proposed redevelopment works at the Glen Dimplex Homes Appliances, Prescott site (the Site).

1.2 Legislation

There are no regulations that specifically govern the UXO risk mitigation industry in the UK. However, there are two pieces of legislation that require consideration. It is industry best practice (and common sense) to frame your site in the context of UXO, and to put in place measures to protect people from risks. In 2009, CIRIA published Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681. This publication, though not legally binding, provides the gold-standard framework to which UXO and construction companies operate.

1.2.1 Construction Design and Management Regulations (CDM) 2015

The regulations identify the client, the CDM coordinator, the designer, and the principal contractor as responsible parties. Under the regulations, responsible parties are held accountable for the way a construction project is managed and for the health and safety of workers. Responsible parties must:

- Provide an appropriate assessment of potential UXO risks, or ensure an assessment is completed by another party.
- Put in place appropriate risk mitigation measures if necessary.
- Supply all parties with information relevant to the risks.
- Ensure the preparation of an emergency response plan.

1.2.2 The Health and Safety at Work Act 1974

The Health and Safety at Work Act 1974 had a transformative impact on health and safety, saving thousands of lives since its enactment. Employers must consider their employees, workers not in their employment, and members of the public. The act places a duty on every employer 'as far as is reasonably practicable' to protect workers from risks. It also says that information must be provided about aspects of health and safety that affect their role.

1.3 Commercial Contractor and the Authorities

1.3.1 Commercial Contractors

If your site has been given a moderate or high-risk rating, then control measures will be recommended. The measures will be specific to the scope of works on site, usually in relation to the depth and extent of excavations, piling and similar activities. There are a range of different methods at Brimstone's disposal, including:

- Non-intrusive surveying (including drone surveying)
- Intrusive surveying
- Search and clear
- Watching brief
- Support to geotechnical investigations
- Target investigation
- Site-specific training packages
- Site safety briefings



Our UXO Engineers can assess suspicious items on site when they are found. This will avoid unnecessary site evacuations. If our engineer(s) decide the item is UXO, they will coordinate with the authorities, manage disruptions, and advise on control measures, such as evacuations and a cordon.

1.3.2 UK Authorities

If Brimstone is not on site and a suspicious item is found, the local police must be immediately called on the non-emergency number. Police will visit the site. They will then inform the Joint Services Explosive Ordnance Disposal (JSEOD) office, which will coordinate the callout of an army or navy response team.

A precautionary cordon will initially be put into effect, with possible evacuation of homes and businesses, road and rail closures. The cordon may be extended following the advice from JSEOD's response team.

To manage their resources, JSEOD triages incidents. A consideration of the type, size and location of the UXO is made. If an incident is not given a high priority rating, a team may not be available for up to two days following the initial report.

The use of JSEOD is under the Military Aid to Civil Authorities (MACA) framework, therefore the budget and personnel is limited, and there are no statutory obligations made of the MOD. Often the MOD will recommend involvement of a commercial UXO contractor to manage the ongoing risk – this is especially true of former airfields and training areas where contact with land service ammunition can be frequent.

1.4 UXO Risk in the UK

Fortunately, to the best of our knowledge, there has not been a single post-war incident in the UK where a construction worker has been killed or injured because of an item of UXO exploding. There have been cases in mainland Europe where UXO had been struck and then exploded, killing workers. In 2019, a WWII general purpose bomb spontaneously detonated in a field north of Frankfurt, Germany.

However, the incident in Frankfurt is not comparable to the UK, due to the way different countries manufactured ordnance. Bombs made in different countries have different associated hazards. British WWII bombs, for example, have a fuzing system which uses chemicals which makes them very unsafe. Please see **APPENDIX 1** for recent examples of UK UXO incidents.

Between 2013 and 2016 JSEOD responded to 7,500 callouts. These callouts range from falsely identified objects, inert objects, small items of UXO and large WWII German unexploded bombs (UXBs). Each year the construction industry inadvertently unearths UXO; often this goes unreported. UXO contamination comes from three main sources:

- **Enemy action:** during WWI and WWII the air forces of Germany, and to a lesser extent Italy, bombed targets throughout the UK. The German navy bombarded several coastal targets in eastern England during WWI and then in WWII German long-range artillery on the French coast bombarded parts of Kent.
- **Allied military activity:** during WWI and WWII several Allied nations used the UK as a staging area for military action in the European Theatre; predominantly the US and Canada.
- **UK military activity:** domestic British Army, Royal Air Force (RAF) and Royal Navy (RN) training activities during peacetime and conflict as well as anti-aircraft gun and rocket batteries during WWI and WWII.

1.5 UXO Detonations

A detonation is a violent chemical reaction which creates a huge volume of gas. This reaction appears to happen instantaneously – the velocity of the shockwave moving is up to 9,000m per second. This chemical reaction is started using a small amount of very sensitive explosives called primary explosives. These types of explosives are highly sensitive to shock, friction, heat, and spark. As the explosive charge undergoes high order decomposition (detonation), the brisance, or shattering effect, causes the casing to splinter, projecting razor-sharp shrapnel across long distances.

The blast wave effect and the shrapnel effect can cause significant damage. Calculating safety distances is a complex process. As a rule of thumb, in open ground, a 250kg explosive charge (as would be found inside a typical 500kg bomb) would require an omnidirectional safety distance of at least 1.6km.

Bombs work by amplifying the explosive charge from the sensitive primary explosive through to the main charge or fill of the item. This process is called an explosive train, if any link in that chain is broken, the item will fail to function as intended. This can be due to mechanical, electrical, or manufacturing tolerances or faults. Amongst other reasons, detonation of UXO could occur under the following circumstances:

- **UXO body impact:** A substantial impact onto the main body of a UXO; borehole rigs, piling rigs, jack hammers and mechanical excavator buckets.
- **Fuse impact:** Environmental conditions during decades of burial can result in the primary explosives located in the fuse pocket to crystallise and become shock sensitive. It would then take a relatively small impact or friction impact to cause the fuse to function and detonate the UXO.
- **Re-starting a timer:** A small proportion of German WWII bombs used clockwork fuses. In 2002, an Army EOD Engineer reported that the clockwork fuse in a UXB re-started. Decades of burial causes substantial corrosion in WWII German UXBs and therefore an incident such as this is extremely rare.

2 ASSESSMENT METHODOLOGY

2.1 Introduction

This assessment has been produced in accordance with the relevant CIRIA guidelines; *Unexploded Ordnance (UXO) - A Guide for the Construction Industry C681* (published in 2009). CIRIA C681 is a publication which originated from round table best practice discussions from industry leaders.

2.2 Source, Pathway, Receptor, Consequence Risk Model

The Source, Pathway, Receptor, Consequence (SPRC) risk model can be applied to buried UXO as follows:

- **Sources:** UK and Allied UXO sources include military firing ranges, bases, storage depots, munitions factories, anti-aircraft batteries, amongst others. There are many wartime causes of UXO contamination. The source for enemy contamination is overwhelmingly from WWII German air raids.
- **Pathways:** the pathway describes how the UXO reaches receptors. Usually, UXO is buried and therefore pathways can be any activity which involve breaking ground. Examples include ground investigation works, site enabling works and excavations.
- **Receptors:** receptors are the people, assets and infrastructure that can be adversely affected by UXO exposure. This includes site personnel, plant, equipment, buildings, the general public, and the environment.
- **Consequence:** the consequences of an inadvertent UXO detonation are catastrophic. They include injury and loss of life, as well as damage to property. Fortunately, the likelihood of UXO detonating is low, even when it is uncovered during works. However, another consequence to consider is delays to works, which itself can be a risk.

2.3 Assessment Structure

In accordance with CIRIA C681 this assessment addresses the following considerations in the appropriate order:

- The likelihood that the site was contaminated with UXO.
- The type of UXO that could have contaminated the site, and their associated hazards.
- The likelihood that UXO remains on the site.



- Theoretical bomb penetration depths.
- The likelihood that UXO will be uncovered during the proposed works.
- Risk rating and risk mapping (as appropriate).
- Risk mitigation recommendations.

2.4 Information Sources

To complete this risk assessment, Brimstone has gathered information from a wide range of sources. Brimstone's research team has completed detailed historical research, including access of original archived records. The list below is a general list of information sources that are consulted during the research process. For Site-specific sources consulted for this risk assessment, please refer to **APPENDIX 5**.

- The National Archives,
- Local archive centres,
- Ministry of Defence,
- The Council for British Archaeology,
- Groundsure mapping services,
- Historical aerial photography (Historic England, Britain from Above, NCAP),
- Google open-source mapping,
- The British Geological Survey,
- Open sources; published book, articles, web resources,
- Site-specific information supplied by the Client,
- Brimstone's library and historical database, and
- Brimstone's former armed forces employees.

2.5 As Low as Reasonably Practicable Principle

The ALARP (as low as reasonably practicable) principle corresponds to the actions that should be taken to reduce risks. The term 'ALARP' is in the Health and Safety at Work Act 1974, which says that risks must be controlled in a reasonable way.

Infinite time, effort and money could be spent trying to eliminate risk entirely. HSE uses the example that spending £1m to prevent five employees bruising their knees is disproportionate, whereas spending the same amount to prevent an explosion which could kill 150 people is proportionate.

Using this principle, Brimstone aims to reduce client costs by recommending strategies that are proportionate to the assessed risks, if any elevated risk is found at all.

2.6 Risk Tolerances

The Brimstone risk assessment process divides UXO risk into two tolerances:

- **Tolerable:** Low Risk and Low-Moderate Risk ratings are tolerable. Where the risk cannot be completely discounted, it may be a useful strategy to opt for a low-cost measure, such as a UXO safety briefing from a qualified UXO engineer.
- **Intolerable:** Moderate, Moderate-High, and High-Risk ratings are intolerable. Proactive risk mitigation measures should be put in place. Various strategies are at Brimstone's disposal to meet your project-specific needs.

2.7 Reliance and Limitations

This report has been prepared using published information and information provided by the Client. Brimstone is not liable for any information which has become available following the publication of this report. No third-party liability or duty of care is extended. Any third-party using information contained in this assessment do so at their own risk.

3 THE PROJECT

3.1 The Site

The Site (approximately centred on the National Grid Ref: SJ 47997 91544) is located in Whiston, within the county of Lancashire, approximately 800m north-east of Whiston railway station. The Site is bound to the north by Stoney Lane, to the west by a commercial structure on Stoney Lane, to the south by mature vegetation and a hardstanding car park, and to the west by residential structures and associated garden areas on Cumber Lane.

The majority of the Site comprises the Glen Dimplex appliances factory, a two to three storey industrial structure present in the centre of the Site. A number of smaller structures, between one and two storeys, are present along the western, southern, and south-eastern Site boundaries. The majority of the remainder of the Site comprises hardstanding, with small areas of mature vegetation present in the north and south-east.

FIGURE 1: Site Location Maps

FIGURE 2: Recent Aerial Photograph

3.2 The Proposed Works

SI works are proposed, comprising 15 sonic drilled boreholes, 12 shallow boreholes to between 5-10m bgl, and three deep boreholes into the bedrock to 20m bgl.

At the time of writing, Brimstone was not aware of any proposed development works taking place on Site.

FIGURE 3: Existing Site Plan

4 SITE HISTORY

4.1 Site Introduction

Site-specific history can be assessed by reviewing historical mapping, historical aerial photography and by carrying out additional Site-specific research where appropriate. Below are descriptions of a selection of records relevant to the Site:

4.2 Mapping

The below table describes the composition of the Site, structural changes in pre- and post-WWII Ordnance Survey (OS) editions, and relevant points of interest. All maps were retrieved from National Library Scotland (NLS) online database and the Landmark Promap OS database.

Period	Map Date	Map Scale	Review
Pre-WWI	1845-1847	1:10,560	The majority of the Site comprises open, undeveloped ground, seemingly agricultural in nature. One small structure and a well are present in the south of the Site, with an associated accessway in the west. Two small ponds are recorded in the east and centre of the Site, and multiple tree-lined field boundaries are present throughout.

	1892	1:2,500	The two ponds on Site have been filled in, and a majority of the field boundaries are no longer visible. No other significant changes appear to have taken place on Site.
	1907	1:2,500	No significant changes appear to have taken place on Site.
Pre-WWII	1925	1:10,560	Two large industrial structures have been constructed, which now occupy a majority of the Site. This is labelled as an Iron Foundry. Associated railway lines are present between the two large structures, as well as to the north, south and east of the structures. Additional smaller structures are present in the west and south-west of the Site.
	1937	1:2,500	FIGURE 4.1: An industrial structure, and associated garden area, on the junction between Stoney Lane and Cumber Lane is now present in the north-west of the Site. The two large industrial structures are now labelled Rainhill Stove Works. No other significant changes appear to have taken place on Site.
Post-WWII	1956	1:2,500	FIGURE 4.2: The two large structures forming Rainhill Stove Works have combined into one structure, and a pond has been dug in the south of the Site. One of the railway lines in the south-east of the Site has been removed.

4.3 Photography/Aerial Photography

The below table describes the composition of the Site visible in post-WWII aerial photography, including areas of possible structural clearance, damage and other possible features of note. All photographs were retrieved from Historic England's (HE) Royal Air Force (RAF) Photography Archive.

Period	Photo Date	Review
Pre-WWII	28 th April 1935	FIGURE 5.1: This oblique image, taken in the inter-war period, displays the majority of the Site from the north-west. The composition of the Site matches that displayed in pre-WWII OS mapping, with the large industrial structures occupying a majority of the Site, along railway lines and peripheral areas of open, undeveloped ground. The areas of open ground do not appear to have an obvious purpose and appear to be poorly maintained.

Post-WWII	10 th August 1945	FIGURE 5.2: This vertical image was taken during the final year of WWII, and after the conclusion of the Luftwaffe bombing campaign in Britain. Light coloured roofing can be seen on the eastern half of the large factory on Site, as well as to peripheral structures in the north, west and south. Whilst this could feasibly be the result of repairs due to bomb damage, the roofing has been replaced in an organised fashion, and the design of the roofing has changed. Combined with the lack of recorded bombing in the area, this is considered more likely to have been planned development. No signs of bomb damage, i.e. cratering, are visible to the open ground on Site, although it should be noted the poor ground cover in the undeveloped areas may potentially mask evidence of a bomb / UXB strike.
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4.4 Additional Site-Specific History

Some sites will have been occupied by landmarks or significant buildings historically and in such cases specific written histories including significant wartime details are occasionally available in the public domain. No such information was available.

5 UXO RISK - GERMAN BOMBING

5.1 WWI Bombing History

5.1.1 Britain during WWI

During World War I (WWI), an estimated 9,000 German bombs were dropped on London, Eastern England and South-Eastern England during some 51 Zeppelin airship raids and 52 fixed-wing aircraft raids. London suffered the worst of the bombing with an estimated 250 tonnes of HE and incendiary bombs recorded across the Capital, over half of which fell on the City of London district.

The WWI bombing campaign waged by Germany was on a far smaller scale than the WWII campaign, in terms of the number of raids, the weight of ordnance dropped during each attack and the size of the bombs used. When coupled with the fact that most WWI-bombed locations have since been redeveloped, German WWI UXB finds are extremely rare. Furthermore, most air raids took place during daylight hours and as it was the first time Britain had experienced strategic aerial bombardment, the raids often attracted public interest and even spectators, increasing the chances of any UXBs being reported.

5.1.2 Site Specific

A collection of written reports describing each air raid in the region was reviewed (I. Castle, 2024). No evidence that Prescott was targeted by enemy bombing during WWI was uncovered.

5.2 WWII Bombing History

5.2.1 Merseyside

During WWII, Liverpool was home to the second largest port complex in the UK – the largest west facing port - and a Royal Navy base. As such, its destruction became a primary objective for the Luftwaffe. The city and its long stretch of docks were subjected to a concentrated bombing campaign which resulted in Liverpool becoming the second most heavily bombed area in Britain, behind London. The scale of these raids also led to extensive bomb damage in neighbouring Bootle, Wallasey and Birkenhead.

The first major air raid on Liverpool took place on 28th August 1940. 160 bombers dropped 350 tons of HE bombs, 30 HE parachute mines and 3,000 incendiary bombs. There were 50 raids during the first three months of the Luftwaffe campaign on the city. In September and October, Liverpool was subject to a raid almost every



other night. Most of these were minor, conducted by just a few aircraft; however, several attacks were executed by approximately 300 aircraft and lasted over ten hours.

The Christmas Blitz of 1940 was a series of three consecutive night raids, which were the heaviest attacks so far. Between 20th and 22nd December, 365 people were killed. Another heavy attack, aimed at the docks specifically, on 9th January was the only raid of that month.

Another period of devastation was known as the May Blitz of 1941, consisting of a seven-night bombardment. 500 roads were closed due to damage, over 6,500 homes were completely demolished and a further 190,000 sustained damaged. It involved 681 bombers dropping 870 tonnes of HE bombs and over 112,000 1kg incendiaries, the latter starting numerous fires throughout Merseyside. As a result of this assault, 70 out of 140 berths in Liverpool's docks were put out of action.

The May Blitz marked the end of concentrated raids over Merseyside. A few small-scale attacks followed with the final bombs falling on the night of 10th January 1942, the eightieth air raid over the city.

5.2.2 Site Specific

Luftwaffe target photography indicates that an electrical engineering plant, approximately 1km north-west of the Site, was identified as a primary target. It is possible that the industrial structure on Site provided an easily identifiable target of opportunity.

5.2.3 Bombing Decoy Sites

In mid-1940 bombing decoys were introduced. The decoys used either:

- A system of lighting to simulate an urban area or a military airfield's runway,
- Deliberately started fires to simulate a previously bombed target,
- Dummy buildings and vehicles to simulate a military facility.

792 static decoy sites were built at 593 locations in Britain. They were estimated to have drawn at least 5% of the total weight of bombs away from their intended targets. No decoys were operational within a significant radius of the Site during WWII. The closest was approximately 5.2km to the south-west.

5.3 WWII Bombing Records

5.3.1 Introduction

The bomb census recorded the location and type of bomb strikes to help with intelligence gathering and planning. It was compiled using information recorded by ARP wardens. These records were gathered by the Ministry of Home Security to calculate bombing density within administrative areas.

The bomb census was unreliable in the early stages of the war, though by 1941 procedures had been standardised. The quality of the census records also depended on where in the UK the records were produced. Some records are held at the National Archives and some are held at local borough archives.

Relevant records held at the National Archives and Lancashire Archives were obtained for this risk assessment.

5.3.2 Bombing Density Statistics

The table below records the Ministry of Home Security's bombing density calculation for the Rural District of Whiston. It gives a breakdown of the types of large German bombs reported and is understood to not include UXBs.

Admin Area	Whiston
Area Acreage	29,446
High Explosive Bombs (all types/weights)	274
High Explosive Parachute Mines	3
Flam (Oil) Bombs	3
40kg Phosphorus Incendiary Bombs (IBs)	0
40kg 'Fire Pot' IBs	0
V1 Flying Bomb	0
V2 Long Range Rocket	0
Total (excluding V-Weapons and 1kg / 2kg IBs)	280
Bombs Per 1,000 Acres	9.5

1kg / 2kg incendiary bombs and 2kg anti-personnel (AP) bombs were often too numerous to record accurately and therefore are not included in the above figures.

5.3.3 Original Bomb Plot Mapping

The National Archives holds a collection of provincial Bomb Census maps for Britain. This collection does not include a map covering the study area.

5.3.4 Lancashire ARP Bomb Map

Brimstone has reviewed a county wide bombing incident map for WWII-era Lancashire, held at Lancashire Archives. This small-scale map covers all boroughs / districts throughout the WWII-era county, aside from County Boroughs, and relates to a set of written ARP incident records (discussed in the following section). Each plot point on the map is thought to represent one incident; however, due to the size of the plot points, the precise location of each incident is not discernible from the map alone. The section of the map covering the Site is displayed at **FIGURE 6**.

- Three bombing incidents are plotted within a 1km radius of the Site; the closest of these, labelled number 387, is approximately 50m south-west of the Site.

5.3.5 Lancashire ARP Incident Reports

Brimstone has reviewed a collection of written ARP incident records for WWII-era Lancashire, related to the bomb map discussed above in **Section 5.3.3**, and also held at Lancashire Archives. Details provided include the date, location, type of ordnance dropped and comments on damage and evacuation. It should be noted that due to the small scale of the related map, unless precise locations were given in written form, the exact locations of these incidents cannot be discerned. The three bombing incidents within a 1km radius of the Site are transcribed below.



Incident No.	Date	Bombs	Details
22	30/08/1940	2 x Incendiary	Rainhill, Hospital Farm & Holt Lane. No damage done. <i>Approximately 1km north-east of the Site.</i>
387	23/10/1940	1 x HE UXB	In the Orchard at Royal Oak Farm, south of Dragon Lane. Road closed while clearance takes place. <i>Approximately 230m west of the Site.</i>
412	27/10/1940	1 x UX AA Shell	Whiston, West of Pine Close. <i>Approximately 750m west of the Site.</i>

5.3.6 Lancashire UXB Register

Brimstone has reviewed a collection of written incident records recording the location of UXBs in WWII-era Lancashire, held at Lancashire Archives. These records provide the date, general location and action taken of each incident, but not the type of UXB discovered. However, no records pertaining to UXBs within a significant distance of the Site (<1km) were found.

5.3.7 Abandoned Bomb Register

Due to the overstretched bomb disposal units during WWII, many bombs were intentionally left undisturbed. UXBs were triaged based on where they were and how big they were. If they didn't pose a significant risk, they were 'abandoned'. The locations of these bombs were recorded on the abandoned bomb register.

The abandoned bomb register is a public record document held at the Parliamentary Archives of the House of Commons, from which Brimstone has obtained a copy. The register should not be relied on for completeness or accuracy. The closest abandoned bomb is recorded approximately 440m south-west of the Site.

5.3.8 Secondary Source / Anecdotal Evidence

A search of online resources, as well as a review of local history publications was carried out with the intention of locating any eyewitness accounts of local bombing incidents. However, no such evidence was found. This is particularly significant due to the presence of a large factory on Site. In such locations, large scale bomb damage would typically be well documented. Multiple references to the works during WWII have been identified online¹²³, none of which mention the factory sustaining bomb damage.

¹ <https://www.stoves.co.uk/en-gb/our-heritage>

² <https://portal.ariadneinfrastructure.eu/resource/42eab6d25cdd20060cf6012fd2c590a8e81224785582a986a8c1689b346937f7>

³ <https://archives.knowsley.gov.uk/whiston/history-of-whiston/>

5.4 Likelihood of UXB Contamination

Where detailed bombing records exist, it is possible to predict whether any UXBs could be found on a site. This likelihood is discussed in the following table:

Density of Bombing	
Number of Air Raids in the Vicinity:	A comparison of the bombing incident records confirms that at least two air raids affected the study area (approximate 1km radius).
Intensity of these Air Raids:	All bombs dropped locally were likely part of small-scale opportunistic bombing raids, likely involving solitary aircraft given the small number of bombs dropped.
Bomb Strike Positions	
Closest Bomb Strikes	HE bombs: Approximately 230m west of the Site. 1kg / 2kg IBs: Approximately 1km north-east of the Site.
Alignment of recorded Bomb Strikes:	For districts with a low bombing density, such as that within which the Site was situated, accurate analysis for the alignment of bomb strikes is not always possible. As it has not been possible to identify bomb sticks over the Site, there may have been an occasion during which a UXB (unobserved and unplotted) could have been released over and landed within the Site boundary. For most small IB spreads (covering a wide area) it is impossible to correctly identify the aircraft's flightpath and thus bomb-stick alignment. Furthermore, such bombs were significantly affected by the wind, further hampering analysis.
Bomb Failure Rate	
Evidence to suggest that the generally accepted failure rate of 10% differs in the vicinity of the Site:	None.
UXBs recorded in close proximity to the Site:	Closest plotted UXB strike to the Site is approximately 230m west of the Site.

5.5 Likelihood of Subsequent UXB Detection

A range of circumstances determine whether a UXB strike location would have been identified, during and after the war. This is discussed in the following table. This includes level of access to the Site during WWII, bomb damage, as well as the ground cover during WWII. This is discussed in the following tables.

Historic Access
A UXB falling on a site which was frequently accessed would have had a better chance of being found. ARP Wardens actively searched for UXBs in heavily bombed residential areas. The importance of a site or nearby buildings and infrastructure was also a factor. Many industrial facilities had fire watchers tasked with extinguishing incendiary bombs and reporting UXBs.
As the majority of the air raids in the immediate vicinity likely occurred during the hours of darkness, there is a greater probability that any UXB strike to the Site could have occurred unobserved as residents/ employees were inside. Furthermore, no evidence of fire watchers providing night-time observation in the vicinity was found, although it is entirely possible that Stoves works employed a unit of fire watchers. Nonetheless, these factors decrease the likelihood that any UXB fall would have been witnessed and reported. As the structures on Site do not appear to have been subject to significant bomb damage, it is thought that these would have been subject to at least a degree of access throughout WWII. Even if they had been temporarily evacuated, it is not thought likely that a UXB entry hole would have been overlooked by returning residents/employees. It is also possible that specific post-raid checks for UXBs or DA bombs were carried out to the railway lines on Site, prior to work resuming at the factory. This greatly increases the likelihood of a UXB strike to these areas of the Site being noticed and dealt with at the time. However, the areas of open/undeveloped ground in the northern and southern sections of the Site do not appear to have had an obvious use. Therefore, it is conceivable that these sections were less frequently accessed, although the presence of the factory and railway lines will likely have provided a degree of access / observation to the entire Site. The residential structure in the north-east of the Site also appears to have survived the war externally structurally intact, likely also remaining inhabited, and well accessed, throughout.
Bomb Damage
As the bombing campaign continued, damaged areas became vulnerable to unreported UXBs. Bomb site wreckage or soil disturbance at a bomb crater could obscure evidence of a subsequent UXB strike.
Light coloured roofing is visible to the large factory on Site; such repairs can often be indicative of bomb damage occurring. However, due to the lack of recorded bombing in the vicinity of the Site, and the relatively uniform nature of the area of repairs, this is thought likely to have been planned development rather than a result of damage. Furthermore, no evidence of bomb damage was evident in post-WWII aerial photography in the areas of open/undeveloped ground on Site.

Ground Cover Type

A UXB which falls on open field could easily go unnoticed, whereas a UXB dropped on a hard-surfaced car park would have been easily observed.

Any UXB strike to the structures or railway lines on Site would have caused incontrovertible evidence of its incidence as it passed the structures / railway lines and into the ground beneath. The same can be said for the majority of neighbouring structures and roads to the north and west, where (assuming no cratering) a HE UXB entry hole would have been persistent and easily recognisable.

Undeveloped areas were present on-Site during WWII. Aerial photography indicates that these areas were poorly maintained, and it is possible that a UXB strike to these locations could have gone unnoticed, the entry hole obscured by vegetation / shifting environmental conditions and filling in over time.

6 WWII GERMAN BOMBS

6.1 Bombs Dropped on the UK

Nazi Germany used different types of ordnance against the UK for different effects. Some types were designed to cause fires, others for their destructive blast effect and other for their penetration capability. Each type of ordnance was fitted with at least one fuze. For some bombs multiple fuzes were used. Many different types of fuzes were available for use – each with its own set of associated hazards.

Data sheets on those bombs most likely to be encountered today are included at **APPENDIX 2**.

- **HE bombs – moderate NEQ (net explosive quantity):** the most common types of HE bombs dropped were the SC (general purpose - GP) and SD (semi-armour piercing - SAP) series of bombs. The NEQ is between 30-50%. SAP bombs are engineered to attack light fortifications, whereas GP bombs are used in a mixed destructive blast and anti-personnel fragmentation role. 70% of bombs dropped on the UK were the 50kg type.
- **HE bombs – high NEQ:** blast bombs and parachute mines have bodies made of thin steel, allowing for larger HE charges. These were designed to detonate above ground, maximising the blast effect. Parachute mines were weapons slowed by parachutes and designed to detonate without penetrating the ground. Although, in some marshland areas, partially buried parachute mines have been observed. Consequently, it is highly unlikely that any unexploded blast bombs remain buried in the UK today.
- **HE bombs – low NEQ:** The PC series were armour piercing bombs used against heavy fortifications and reinforced bunkers. They were not commonly used over the UK.
- **Small incendiary bombs:** The 1kg and 2kg incendiaries were the most dropped bomb. Up to 620 x 1kg incendiaries could be packed into the largest container unit, which opened at a pre-determined height scattering its payload over a wide area. These small bombs could fully penetrate soft ground due to their small diameter. Variants of the 1kg and 2kg incendiary bombs contained a small HE charge designed for an anti-personnel role, and to increase its incendiary effect.
- **Large incendiary bombs - Thick skinned:** The C50 has a thick body and contained a mixture of incendiary liquids and white phosphorus. Another version of the C50 had a white phosphorus fill. The C50 'firepot' contained thermite incendiary containers (aka firepots) and a small HE charge.
- **Large incendiary bombs - Thin skinned:** The Flam 250 and Flam 500 models had thin steel bodies designed to break up on impact, spreading their oil-incendiary mixture, which was ignited by a small HE charge. Consequently, it is highly unlikely that any unexploded Flam bombs remain buried in the UK today. Their unreliability meant withdrawal from frontline use by January 1941.

- **Submunitions:** The SD2 'butterfly' bomb was a 2kg submunition dropped on several British cities and towns. It contained a 225gram HE charge. SD2s had no ground penetration ability so the vast majority were recovered at the time. However, SD2s are still found across Britain today.
- **V1 flying bombs and V2 rockets:** In the final year of WWII Germany began using pilotless weapons against England. Both V Weapons had 1,000kg HE warheads. Due to their light-body construction, they had no penetration ability, and any impact left a noticeable debris field. As such, there is negligible risk from unexploded V Weapons today.

6.2 Bomb Failures

Records from September 1940 to July 1941 show that an average of 84 UXBs were dropped on civilian targets each day. Around 8% of these were time delay bombs – designed to strike the ground and start a predetermined countdown which could last days.

There is a generally accepted 10% failure rate for WWII German HE bombs. This is estimated from records gathered by bomb disposal units. These statistics do not account for UXBs that went by unnoticed.

Failures can happen for different reasons, including:

- Equipment or human error in arming the bombs before release,
- Failure of a mechanism within the fuze (out of tolerance),
- Jettisoning payloads if the bomber was under attack or crashing, or
- Partially functioned bombs (e.g. cracks in the cast TNT).

6.3 Bomb Ground Penetration

6.3.1 Introduction

Using data gathered during WWII by the Ministry of Home Security, estimations can be made about how deep a bomb is likely to penetrate the ground. Over one thousand incidents were reported by the bomb disposal units to support this research. Further tests were carried out, dropping bombs of different sizes into chalk and measuring the depths they reached. This research is held at the National Archives. The estimates are:

Bomb weight (kg)	Ground Type (m)									
	Sand		Gravel		Chalk		Clay		Sandstone	
	Average	Max.	Average	Max.	Average	Max.	Average	Max.	Average	Max.
50	2.8	7.8	2.8	7.8	3.5	7.7	4.0	9.1	2.7	6.0
250	4.8	13.7	4.8	13.7	6.0	13.1	6.8	15.8	4.6	10.4
500	6.0	17.3	6.0	17.3	7.6	16.4	8.7	19.8	5.8	13.1
1,000	7.6	21.9	7.6	21.9	9.6	20.7	10.9	24.9	7.3	16.5

Different layers of geology affect penetration depths. For example, 1m of made ground, then 1m of gravel before reaching clay – as is many areas of London – is not easily calculated from the data above.

When calculating how deep a bomb could have reached, we must make three assumptions:

- **Impact velocity:** German bombing raids were carried out at altitudes in excess of 5,000m. The velocity of impact is roughly 313ms^{-1} (not accounting for resistance). It is the same velocity regardless of mass.
- **Impact angle:** strike angles of 10 to 15 degrees to the vertical. It must be assumed that the bomb was stable at the moment of ground penetration.



- **Bomb design:** Some larger German bombs were occasionally fitted with ‘kopfrings’ - a metal ring, triangular in cross section, fitted around the nose of the bomb to help prevent penetration. It must be assumed that no ‘kopfrings’ were fitted.

6.3.2 The J-Curve Effect

During WWII, Bomb Disposal Units (BDUs) reported that most buried UXBs were found horizontal or upturned. This observation confirmed the ‘J-curve effect’. As an HE bomb penetrates the ground, slightly offset from the vertical, its passage underground creates a ‘J’ shape.

This is relevant because the J-curve effect results in a horizontal offset between the buried UXB and its point of entry. This distance is estimated to be one third of the theoretical penetration depth. A low altitude attack, meaning a low impact angle, could produce an even greater offset, of up to 15m.

6.3.3 Site Specific Geology

BGS Mapping	Superficial Deposits: Till, Devensian (Diamicton)	Bedrock Deposits: Kinnerton Sandstone Formation (Sandstone)
SI Data	Recent SI borehole logs on Site have been provided by the client. This SI (June 2024) encountered the following ground conditions: - 2.70m of made ground - 6.00m of sandy clay - 0.39m of bedrock (sandstone)	

6.3.4 Site Specific Maximum Bomb Penetration Depth

During WWII, the Luftwaffe dropped many different types of HE bomb. The SC (general purpose) series was by far the most numerous and of this series, the SC 500 model (weighing 500kg) was the largest of the most commonly deployed and therefore this will be used as the benchmark weapon for the Site-specific bomb penetration depth calculations.

In order to calculate the most likely maximum depth to which a bomb would penetrate, Brimstone has taken the average of the average and maximum figures for the predominant Site-specific geology (clay, sand and sandstone) in the table above. This gives a likely maximum bomb penetration depth of 11.80m below WWII ground level for a 500kg bomb.

However, any UXB striking the structures on Site will have first passed through multiple storeys. This will have caused the bomb to lose kinetic energy prior to ground penetration. Furthermore, in each of the borehole logs, made ground was encountered at very shallow (<1m bgl) depths, and bedrock was encountered at varying depths (between 4 - 9.37m bgl) across the Site. These factors indicate that sections of the Site will have had a maximum bomb penetration depth significantly shallower than 11.80m bgl. However, the combination of these actors makes calculating an accurate depth impossible.

Note, the Ministry of Home Security data indicates that the maximum bomb penetration depth could be down to 19.8m for a 500kg bomb, or 24.9m for a 1,000kg bomb; however, in line with the ALARP principle, it is not considered to be a likely scenario that a bomb would penetrate so deeply. Furthermore, while evidence indicates that a 1800kg HE bomb could penetrate to over 30m, these types of bombs were not dropped frequently. For example, War Office statistics confirm that between October 1940 and May 1941 the majority of HE UXBs (>90%) were either 50kg or 250kg, with the 500kg bombs making up most of the remaining 10%.

7 UXO RISK - BRITISH/ALLIED ACTIVITY

7.1 Introduction

The table below lists potential sources of UXO (excluding enemy action). Those which are potentially relevant to the Site are discussed in the subsequent section(s).

Potential UXO Source	Potentially Significant
Army or RAF training areas / ranges	✗
Military bases and other installations	✗
Munitions and explosives factories	✗
Military storage depots	✗
Defensive fortifications	✗
Wartime site requisitions	✗
WWII defensive mining (landmines)	✗
WWII Home Guard activity	✗
Wartime anti-aircraft fire	✓

7.2 Potential Sources of UXO

7.2.1 Introduction

Research suggests that the large industrial structure in the centre of the Site was initially constructed for aid in the production of munitions, and again was requisitioned to support the war effort during WWII. Potential sources of historic UXO contamination are discussed below.

7.2.2 Munitions Factory

Anecdotal evidence, within client provided information, Merseyside HER⁴ and a history of Stoves⁵, indicate that the Rainhill factory Site was initially developed for the production of WWI-era munitions, and that during WWII the factory was once again requisitioned to assist in the war effort with the production of munitions. However, in each of these sources, no specific details about the types of munitions produced were available, or the nature of the munitions themselves, whether they be ammunition, weapons or associated equipment e.g. ammunition boxes.

It was commonplace for factories to be requisitioned during both world wars to assist in the war effort; however, it is highly unusual for a factory to be used for the construction / filling of live ordnance, with no information regarding the types of shells / weapons available. The vast majority of the munitions produced were constructed and filled at the large National Filling Factories (NFF) during WWI, and Royal Ordnance Factories (ROF) during WWII. All relevant local and national archives have been contacted, as has the Merseyside HER, and no positive evidence to suggest that live ordnance / explosives were ever present on Site could be found. As the production and use of explosives was relatively noteworthy in local communities, it is

⁴ <https://archaeologydataservice.ac.uk/archsearch/record?titleId=3574218>

⁵ <https://www.stoves.co.uk/en-gb/our-heritage>



considered likely that if this occurred in substantial quantities, more information regarding the usage would be available.

Client provided information suggests that the factory may have been used for the production of ammunition boxes. The source of this information was discussions with Site personnel so cannot be verified; however, this is consistent with the Sites historic usage as a sheet metal processing plant and would account for the lack of information available. Furthermore, the Stoves online history indicates that during WWII the factory ‘supported’ the munitions manufacturing effort, potentially suggesting that the munitions themselves were not produced at the factory, and supporting the hypothesis that the factory was used for producing ammunition boxes.

However, had the production of live ordnance taken place on Site, this raises the potential of unwanted / superfluous ordnance to have been disposed of in an improper manner in the open ground on Site. Such an occurrence was not uncommon at ordnance factories, as evidenced by UXO finds throughout the country today, such as at Rotherwas, Herefordshire⁶, where multiple mortars have been encountered within the boundary of the former ROF Rotherwas. Due to the suggestion that the Site may also have been used for the production of ordnance, such an occurrence within the open ground on Site cannot be completely discounted. The only likely locations for this to take place on Site are the areas of open ground with no obvious purpose, which appear poorly maintained in WWII-era photography. It is highly unlikely that any unwanted ordnance could have been disposed of within the footprint of the factory or the railway lines.

7.2.3 WWII Anti-Aircraft Fire

Anti-Aircraft (AA) Command was a British Army command established in 1939 to defend the UK during the anticipated German bombing campaign. It controlled the Territorial Army AA artillery and searchlight units. From 1940 to 1945 BDUs dealt with 7,000 unexploded AA shells in Britain. There were three main types of AA battery used for home defence (see below). Data sheets on these AA defences are included at **APPENDIX 3**.

- **Heavy Anti-Aircraft (HAA):** large-calibre guns (3.7” and 4.5”) for engaging high-altitude bomber formations. Hundreds of permanent batteries were constructed in and around major cities and military bases during the 1930s. Some 2,000 of these guns were available during the Blitz. Each gun could fire between 10 and 20 rounds per minute and consequently HAA batteries could expend large quantities of shells during each engagement.

British time fuses were poorly manufactured during WWII, and this led to high failure rate for HAA shells, up to 30%. Unexploded HAA shells had the potential to land up to 27km from their battery, although more typically landed within a 15km radius.

- **Light Anti-Aircraft (LAA):** smaller calibre guns for engaging dive bombers and low altitude intruders. As such, they were mostly used to defend specific industrial and military targets which were subject to precision bomber attack. LAA guns were either .303” calibre machine guns or 20mm and 40mm calibre cannon. The latter were fitted with simply impact fuses and small incendiary or HE bursting charges.

The 40mm Bofors gun could fire 120 x HE shells / minute to a ceiling of 1,800m. Each shell was designed to self-destruct if it didn’t strike an aircraft, however, inevitably some failed and fell back to earth.

- **Z (Rocket) Batteries:** a Z-Battery comprised a grid formation of 64 rocket projectors which fired 2” and later 3” Unrotated Projectile (UP) rockets to a maximum altitude of 5,800m; a ground range of some 9,000m. They were deployed in cities all around the UK from 1941 and proved to be an effective addition to the existing AA guns.

⁶ <https://zeticauxo.com/news/mortar-shell-found-at-former-ordnance-factory-in-hereford/>

The rockets measured 0.9m (2") and 1.8m (3") in length with four stabilising fins at the base and were fitted with 3.5kg or 8.2kg HE warheads. The larger warhead had an effective airborne blast radius of up to 20m. Some variants deployed a form of aerial mine described as a "small yellow bomb" which was designed to detach from the rocket at height and descend on a parachute with the objective of becoming snagged on target aircraft and then detonating.

Unlike bombs which were designed to strike the ground, AA projectiles and rockets were designed to function in the air. Due to their shape, and centre of gravity they would often not strike the ground nose first. This coupled with the lower mass of AA UXO resulted in shallower ground penetration depths, compared to UXBs. Although, in very soft conditions, unexploded AA projectiles have been found deeper than 1.5m bgl.

20 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. However, Luftwaffe activity was infrequent over the wider area and therefore these guns would not have expended a vast quantity of ammunition. Consequently, it is unlikely (although still possible) that an unexploded AA shell struck the Site, potentially penetrating to a shallow depth within the areas of open ground on Site.

8 UXO RISK MITIGATING CIRCUMSTANCES

8.1 Introduction

Works on a UXO contaminated site could result in the partial or complete removal of UXO risk. Construction or earthworks may have uncovered any UXO contamination, which would then have been reported and removed by the authorities. A site may have been subject to an explosive ordnance clearance (EOC) task conducted by the armed forces. EOC tasks involve surveying, subsequent target investigation and removal of UXO. Although the effectiveness of historic EOC tasks will have often been unsatisfactory.

8.2 Explosive Ordnance Clearance Tasks

The division of EOC tasks has been complex throughout British military history. It used to be the case that anything under the water level would be dealt with by navy units, and anything on land would be dealt with by army units. In recent years, RAF Explosive Ordnance Disposal (EOD) capability has been discontinued, and now only the Royal Navy and the British Army have EOD units. In the army, the Royal Logistics Corps and Royal Engineer EOD units have been amalgamated to form 29 EOD & Search Group. Often taskings are assigned to either the naval or army elements based on where in the country the threat is and the nature of the threat.

Brimstone has access to a database of historic EOC tasks. This database is only complete up until the early 2000s and therefore does not include recent EOC tasks. No such database for the RAF and Royal Navy EOD units is easily accessible. A search of this database has not resulted in any Army EOC tasks in the vicinity of the Site.

UXO encounters on civilian land are often reported in the media and therefore a web search of local media outlets was also carried out. No recent incidents within close proximity to the Site were identified.

8.3 Ground Works

By 1999, the factory had been extended slightly, and small ancillary structures had been constructed along the southern and western Site boundaries, with an additional structure present in the south-east. The railway lines had been removed, and the entire eastern extent of the Site had been paved over to form a hardstanding car park.

It is likely that the extension to the main factory, and the construction of the ancillary structures, have disturbed ground to shallow (1-2m bgl) depths. The removal of railway lines and the laying of hardstanding on previously undeveloped ground has likely disturbed soil to a very shallow (<1m bgl) depth.



SI works have been completed on Site, all of which disturbed ground to a deep (>2m bgl) depth. These consisted of 12 shallow window sample boreholes to 5m bgl, two cable percussive boreholes to 10m bgl and two rotary open boreholes to 20m bgl.

8.4 Deductions

The risk associated with any deep buried German UXBs will likely have been mitigated in the locations of deep excavations throughout the Site, outside the footprint of the factory. The risk associated with any very shallow or shallow buried Allied UXO will have been mitigated with the clearing of pre-WWII structures / railway lines, the construction of additional structures / extensions and the subsequent laying of hardstanding on previously undeveloped ground.

Please note, the risk of a UXO encounter can be considered mitigated in the exact locations and down to the exact depths of any post-WWII intrusive works.

9 CONCLUSION

9.1 Accuracy of Historical Records

Occasionally, the accuracy of some historical records can prove to be poor when compared with other sources of information. One significant consequence of this can be the possibility of unrecorded German bomb strikes in the study area. No such inconsistencies were noted within the records consulted for this report.

9.2 The Risk of UXO Contamination on Site

9.2.1 Key Findings – German UXO Risk

- During WWII, the Site was located within the Rural District of Whiston, which experienced 9.5 bombs / 1,000 acres, a low bombing density. A large electrical engineering plant, approximately 1km north-west of the Site, was identified as a primary target by the Luftwaffe. It is also entirely possible that the industrial structure on Site provided an easily identifiable target of opportunity.
- County wide records covering Lancashire were consulted, and only three bombing incidents within a 1km radius of the Site were identified, accounting for two incendiary bombs, one unexploded high explosive bomb, and one unexploded anti-aircraft shell. The closest of these incidents, the HE UXB, occurred approximately 230m south-west of the Site. No anecdotal evidence suggesting the factory sustained significant bomb damage could be found; substantial damage to factories is typically well documented in online sources / histories.
- Furthermore, no evidence of significant bomb damage is visible on Site in post-WWII aerial photography. Light coloured roofing is visible to the large structure on Site; whilst this could feasibly be the result of repairs due to bomb damage, the roofing has been replaced in an organised fashion, and the design of the roofing has changed. Combined with the lack of recorded bombing in the area, this is considered more likely to have been planned redevelopment. Had this been the result of bomb damage, it is still thought likely that a UXB entry hole to the hardstanding floor of the factory beneath would have been instantly recognisable. No cratering is visible to the open ground on Site; however, these areas do appear poorly maintained, potentially masking evidence of bomb damage.
- In addition, the Site is considered likely to have experienced a frequent level of access throughout WWII. The factory on Site likely remained in use throughout and may have employed a team of fire watchers / ARP personnel responsible for recording and reporting bombing incidents. It is also possible that specific post-raid checks took place for unexploded / delayed action bombs, to ensure work at the factory could continue safely. This is especially pertinent in the areas occupied by railway tracks, which were often earmarked for such checks.



- However, areas of open, undeveloped ground are present around the periphery of the factory, particularly in the north, south and between the railway lines in the east. These areas appear poorly maintained in post-WWII aerial photography, and it cannot be assumed that these areas experienced a frequent level of access throughout WWII. It is therefore more likely that a UXB strike to these areas could potentially have occurred unrecorded as opposed to the areas of the Site occupied by structures / infrastructure. However, given the lack of bombing recorded in the Site area, this is not considered a significantly likely scenario.
- In summary, no evidence of the Site being affected by German bombing has been found. The Site is also anticipated to have experienced a high level of access and monitor, provided by employees of the factory on Site, which appears to have been active throughout WWII. It is therefore considered unlikely that a UXB could have landed on Site unnoticed and unrecorded. As such, a **Low Risk** from German UXBs has been assessed on Site.

9.2.2 Key Findings - British UXO Risk

- Evidence has been found to suggest that the factory on Site was utilised for the production of munitions during both WWI and WWII. However, no specific evidence detailing this activity or the types of munitions produced could be found during the production of this assessment. The production / use of live explosives was typically well documented, and it would be highly unusual for this to have occurred undocumented. Client provided information suggests that the factory may have been used for the production of ammunition boxes. The source of this information was discussions with Site personnel and therefore cannot be verified; however, this is consistent with the Site's historic usage as a sheet metal processing plant and would account for the lack of information available.
- However, had the factory been utilised for the production of ordnance, there is the potential for any unwanted / superfluous items to be disposed of in nearby open ground. Such an occurrence was not uncommon at facilities used for the production of ordnance, such as ROF Rotherwas in Herefordshire, where mortar shells have been encountered on multiple occasions.⁷ Areas of poorly maintained open ground were present in the north, south and east of the Site. It cannot be completely discounted that the disposal of potential ordnance present at the factory took place in these areas, given the lack of conclusive information available. However, in line with the ALARP principle, no specific evidence of this occurring, or of ordnance ever being present at the factory, has been found, and as such a **Low-Moderate Risk** from Allied UXO has been assessed.
- It should be noted that Allied UXO is typically encountered at very shallow (<1m bgl) and shallow (1-2m bgl) depths. Therefore, the risk can be considered mitigated within any ground which has been disturbed to these depths post-WWII.
- 20 permanent HAA batteries were active within range of the Site during WWII. LAA guns likely defended vulnerable points within the borough. Luftwaffe activity was infrequent over the wider area and therefore these guns would not have expended a vast quantity of ammunition. Consequently, it is unlikely (although still possible) that an unexploded AA shell struck the Site, potentially penetrating to a shallow depth within the areas of open ground on Site. Given the lack of Luftwaffe activity in the area, this risk is considered analogous with that of German UXBs, and a **Low Risk** has been assessed.

9.3 Site-Specific UXO Hazards

Different types of UXO pose differing types of hazard, depending on their structural design, Net Explosive Quantity (NEQ), fill type and likely contamination depth. The table below lists the main types of UXO most often encountered on urban UK sites and their relative hazard levels.

⁷ <https://www.herefordtimes.com/news/18134013.bomb-squad-called-hereford-industrial-estate/>



UXO Type	NEQ (NEQ Range)	Likely Burial Depth	Hazard Posed
WWII German General Purpose HE Bombs	25kg - 220kg (most commonly deployed bomb weights)	Deep burial (>2m)	HIGH
WWII British Heavy Anti-Aircraft Shells (HAA Shells)	1.1kg - 1.7kg	Shallow burial (1-2m)	MODERATE-HIGH
WWII British Land Service Ammunition (LSA)	<2kg	Shallow burial (1-2m)	
WWII German 2kg Incendiary / HE Bombs (IBs)	680g incendiary hazard + ~500g explosive hazard	Shallow burial (1-2m)	
WWII German 1kg IBs	680g (incendiary, not explosive hazard)	Shallow burial (1-2m)	MODERATE
WWII British Light Anti-Aircraft Shells (LAA Shells)	4g - 70g	Very shallow burial (<1m)	LOW-MODERATE
Small Arms Ammunition (SAA)	<1g	Very shallow burial (<1m)	LOW
Inert/Practice Item	0g	Very shallow burial (<1m)	

9.4 The Likelihood of UXO Encounter

9.4.1 Introduction

This report assesses the risk of UXO in relation to the proposed works, not simply the risk that UXO remains buried on Site. The likelihood of UXO encounter during intrusive ground works will vary depending on the type of UXO and the type of construction methods employed during the project. With increased soil disturbance i.e. more excavations, the likelihood of encountering UXO increases.

Within an area of elevated UXO contamination likelihood, the sub-surface volume of potential UXO contamination will comprise the natural soil / geology in between WWII ground level and the maximum bomb penetration depth. Therefore, any intrusions into this layer will be at risk of UXO encounter.

Any post-WWII fill material deposited on a site is unlikely to be contaminated with UXO and therefore the risk of encountering UXO on such a site could vary with depth.

In the wake of the initial nine-month Blitz, many cities and towns were left with vast quantities of bomb site rubble that required removal and relocation. This material was put to use for in a variety of ways, for example >750,000 tons of London's rubble was used to build runways for new RAF and USAAF airfields and much of Liverpool's rubble was used to create and maintain sea / flood defences throughout Merseyside.

It is quite possible that unexploded British AA projectiles and German 1kg incendiaries were overlooked during removal, resulting in UXO contaminated fill material ending up on otherwise low UXO risk sites, possibly many miles from any high bombing density areas.

9.4.2 German UXBs

Although most German UXBs came to rest several metres below WWII ground level, these weapons can be found at any level between just below WWII ground level and the maximum bomb penetration depth. There are a number of reasons why these heavy bombs might be found at surprisingly shallow depths.



- **Tip and run:** When enemy aircraft had to take evasive action to escape RAF fighter intercepts or AA defences, they often dropped their bomb loads from a reduced height, potentially resulting in extreme J-curve effect.
- **Deflection:** the shape of German bomb nose sections meant they were susceptible to deflection when striking surface or shallow sub-surface obstacles, occasionally resulting in shallow burial or even UXBs skidding across hardstanding.
- **Aircraft Crash Site:** if an aircraft was unable to dump its bomb load before impacting the ground, due to mechanical fault, any externally fitted bombs could have become buried on impact.

German 1kg / 2kg incendiaries were cylindrical and approximately 50mm in diameter. They had tail sections, and so landed nose first. Within soft ground this could result in full penetration of the bomb below the surface. Such UXBs are usually found close to the surface.

9.4.3 British / Allied UXO

The nature of British/Allied military activity involving LSA and SAA and the smaller size of these munitions (in relation to German HE bombs) indicates that any resulting UXO contamination on a site will be limited to shallow depths, usually within 1.5m of the surface, notwithstanding added material to raise the ground level.

Domestic military LSA and SAA contamination will either be the result of expending blinds (dud ammunition) which bury into the ground on impact or munitions purposefully buried, for a number of reasons. Either way, these types of UXO are all found at shallow depth.

9.4.4 Deductions

A slightly elevated likelihood of UXO contamination (British) and likelihood of that UXO remaining up to the present day has been identified across sections of the Site. Therefore, it is conceivable that proposed works within the Low-Moderate Risk zone could be exposed to a UXO encounter, although this is not considered to be a significant possibility.

10 OVERALL RISK RATING

Ratings for the likelihood of UXO contaminating the Site, remaining within the Site up to the present day and being encountered during the proposed works, inform the overall risk rating. Please refer to the UXO hazard table presented in **Section 9.3** for a breakdown of the most common hazards and their associated risk. The colour of each respective type of hazard indicates the associated risk, as defined within the aforementioned table. The UXO risk to the proposed works varies. Areas of **Low Risk** and **Low-Moderate Risk** have been identified. These are displayed on a Risk Map at **FIGURE 7**, and in the table below.

Risk Table					
Risk Zone	UXO Type (Hazard)	Likelihood of UXO Contamination	Likelihood of UXO Remaining	Likelihood of UXO Encounter	Overall Risk Rating
Low	WWII German GP HE Bombs	Low	n/a		LOW
	HAA Shells	Low	n/a		
	LSA	Low	n/a		
	German 2kg IBs	Low	n/a		
	German 1kg IBs	Low	n/a		
	LAA Shells	Low	n/a		
	SAA	Low	n/a		
Low-Moderate	WWII German GP HE Bombs	Low	n/a		LOW
	HAA Shells	Low	n/a		
	LSA	Low-Moderate	Low-Moderate	Moderate	LOW-MODERATE
	German 2kg IBs	Low	n/a		LOW
	German 1kg IBs	Low	n/a		
	LAA Shells	Low	n/a		
	SAA	Low	n/a		



11 RISK MITIGATION RECOMMENDATIONS

Brimstone has not identified an elevated UXO risk to the proposed works. The measures detailed below are recommended to mitigate the risk to ALARP level.

Risk Mitigation Measure	Recommendation
UXO Safety Awareness Briefings: To all personnel conducting intrusive works on Site. An essential part of the Health & Safety Plan for a site. Conforms to the requirements of CDM2015.	Prior to all intrusive works commencing.

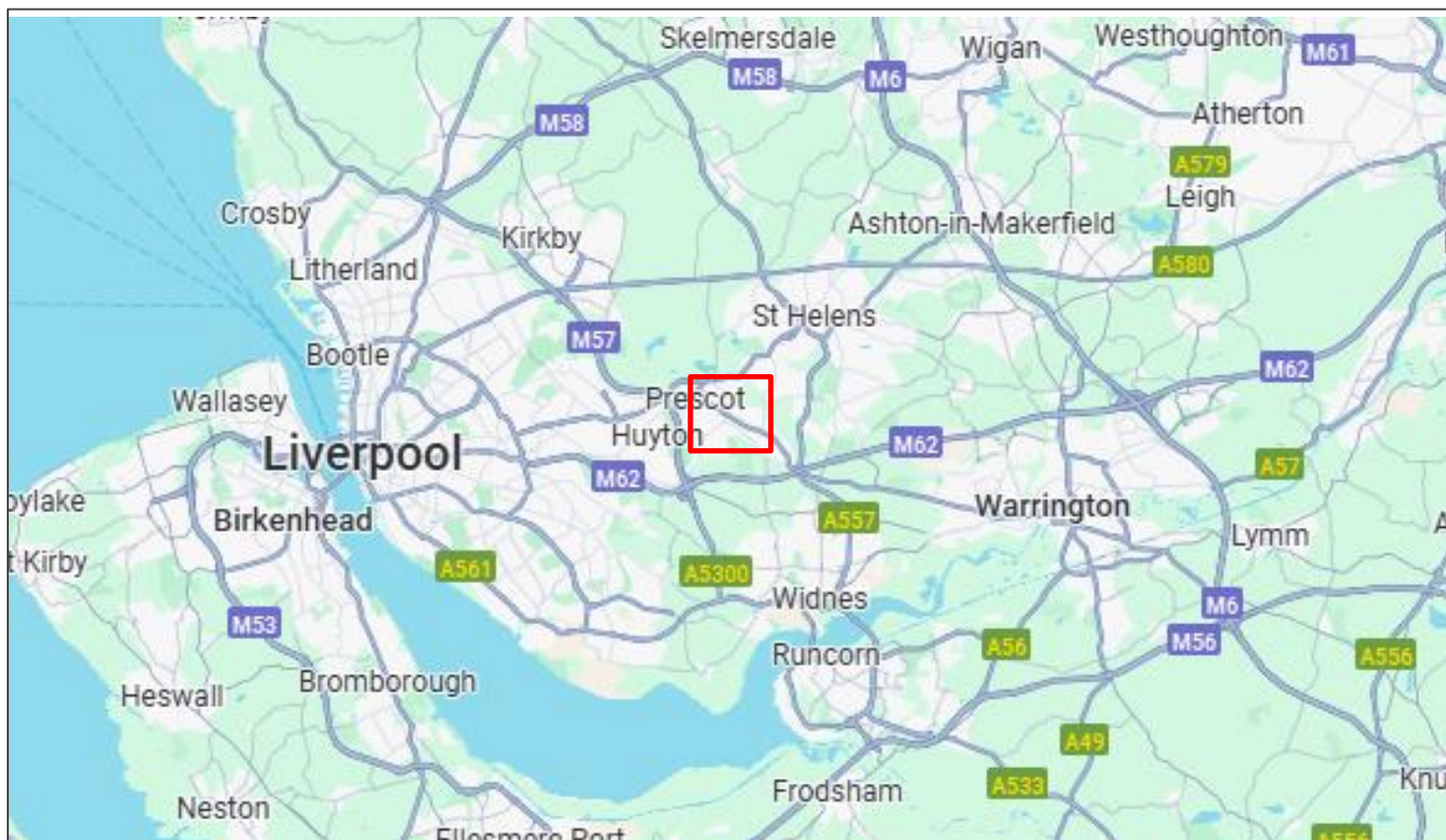
FIGURES: 1 - 7



Title:

Site Location Maps

FIGURE: 1



Project: Glen Dimplex Homes Appliances, Prescot

Client: E3P

Report Ref: DRA-24-1792

General Site Location:  Info Source: Google (open-source)



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Maldstone Road
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Title:

Recent Aerial Photograph

FIGURE: 2



Project:

Glen Dimplex Homes Appliances, Prescot

Client:

E3P

Report Ref:

DRA-24-1792

Approx. Site Boundary: 

Info Source:

Google (open-source)



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Title:

Existing Site Plan

FIGURE: 3



Project:	Glen Dimplex Homes Appliances, Prescott		
Client:		E3P	
Report Ref:		DRA-24-1792	
Site Boundary:		Info Source:	E3P

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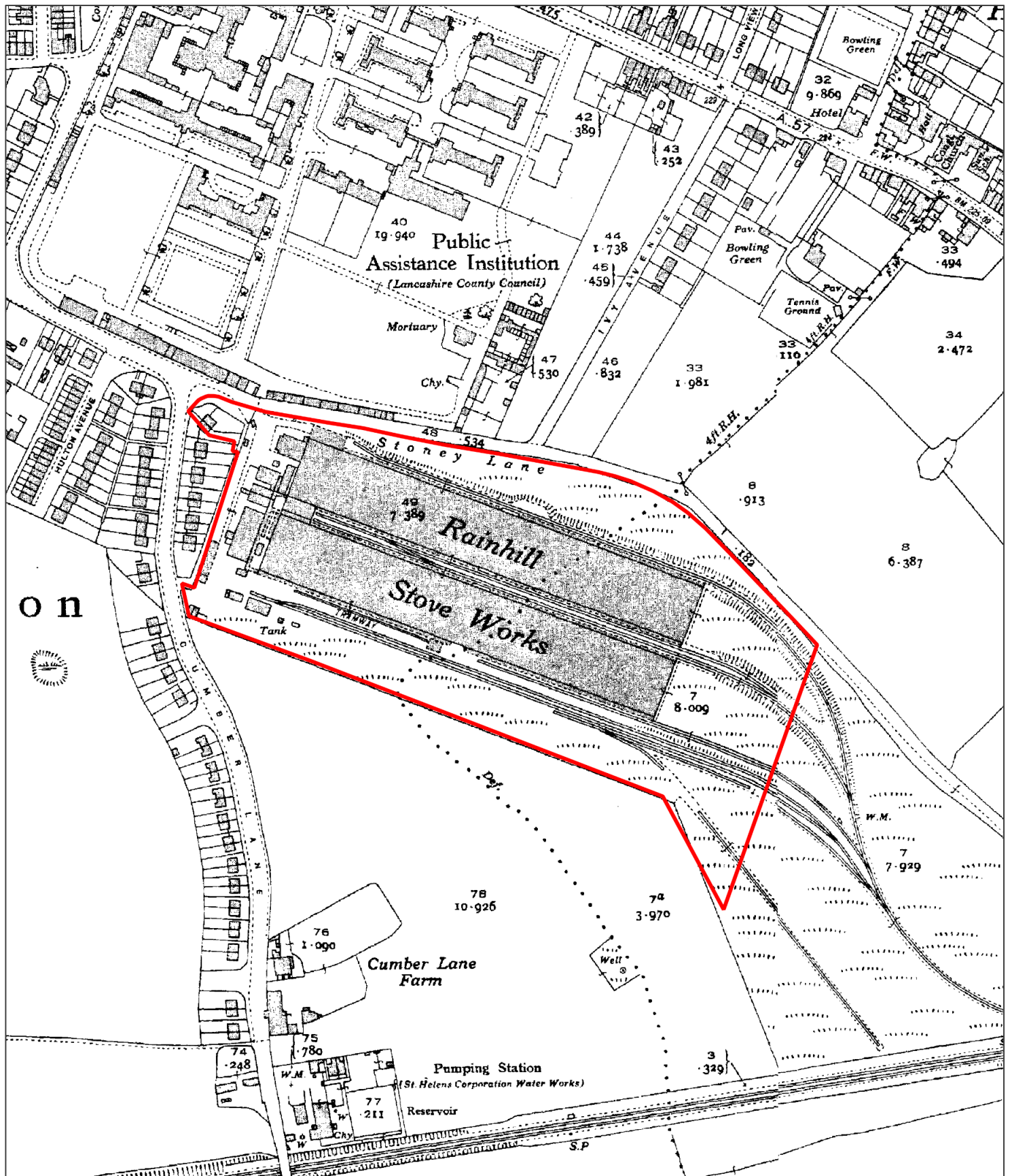
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Title:

Historical OS Mapping - 1937

FIGURE: 4.1



Project: Glen Dimplex Homes Appliances, Prescott

Client: E3P

Report Ref: DRA-24-1792

Approx. Site Boundary: — Info Source: Promaps



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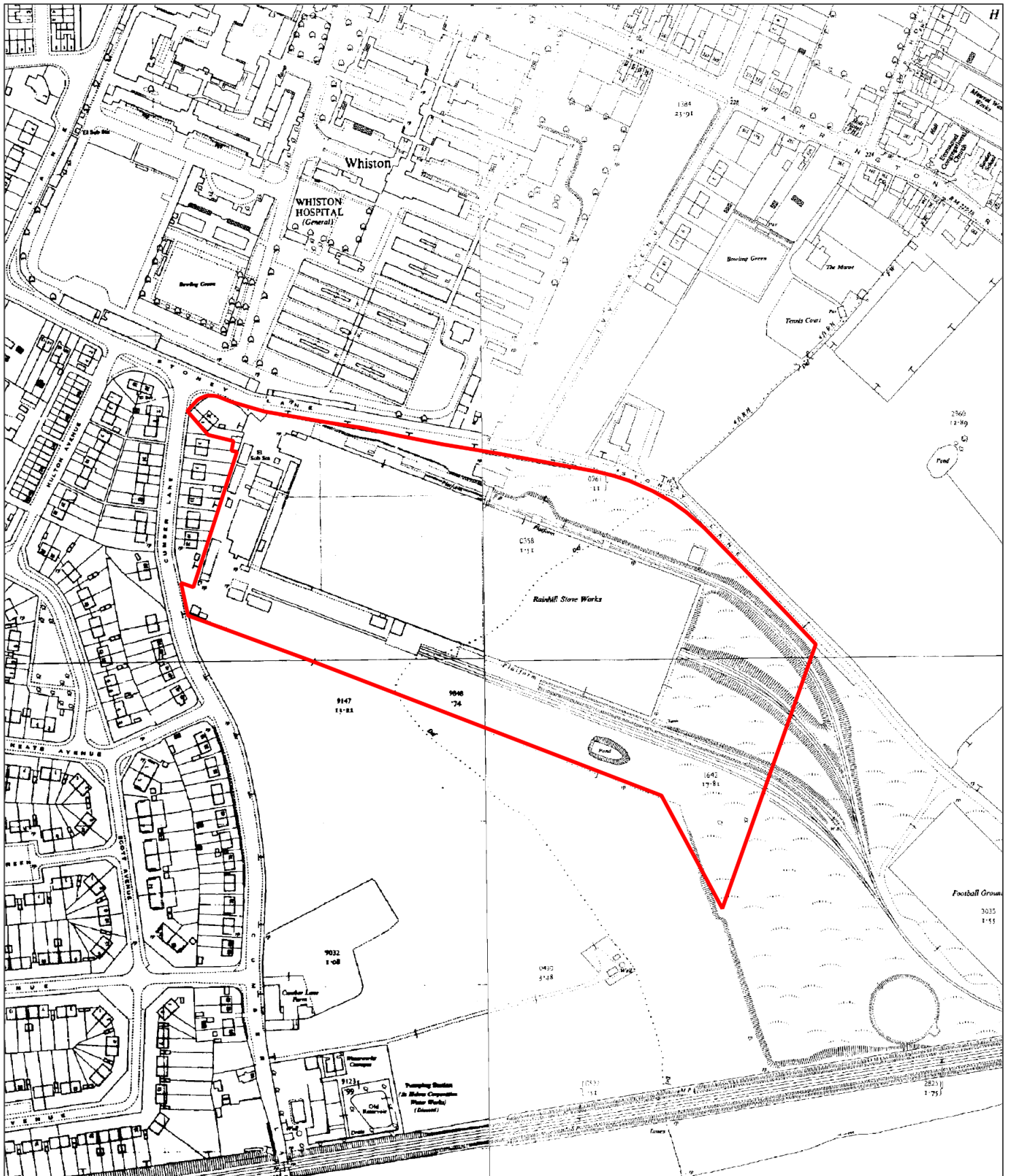
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Title:

Historical OS Mapping - 1956

FIGURE: 4.2



Project: Glen Dimplex Homes Appliances, Prescott

Client: E3P

Report Ref: DRA-24-1792

Approx. Site Boundary:  Info Source: Promaps



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Title:

Historical Aerial Photography – 28th April 1935

FIGURE: 5.1



Project:	Glen Dimplex Homes Appliances, Prescot		
Client:			E3P
Report Ref:			DRA-24-1792
Partial Site Boundary:		Info Source:	Britain from Above

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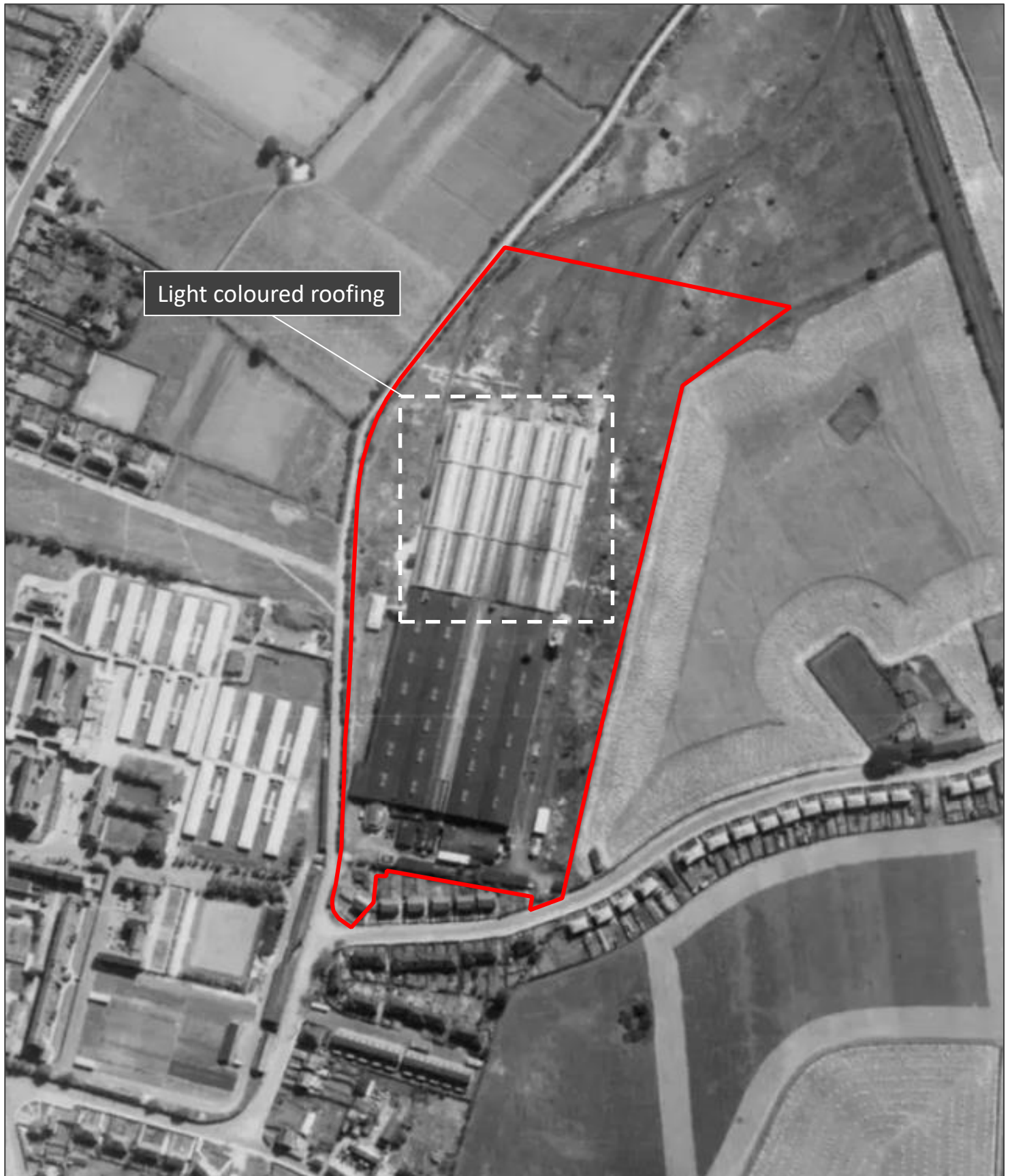
 enquire@brimstoneuxo.com



Title:

Historical Aerial Photography – 10th August 1945

FIGURE: 5.2



Project:	Glen Dimplex Homes Appliances, Prescot		
Client:	E3P		
Report Ref:	DRA-24-1792		
Approx. Site Boundary: 	Info Source:	Historic England	

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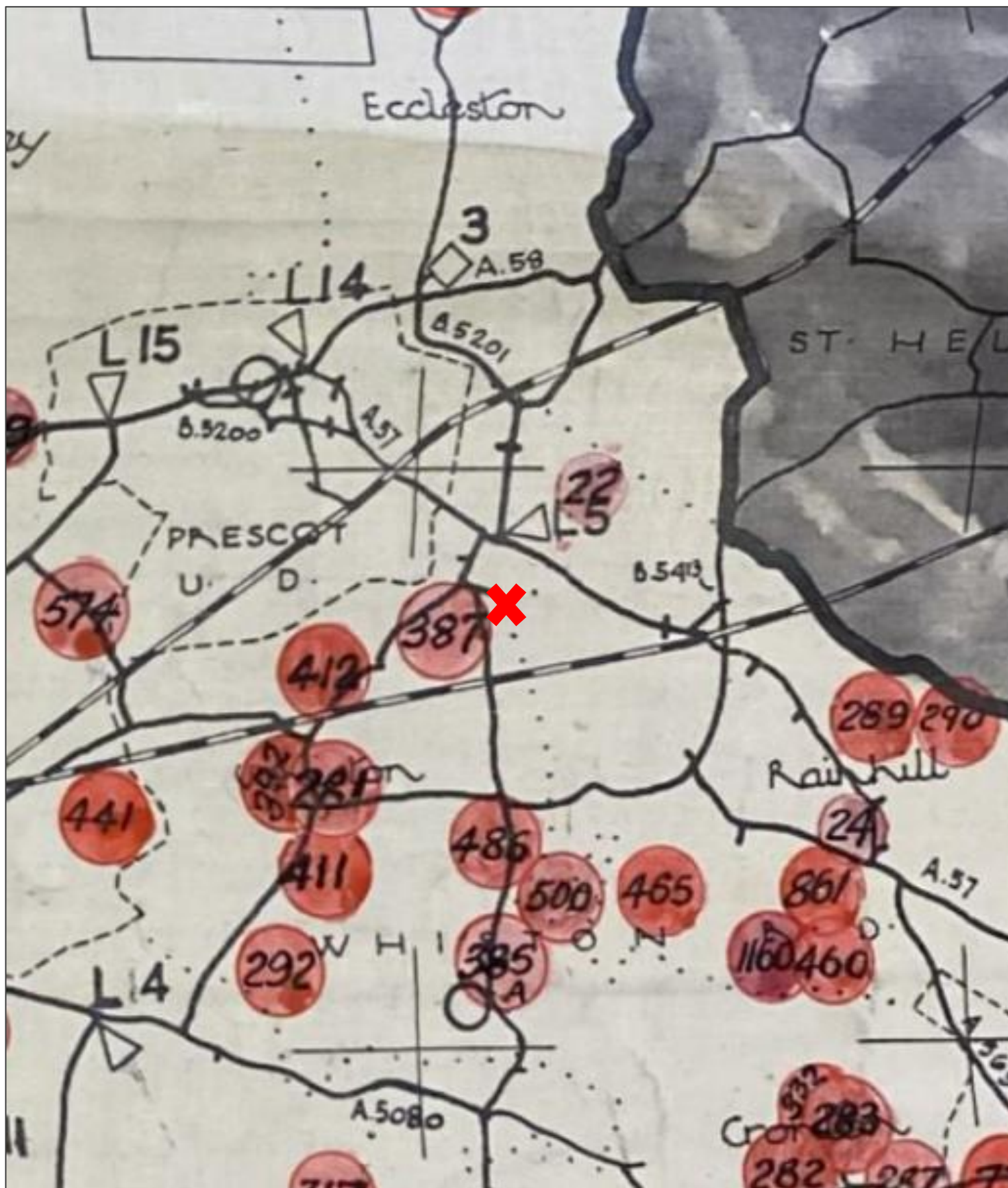
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Title:

Lancashire ARP Bomb Map

FIGURE: 6



Project: Glen Dimplex Homes Appliances, Prescott

Client: E3P

Report Ref: DRA-24-1792

Approx. Site Location: 

Info Source: Lancashire Archives



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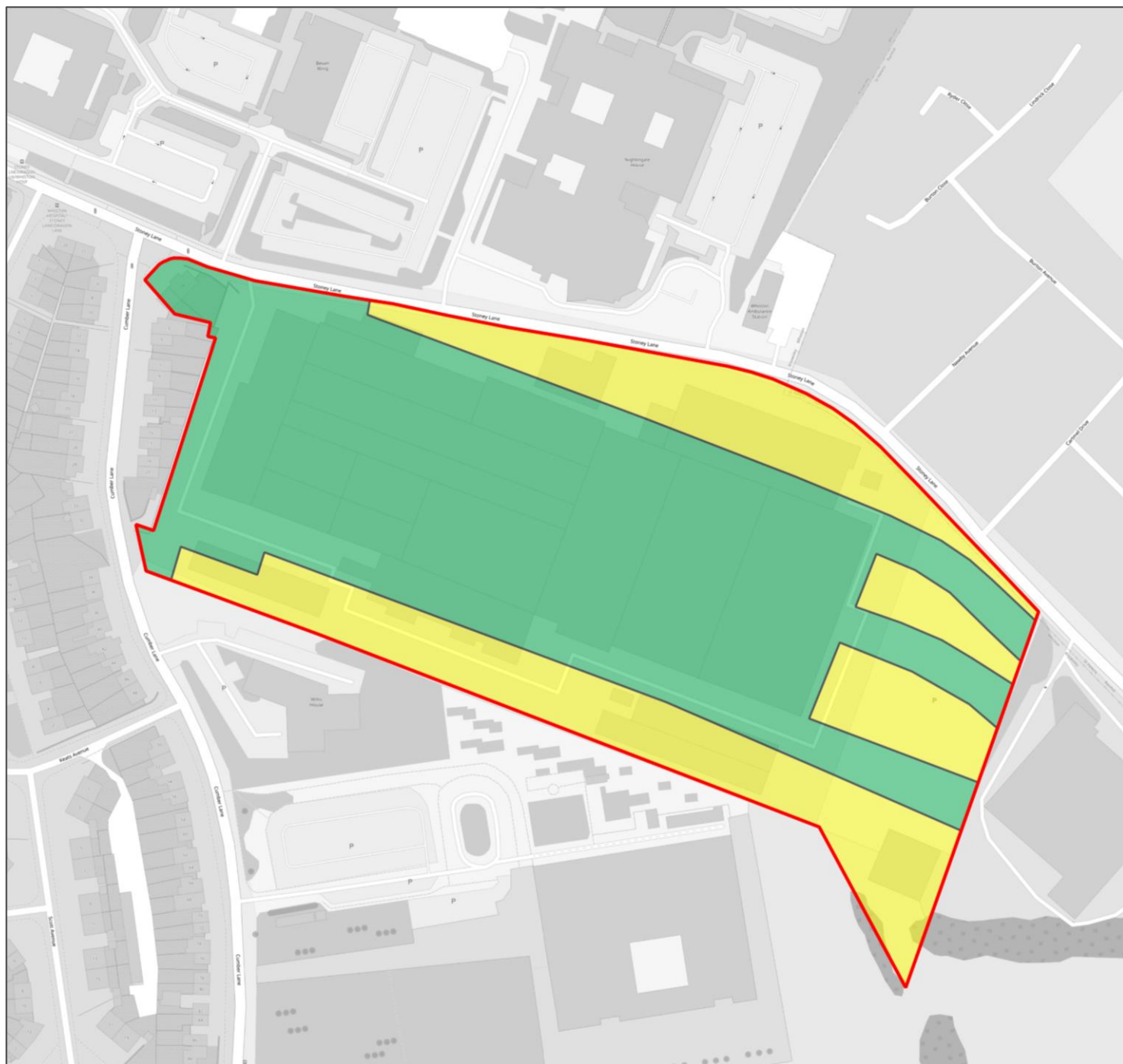
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Title:

Risk Map

FIGURE: 7.1



LOW RISK: Low likelihood of German and British UXO remaining here.

LOW-MODERATE RISK: Slightly elevated likelihood of British UXO remaining here.

Project: Glen Dimplex Homes Appliances, Prescot

Client: E3P

Report Ref: DRA-24-1792

Approx. Site Boundary:  Info Source: Brimstone



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Title:

Risk Map

FIGURE: 7.2



LOW RISK: Low likelihood of German and British UXO remaining here.

LOW-MODERATE RISK: Slightly elevated likelihood of British UXO remaining here.

Project: Glen Dimplex Homes Appliances, Prescot

Client: E3P

Report Ref: DRA-24-1792

Approx. Site Boundary:  Info Source: Brimstone



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APPENDICES: 1 - 5



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Recent German UXB Finds in the UK + Historical Analysis

The Ministry of Defence (MOD) says that bomb disposal teams around the UK deal with approximately 60 German WWII-era UXBs per year.

- **20th February 2024** – An SC500 (standard 500kg HE bomb) was found during shallow excavations in a residential garden in Keyham, Plymouth. *Historical Analysis: The UXB landed in a small residential back garden belonging to an undamaged terraced house. It came to rest at approximately 1 to 2m bgl.*
- **10th February 2023** – An SC250 (standard 250kg HE bomb) was dredged out of the River Yare in Great Yarmouth. The UXB detonated unexpectedly in situ during an attempt to disarm it. *Historical Analysis: The UXB landed in the River Yare; the precise location of its initial impact is unknown. UXBs in water are often affected by migration, whereby the item can travel along the riverbed.*
- **26th February 2021** – An SC1000 (standard 1,000kg HE bomb) was discovered during shallow excavations in Exeter, adjacent to the University of Exeter. The item was detonated in situ and caused structural damage to nearby properties, leaving some inhabitable. *Historical Analysis: The UXB landed in undeveloped land of no obvious significance. It came to rest at approximately 2 to 3m bgl with its nose facing upwards, highlighting the potential of J-curve occurring.*
- **23rd May 2019** – An SC250 (standard 250kg HE bomb) was found during shallow excavations at a building site in Kingston upon Thames, London. *Historical Analysis: The UXB landed in a small residential back garden belonging to an undamaged terraced house. It came to rest approximately 3 to 4m bgl.*
- **11th February 2018** – An SC500 (standard 500kg bomb) was discovered in George V Dock in London during planned work at London City Airport. *Historical Analysis: George V Dock was identified as a primary target by the Luftwaffe during WWII and was bombed on multiple occasions.*
- **15th May 2017** – An SC250 (standard 250kg HE bomb) was found during shallow excavations at a building site in Aston, Birmingham. *Historical Analysis: The UXB landed in a small back garden belonging to a terraced house, part of a row. It J-Curved under a neighbouring garden and came to rest at just 1.4m bgl. NB: These houses had not sustained bomb damage.*
- **2nd March 2017** – A 250kg HE bomb was found during deep excavations at a building site in Brondesbury Park, London. *Historical Analysis: UXB landed in a large residential back garden. A single storey building was built on top of the UXB post WWII.*

Recent Allied UXB finds in Europe

- **27th June 2024** – A 250kg HE UXB of Allied origin was discovered in a wooded area in Gruenheide (Germany).
- **26th April 2024** – A 500kg American HE UXB was discovered during construction work in Mainz (Germany), nearby the MEWA Arena stadium.
- **3rd April 2024** – A 500kg UXB of Allied origin was discovered during construction work on a shipping channel in Deutz, Cologne (Germany). The device was defused in situ.
- **28th March 2024** – A 500lb American HE UXB was discovered during construction work in Aachen (Germany). The device was defused in situ.
- **11th August 2023** – A 250kg HE UXB of Allied origin was discovered in Lublin (Poland). The device was discovered in an area where an aircraft factory had been located prior to WWII.
- **8th August 2023** – An unexploded “one-tonne shell” (1000kg HE UXB) of anticipated Allied origin was discovered near Dusseldorf city zoo (Germany).
- **5th July 2023** – A UXB of unspecified origin and calibre (alleged to have been Russian but no confirmation) was discovered on a construction site in Hohenschönhausen, Berlin (Germany). The device was defused in situ.
- **17th March 2022** – A farmer ploughing a field discovered a British INC30 (incendiary) bomb, which contained phosphorous, in Viersen (Germany). The plough became embedded in the device, which did not explode.

NB: Domestic UXO finds in the UK are too numerous to list. Between 2006 and 2009, over 15,000 items of British / Allied UXO (excluding small arms ammunition) were found on UK construction sites (CIRIA).

Project: **Glen Dimplex Homes Appliances, Prescott**

Client: **E3P**

Report Ref: **DRA-24-1792**

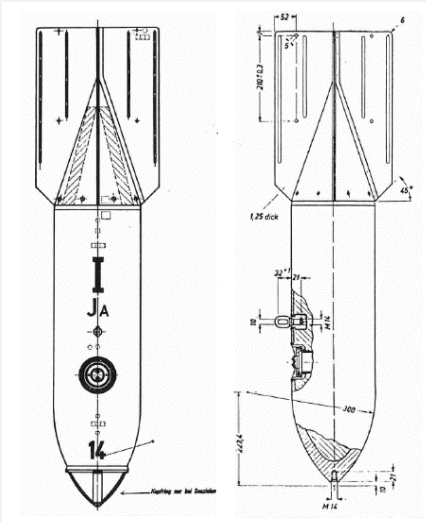
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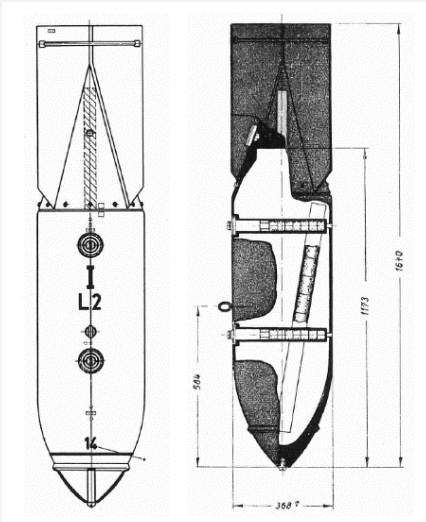
SC 50

Bomb Weight: 40-54kg (110-119lb)
Explosive Weight: 25kg (55lb)
Filling: TNT, Amatol or Trialen
Charge/Weight Ratio: 46%
Fuse Type: Electrical impact fuse or mechanical delayed action fuse
Body Dimensions: 1,100mm length x 200mm diameter
Appearance: Bomb body and tail painted grey/green with a yellow stripe on the tail unit. Steel construction.
Variants: 8 x variants. Additional fittings: Kopfring nose for limited penetration and Stabbo nose for dive-bombing.



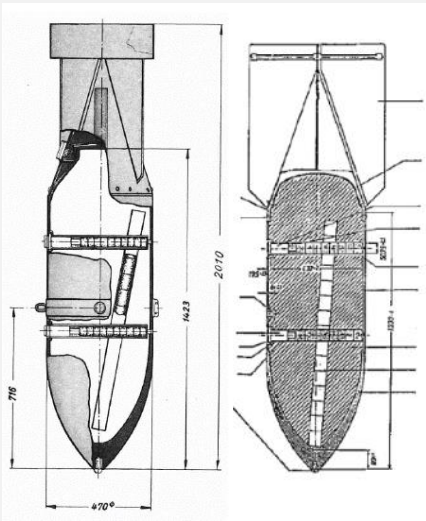
SC 250

Bomb Weight: 245-256kg (540-564lb)
Explosive Weight: 125-130kg (276-287lb)
Filling: TNT, Amatol and Trialen mix
Charge/Weight Ratio: 44%
Fuse Type: 1 or 2 electrical impact fuse(s) or mechanical delayed action fuse(s)
Body Dimensions: 1,173mm length x 368mm diameter
Appearance: Bomb body and tail painted grey/green with a yellow stripe on the tail unit. Steel construction.
Variants: 8 x variants. Kopfring nose for limited penetration. Stabbo nose for dive-bombing.



SC 500

Bomb Weight: 480-520kg (1,058-1,146lb)
Explosive Weight: 220kg (485lb)
Filling: TNT, Amatol and Trialen mix
Charge/Weight Ratio: 44%
Fuse Type: 2 electrical impact fuses or mechanical delayed action fuses
Body Dimensions: 1,423mm length x 470mm diameter
Appearance: Bomb body and tail painted grey/green or buff with a yellow stripe on the tail unit. Steel construction.
Variants: 3 x variants. Kopfring nose for limited penetration.



B-1E Sub-Munition

Bomb Weight: 1-1.3kg (2.2-2.87lb)

Incendiary Weight: 680g (1.4lb)

Filling: Thermite

Fuse Type: Simple impact fuse

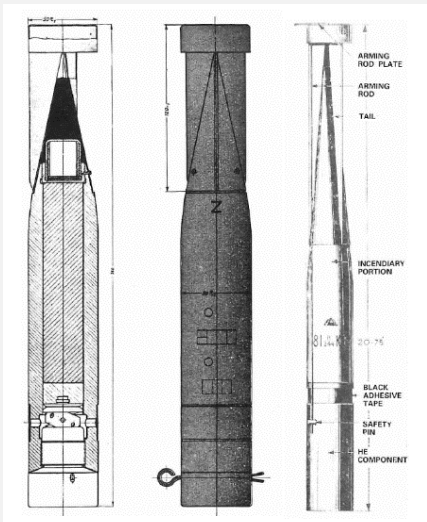
Body Dimensions: 247mm length x 50mm diameter

Appearance: Grey body and dark green painted tail unit. Magnesium alloy case.

Operation: Small percussion charge ignites Thermite (>1,000°C burn).

Variants: Most common variant: B 2EZ (2kg) included a small HE charge

Remarks: Drop containers varied in size. The smallest cluster bomb held 36 x B-1Es and the largest 620 x B-1Es.



Brand C50

Bomb Weight: 41kg (90.4lb)

Incendiary Weight: 13kg (30lb)

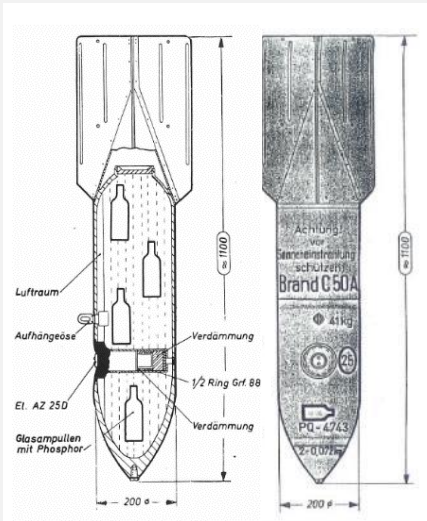
Filling: Main fill (86% Benzine, 10% Rubber) plus 4% Phosphorus in glass bottles

Fuse Type: 1 x electrical impact fuse

Bomb Dimensions: 762mm length x 203mm diameter

Appearance: bomb body and tail painted grey or green with the rear of the bomb painted red and a red band around the centre of the body.

Variants: C 50 B: 77% White Phos fill
C 250 A: 87.7% Petroleum, 11.7% Polystyrene, 0.5% White Phos (185kg version)



Spreng-Brand C50 - Fire Pot

Bomb Weight: 34kg (75lb)

Explosive Weight: 9kg (20lb)

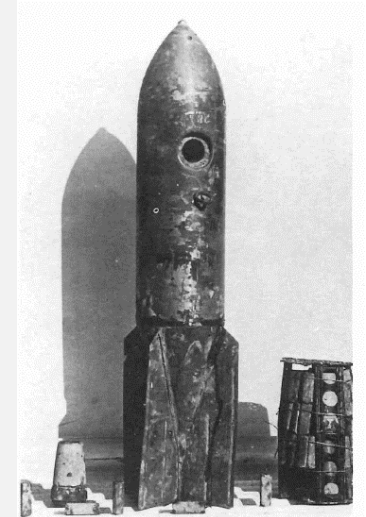
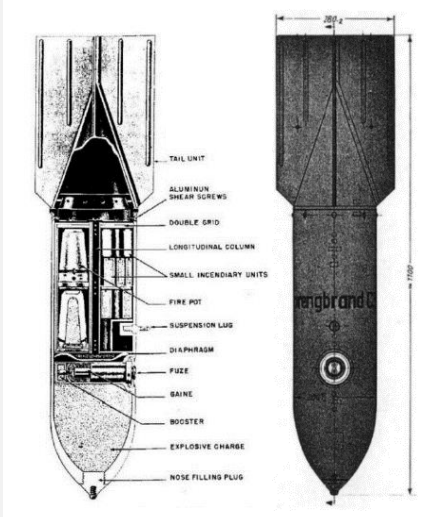
Filling: TNT burster charge, 6 x Thermite containers (fire pots) and 67 x small triangular incendiary elements.

Fuse Type: 1 x electrical impact fuses or aerial burst fuse

Bomb Dimensions: 711mm length x 203mm diameter

Appearance: Bomb body and tail painted grey/green or pale blue with red base plug and red or green incendiary markings. Steel construction.

Operation: A charge blows off the base plate, firing a plume of incendiary mixture 100 yds. Approx 1 second later the HE charge detonates.



HAA Battery - 3.7" QF Shell

Shell Weight: 12.7kg

Shell Dimensions: 94mm x 438mm

Fill Weight: 1.1kg

Fill Type: TNT

Fuse Type: Mechanical Time Delay fuse

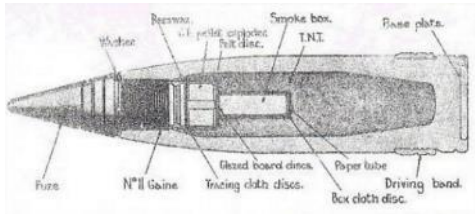
Appearance: Grey body, copper driving bands, brass neck

Rate of Fire: 10 - 20 rpm

Ceiling: 9,000 - 18,000m

Variants: HE or shrapnel shells.

Note, the 4.5" gun was also used in an HAA role throughout the UK.



LAA Battery - 40mm Bofors Shell

Shell Weight: 0.84kg

Shell Dimensions: 40mm x 180mm

Fill Weight: 70g

Fill Type: TNT

Fuse Type: Impact fuse

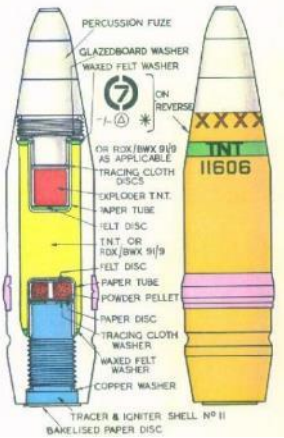
Appearance: Grey body, copper driving bands, brass neck

Rate of Fire: 120 rpm

Ceiling: 7,000m

Variants: HE or AP shells. Both with rear tracer compartment

SHELL, Q.F., HIGH EXPLOSIVE, 40 MM.



Z Battery - 3" U.P Rocket

Rocket Weight: 24.5kg

Warhead Weight: 1.94kg

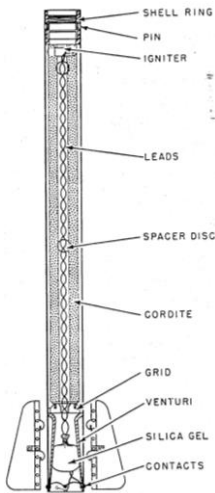
Filling: TNT warhead. Black Powder solid fuel rocket motor.

Fuse Type: Mechanical Time Delay fuse

Rocket Dimensions: 1,930mm x 76mm

Ceiling: 6,770m

Operation: Fired from single, tandem and (later) 36 x rail launchers (Z Batteries). Limited use throughout the UK.



AA	Anti-Aircraft (defences)
AFS	Auxiliary Fire Service
AP	Anti-Personnel
ARP	Air Raid Precautions
ASW	Anti-Submarine Warfare
BDU	Bomb Disposal Unit (historic term for EOD)
Bgl	Below Ground Level
EOC	Explosive Ordnance Clearance
EOD	Explosive Ordnance Disposal
FP	Fire Pot (German bomb)
GI	Ground Investigation
HAA	Heavy Anti-Air (gun battery)
Ha	Hectare (10,000m2)
HE	High Explosive
IB	Incendiary Bomb
Kg	Kilogram
LAA	Light Anti Air (gun battery)
LCC	London County Council
LRRB	Long Range Rocket Bomb (V2)
LSA	Land Service Ammunition
Luftwaffe	German Air Force
OB	Oil Bomb (German bomb)
PM	Parachute Mine (German bomb)
RAF	Royal Air Force
RFC	Royal Flying Corps
RN	Royal Navy (British)
RNAS	Royal Naval Air Service
ROF	Royal Ordnance Factory
SAA	Small Arms Ammunition
SD2	2kg AP bomb (German bomb)
SI	Site Investigation
U/C	Unclassified (German) bomb
UP	Unrotating Projectile (British 3" AA rocket)
USAAF	United States Army Air Force
UX	Unexploded
UXB	Unexploded Bomb
UXO	Unexploded Ordnance
V1	German Flying (pilotless) bomb - "Doodlebug"
V2	German LRRB - "Big Ben"
WAAF	Women's Auxiliary Air Force
WWI	World War One
WWII	World War Two

Project:	Glen Dimplex Homes Appliances, Prescott
Client:	E3P
Report Ref:	DRA-24-1792
Info Source:	n/a



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Project: Glen Dimplex Homes Appliances, Prescott

Client: E3P

Report Ref: DRA-24-1792

Info Source: n/a



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The National Archives

- **HO 196/10/112:** D. Christopherson. (1941-1942) *Penetration of unexploded bombs in earth*, Ministry of Home Security

Lancashire Archives

- **RC/1/1-3** - County Control Centre Incident Report Book 1940-1945
- **RC/4** – Unexploded High Explosive Bombs Record Books
- **RC/18** – A.R.P. Key Maps showing positions of incidents and bombings, 1939-1941 and 1945

Project: Glen Dimplex Homes Appliances, Prescott

Client: E3P

Report Ref: DRA-24-1792

Info Source: n/a



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Appendix VII: Exploratory Hole Logs





Borehole Log

Borehole No. **BH101**

Sheet 1 of 1

Project Name: Glen Dimplex

Project No. 17500

Co-ords: 347894E - 391541N

Hole Type BH

Location: Prescot

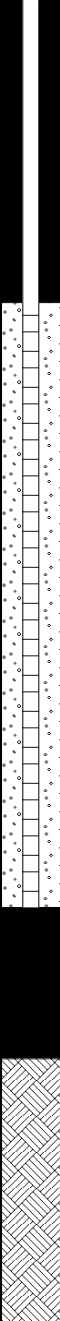
Level:

Scale 1:50

Client: Glen Dimplex Homes Appliances Ltd

Dates: 23/01/2025

Logged By I.Diack

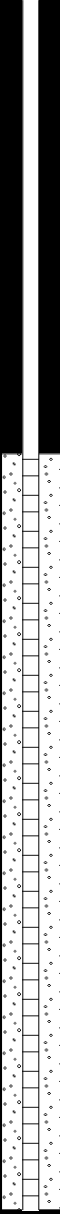
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete. POOR RECOVERY: MADE GROUND: Black and red slightly sandy gravel with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of asphalt, concrete, brick, mudstone and sandstone. Cobbles are subangular of asphalt and brick.	1	
		1.20	SPT	N=2 (1,0/0,0,1,1)					
		1.80	ES		1.70				
		2.00	SPT	N=4 (1,1/1,1,1,1)	2.00		MADE GROUND: Soft brown mottled black sandy very gravelly clay. Gravel is fine to medium, subangular to rounded of asphalt and mudstone (Reworked Clay). Soft very low strength brown very sandy CLAY with lenses of brown very clayey fine to medium SAND. (Becoming Firm Low Strength from 3.00m bgl).	2	
		2.90	ES						
		3.00	SPT	N=9 (2,2/2,2,2,3)					3
		4.00 - 4.45	U	Ublow=70	3.60		Firm low strength brown gravelly CLAY. Gravel is fine to medium, subangular to rounded of mudstone and sandstone. (Becoming very stiff high strength at 5.00m bgl) (Becoming very stiff very high strength at 6.50m bgl).	4	
		5.00	SPT	N=29 (3,5/5,6,8,10)					5
		6.50	SPT	N=42 (6,8/8,10,12,12)					6
		8.00	SPT	N=50 (10,13/13,13,14,10)					8
	8.50	SPT	50 (25 for 75mm/50 for 235mm)	8.74				9	
End of Borehole at 8.74m								10	

Remarks

1. Terminated due to refusal on very stiff CLAY at 8.74m bgl. 2. Environmental Monitoring Well Installed - Response Zone 2.00-6.00m bgl. 3. Water strike encountered at 1.70m bgl as seepage. 4. No elevated PID readings encountered. 5. Coordinates are approximate.



				Borehole Log				Borehole No. BH102	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 347943E - 391561N		Sheet 1 of 1 Hole Type BH	
Location: Prescott				Level:				Scale 1:50	
Client: Glen Dimplex Homes Appliances Ltd				Dates: 22/01/2025				Logged By I.Diack	

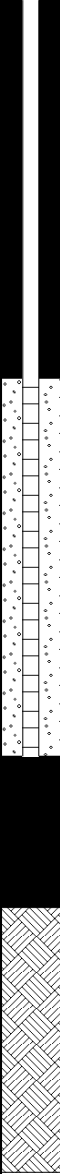
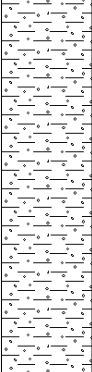
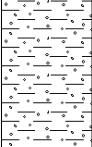
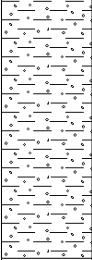
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete.		
		0.50	ES		0.40		POOR RECOVERY: MADE GROUND: Black and red slightly sandy gravel with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of asphalt, concrete, brick, mudstone and sandstone. Cobbles are subangular of asphalt and brick.		
		1.20	SPT	N=4 (1,1/1,1,1,1)	1.00		MADE GROUND: Black silty very sandy clay (Reworked Clay).	1	
					1.30		MADE GROUND: Dark reddish brown mottled black gravelly very sandy clay. Gravel is fine to medium, subangular to rounded of brick, concrete, and mudstone.		
		2.00	SPT	N=9 (2,2/2,2,2,3)			MADE GROUND: Dark reddish brown mottled grey very sandy very gravelly clay. Gravel is fine to medium, subangular to rounded of sandstone and mudstone (Reworked Clay).	2	
		3.00	SPT	N=12 (2,2/2,3,3,4)	2.90				
		3.20	ES				Stiff medium strength brown gravelly very sandy CLAY with pockets of brown very sandy GRAVEL. Gravel is fine to coarse, very angular to rounded of mudstone and sandstone.	3	
		3.50 - 4.00	U						
		4.00	SPT	N=24 (5,5/5,6,6,7)	4.00		Stiff high strength dark brown gravelly CLAY. Gravel is fine to medium, subangular to rounded of mudstone and sandstone.	4	
		5.00 - 5.45	U	Ublow=85	5.10		Very stiff very high strength brown gravelly very sandy CLAY with pockets of brown very sandy clayey GRAVEL. Gravel is fine to coarse, very angular to rounded of sandstone and mudstone.	5	
							6		
							7		
							8		
					8.50		End of Borehole at 8.50m	9	
								10	

Remarks 1. Terminated due to refusal on very stiff CLAY at 8.50m bgl. 2. Environmental Monitoring Well Installed - Response Zone 3.00-8.00m bgl. 3. Water strike encountered at 5.50m bgl as slow ingress. 4. No elevated PID readings encountered. 5. Coordinates are approximate.									
--	--	--	--	--	--	--	--	---	--

				Borehole Log				Borehole No. BH103 Sheet 1 of 1	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 348004E - 391515N		Hole Type BH	
Location: Prescott						Level:		Scale 1:50	
Client: Glen Dimplex Homes Appliances Ltd						Dates: 17/01/2025		Logged By I.Diack	

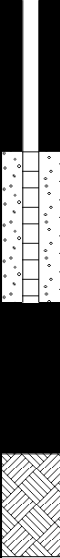
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	 0.40	0.20			0.20			MADE GROUND: Concrete.	
		0.40			0.40			MADE GROUND: Dark grey sandy gravel. Gravel is fine to coarse, subangular to subrounded of sandstone, mudstone, brick and concrete (Organic odour encountered).	
		0.50	ES					MADE GROUND: Dark brown to black silty gravelly clay. Gravel is fine to coarse, subangular to subrounded of brick, sandstone, and mudstone.	1
		0.60	ES						
		1.20	SPT	N=12 (2,3/3,3,3,3)		1.50		Orangish brown gravelly clayey fine to medium SAND. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone.	
		2.00	SPT	N=17 (2,3/3,4,5,5)	2.00			Very stiff high strength brown slightly gravelly silty sandy CLAY. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone.	2
		3.00 - 3.45	U	Ublow=55					3
		3.50	ES		3.50			Very stiff high strength brown slightly sandy CLAY.	
		4.00	SPT	N=26 (3,5/5,6,7,8)	4.00			Very stiff high strength brown silty gravelly very sandy CLAY. Gravel is fine to coarse, subangular to subrounded of sandstone.	4
		5.00	SPT	32 (8,10/10,10,12,)	5.00			Highly weathered SANDSTONE bedrock recovered as: Very stiff very high strength reddish brown sandy very gravelly CLAY. Gravel is fine to medium, subangular to subrounded of sandstone.	5
6.50	SPT	N=50 (12,12/12,12,16,10)					6		
6.80	SPT	50 (25 for 100mm/50 for 100mm)	6.90			End of Borehole at 6.90m	7		
								8	
								9	
								10	

Remarks 1. Terminated due to refusal on very stiff CLAY at 6.90m bgl. 2. Environmental Monitoring Well Installed - Response Zone 0.50-1.50m bgl. 3. Water strike encountered at 0.40m bgl as seepage. 4. No elevated PID readings encountered. 5. Coordinates are approximate.									
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		Borehole Log				Borehole No. BH104			
Project Name: Glen Dimplex		Project No. 17500		Co-ords: 348049E - 391493N		Sheet 1 of 1			
Location: Prescot				Level:		Hole Type BH			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 16/01/2025		Scale 1:50			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 16/01/2025		Logged By I.Diack			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	 2.10	2.10	ES		2.10		 MADE GROUND: Concrete.		1
		2.30	ES		2.35				 MADE GROUND: Reddish brown sandy gravelly clay. Gravel is fine to medium, subangular to rounded of mudstone, sandstone, and concrete.
		3.00	SPT	N=21 (3,4/4,5,6,6)			 Very stiff high strength brown silty sandy gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of sandstone and mudstone.	3	
		4.00 - 4.45	U	Ublow=68				 Very stiff high strength brown slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of mudstone and sandstone.	4
		5.00	SPT	N=25 (3,5/5,6,7,7)	5.00		 Highly weathered SANDSTONE bedrock recovered as: Very stiff very high strength reddish brown sandy very gravelly CLAY. Gravel is fine to medium, subangular to subrounded of sandstone.		5
		5.50	ES					 End of Borehole at 7.75m	6
		6.50	SPT	50 (8,10/50 for 295mm)	6.00		 End of Borehole at 7.75m		7
		7.50	SPT	50 (10,11/50 for 250mm)	7.75			 End of Borehole at 7.75m	8
									9
								10	

Remarks
1.Terminated due to refusal on very stiff CLAY at 7.75m bgl. 2. Environmental Monitoring Well Installed - Response Zone 2.50-5.00m bgl. 3. Water strike encountered at 2.10m bgl as seepage. 4. No elevated PID readings encountered. 5. Coordinates are approximate.

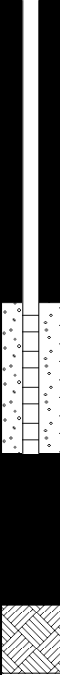



				Borehole Log			Borehole No. BH106 Sheet 1 of 1		
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 348091E - 391530N		Hole Type BH	
Location: Prescot				Level:		Scale 1:50		Logged By I.Diack	
Client: Glen Dimplex Homes Appliances Ltd				Dates: 15/01/2025					
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
	 0.50				0.10			MADE GROUND: Concrete.	
					0.45			POOR RECOVERY: MADE GROUND: Black sandy gravel with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of brick, slag, concrete, plastic, shale, ash, and mudstone. Cobbles are angular of brick.	
		0.80	ES					MADE GROUND: Reddish brown mottled black very gravelly clay with rare cobbles. Gravel is fine to medium, angular to subrounded of mudstone, sandstone, coal, and rare concrete. Cobbles are angular of brick (Slight hydrocarbon odour encountered).	1
		1.20	SPT	N=10 (1,2/2,2,3,3)					2
		2.00	SPT	N=16 (2,3/3,3,4,6)					
		2.60	ES		2.40			Very stiff high strength reddish brown slightly gravelly very sandy CLAY with frequent lenses of orangish brown very clayey fine to medium SAND. Gravel is fine to medium, angular to subrounded of sandstone.	3
		3.00 3.10 - 3.50	SPT U	N=33 (5,6/7,8,8,10)					
					3.40 3.60 3.68		Highly weathered SANDSTONE bedrock recovered as: Very stiff very high strength reddish brown gravelly very sandy CLAY. Gravel is fine to medium, angular to subrounded of sandstone. POOR RECOVERY: Assumed highly weathered SANDSTONE bedrock recovered as: reddish brown gravelly very sandy CLAY. Gravel is fine to medium, subangular to subrounded of sandstone. End of Borehole at 3.68m	4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks

1. Terminated due to refusal on very stiff CLAY at 3.68m bgl. 2. Environmental Monitoring Well Installed - Response Zone 1.00-2.00m bgl. 3. Water strike encountered at 0.50m bgl as seepage. 4. No significantly elevated PID readings encountered (Peak readings of 0.5 ppm at 1.20m bgl). 5. Slight hydrocarbon odour encountered at 0.45-2.40m bgl in Made Ground. 6. Coordinates are approximate.


				Borehole Log				Borehole No. BH107 Sheet 1 of 1	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 348095E - 391557N		Hole Type BH	
Location: Prescott				Level:		Scale 1:50			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 15/01/2025		Logged By I.Diack			

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete.		
					0.45		POOR RECOVERY: MADE GROUND: Black and grey slightly sandy very gravelly clay with occasional cobbles. Gravel is fine to coarse, angular to subrounded of asphalt, granite, concrete, slag, brick, mudstone, sandstone, and rare glass. Cobbles are angular of brick.		
					1.00		MADE GROUND: Reddish brown gravelly very sandy clay. Gravel is fine to coarse, subangular to subrounded of sandstone, mudstone, and occasional concrete and slate.	1	
					1.20				
					1.50				
					1.70				
					2.00		Stiff medium strength reddish brown slightly gravelly very sandy CLAY with frequent lenses of brown very clayey fine SAND. Gravel is fine to medium, subangular to subrounded of sandstone.	2	
					2.40				
					2.80				
					3.10		Stiff medium strength dark reddish brown slightly sandy very gravelly CLAY. Gravel is fine to medium, subangular to rounded of sandstone. (Very stiff very high strength from 4.00m bgl). Highly weathered SANDSTONE bedrock recovered as: Stiff medium strength reddish brown gravelly very sandy CLAY. Gravel is fine to medium, angular to subrounded of sandstone. (Becoming very stiff very high strength at 4.00m bgl).	3	
				3.00 - 3.45					
				4.00					
				4.45			End of Borehole at 4.45m	4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks 1. Terminated due to refusal on very stiff CLAY at 4.45m bgl. 2. Environmental Monitoring Well Installed - Response Zone 2.00-3.00m bgl. 3. Water strike encountered at 0.50m bgl and 1.50 m bgl as seepage. 4. No elevated PID readings encountered. 5. Coordinates are approximate.									
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				Borehole Log				Borehole No. BH108	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 348057E - 391587N		Sheet 1 of 1 Hole Type BH	
Location: Prescott						Level:		Scale 1:50	
Client: Glen Dimplex Homes Appliances Ltd						Dates: 16/01/2025		Logged By I.Diack	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete.		
		0.50	ES				POOR RECOVERY: MADE GROUND: Black and grey slightly sandy gravel with occasional cobbles. Gravel is fine to coarse, very angular to subrounded of brick, concrete, sandstone, limestone, metal and rare glass. Cobbles is subangular of brick.	1	
		0.60	ES			0.65	MADE GROUND: Firm reddish brown mottled orange and grey slightly gravelly clay. Gravel is fine to medium, subangular to subrounded of sandstone, mudstone, and rare concrete and brick (Reworked Clay).		
		1.00	SPT	N=4 (1,1/1,0,1,2)					
		1.80	ES			1.60	Stiff to very stiff greyish brown gravelly very sandy CLAY. Gravel is fine to medium, subangular to rounded of sandstone and mudstone. (Becoming very gravelly at 2.80m bgl).	2	
		2.00 - 2.45	U	Ublow=50		2.50	Very stiff high high strength reddish brown gravelly very sandy CLAY. Gravel is fine to medium, very angular to rounded of sandstone. (Becoming very stiff very high strength at 5.00m bgl).	3	
		3.00	SPT	N=23 (2,3/4,5,6,8)				4	
		5.00	SPT	N=43 (6,8/8,10,10,15)				5	
		6.50	SPT	50 (10,12/50 for 290mm)				6	
					6.79		End of Borehole at 6.79m	7	
								8	
								9	
								10	

Remarks

1. Terminated due to refusal on very stiff CLAY at 6.79m bgl. 2. Environmental Monitoring Well Installed - Response Zone 0.60-1.60m bgl. 3. Water strike encountered at 1.50m bgl as seepage. 4. No significantly elevated PID readings encountered (peak reading of 1.1 ppm at 0.40m bgl). 5. Coordinates are approximate.





Borehole Log

Borehole No. BH109

Sheet 1 of 1

Project Name: Glen Dimplex

Project No. 17500

Co-ords: 348020E - 391561N

Hole Type BH

Location: Prescot

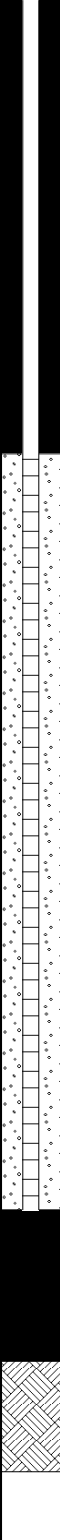
Level:

Scale 1:50

Client: Glen Dimplex Homes Appliances Ltd

Dates: 22/01/2025

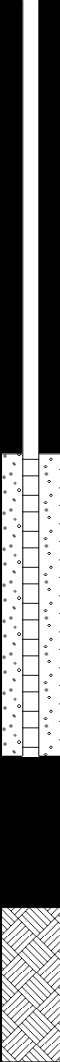
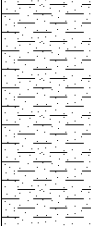
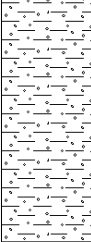
Logged By I.Diack

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete.		
					0.60		POOR RECOVERY: MADE GROUND: Grey slightly silty gravel. Gravel is fine to coarse, angular to subrounded of concrete and limestone.		
		1.00	ES		0.95		POOR RECOVERY: MADE GROUND: Grey and red slightly silty gravel with occasional cobbles. Gravel is fine to coarse, very angular to subrounded brick, sandstone, and concrete.	1	
		1.20	SPT	N=2 (1,1/0,1,0,1)	1.40		MADE GROUND: Black slightly gravelly silty very sandy clay. Gravel is fine, subangular to subrounded of concrete and mudstone (Very strong hydrocarbon odour and hydrocarbon sheen encountered).		
		2.00	SPT	N=5 (1,1/1,1,1,2)	2.20		MADE GROUND: Dark brown and red very sandy gravel with occasional cobbles. Gravel is fine to coarse, very angular to subrounded of brick, concrete, sandstone and rare pockets of organic material. Cobbles are subangular of brick (Slight hydrocarbon odour encountered).	2	
		2.40	ES		3.00		Greyish brown clayey fine to medium SAND.		
		3.00	SPT	N=9 (1,2/2,2,2,3)	3.70		Firm low strength greyish brown sandy gravelly CLAY. Gravel is fine to medium, subangular to subrounded of sandstone and mudstone.	3	
		4.00 - 4.45	U	Ublow=78			Stiff medium strength reddish brown very sandy CLAY with frequent lenses of brown very clayey fine to medium SAND.	4	
		4.00	SPT	N=12 (2,2/2,2,3,5)					
		5.00	SPT	N=24 (3,5/5,5,6,8)				5	
	6.00						6		
	6.50	SPT	N=31 (6,7/4,8,9,10)				7		
	7.30						8		
	8.00	SPT	50 (10,12/50 for 280mm)			Highly weathered SANDSTONE bedrock recovered as: Very stiff very high strength reddish brown gravelly very sandy CLAY. Gravel is fine to medium, angular to subrounded of sandstone.	9		
	9.50	SPT	50 (12,13/50 for 230mm)				10		
					9.73		End of Borehole at 9.73m		

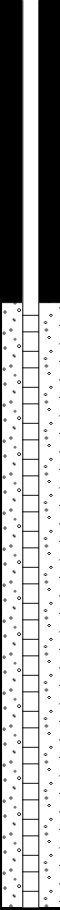
Remarks

1. Terminated due to refusal on very stiff CLAY at 9.73m bgl. 2. Environmental Monitoring Well Installed - Response Zone 3.00-8.00m bgl. 3. Water strike encountered at 6.00m bgl as moderate ingress. 4. No significantly elevated PID readings encountered (peak reading of 0.9 ppm at 0.80m bgl). 5. Coordinates are approximate.



				Borehole Log				Borehole No. BH110 Sheet 1 of 1	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 347971E - 391572N		Hole Type BH	
Location: Prescott				Level:		Scale 1:50			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 23/01/2025		Logged By I.Diack			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30		MADE GROUND: Concrete.	1	
							VOID SPACE.		
		1.30	SPT	N=0 (1,0/0,0,0,0)	1.30		 MADE GROUND: Black slightly sandy gravel. Gravel is fine to coarse, subangular to subrounded of slag, ash, brick, plastic, mudstone, sandstone and occasional metal.	2	
		2.00 2.00	ES SPT	N=9 (2,2/2,2,2,3)	2.30				
					2.80		 MADE GROUND: Grey very sandy very gravelly clay with lenses of grey very sandy very clayey gravel. Gravel is fine to coarse, subangular to subrounded of slag, mudstone, and sandstone. Soft to firm brown very sandy CLAY. (Becoming very stiff medium strength at 3.00m bgl).	3	
		3.00 3.20	SPT ES	N=11 (2,2/2,2,3,4)					
					3.60		 Stiff medium strength reddish brown slightly gravelly very sandy CLAY with frequent lenses of brown very clayey fine SAND. Gravel is fine to medium, subangular to subrounded of sandstone. (Becoming very stiff high strength at 5.00m bgl).	4	
		4.00 - 4.45	U	Ublow=100					
					5.00		 Very stiff high strength brown gravelly CLAY. Gravel is fine to medium, subangular to subrounded of mudstone and sandstone. (Becoming very stiff very high strength at 6.50m bgl).	5	
					5.40				
						End of Borehole at 7.02m	7		
								8	
								9	
								10	
Remarks 1. Terminated due to refusal on very stiff CLAY at 7.02m bgl 2.Environmental Monitoring Well Installed - Response Zone 3.00-5.00m bgl. 3. No elevated PID readings encountered. 4. Voided ground encountered between 0.30-1.30m bgl. 5. Coordinates are approximate.									

				Borehole Log				Borehole No. BH111	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 347951E - 391605N		Sheet 1 of 1 Hole Type BH	
Location: Prescot				Level:				Scale 1:50	
Client: Glen Dimplex Homes Appliances Ltd				Dates: 23/01/2025				Logged By I.Diack	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10		MADE GROUND: Concrete.		
		1.00	ES		0.90		POOR RECOVERY: MADE GROUND: Black and red slightly sandy gravel with occasional cobbles. Gravel is fine to coarse, very angular to subrounded of concrete, brick, mudstone, slag, and occasional coal fragments. Cobbles are subangular of brick.	1	
		1.20	SPT	N=5 (3,1/1,1,1,2)	1.30		MADE GROUND: Firm to stiff brown mottled grey gravelly very sandy clay. Gravel is fine to medium, subangular to subrounded of mudstone, sandstone and rare brick (Reworked Clay).		
		2.00	SPT	N=8 (2,2/2,2,2,2)			Firm low strength brown very sandy CLAY. (Becoming stiff medium strength at 3.00m bgl).	2	
		3.00	SPT	N=13 (2,3/2,3,4,4)				3	
		3.60	ES						
		4.00 - 4.45	U	Ublow=69				4	
		5.00	SPT	N=29 (4,5/5,6,8,10)	4.60		Very stiff high strength brown slightly sandy very gravelly CLAY with frequent bands of slightly clayey very sandy GRAVEL. Gravel is fine to coarse, very angular to rounded of sandstone and mudstone. (Becoming very stiff very high strength at 6.50m bgl).	5	
		6.50	SPT	50 (10,12/50 for 245mm)				6	
		7.00	SPT	50 (12,12/50 for 195mm)	7.20			7	
						End of Borehole at 7.20m	8		
							9		
							10		


5.00

Remarks
 1. Terminated due to refusal on very stiff CLAY at 7.20m bgl 2. Environmental Monitoring Well Installed - Response Zone 2.00-6.00m bgl. 3. Water strike encountered at 5.00m bgl as very slow ingress. 4. No elevated PID readings encountered. 5. Coordinates are approximate.





Borehole Log

Borehole No. **BH112**

Sheet 1 of 2

Project Name: Glen Dimplex

Project No. 17500

Co-ords: 348044E - 391461N

Hole Type BH

Location: Prescot

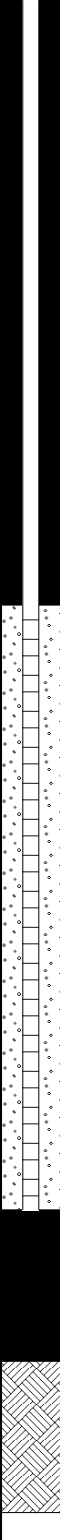
Level:

Scale 1:50

Client: Glen Dimplex Homes Appliances Ltd

Dates: 14/01/2025

Logged By I.Diack

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15		MADE GROUND: Concrete.		
					1.00		POOR RECOVERY: MADE GROUND: Firm dark brown mottled black very sandy very gravelly clay with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of brick, concrete, sandstone, limestone, and rare fine fragments of coal and metal. Cobbles are angular of brick (Slight hydrocarbon odour encountered).	1	
		1.20	SPT	N=5 (1,1/1,1,1,2)					
		1.50	ES				MADE GROUND: Firm dark brown mottled black very sandy very gravelly clay with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of brick, concrete, sandstone, limestone, and rare fine fragments of coal and metal. Cobbles are angular of brick (Slight hydrocarbon odour encountered).	2	
		2.00	ES						
		2.00	SPT	N=4 (1,1/1,1,1,1)	2.10				
					2.40		MADE GROUND: Firm to stiff grey silty sandy gravelly clay. Gravel is fine to medium, subangular to rounded of mudstone and sandstone (Reworked Clay) (Slight Hydrocarbon sheen). Firm brown slightly sandy CLAY.		
		3.00	SPT	N=6 (1,2/1,1,2,2)	3.00				3
		4.00	SPT	N=9 (1,2/2,2,2,3)			Firm low strength dark reddish brown gravelly very sandy CLAY with occasional bands of brown clayey fine to medium SAND. Gravel is fine to medium, subangular to subrounded of sandstone. (Becoming very stiff high strength at 8.0m bgl).		4
		4.40	ES						
	5.00 - 5.45	U	Ublow=100					5	
								6	
								7	
								8	
					9.00				9
					9.50	SPT	50 (10,11/50 for 280mm)	Highly weathered SANDSTONE bedrock recovered as: Dense reddish brown very clayey fine to medium SAND.	10

Remarks

1. Complete. 2. Environmental Monitoring Well Installed - Response Zone 4.00-8.00m bgl. 3. Water strike encountered at 1.50m bgl and 6.5m bgl as seepage and moderate ingress respectively. 4. No significantly elevated PID readings encountered (peak reading of 3.3 ppm at 2.00m bgl in Made Ground). 5. Slight hydrocarbon odour encountered between 0.15-2.10m bgl in Made Ground. 6. Slight hydrocarbon sheen encountered between 2.10-2.40m bgl in Made Ground. 7. Coordinates are approximate.



					Borehole Log			Borehole No. BH201 Sheet 1 of 3	
Project Name: Glen Dimplex					Project No. 17500		Co-ords: 347955E - 391512N		Hole Type BH
Location: Prescot					Level:		Scale 1:50		Logged By I.Diack
Client: Glen Dimplex Homes Appliances Ltd					Dates: 27/01/2025				

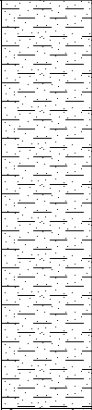
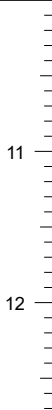
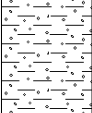
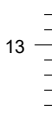
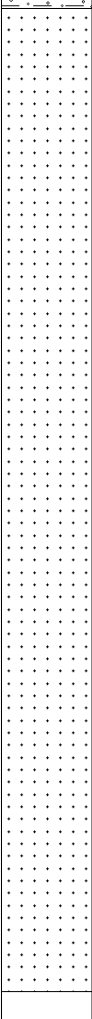
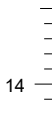
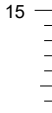
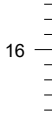
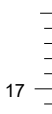
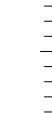
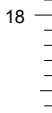
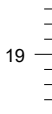
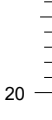
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
1					0.35			MADE GROUND: Concrete.	
		1.20	SPT	N=8 (2,2/2,2,2,2)				POOR RECOVERY: MADE GROUND: Black sandy gravel. Gravel is fine to coarse, very angular to rounded of slag, ash, metal, sandstone, concrete, mudstone, timber and brick.	1
		1.50	ES						
		2.00	SPT	N=9 (2,2/2,2,2,3)	2.00			MADE GROUND: Dark reddish brown mottled black gravelly very sandy clay with rare cobbles. Gravel is fine to coarse, very angular to rounded of sandstone, mudstone, asphalt, slag and ash. Cobbles are subangular of sandstone.	2
		3.00	SPT	N=19 (2,3/4,5,5,5)	3.00				
		3.60	ES				Very stiff high strength reddish brown slightly gravelly very sandy CLAY with frequent lenses of brown very clayey fine SAND. Gravel is fine to medium, subangular to rounded of sandstone and mudstone.	3	
		4.00 - 4.45	U	Ublow=69	4.10				
					4.60			Reddish brown very clayey very gravelly fine to medium SAND. Gravel is fine to coarse, subangular to rounded of sandstone and mudstone.	4
		5.00	SPT	N=23 (4,5/5,5,6,7)	5.50				
								Very stiff high strength dark brown sandy CLAY.	5
6.50	SPT	N=39 (5,6/8,9,10,12)							
						Very stiff very high strength brown mottled dark grey very sandy CLAY with frequent lenses of light brown very clayey fine to medium SAND. Gravel is fine to medium, subangular to subrounded of sandstone. (becoming very stiff very high strength at 6.50m bgl).	6		
8.00	SPT	50 (12,13/50 for 285mm)	7.90						
						Very stiff very high strength dark brown gravelly very sandy CLAY with frequent lenses of brown clayey very gravelly fine to medium SAND. Gravel is fine to medium, angular to subrounded of sandstone.	8		
9.50	SPT	50 (14,11/50 for 95mm)							
								9	
								10	

Remarks

1. Complete. 2. Environmental Monitoring Well Installed - Response Zone 16.50-20.50m bgl. 3. Water strike encountered at 18.50m bgl as moderate ingress. 4. No significantly elevated PID readings encountered (peak reading of 4.7 ppm at 2.50m bgl in Made Ground). 5. Coordinates are approximate.



				Borehole Log				Borehole No. BH201	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 347955E - 391512N		Sheet 2 of 3	
Location: Prescott				Level:		Hole Type BH			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 27/01/2025		Scale 1:50			
Logged By I.Diack									

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Very stiff very high strength dark brown gravelly very sandy CLAY with frequent lenses of brown clayey very gravelly fine to medium SAND. Gravel is fine to medium, angular to subrounded of sandstone.	
								Very stiff dark brown slightly sandy very gravelly CLAY. Gravel is fine to medium, angular to subrounded of sandstone.	
								NO RECOVERY: Assumed dark brown fine grained SANDSTONE.	
									
									
									
									
									
									
									

Remarks 1. Complete. 2. Environmental Monitoring Well Installed - Response Zone 16.50-20.50m bgl. 3. Water strike encountered at 18.50m bgl as moderate ingress. 4. No significantly elevated PID readings encountered (peak reading of 4.7 ppm at 2.50m bgl in Made Ground). 5. Coordinates are approximate.								
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Sheet 3 of 3

Hole Type
BH

Scale
1:50

Logged By
I.Diack

21

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23

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Borehole Log

Borehole No. **BH202**

Sheet 1 of 2

Project Name: Glen Dimplex

Project No. 17500

Co-ords: 348061E - 391547N

Hole Type BH

Location: Prescot

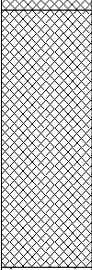
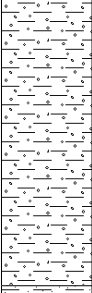
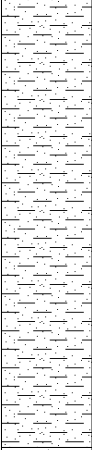
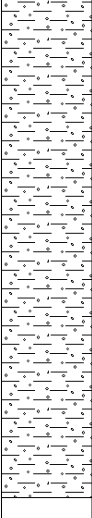
Level:

Scale 1:50

Client: Glen Dimplex Homes Appliances Ltd

Dates: 21/01/2025

Logged By I.Diack

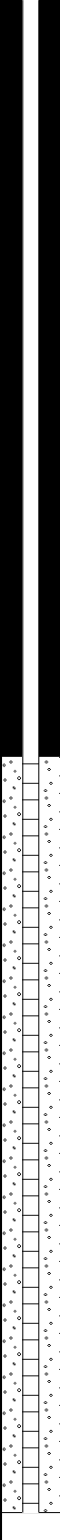
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.10			MADE GROUND: Concrete.	1		
		0.90	ES					MADE GROUND: Dark grey and red sandy very gravelly clay with frequent cobbles. Gravel is fine to coarse, very angular to subrounded of brick, sandstone, concrete, slate, paper, plastic, and occasional coal. Cobbles are subangular of brick.			
		1.20	SPT	N=11 (2,3/2,3,3,3)							
					1.80			Stiff medium strength reddish brown mottled dark grey slightly sandy gravelly CLAY. Gravel is fine to medium, angular to subrounded of sandstone and mudstone.	2		
		2.00	SPT	N=13 (3,3/3,3,3,4)							
		2.60	ES								
					3.00	SPT	N=14 (2,4/3,3,4,4)				3
					3.70			Stiff medium strength greyish brown slightly gravelly very sandy CLAY with occasional lenses of greyish brown very clayey fine to medium SAND. Gravel is fine to medium, subangular to subrounded of sandstone. (Becoming very stiff high strength at 4.00m bgl).	4		
		4.00	SPT	N=18 (3,5/4,4,5,5)							
		5.00	SPT	N=20 (5,6/5,5,5,5)							
			6.70			Highly weathered SANDSTONE bedrock recovered as: Very stiff high strength brown slightly sandy very gravelly CLAY with occasional bands of clayey very sandy GRAVEL. Gravel is fine to coarse, very angular to subrounded of sandstone. (Becoming very stiff very high strength from 9.50m bgl).	7				
6.50 - 6.95	U	Ublow=86									
8.00	SPT	N=24 (4,5/5,6,6,7)									
			9.50	SPT	N=50 (10,10/10,10,13,17)				8		
									9		
									10		

Remarks

1. Complete. 2. Environmental Monitoring Well Installed - Response zone 15.00-20.00m bgl. 3. Water strike encountered at 19.00m bgl. 4. Very slight hydrocarbon odours encountered between 0.15-1.10m bgl in Made Ground. 5. Coordinates are approximate.



				Borehole Log				Borehole No. BH202	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 348061E - 391547N		Sheet 2 of 2 Hole Type BH	
Location: Prescot				Level:				Scale 1:50	
Client: Glen Dimplex Homes Appliances Ltd				Dates: 21/01/2025				Logged By I.Diack	

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					10.40		Highly weathered SANDSTONE bedrock recovered as: Very stiff high strength brown slightly sandy very gravelly CLAY with occasional bands of clayey very sandy GRAVEL. Gravel is fine to coarse, very angular to subrounded of sandstone. (Becoming very stiff very high strength from 9.50m bgl). Weathered SANDSTONE bedrock recovered as: Very stiff very high strength light reddish brown very sandy CLAY.	11	
	11.00	SPT	N=50 (9,11/11,15,16,8)			12			
	12.50	SPT	N=50 (7,14/12,14,15,9)	12.40		13			
	14.00	SPT	N=50 (12,12/12,13,15,10)			14			
	15.50	SPT	50 (14,16/50 for 155mm)			15			
	17.00	SPT	50 (25 for 135mm/50 for 155mm)			16			
							POOR RECOVERY: Assumed light reddish brown fine grained SANDSTONE.	17	
								18	
								19	
								20	
End of Borehole at 20.00m									

19.00
 

20.00

Remarks

1. Complete. 2. Environmental Monitoring Well Installed - Response zone 15.00-20.00m bgl. 3. Water strike encountered at 19.00m bgl. 4. Very slight hydrocarbon odours encountered between 0.15-1.10m bgl in Made Ground. 5. Coordinates are approximate.



				Borehole Log				Borehole No. BH203 Sheet 1 of 2	
Project Name: Glen Dimplex				Project No. 17500		Co-ords: 347907E - 391615N		Hole Type BH	
Location: Prescot				Level:		Scale 1:50			
Client: Glen Dimplex Homes Appliances Ltd				Dates: 24/01/2025		Logged By I.Diack			
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.15			MADE GROUND: Concrete.	1 2 3 4 5 6 7 8 9 10
		1.20	SPT	N=8 (2,2/2,2,2,2)	1.30			POOR RECOVERY: MADE GROUND: Black and red gravelly very sandy clay with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, sandstone, concrete, asphalt, slag, and mudstone. Cobbles are angular to subangular of brick.	
		1.90 2.00	ES SPT	N=10 (2,2/2,2,3,3)	2.40			MADE GROUND: Dark reddish brown sandy very gravelly clay with rare cobbles. Gravel is fine to medium, angular to subrounded of sandstone and mudstone with occasional brick. Cobbles are subangular of brick.	
		3.00	SPT	N=43 (6,7/8,9,11,15)				Stiff reddish brown gravelly very sandy CLAY with frequent lenses of clayey very sandy GRAVEL. Gravel is fine to coarse, subangular to rounded of sandstone and mudstone. (Becoming very stiff very high strength from 3.00m bgl).	
		4.00 4.00	ES SPT	50 (10,12/50 for 200mm)					
		5.00	SPT	N=50 (12,12/12,12,14,12)	5.20			Very stiff very high strength brown very gravelly CLAY. Gravel is fine to medium, very angular to rounded of sandstone and mudstone.	
					6.10				
					6.50			Highly weathered SANDSTONE bedrock recovered as: Dark red slightly clayey very gravelly medium to coarse SAND. Gravel is fine to coarse, very angular to subangular of sandstone.	
								POOR RECOVERY: Highly weathered SANDSTONE bedrock recovered as: Dark red slightly clayey very gravelly medium to coarse SAND. Gravel is fine to coarse, very angular to subangular of sandstone.	
					8.00			POOR RECOVERY: Assumed dark reddish brown fine grained SANDSTONE.	
Remarks 1. Complete. 2. Environmental Monitoring Well Installed - Response Zone 12.00-20.00m bgl. 3. Water strike encountered at 18.00m bgl as moderate ingress. 4. No elevated PID readings encountered. 5. Coordinates are approximate.									



Borehole Log

Borehole No.

BH203

Sheet 2 of 2

Project Name: Glen Dimplex

Project No.
17500

Co-ords: 347907E - 391615N

Hole Type
BH

Location: Prescott

Level:

Scale
1:50

Client: Glen Dimplex Homes Appliances Ltd

Dates: 24/01/2025

Logged By
I.Diack

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								POOR RECOVERY: Assumed dark reddish brown fine grained SANDSTONE.	
									11
									12
									13
									14
									15
									16
									17
									18
									19
					20.00			End of Borehole at 20.00m	20

Remarks

1. Complete. 2. Environmental Monitoring Well Installed - Response Zone 12.00-20.00m bgl. 3. Water strike encountered at 18.00m bgl as moderate ingress. 4. No elevated PID readings encountered. 5. Coordinates are approximate.



Appendix VIII: Chemical Testing Results





Final Report

Report No.: 25-01755-1

Initial Date of Issue: 03-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk mwilson@e3p.co.uk

Project Glen Dimplex Prescott (Standard 1)

Quotation No.: **Date Received:** 21-Jan-2025

Order No.: 010360 **Date Instructed:** 21-Jan-2025

No. of Samples: 9

Turnaround (Wkdays): 5 **Results Due:** 27-Jan-2025

Date Approved: 03-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:						25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755
Quotation No.:		Chemtest Sample ID.:						1920017	1920018	1920019	1920020	1920021	1920022	1920023
		Client Sample ID.:						BH112	BH112	BH106	BH106	BH107	BH107	BH108
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						2.0	4.4	0.8	2.6	1.0	2.4	0.6
		Date Sampled:						14-Jan-2025	14-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM		DURHAM		DURHAM		DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
ACM Type		U	2192		N/A	-		-		-			Fibres/Clumps	
Asbestos Identification		U	2192		N/A	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected			Chrysotile	
Asbestos by Gravimetry		U	2192	%	0.001								<0.001	
Total Asbestos		U	2192	%	0.001								<0.001	
Moisture		N	2030	%	0.020	22	17	12	13	12	12	28	13	
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Black	Brown	
Other Material		N	2040		N/A	Stones	Stones	Stones	Stones	Stones	Stones	Stones	Stones	
Soil Texture		N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Clay	Sand	Clay	
pH at 20C		M	2010		4.0	8.2	9.8	9.6	8.3	8.3	8.5	8.1	8.6	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010	< 0.010	0.14	< 0.010	0.083	0.035	1.7	< 0.010	
Total Sulphur		U	2175	%	0.010	0.12	0.030	0.040	0.14	0.030	0.020	0.45	0.13	
Cyanide (Total)		M	2300	mg/kg	0.50	2.4	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.5	< 0.50	
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	6.7	5.3	2.3	3.4	3.0	3.0	4.4	3.4	
Sulphate (Total)		U	2430	%	0.010	0.29	0.041	0.087	0.020	0.029	0.035	1.9	0.069	
Arsenic		M	2455	mg/kg	0.5	97	12	7.3	7.6	3.7	8.2	26	11	
Cadmium		M	2455	mg/kg	0.10	4.4	< 0.10	< 0.10	< 0.10	< 0.10	0.12	1.3	0.32	
Chromium		M	2455	mg/kg	0.5	210	50	44	31	31	24	40	41	
Copper		M	2455	mg/kg	0.50	270	24	25	20	18	22	190	48	
Mercury		M	2455	mg/kg	0.05	0.21	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.51	< 0.05	
Nickel		M	2455	mg/kg	0.50	650	51	47	34	33	30	47	58	
Lead		M	2455	mg/kg	0.50	440	22	20	9.3	10	26	430	22	
Selenium		M	2455	mg/kg	0.25	0.66	0.48	0.42	0.29	< 0.25	< 0.25	0.85	0.37	
Zinc		M	2455	mg/kg	0.50	9200	69	61	53	40	47	480	110	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	3.7	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.85	
Organic Matter		M	2625	%	0.40	4.1	0.84	0.76	< 0.40	< 0.40	< 0.40	10	< 0.40	
Total Organic Carbon		M	2625	%	0.20	2.4	0.49	0.44	0.22	< 0.20	< 0.20	5.8	< 0.20	
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	1.4	< 1.0	< 1.0	< 1.0	14	< 1.0	
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	8.0	< 1.0	10	< 1.0	< 1.0	< 1.0	47	< 1.0	
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	7.7	< 1.0	25	< 1.0	< 1.0	< 1.0	37	< 1.0	
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	33	< 1.0	140	< 1.0	< 1.0	< 1.0	300	< 1.0	
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	3.9	< 1.0	17	< 1.0	< 1.0	< 1.0	270	< 1.0	
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	53	< 10	190	< 10	< 10	< 10	660	< 10	
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755
Quotation No.:		Chemtest Sample ID.:		1920017	1920018	1920019	1920020	1920021	1920022	1920023	1920024	
		Client Sample ID.:		BH112	BH112	BH106	BH106	BH107	BH107	BH108	BH108	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Bottom Depth (m):		2.0	4.4	0.8	2.6	1.0	2.4	0.6	1.8	
		Date Sampled:		14-Jan-2025	14-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025	16-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
		Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Vinyl Chloride		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane		N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	6.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8	28	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0	2.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755
Quotation No.:		Chemtest Sample ID.:		1920017	1920018	1920019	1920020	1920021	1920022	1920023	1920024	
		Client Sample ID.:		BH112	BH112	BH106	BH106	BH107	BH107	BH108	BH108	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Bottom Depth (m):		2.0	4.4	0.8	2.6	1.0	2.4	0.6	1.8	
		Date Sampled:		14-Jan-2025	14-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025	16-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
		Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755
Quotation No.:		Chemtest Sample ID.:		1920017	1920018	1920019	1920020	1920021	1920022	1920023	1920024	
		Client Sample ID.:		BH112	BH112	BH106	BH106	BH107	BH107	BH108	BH108	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Bottom Depth (m):		2.0	4.4	0.8	2.6	1.0	2.4	0.6	1.8	
		Date Sampled:		14-Jan-2025	14-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025	16-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
		Asbestos Lab:		DURHAM		DURHAM		DURHAM		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	6.4	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.6	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	7.3	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	6.6	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.8	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.5	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	4.4	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.6	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.5	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.1	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.85	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:						25-01755	25-01755	25-01755	25-01755	25-01755	25-01755	25-01755
Quotation No.:		Chemtest Sample ID.:						1920017	1920018	1920019	1920020	1920021	1920022	1920024
		Client Sample ID.:						BH112	BH112	BH106	BH106	BH107	BH107	BH108
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						2.0	4.4	0.8	2.6	1.0	2.4	0.6
		Date Sampled:						14-Jan-2025	14-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	15-Jan-2025	16-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						DURHAM		DURHAM		DURHAM		DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.6	< 0.50
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755		
Quotation No.:		Chemtest Sample ID.:		1920025		
		Client Sample ID.:		BH104		
		Sample Type:		SOIL		
		Bottom Depth (m):		2.3		
		Date Sampled:		16-Jan-2025		
		Time Sampled:		12:00		
		Asbestos Lab:		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
ACM Type		U	2192		N/A	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected
Asbestos by Gravimetry		U	2192	%	0.001	
Total Asbestos		U	2192	%	0.001	
Moisture		N	2030	%	0.020	11
Soil Colour		N	2040		N/A	Brown
Other Material		N	2040		N/A	Stones
Soil Texture		N	2040		N/A	Clay
pH at 20C		M	2010		4.0	8.4
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010
Total Sulphur		U	2175	%	0.010	0.020
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.9
Sulphate (Total)		U	2430	%	0.010	0.032
Arsenic		M	2455	mg/kg	0.5	8.2
Cadmium		M	2455	mg/kg	0.10	< 0.10
Chromium		M	2455	mg/kg	0.5	38
Copper		M	2455	mg/kg	0.50	30
Mercury		M	2455	mg/kg	0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	73
Lead		M	2455	mg/kg	0.50	12
Selenium		M	2455	mg/kg	0.25	0.37
Zinc		M	2455	mg/kg	0.50	55
Chromium (Hexavalent)		N	2490	mg/kg	0.50	0.85
Organic Matter		M	2625	%	0.40	< 0.40
Total Organic Carbon		M	2625	%	0.20	< 0.20
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	< 10
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0	< 1.0

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755		
Quotation No.:		Chemtest Sample ID.:		1920025		
		Client Sample ID.:		BH104		
		Sample Type:		SOIL		
		Bottom Depth (m):		2.3		
		Date Sampled:		16-Jan-2025		
		Time Sampled:		12:00		
		Asbestos Lab:		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Vinyl Chloride		M	2760	µg/kg	1.0	5.5
Bromomethane		M	2760	µg/kg	20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	13
Dichloromethane		N	2760	µg/kg	50	< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	28
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	82
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	3100
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10
Toluene		M	2760	µg/kg	1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0
Tri bromomethane		U	2760	µg/kg	1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755		
Quotation No.:		Chemtest Sample ID.:		1920025		
		Client Sample ID.:		BH104		
		Sample Type:		SOIL		
		Bottom Depth (m):		2.3		
		Date Sampled:		16-Jan-2025		
		Time Sampled:		12:00		
		Asbestos Lab:		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:		25-01755		
Quotation No.:		Chemtest Sample ID.:		1920025		
		Client Sample ID.:		BH104		
		Sample Type:		SOIL		
		Bottom Depth (m):		2.3		
		Date Sampled:		16-Jan-2025		
		Time Sampled:		12:00		
		Asbestos Lab:		DURHAM		
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 1)

Client: E3P		Chemtest Job No.:	25-01755			
Quotation No.:		Chemtest Sample ID.:	1920025			
		Client Sample ID.:	BH104			
		Sample Type:	SOIL			
		Bottom Depth (m):	2.3			
		Date Sampled:	16-Jan-2025			
		Time Sampled:	12:00			
		Asbestos Lab:	DURHAM			
Determinand	HWOL Code	Accred.	SOP	Units	LOD	
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50
Total Phenols		M	2920	mg/kg	0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

Report Information

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-02012-1

Initial Date of Issue: 10-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Prescott (Standard 2)

Quotation No.: **Date Received:** 22-Jan-2025

Order No.: 010360 **Date Instructed:** 22-Jan-2025

No. of Samples: 7

Turnaround (Wkdays): 5 **Results Due:** 28-Jan-2025

Date Approved: 10-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex Prescott (Standard 2)

Client: E3P		Chemtest Job No.:						25-02012	25-02012	25-02012	25-02012	25-02012	25-02012
Quotation No.:		Chemtest Sample ID.:						1920861	1920862	1920863	1920864	1920865	1920866
		Client Sample ID.:						BH104	BH103	BH103	BH202	BH202	BH105
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						5.5	0.5	3.5	0.9	2.6	0.7
		Date Sampled:						17-Jan-2025	17-Jan-2025	17-Jan-2025	20-Jan-2025	20-Jan-2025	21-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM		DURHAM		DURHAM
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
ACM Type		U	2192		N/A			-		-		-	
Asbestos Identification		U	2192		N/A		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		
Moisture		N	2030	%	0.020	15	23	17	12	14	16	15	
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	
Other Material		N	2040		N/A	Stones	Stones, and Roots	Stones and	Stones	Stones and	Stones and	Stones and	
Soil Texture		N	2040		N/A	Sand	Clay	clay/sand	Clay	Clay	Clay	Clay	
pH at 20C		M	2010		4.0	7.8	7.7	7.6	7.6	7.3	7.7	7.6	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010	0.35	0.041	0.016	0.099	0.78	< 0.010	
Total Sulphur		U	2175	%	0.010	0.010	0.16	0.070	0.010	0.020	2.4	0.030	
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	2.5	7.5	2.5	2.0	3.6	6.1	2.9	
Sulphate (Total)		U	2430	%	0.010	0.031	0.50	0.035	0.038	0.022	2.6	0.16	
Arsenic		M	2455	mg/kg	0.5	7.2	9.2	5.6	11	11	39	6.8	
Cadmium		M	2455	mg/kg	0.10	< 0.10	0.15	< 0.10	0.15	< 0.10	0.16	0.12	
Chromium		M	2455	mg/kg	0.5	35	20	28	55	66	270	75	
Copper		M	2455	mg/kg	0.50	30	58	19	31	24	120	37	
Mercury		M	2455	mg/kg	0.05	< 0.05	0.10	< 0.05	< 0.05	< 0.05	0.08	< 0.05	
Nickel		M	2455	mg/kg	0.50	47	120	34	54	41	830	160	
Lead		M	2455	mg/kg	0.50	10	74	12	16	15	150	20	
Selenium		M	2455	mg/kg	0.25	0.63	0.61	0.40	0.79	0.50	3.7	0.95	
Zinc		M	2455	mg/kg	0.50	46	150	42	71	60	430	99	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Organic Matter		M	2625	%	0.40	0.50	5.1	2.0	1.7	0.88	2.6	0.78	
Total Organic Carbon		M	2625	%	0.20	0.29	2.9	1.2	1.0	0.51	1.5	0.45	
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	3.7	3.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	2.1	3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	2.8	5.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	4.4	12	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	5.8	5.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	7.3	25	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	3.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	27	57	< 10	< 10	< 10	< 10	< 10	
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride		M	2760	µg/kg	1.0	13	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Results - Soil

Project: Glen Dimplex Prescott (Standard 2)

Client: E3P		Chemtest Job No.:						25-02012	25-02012	25-02012	25-02012	25-02012	25-02012	25-02012
Quotation No.:		Chemtest Sample ID.:						1920861	1920862	1920863	1920864	1920865	1920866	1920867
		Client Sample ID.:						BH104	BH103	BH103	BH202	BH202	BH105	BH105
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						5.5	0.5	3.5	0.9	2.6	0.7	2.6
		Date Sampled:						17-Jan-2025	17-Jan-2025	17-Jan-2025	20-Jan-2025	20-Jan-2025	21-Jan-2025	21-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM		DURHAM		DURHAM	
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	48	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane		N	2760	µg/kg	50							< 50		
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	670	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	> 10000	15	13	< 1.0	< 1.0	69	11		
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0	< 1.0		
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0		
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Glen Dimplex Prescott (Standard 2)

Client: E3P		Chemtest Job No.:						25-02012	25-02012	25-02012	25-02012	25-02012	25-02012	25-02012
Quotation No.:		Chemtest Sample ID.:						1920861	1920862	1920863	1920864	1920865	1920866	1920867
		Client Sample ID.:						BH104	BH103	BH103	BH202	BH202	BH105	BH105
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						5.5	0.5	3.5	0.9	2.6	0.7	2.6
		Date Sampled:						17-Jan-2025	17-Jan-2025	17-Jan-2025	20-Jan-2025	20-Jan-2025	21-Jan-2025	21-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM		DURHAM		DURHAM	
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 2)

Client: E3P		Chemtest Job No.:						25-02012	25-02012	25-02012	25-02012	25-02012	25-02012	25-02012
Quotation No.:		Chemtest Sample ID.:						1920861	1920862	1920863	1920864	1920865	1920866	1920867
		Client Sample ID.:						BH104	BH103	BH103	BH202	BH202	BH105	BH105
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						5.5	0.5	3.5	0.9	2.6	0.7	2.6
		Date Sampled:						17-Jan-2025	17-Jan-2025	17-Jan-2025	20-Jan-2025	20-Jan-2025	21-Jan-2025	21-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM		DURHAM		DURHAM	
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 2)

Client: E3P		Chemtest Job No.:						25-02012	25-02012	25-02012	25-02012	25-02012	25-02012	25-02012
Quotation No.:		Chemtest Sample ID.:						1920861	1920862	1920863	1920864	1920865	1920866	1920867
		Client Sample ID.:						BH104	BH103	BH103	BH202	BH202	BH105	BH105
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						5.5	0.5	3.5	0.9	2.6	0.7	2.6
		Date Sampled:						17-Jan-2025	17-Jan-2025	17-Jan-2025	20-Jan-2025	20-Jan-2025	21-Jan-2025	21-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM		DURHAM		DURHAM	
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Total Phenols		M	2920	mg/kg	0.10		1.9	2.0	1.8	1.8	< 0.10	2.0	< 0.10	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

Report Information

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-02676-1

Initial Date of Issue: 06-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Prescott (Standard 3)

Quotation No.: **Date Received:** 27-Jan-2025

Order No.: 010360 **Date Instructed:** 27-Jan-2025

No. of Samples: 11

Turnaround (Wkdays): 5 **Results Due:** 31-Jan-2025

Date Approved: 06-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:						25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:						1923351	1923352	1923353	1923354	1923355	1923356	1923357
		Client Sample ID.:						BH109	BH109	BH102	BH102	BH101	BH101	BH111
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						1.0	2.4	0.5	3.2	1.8	2.9	1.0
		Date Sampled:						22-Jan-2025	22-Jan-2025	22-Jan-2025	22-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
ACM Type		U	2192		N/A	-		-		-		-		
Asbestos Identification		U	2192		N/A	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected		No Asbestos Detected
Moisture		N	2030	%	0.020	22	12	22	11	19	15	14	11	
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	brown/black	Brown	Brown	Brown	
Other Material		N	2040		N/A	Stones, Roots and	Stones and	Stones and	Stones and	Stones and	None	Stones and	Stones and	
Soil Texture		N	2040		N/A	Clay	Sand	Clay	Clay	clay/sand	Sand	Clay	Clay	
pH at 20C		M	2010		4.0	8.0	7.8	6.3	7.6	7.8	7.2	7.4	7.7	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.031	< 0.010	0.22	< 0.010	< 0.010	< 0.010	0.042	< 0.010	
Total Sulphur		U	2175	%	0.010	0.38	0.010	0.070	0.020	0.11	0.010	0.020	0.010	
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	4.1	2.1	4.8	2.7	1.8	2.2	2.1	1.7	
Sulphate (Total)		U	2430	%	0.010	0.34	0.014	0.16	0.050	0.25	0.013	0.045	0.018	
Arsenic		M	2455	mg/kg	0.5	15	3.3	16	9.9	20	4.7	6.8	7.1	
Cadmium		M	2455	mg/kg	0.10	0.19	< 0.10	0.14	0.13	0.31	< 0.10	< 0.10	0.15	
Chromium		M	2455	mg/kg	0.5	26	41	21	45	59	42	42	39	
Copper		M	2455	mg/kg	0.50	95	17	89	27	100	26	17	23	
Mercury		M	2455	mg/kg	0.05	0.16	< 0.05	0.16	< 0.05	0.07	< 0.05	< 0.05	< 0.05	
Nickel		M	2455	mg/kg	0.50	26	28	21	52	73	44	25	45	
Lead		M	2455	mg/kg	0.50	150	11	95	13	49	12	9.4	13	
Selenium		M	2455	mg/kg	0.25	0.78	0.32	0.69	0.77	1.4	0.51	0.52	0.57	
Zinc		M	2455	mg/kg	0.50	130	41	76	62	100	53	34	54	
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Organic Matter		M	2625	%	0.40	7.2	< 0.40	6.7	1.9	21	< 0.40	< 0.40	0.64	
Total Organic Carbon		M	2625	%	0.20	4.2	< 0.20	3.9	1.1	12	< 0.20	< 0.20	0.37	
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl Chloride		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:	1923351	1923352	1923353	1923354	1923355	1923356	1923357	1923358		
		Client Sample ID.:	BH109	BH109	BH102	BH102	BH101	BH101	BH111	BH111		
		Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
		Bottom Depth (m):	1.0	2.4	0.5	3.2	1.8	2.9	1.0	3.6		
		Date Sampled:	22-Jan-2025	22-Jan-2025	22-Jan-2025	22-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025		
		Time Sampled:	12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00		
		Asbestos Lab:	NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB			
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	9.6	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.0	3.0	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.9	1.6	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:		25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:		1923351	1923352	1923353	1923354	1923355	1923356	1923357	1923358	
		Client Sample ID.:		BH109	BH109	BH102	BH102	BH101	BH101	BH111	BH111	
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
		Bottom Depth (m):		1.0	2.4	0.5	3.2	1.8	2.9	1.0	3.6	
		Date Sampled:		22-Jan-2025	22-Jan-2025	22-Jan-2025	22-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00	12:00	
		Asbestos Lab:		NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB		
Determinand	HWOL Code	Accred.	SOP	Units	LOD							
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:						25-02676	25-02676	25-02676	25-02676	25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:						1923351	1923352	1923353	1923354	1923355	1923356	1923357
		Client Sample ID.:						BH109	BH109	BH102	BH102	BH101	BH101	BH111
		Sample Type:						SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):						1.0	2.4	0.5	3.2	1.8	2.9	1.0
		Date Sampled:						22-Jan-2025	22-Jan-2025	22-Jan-2025	22-Jan-2025	23-Jan-2025	23-Jan-2025	23-Jan-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:						NEW-ASB		NEW-ASB		NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:				25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:				1923359	1923360	1923361
		Client Sample ID.:				BH110	BH110	BH203
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				2.0	3.2	1.9
		Date Sampled:				24-Jan-2025	24-Jan-2025	24-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:				NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
ACM Type		U	2192		N/A	-		-
Asbestos Identification		U	2192		N/A	No Asbestos Detected		No Asbestos Detected
Moisture		N	2030	%	0.020	18	16	18
Soil Colour		N	2040		N/A	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones and	Stones and	Stones and
Soil Texture		N	2040		N/A	Sand	Clay	Clay
pH at 20C		M	2010		4.0	7.6	7.7	7.0
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.83	0.023	0.17
Total Sulphur		U	2175	%	0.010	1.0	0.030	0.050
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	3.4	2.9	2.2
Sulphate (Total)		U	2430	%	0.010	0.70	0.042	0.20
Arsenic		M	2455	mg/kg	0.5	24	8.2	26
Cadmium		M	2455	mg/kg	0.10	0.18	0.11	< 0.10
Chromium		M	2455	mg/kg	0.5	12	56	24
Copper		M	2455	mg/kg	0.50	80	34	790
Mercury		M	2455	mg/kg	0.05	0.13	< 0.05	0.07
Nickel		M	2455	mg/kg	0.50	46	60	44
Lead		M	2455	mg/kg	0.50	74	21	170
Selenium		M	2455	mg/kg	0.25	0.92	0.77	0.67
Zinc		M	2455	mg/kg	0.50	55	70	1200
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	26	0.88	3.3
Total Organic Carbon		M	2625	%	0.20	15	0.51	1.9
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	< 10	< 10	< 10
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:				25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:				1923359	1923360	1923361
		Client Sample ID.:				BH110	BH110	BH203
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				2.0	3.2	1.9
		Date Sampled:				24-Jan-2025	24-Jan-2025	24-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:				NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	< 1.0	1.9	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:				25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:				1923359	1923360	1923361
		Client Sample ID.:				BH110	BH110	BH203
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				2.0	3.2	1.9
		Date Sampled:				24-Jan-2025	24-Jan-2025	24-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:				NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex Prescott (Standard 3)

Client: E3P		Chemtest Job No.:				25-02676	25-02676	25-02676
Quotation No.:		Chemtest Sample ID.:				1923359	1923360	1923361
		Client Sample ID.:				BH110	BH110	BH203
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				2.0	3.2	1.9
		Date Sampled:				24-Jan-2025	24-Jan-2025	24-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:				NEW-ASB		NEW-ASB
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	1.2	< 0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

Report Information

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-03251-1

Initial Date of Issue: 25-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex, Prescot (Standard 4)

Quotation No.: **Date Received:** 30-Jan-2025

Order No.: 010360 **Date Instructed:** 30-Jan-2025

No. of Samples: 3

Turnaround (Wkdays): 5 **Results Due:** 05-Feb-2025

Date Approved: 25-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex, Prescott (Standard 4)

Client: E3P		Chemtest Job No.:				25-03251	25-03251	25-03251
Quotation No.:		Chemtest Sample ID.:				1925358	1925359	1925360
		Client Sample ID.:				BH203	BH201	BH201
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				4.0	1.5	3.6
		Date Sampled:				27-Jan-2025	28-Jan-2025	28-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:					NEW-ASB	
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
ACM Type		U	2192		N/A		-	
Asbestos Identification		U	2192		N/A		No Asbestos Detected	
Moisture		N	2030	%	0.020	18	8.4	17
Soil Colour		N	2040		N/A	Brown	Black	Brown
Other Material		N	2040		N/A	Stones and	Stones and	None
Soil Texture		N	2040		N/A	Clay	Sand	Clay
pH at 20C		M	2010		4.0	8.3	7.6	7.1
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.21	0.28	< 0.010
Total Sulphur		U	2175	%	0.010	0.050	0.080	0.010
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	46	6.1	3.3
Sulphate (Total)		U	2430	%	0.010	0.096	0.18	0.017
Arsenic		M	2455	mg/kg	0.5	9.5	11	9.4
Cadmium		M	2455	mg/kg	0.10	0.12	0.22	0.11
Chromium		M	2455	mg/kg	0.5	39	31	54
Copper		M	2455	mg/kg	0.50	45	46	35
Mercury		M	2455	mg/kg	0.05	< 0.05	0.10	< 0.05
Nickel		M	2455	mg/kg	0.50	43	24	72
Lead		M	2455	mg/kg	0.50	21	32	19
Selenium		M	2455	mg/kg	0.25	< 0.25	< 0.25	0.60
Zinc		M	2455	mg/kg	0.50	38	40	72
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Organic Matter		M	2625	%	0.40	1.3	2.4	< 0.40
Total Organic Carbon		M	2625	%	0.20	0.73	1.4	0.20
TPH >C6-C8	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C8-C10	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C12	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C12-C16	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C16-C21	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C25	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C25-C35	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
TPH >C35-C40	EH_1D_Total	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0
Total TPH >C6-C40	EH_1D_Total	U	2670	mg/kg	10	< 10	< 10	< 10
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20

Results - Soil

Project: Glen Dimplex, Prescott (Standard 4)

Client: E3P		Chemtest Job No.:				25-03251	25-03251	25-03251
Quotation No.:		Chemtest Sample ID.:				1925358	1925359	1925360
		Client Sample ID.:				BH203	BH201	BH201
		Sample Type:				SOIL	SOIL	SOIL
		Bottom Depth (m):				4.0	1.5	3.6
		Date Sampled:				27-Jan-2025	28-Jan-2025	28-Jan-2025
		Time Sampled:				12:00	12:00	12:00
		Asbestos Lab:					NEW-ASB	
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Dichloromethane		N	2760	µg/kg	50	< 50	< 50	< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	22	< 1.0	19
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	150	< 1.0	180
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Glen Dimplex, Prescott (Standard 4)

Client: E3P		Chemtest Job No.:		25-03251	25-03251	25-03251	
Quotation No.:		Chemtest Sample ID.:		1925358	1925359	1925360	
		Client Sample ID.:		BH203	BH201	BH201	
		Sample Type:		SOIL	SOIL	SOIL	
		Bottom Depth (m):		4.0	1.5	3.6	
		Date Sampled:		27-Jan-2025	28-Jan-2025	28-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	
		Asbestos Lab:			NEW-ASB		
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50

Results - Soil

Project: Glen Dimplex, Prescott (Standard 4)

Client: E3P		Chemtest Job No.:		25-03251	25-03251	25-03251	
Quotation No.:		Chemtest Sample ID.:		1925358	1925359	1925360	
		Client Sample ID.:		BH203	BH201	BH201	
		Sample Type:		SOIL	SOIL	SOIL	
		Bottom Depth (m):		4.0	1.5	3.6	
		Date Sampled:		27-Jan-2025	28-Jan-2025	28-Jan-2025	
		Time Sampled:		12:00	12:00	12:00	
		Asbestos Lab:			NEW-ASB		
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Alkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N-dimethyl-p-phenylenediamine.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazine.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Final Report

Report No.: 25-01620-1

Initial Date of Issue: 30-Jan-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Prescott (PFAS 1)

Quotation No.: **Date Received:** 20-Jan-2025

Order No.: 010361 **Date Instructed:** 20-Jan-2025

No. of Samples: 4

Turnaround (Wkdays): 22 **Results Due:** 18-Feb-2025

Date Approved: 30-Jan-2025 **Subcon Results Due:** 10-Feb-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex Prescott (PFAS 1)

Client: E3P		Chemtest Job No.:				25-01620	25-01620	25-01620	25-01620
Quotation No.:		Chemtest Sample ID.:				1919686	1919687	1919688	1919689
		Client Sample ID.:				BH112	BH108	BH107	BH104
		Sample Type:				SOIL	SOIL	SOIL	SOIL
		Bottom Depth (m):				1.5	0.5	1.0	2.1
		Date Sampled:				14-Jan-2025	16-Jan-2025	15-Jan-2025	16-Jan-2025
		Time Sampled:				12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Perfluorooctanoic Acid (PFOA) (Subcon)		SN		µg/kg	N/A	See Attached	See Attached	See Attached	See Attached
Perfluorooctyl sulfonate (PFOS) (Subcon)		SN		µg/kg	N/A	See Attached	See Attached	See Attached	See Attached
PFAS Suite Soils		SN		µg/kg	0.0	See Attached	See Attached	See Attached	See Attached

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NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

Report Information

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EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
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#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-02014
Our reference : Project 1879743
Validation Ref. : 1879743_certificaat_v1
Verificationcode : OCOH-NBGA-RCRB-GGQN
Enclosure(s) : 4 table(s) + 3 supplement(s)

Amsterdam, 25 February 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

I would like to point out to you that the results apply only to the samples supplied, such as these were presented for testing.

The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

Do also note that the enclosed report may not be copied or reproduced in any way except in its entirety. I trust that we have completed your order as agreed and to your full satisfaction. If you have any questions reading this report, then please don't hesitate to contact our Customer Service.

Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

Conditions of delivery of Eurofins Omegam have been registered.
This certificate may not be reproduced other than in full, except with the prior written approval of Eurofins Omegam.

Eurofins Omegam B.V.
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NL-1114 AD Amsterdam-Duivendrecht
Netherlands

T +31-(0)20-597 66 80
CSOmegam@etbnl.eurofins.com
www.eurofins.nl/en

IBAN NL 16 BNPA 0227667980
Swiftaddress BNPANL2A
VAT: NL8139.67.132.B01
Trade register No. 34215654

CERTIFICATE

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Your Sample identification

8655653 = 1920874 BH103

8655670 = 1920875 BH105

Client sampling date	:	17/01/2025	17/01/2025
Date of receipt	:	19/02/2025	19/02/2025
Startdate	:	21/02/2025	21/02/2025
Reference number	:	8655653	8655670
Your Matrix	:	Soil	Soil

Sample preparation

S AS3000 (steekmonster)		done	done
S weight of artifact	g	n.a.	n.a.
S type of artifact		n.v.t.	n.v.t.
S sample preparation		done	done

General analysis - physics

S dry weight	%	74,2	89,6
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C E R T I F I C A T E

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Your Sample identification

8655653 = 1920874 BH103

8655670 = 1920875 BH105

Client sampling date	:	17/01/2025	17/01/2025
Date of receipt	:	19/02/2025	19/02/2025
Startdate	:	21/02/2025	21/02/2025
Reference number	:	8655653	8655670
Your Matrix	:	Soil	Soil

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS*Perfluorinated carboxylic acids:*

S	PFBA	µg/kg dw	< 0,1	< 0,1
S	PFPeA	µg/kg dw	< 0,1	< 0,1
S	PFHxA	µg/kg dw	< 0,1	< 0,1
S	PFHpA	µg/kg dw	< 0,1	< 0,1
S	PFOA linear	µg/kg dw	< 0,1	< 0,1
S	PFOA branched	µg/kg dw	< 0,1	< 0,1
S	PFNA	µg/kg dw	< 0,1	< 0,1
S	PFDA	µg/kg dw	< 0,1	< 0,1
S	PFUnDA	µg/kg dw	< 0,1	< 0,1
S	PFDODA	µg/kg dw	< 0,1	< 0,1
S	PFTTrDA	µg/kg dw	< 0,1	< 0,1
S	PFTeDA	µg/kg dw	< 0,1	< 0,1
S	PFHxDA	µg/kg dw	< 0,1	< 0,1
S	PFODA	µg/kg dw	< 0,1	< 0,1

Perfluorinated sulfonic acids:

S	PFBS	µg/kg dw	< 0,1	< 0,1
S	PFPeS	µg/kg dw	< 0,1	< 0,1
S	PFHxS	µg/kg dw	< 0,1	< 0,1
S	PFHpS	µg/kg dw	< 0,1	< 0,1
S	PFOS linear	µg/kg dw	< 0,1	< 0,1
S	PFOS branched	µg/kg dw	< 0,1	< 0,1
S	PFDS	µg/kg dw	< 0,1	< 0,1

Perfluorinated alkyl substances - precursors:

S	4:2 FTS	µg/kg dw	< 0,1	< 0,1
S	6:2 FTS	µg/kg dw	< 0,1	< 0,1
S	8:2 FTS	µg/kg dw	< 0,1	< 0,1
S	10:2 FTS	µg/kg dw	< 0,1	< 0,1
S	PFOSA	µg/kg dw	< 0,1	< 0,1

Perfluorinated alkyl substances - remainder:

	HPFHpA	µg/kg dw	< 0,4	< 0,4
	4H-PFUnDA	µg/kg dw	< 0,4	< 0,4
	8:2 FTUCA	µg/kg dw	< 0,4	< 0,4
Q	9CI-PF3ONS (F53-B)	µg/kg dw	< 0,1	< 0,1
Q	ADONA	µg/kg dw	< 0,1	< 0,1
Q	EtFOSA	µg/kg dw	< 0,1	< 0,1
S	EtFOSAA	µg/kg dw	< 0,1	< 0,1
	MeFBSA	µg/kg dw	< 0,4	< 0,4
S	MeFOSAA	µg/kg dw	< 0,1	< 0,1
Q	P37DMOA	µg/kg dw	< 1	< 1
Q	PFBSA	µg/kg dw	< 0,1	< 0,1
S	MeFOSA	µg/kg dw	< 0,1	< 0,1
Q	MeFBSAA	µg/kg dw	< 0,1	< 0,1
S	8:2 DiPAP	µg/kg dw	< 0,1	< 0,1
S	HFPO-DA (GenX)	µg/kg dw	< 0,1	< 0,1

- The frontpage and, where applicable, appendices of this document are integral parts of this certificate.

- Analyses marked with a 'Q' are part of the RvA accreditation certificate L086.

- Analyses marked with a 'S' are part of the AS 3000 accreditation certificate.

Verificationcode: OCOH-NBGA-RCRB-GGQN

Ref.: 1879743_certificaat_v1

CERTIFICATE

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Your Sample identification

8655653 = 1920874 BH103

8655670 = 1920875 BH105

Client sampling date	:	17/01/2025	17/01/2025
Date of receipt	:	19/02/2025	19/02/2025
Startdate	:	21/02/2025	21/02/2025
Reference number	:	8655653	8655670
Your Matrix	:	Soil	Soil

S som PFOA	µg/kg dw	0,1	0,1
S sum PFOS	µg/kg dw	0,1	0,1

C E R T I F I C A T E

Project code	:	1879743
Your Project Description	:	25-02014
Client	:	Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identification, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

Project Note(s):	- Quantification of HFPO-DA (GenX) is based on 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (CAS nr. 13252-13-6). Another name of GenX is perfluoro-2-propoxypropanoic acid (PFPrOPrA).
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C E R T I F I C A T E

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Storage and Preservation Comments

The comments below indicate a deviation from the procedures mentioned in the NEN-ISO 18512 ("Soil quality - Guidance on long and short term storage of soil samples"), NEN-EN-ISO 5667-15 ("Water quality - Sampling - Part 15: Guidance on the preservation and handling of sludge and sediment samples") and NEN-EN-ISO 5667-3 ("Water quality - Sampling - Part 3: Preservation and handling of water samples"). The deviation from the procedures may have affected the reliability of the following results.

This appendix forms an integral part of this certificate.

Sample identification : 1920874 BH103
Reference number : 8655653

.....
Analyses Note(s):

GenX: - The conserving term for the analysis is exceeded.
PFAS: - The conserving term for the analysis is exceeded.

Sample identification : 1920875 BH105
Reference number : 8655670

.....
Analyses Note(s):

GenX: - The conserving term for the analysis is exceeded.
PFAS: - The conserving term for the analysis is exceeded.

C E R T I F I C A T E

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHhA	PFHhA (perfluoroheptanoic acid)
PFHhS	PFHhS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)

C E R T I F I C A T E

Project code : 1879743
Your Project Description : 25-02014
Client : Eurofins Chemtest Ltd

Methodology Soil (AS3000)**AS3000**

In dit analysecertificaat zijn de met 'S' gemerkte analyses uitgevoerd volgens de analysemethoden beschreven in het "Accreditatieschema Laboratoriumanalyses voor grond-, waterbodem- en grondwateronderzoek (AS SIKB 3000)". Het laboratoriumonderzoek is uitgevoerd volgens de onderstaande analysemethoden. Deze analyses zijn vastgelegd in het geldende accreditatie-certificaat met bijbehorende verrichtingenlijst L086 van Eurofins Omegam BV.

Samplemate : Conform AS3000 en NEN-EN 16179
Dry weight : Conform AS3010 prestatieblad 2
PFAS : Conform AS3080 prestatieblad 1
GenX : Conform AS3080 prestatieblad 2

In this certificate of analysis, the analysis marked with 'Q' have been carried out according to the analysis methods below. The analysis are registered in the current accreditation certificate with associated annex to declaration of accreditation (scope of accreditation) L086 of Eurofins Omegam BV.

PFAS : In house method

Final Report

Report No.: 25-02014-1

Initial Date of Issue: 26-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex, Prescott (PFAS 2)

Quotation No.: **Date Received:** 22-Jan-2025

Order No.: 010361 **Date Instructed:** 22-Jan-2025

No. of Samples: 2

Turnaround (Wkdays): 26 **Results Due:** 26-Feb-2025

Date Approved: 26-Feb-2025 **Subcon Results Due:** 26-Feb-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Glen Dimplex, Prescott (PFAS 2)

Client: E3P		Chemtest Job No.:				25-02014	25-02014
Quotation No.:		Chemtest Sample ID.:				1920874	1920875
		Client Sample ID.:				BH103	BH105
		Sample Type:				SOIL	SOIL
		Bottom Depth (m):				0.6	1.0
		Date Sampled:				17-Jan-2025	21-Jan-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Perfluorooctanoic Acid (PFOA) (Subcon)		SN		µg/kg	N/A	See Attached	See Attached
Perfluorooctyl sulfonate (PFOS) (Subcon)		SN		µg/kg	N/A	See Attached	See Attached
PFAS Suite Soils		SN		µg/kg	0.0	See Attached	See Attached

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-01620
Our reference : Project 1864829
Validation Ref. : 1864829_certificaat_v3
Verificationcode : EURM-BYOO-BAHI-VGJC
Enclosure(s) : 7 table(s) + 2 supplement(s)

Amsterdam, 31 January 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

I would like to point out to you that the results apply only to the samples supplied, such as these were presented for testing.

The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

Do also note that the enclosed report may not be copied or reproduced in any way except in its entirety. I trust that we have completed your order as agreed and to your full satisfaction. If you have any questions reading this report, then please don't hesitate to contact our Customer Service.

Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

Conditions of delivery of Eurofins Omegam have been registered.
This certificate may not be reproduced other than in full, except with the prior written approval of Eurofins Omegam.

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Trade register No. 34215654

C E R T I F I C A T E

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Your Sample identification

8608910 = 1919686 BH112

8608919 = 1919687 BH108

8608920 = 1919688 BH107

Client sampling date	:	14/01/2025	14/01/2025	14/01/2025
Date of receipt	:	22/01/2025	22/01/2025	22/01/2025
Startdate	:	22/01/2025	22/01/2025	22/01/2025
Reference number	:	8608910	8608919	8608920
Your Matrix	:	Soil	Soil	Soil

Sample preparation

S AS3000 (steekmonster)	done	done	done
cryogenic grinding		grinded	
S sample preparation	done	done	done

General analysis - physics

S dry weight	%	86,5	70,9	86,3
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CERTIFICATE

Project code : 1864829
 Your Project Description : 25-01620
 Client : Eurofins Chemtest Ltd

Your Sample identification

8608910 = 1919686 BH112

8608919 = 1919687 BH108

8608920 = 1919688 BH107

Client sampling date	:	14/01/2025	14/01/2025	14/01/2025
Date of receipt	:	22/01/2025	22/01/2025	22/01/2025
Startdate	:	22/01/2025	22/01/2025	22/01/2025
Reference number	:	8608910	8608919	8608920
Your Matrix	:	Soil	Soil	Soil

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

S	PFBA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFPeA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFHxA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFHpA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFOA linear	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFOA branched	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFNA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFDA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFUnDA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFDoDA	µg/kg dw	< 0,1	< 0,1	< 0,2
S	PFTTrDA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFTeDA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFHxDA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFODA	µg/kg dw	< 0,1	< 0,1	< 0,1

Perfluorinated sulfonic acids:

S	PFBS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFPeS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFHxS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFHpS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFOS linear	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFOS branched	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFDS	µg/kg dw	< 0,1	< 0,1	< 0,1

Perfluorinated alkyl substances - precursors:

S	4:2 FTS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	6:2 FTS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	8:2 FTS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	10:2 FTS	µg/kg dw	< 0,1	< 0,1	< 0,1
S	PFOSA	µg/kg dw	< 0,1	< 0,1	< 0,1

Perfluorinated alkyl substances - remainder:

	HPFHpA	µg/kg dw	< 0,4	< 0,4	< 0,4
	4H-PFUnDA	µg/kg dw	< 0,4	< 0,4	< 0,4
	8:2 FTUCA	µg/kg dw	< 0,4	< 0,4	< 0,4
Q	9CI-PF3ONS (F53-B)	µg/kg dw	< 0,1	< 0,1	< 0,1
Q	ADONA	µg/kg dw	< 0,1	< 0,1	< 0,1
Q	EtFOSA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	EtFOSAA	µg/kg dw	< 0,1	< 0,1	0,1
	MeFBSA	µg/kg dw	< 0,4	< 0,4	< 0,4
S	MeFOSAA	µg/kg dw	< 0,1	< 0,1	< 0,1
Q	P37DMOA	µg/kg dw	< 1	< 1	< 1
Q	PFBSA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	MeFOSA	µg/kg dw	< 0,1	< 0,1	< 0,1
Q	MeFBSAA	µg/kg dw	< 0,1	< 0,1	< 0,1
S	8:2 DiPAP	µg/kg dw	< 0,1	< 0,1	< 0,1
S	HFPO-DA (GenX)	µg/kg dw	< 0,1	< 0,1	< 0,1

- The frontpage and, where applicable, appendices of this document are integral parts of this certificate.

- Analyses marked with a 'Q' are part of the RvA accreditation certificate L086.

- Analyses marked with a 'S' are part of the AS 3000 accreditation certificate.

Verificationcode: EURM-BYOO-BAHI-VGJC

Ref.: 1864829_certificaat_v3

 CERTIFICATE

Project code : 1864829
 Your Project Description : 25-01620
 Client : Eurofins Chemtest Ltd

Your Sample identification

8608910 = 1919686 BH112

8608919 = 1919687 BH108

8608920 = 1919688 BH107

Client sampling date	:	14/01/2025	14/01/2025	14/01/2025
Date of receipt	:	22/01/2025	22/01/2025	22/01/2025
Startdate	:	22/01/2025	22/01/2025	22/01/2025
Reference number	:	8608910	8608919	8608920
Your Matrix	:	Soil	Soil	Soil

S som PFOA	µg/kg dw	0,1	0,1	0,1
S sum PFOS	µg/kg dw	0,1	0,1	0,1

CERTIFICATE

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Your Sample identification
8608921 = 1919689 BH104

Client sampling date : 14/01/2025
Date of receipt : 22/01/2025
Startdate : 22/01/2025
Reference number : 8608921
Your Matrix : Soil

Sample preparation

S AS3000 (steekmonster) done
cryogenic grinding
S sample preparation done

General analysis - physics

S dry weight % 79,8

C E R T I F I C A T E

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Your Sample identification
 8608921 = 1919689 BH104

Client sampling date : 14/01/2025
Date of receipt : 22/01/2025
Startdate : 22/01/2025
Reference number : 8608921
Your Matrix : Soil

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS
Perfluorinated carboxylic acids:

S PFBA	µg/kg dw	< 0,1
S PFPeA	µg/kg dw	< 0,1
S PFHxA	µg/kg dw	< 0,1
S PFHpA	µg/kg dw	< 0,1
S PFOA linear	µg/kg dw	< 0,1
S PFOA branched	µg/kg dw	< 0,1
S PFNA	µg/kg dw	< 0,1
S PFDA	µg/kg dw	< 0,1
S PFUnDA	µg/kg dw	< 0,1
S PFDoDA	µg/kg dw	< 0,2
S PFTTrDA	µg/kg dw	< 0,1
S PFTeDA	µg/kg dw	< 0,1
S PFHxDA	µg/kg dw	< 0,1
S PFODA	µg/kg dw	< 0,1

Perfluorinated sulfonic acids:

S PFBS	µg/kg dw	< 0,1
S PFPeS	µg/kg dw	< 0,1
S PFHxS	µg/kg dw	< 0,1
S PFHpS	µg/kg dw	< 0,1
S PFOS linear	µg/kg dw	< 0,1
S PFOS branched	µg/kg dw	< 0,1
S PFDS	µg/kg dw	< 0,1

Perfluorinated alkyl substances - precursors:

S 4:2 FTS	µg/kg dw	< 0,1
S 6:2 FTS	µg/kg dw	< 0,1
S 8:2 FTS	µg/kg dw	< 0,1
S 10:2 FTS	µg/kg dw	< 0,1
S PFOSA	µg/kg dw	< 0,1

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/kg dw	< 0,4
4H-PFUnDA	µg/kg dw	< 0,4
8:2 FTUCA	µg/kg dw	< 0,4
Q 9CI-PF3ONS (F53-B)	µg/kg dw	< 0,1
Q ADONA	µg/kg dw	< 0,1
Q EtFOSA	µg/kg dw	< 0,1
S EtFOSAA	µg/kg dw	< 0,1
MeFBSA	µg/kg dw	< 0,4
S MeFOSAA	µg/kg dw	< 0,1
Q P37DMOA	µg/kg dw	< 1
Q PFBSA	µg/kg dw	< 0,1
S MeFOSA	µg/kg dw	< 0,1
Q MeFBSAA	µg/kg dw	< 0,1
S 8:2 DiPAP	µg/kg dw	< 0,1
S HFPO-DA (GenX)	µg/kg dw	< 0,1

- The frontpage and, where applicable, appendices of this document are integral parts of this certificate.

- Analyses marked with a 'Q' are part of the RvA accreditation certificate L086.

- Analyses marked with a 'S' are part of the AS 3000 accreditation certificate.

Verificationcode: EURM-BYOO-BAHI-VGJC

Ref.: 1864829_certificaat_v3

CERTIFICATE

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Your Sample identification
8608921 = 1919689 BH104

Client sampling date : 14/01/2025
Date of receipt : 22/01/2025
Startdate : 22/01/2025
Reference number : 8608921
Your Matrix : Soil

S	som PFOA	µg/kg dw	0,1
S	sum PFOS	µg/kg dw	0,1

C E R T I F I C A T E

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identification, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

Project Note(s): - Quantification of HFPO-DA (GenX) is based on 2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (CAS nr. 13252-13-6). Another name of GenX is perfluoro-2-propoxypropanoic acid (PFPrOPrA).

Sample identification : 1919688 BH107
Reference number : 8608920

Results Note(s):
perfluorododecanoic acid (PFDoDA): - Raised reporting limit because of interference by the matrix.

Sample identification : 1919689 BH104
Reference number : 8608921

Results Note(s):
perfluorododecanoic acid (PFDoDA): - Raised reporting limit because of interference by the matrix.

C E R T I F I C A T E

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHpA	PFHpA (perfluoroheptanoic acid)
PFHpS	PFHpS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)

C E R T I F I C A T E

Project code : 1864829
Your Project Description : 25-01620
Client : Eurofins Chemtest Ltd

Methodology Soil (AS3000)**AS3000**

In dit analysecertificaat zijn de met 'S' gemerkte analyses uitgevoerd volgens de analysemethoden beschreven in het "Accreditatieschema Laboratoriumanalyses voor grond-, waterbodem- en grondwateronderzoek (AS SIKB 3000)". Het laboratoriumonderzoek is uitgevoerd volgens de onderstaande analysemethoden. Deze analyses zijn vastgelegd in het geldende accreditatie-certificaat met bijbehorende verrichtingenlijst L086 van Eurofins Omegam BV.

Samplemate : Conform AS3000 en NEN-EN 16179
Dry weight : Conform AS3010 prestatieblad 2
PFAS : Conform AS3080 prestatieblad 1
GenX : Conform AS3080 prestatieblad 2

In this certificate of analysis, the analysis marked with 'Q' have been carried out according to the analysis methods below. The analysis are registered in the current accreditation certificate with associated annex to declaration of accreditation (scope of accreditation) L086 of Eurofins Omegam BV.

PFAS : In house method



Final Report

Report No.: 25-03932-1

Initial Date of Issue: 03-Mar-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Waters (Deep Wells V1)

Quotation No.: **Date Received:** 06-Feb-2025

Order No.: 010466 **Date Instructed:** 06-Feb-2025

No. of Samples: 7

Turnaround (Wkdays): 5 **Results Due:** 12-Feb-2025

Date Approved: 03-Mar-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex Waters (Deep Wells V1)

Client: E3P		Chemtest Job No.:				25-03932	25-03932
Quotation No.:		Chemtest Sample ID.:				1927791	1927792
		Client Sample ID.:				BH201	BH202
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				04-Feb-2025	04-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
pH at 20C		U	1010		4.0	7.6	7.7
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium (Dissolved)		U	1455	mg/l	2.00	130	86
Arsenic (Dissolved)		U	1455	µg/l	0.20	4.3	0.79
Cadmium (Dissolved)		U	1455	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)		U	1455	µg/l	0.50	2.7	2.7
Copper (Dissolved)		U	1455	µg/l	0.50	1.6	2.9
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)		U	1455	µg/l	0.50	2100	590
Nickel (Dissolved)		U	1455	µg/l	0.50	5.1	16
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	< 0.50	0.70
Zinc (Dissolved)		U	1455	µg/l	2.5	5.9	12
Dissolved Organic Carbon		U	1610	mg/l	2.0	5.7	2.9
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	< 10	< 10
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	64	< 1.0
Bromomethane		U	1760	µg/l	5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Deep Wells V1)

Client: E3P		Chemtest Job No.:				25-03932	25-03932
Quotation No.:		Chemtest Sample ID.:				1927791	1927792
		Client Sample ID.:				BH201	BH202
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				04-Feb-2025	04-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
1,1-Dichloroethene		U	1760	µg/l	1.0	53	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	260	< 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	1000	< 1.0
Bromochloromethane		U	1760	µg/l	5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	3.2
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	7300	3.8
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	1.9	< 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Deep Wells V1)

Client: E3P		Chemtest Job No.:				25-03932	25-03932
Quotation No.:		Chemtest Sample ID.:				1927791	1927792
		Client Sample ID.:				BH201	BH202
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				04-Feb-2025	04-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: Glen Dimplex Waters (Deep Wells V1)

Client: E3P		Chemtest Job No.:				25-03932	25-03932
Quotation No.:		Chemtest Sample ID.:				1927791	1927792
		Client Sample ID.:				BH201	BH202
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				04-Feb-2025	04-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo(g,h,i)perylene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-05356-1

Initial Date of Issue: 28-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Waters (Standard V2)

Quotation No.: **Date Received:** 16-Feb-2025

Order No.: 010466 **Date Instructed:** 16-Feb-2025

No. of Samples: 4

Turnaround (Wkdays): 5 **Results Due:** 20-Feb-2025

Date Approved: 28-Feb-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05356	25-05356	25-05356	25-05356
Quotation No.:		Chemtest Sample ID.:		1933512	1933513	1933514	1933515
		Client Sample ID.:		BH102	BH104	BH109	BH112
		Sample Type:		WATER	WATER	WATER	WATER
		Sample Sub Type:					
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
pH at 20C		U	1010		4.0	8.2	6.3
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050
Calcium (Dissolved)		U	1455	mg/l	2.00	170	41
Arsenic (Dissolved)		U	1455	µg/l	0.20	0.81	0.25
Cadmium (Dissolved)		U	1455	µg/l	0.11	< 0.11	0.40
Chromium (Dissolved)		U	1455	µg/l	0.50	3.0	2.6
Copper (Dissolved)		U	1455	µg/l	0.50	2.3	5.5
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05
Manganese (Dissolved)		U	1455	µg/l	0.50	1100	1800
Nickel (Dissolved)		U	1455	µg/l	0.50	9.2	5800
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	1.7	0.57
Zinc (Dissolved)		U	1455	µg/l	2.5	16	65
Dissolved Organic Carbon		U	1610	mg/l	2.0	5.7	2.6
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	3000	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	8.8	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	3000	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	3000	< 10
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	< 1.0	< 1.0
Bromomethane		U	1760	µg/l	5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05356	25-05356	25-05356	25-05356
Quotation No.:		Chemtest Sample ID.:		1933512	1933513	1933514	1933515
		Client Sample ID.:		BH102	BH104	BH109	BH112
		Sample Type:		WATER	WATER	WATER	WATER
		Sample Sub Type:					
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
1,1-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
Bromochloromethane		U	1760	µg/l	5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05356	25-05356	25-05356	25-05356
Quotation No.:		Chemtest Sample ID.:		1933512	1933513	1933514	1933515
		Client Sample ID.:		BH102	BH104	BH109	BH112
		Sample Type:		WATER	WATER	WATER	WATER
		Sample Sub Type:					
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05356	25-05356	25-05356	25-05356
Quotation No.:		Chemtest Sample ID.:		1933512	1933513	1933514	1933515
		Client Sample ID.:		BH102	BH104	BH109	BH112
		Sample Type:		WATER	WATER	WATER	WATER
		Sample Sub Type:					
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-05432-1

Initial Date of Issue: 10-Mar-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Waters (Standard V2)

Quotation No.: **Date Received:** 16-Feb-2025

Order No.: 010466 **Date Instructed:** 17-Feb-2025

No. of Samples: 6

Turnaround (Wkdays): 5 **Results Due:** 21-Feb-2025

Date Approved: 10-Mar-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:				25-05432	25-05432	25-05432	25-05432	25-05432	25-05432
Quotation No.:		Chemtest Sample ID.:				1933732	1933733	1933734	1933735	1933736	1933737
		Client Sample ID.:				BH101	BH106	BH107	BH110	BH201	BH202
		Sample Type:				WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:									
		Date Sampled:				12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:				12:00	12:00	12:00	12:00		
Determinand	HWOL Code	Accred.	SOP	Units	LOD						
pH at 20C		U	1010		4.0	6.5	7.9	8.5	8.0	7.4	8.0
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)		U	1455	mg/l	2.00	33	84	180	90	130	75
Arsenic (Dissolved)		U	1455	µg/l	0.20	0.22	0.40	2.6	0.38	3.9	0.83
Cadmium (Dissolved)		U	1455	µg/l	0.11	0.23	< 0.11	< 0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)		U	1455	µg/l	0.50	2.7	2.5	6.7	2.7	2.5	3.2
Copper (Dissolved)		U	1455	µg/l	0.50	1.2	0.62	1.9	1.1	< 0.50	2.5
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)		U	1455	µg/l	0.50	620	180	< 0.50	530	2100	160
Nickel (Dissolved)		U	1455	µg/l	0.50	110	4.0	2.3	5.3	4.6	7.0
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	< 0.50	1.9	17	0.87	< 0.50	0.57
Zinc (Dissolved)		U	1455	µg/l	2.5	55	6.3	2.9	5.6	9.1	13
Dissolved Organic Carbon		U	1610	mg/l	2.0	2.2	2.9	6.0	4.4	5.3	4.4
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	67	< 1.0
Bromomethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05432	25-05432	25-05432	25-05432	25-05432	25-05432	25-05432
Quotation No.:		Chemtest Sample ID.:		1933732	1933733	1933734	1933735	1933736	1933737	
		Client Sample ID.:		BH101	BH106	BH107	BH110	BH201	BH202	
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER	
		Sample Sub Type:								
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	
		Time Sampled:		12:00	12:00	12:00	12:00			
Determinand	HWOL Code	Accred.	SOP	Units	LOD					
1,1-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	86 < 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	160 < 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	6.7	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	3.6	4.3	< 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.9
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.7 < 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05432	25-05432	25-05432	25-05432	25-05432	25-05432
Quotation No.:		Chemtest Sample ID.:		1933732	1933733	1933734	1933735	1933736	1933737
		Client Sample ID.:		BH101	BH106	BH107	BH110	BH201	BH202
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:							
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00		
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: Glen Dimplex Waters (Standard V2)

Client: E3P		Chemtest Job No.:		25-05432	25-05432	25-05432	25-05432	25-05432	25-05432
Quotation No.:		Chemtest Sample ID.:		1933732	1933733	1933734	1933735	1933736	1933737
		Client Sample ID.:		BH101	BH106	BH107	BH110	BH201	BH202
		Sample Type:		WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:							
		Date Sampled:		12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:		12:00	12:00	12:00	12:00		
Determinand	HWOL Code	Accred.	SOP	Units	LOD				
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com



Final Report

Report No.: 25-06906-1

Initial Date of Issue: 17-Mar-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex, Prescot (Waters V3)

Quotation No.: **Date Received:** 27-Feb-2025

Order No.: 010466 **Date Instructed:** 27-Feb-2025

No. of Samples: 10

Turnaround (Wkdays): 5 **Results Due:** 05-Mar-2025

Date Approved: 17-Mar-2025

Approved By:

Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.: 25-06906 25-06906 25-06906 25-06906 25-06906 25-06906 25-06906 25-06906 25-06906											
Quotation No.:		Chemtest Sample ID.: 1939816 1939817 1939818 1939819 1939820 1939821 1939822 1939823											
		Client Sample ID.: BH201 BH202 BH101 BH102 BH104 BH106 BH107 BH109											
		Sample Type: WATER WATER WATER WATER WATER WATER WATER WATER WATER											
		Sample Sub Type:											
		Date Sampled: 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025 24-Feb-2025											
		Time Sampled: 12:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00 12:00											
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
pH at 20C		U	1010		4.0	8.2	8.4	7.1	8.4	8.1	7.7	7.4	8.3
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Calcium (Dissolved)		U	1455	mg/l	2.00	120	81	41	160	77	77	220	75
Arsenic (Dissolved)		U	1455	µg/l	0.20	4.0	0.58	< 0.20	0.79	3.1	0.28	2.2	0.35
Cadmium (Dissolved)		U	1455	µg/l	0.11	< 0.11	< 0.11	0.50	< 0.11	0.21	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	2.8	< 0.50
Copper (Dissolved)		U	1455	µg/l	0.50	< 0.50	1.9	4.3	2.3	1.1	< 0.50	1.6	0.94
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)		U	1455	µg/l	0.50	2200	500	900	1600	2600	150	1.6	400
Nickel (Dissolved)		U	1455	µg/l	0.50	2.0	12	190	8.5	4200	2.6	2.1	2.6
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	1.0	< 0.50	< 0.50	13	< 0.50
Zinc (Dissolved)		U	1455	µg/l	2.5	10	20	89	7.0	34	4.1	11	8.1
Dissolved Organic Carbon		U	1610	mg/l	2.0	5.9	6.6	2.2	6.2	3.2	3.2	5.8	3.3
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:						25-06906	25-06906	25-06906	25-06906	25-06906	25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:						1939816	1939817	1939818	1939819	1939820	1939821	1939823
		Client Sample ID.:						BH201	BH202	BH101	BH102	BH104	BH106	BH107
		Sample Type:						WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:												
		Date Sampled:						24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
1,1-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:					25-06906	25-06906	25-06906	25-06906	25-06906	25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:					1939816	1939817	1939818	1939819	1939820	1939821	1939823
		Client Sample ID.:					BH201	BH202	BH101	BH102	BH104	BH106	BH109
		Sample Type:					WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:											
		Date Sampled:					24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025
		Time Sampled:					12:00	12:00	12:00	12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD								
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:						25-06906	25-06906	25-06906	25-06906	25-06906	25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:						1939816	1939817	1939818	1939819	1939820	1939821	1939823
		Client Sample ID.:						BH201	BH202	BH101	BH102	BH104	BH106	BH109
		Sample Type:						WATER	WATER	WATER	WATER	WATER	WATER	WATER
		Sample Sub Type:												
		Date Sampled:						24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025	24-Feb-2025
		Time Sampled:						12:00	12:00	12:00	12:00	12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD									
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:				25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:				1939824	1939825
		Client Sample ID.:				BH110	BH112
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				24-Feb-2025	24-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
pH at 20C		U	1010		4.0	7.4	7.0
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	0.21
Calcium (Dissolved)		U	1455	mg/l	2.00	90	21
Arsenic (Dissolved)		U	1455	µg/l	0.20	0.24	31
Cadmium (Dissolved)		U	1455	µg/l	0.11	< 0.11	0.22
Chromium (Dissolved)		U	1455	µg/l	0.50	< 0.50	19
Copper (Dissolved)		U	1455	µg/l	0.50	0.69	72
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	0.14
Manganese (Dissolved)		U	1455	µg/l	0.50	470	250
Nickel (Dissolved)		U	1455	µg/l	0.50	4.5	74
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	25
Selenium (Dissolved)		U	1455	µg/l	0.50	< 0.50	3.2
Zinc (Dissolved)		U	1455	µg/l	2.5	7.1	42
Dissolved Organic Carbon		U	1610	mg/l	2.0	2.8	200
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	< 10	< 10
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	< 1.0	26
Bromomethane		U	1760	µg/l	5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:				25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:				1939824	1939825
		Client Sample ID.:				BH110	BH112
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				24-Feb-2025	24-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
1,1-Dichloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	22
Bromochloromethane		U	1760	µg/l	5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:				25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:				1939824	1939825
		Client Sample ID.:				BH110	BH112
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				24-Feb-2025	24-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50

Results - Water

Project: Glen Dimplex, Prescott (Waters V3)

Client: E3P		Chemtest Job No.:				25-06906	25-06906
Quotation No.:		Chemtest Sample ID.:				1939824	1939825
		Client Sample ID.:				BH110	BH112
		Sample Type:				WATER	WATER
		Sample Sub Type:					
		Date Sampled:				24-Feb-2025	24-Feb-2025
		Time Sampled:				12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD		
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		N	1790	µg/l	0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW

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T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

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NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Final Report

Report No.: 25-04082-1

Initial Date of Issue: 13-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Waters (PFAS V1)

Quotation No.: **Date Received:** 06-Feb-2025

Order No.: 010467 **Date Instructed:** 06-Feb-2025

No. of Samples: 3

Turnaround (Wkdays): 6 **Results Due:** 13-Feb-2025

Date Approved: 13-Feb-2025 **Subcon Results Due:** 27-Feb-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex Waters (PFAS V1)

Client: E3P		Chemtest Job No.:				25-04082	25-04082	25-04082
Quotation No.:		Chemtest Sample ID.:				1928343	1928344	1928345
		Client Sample ID.:				BH104	BH109	BH112
		Sample Type:				WATER	WATER	WATER
		Sample Sub Type:						
		Date Sampled:				03-Feb-2025	03-Feb-2025	03-Feb-2025
		Time Sampled:				12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
PFAS in Waters (Subcon)		SN			0.0200000	See attached	See attached	See attached
Perfluorooctanoic Acid (PFOA) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached
Perfluorooctyl sulfonate (PFOS) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached

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M	MCERTS and UKAS accredited
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NEW_ASB Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL

DURHAM Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

A - Date of sampling not supplied

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C - Sample not received in appropriate containers

D - Broken Container

E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

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Water Sample Category Key for Accreditation

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SW - Surface Water
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UL - Unspecified Liquid

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NC - No Clean Up
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FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
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2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
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+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-04082
Our reference : Project 1874935
Validation Ref. : 1874935_certificaat_v1
Verificationcode : UZZT-CPSN-VMZR-PXWF
Enclosure(s) : 3 table(s) + 1 supplement(s)

Amsterdam, 13 February 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

I would like to point out to you that the results apply only to the samples supplied, such as these were presented for testing.

The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

Do also note that the enclosed report may not be copied or reproduced in any way except in its entirety. I trust that we have completed your order as agreed and to your full satisfaction. If you have any questions reading this report, then please don't hesitate to contact our Customer Service.

Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

Conditions of delivery of Eurofins Omegam have been registered.
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Eurofins Omegam B.V.
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NL-1114 AD Amsterdam-Duivendrecht
Netherlands

T +31-(0)20-597 66 80
CSOmegam@etbnl.eurofins.com
www.eurofins.nl/en

IBAN NL 16 BNPA 0227667980
Swiftaddress BNPANL2A
VAT: NL8139.67.132.B01
Trade register No. 34215654

CERTIFICATE

Project code : 1874935
 Your Project Description : 25-04082
 Client : Eurofins Chemtest Ltd

Your Sample identification

8641181 = 1928343 BH104

8641244 = 1928344 BH109

8641245 = 1928345 BH112

Client sampling date	:	03/02/2025	03/02/2025	03/02/2025
Date of receipt	:	11/02/2025	11/02/2025	11/02/2025
Startdate	:	11/02/2025	11/02/2025	11/02/2025
Reference number	:	8641181	8641244	8641245
Your Matrix	:	Water	Water	Water

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

PFBA	µg/l	< 0,02	< 0,02	< 0,02
PFPeA	µg/l	< 0,02	< 0,02	< 0,02
PFHxA	µg/l	< 0,02	< 0,02	< 0,02
PFHpA	µg/l	< 0,02	< 0,02	< 0,02
PFOA linear	µg/l	< 0,02	< 0,02	< 0,02
PFOA branched	µg/l	< 0,02	< 0,02	< 0,02
PFNA	µg/l	< 0,02	< 0,02	< 0,02
PFDA	µg/l	< 0,02	< 0,02	< 0,02
PFUnDA	µg/l	< 0,02	< 0,02	< 0,02
PFDoDA	µg/l	< 0,02	< 0,02	< 0,02
PFTTrDA	µg/l	< 0,02	< 0,02	< 0,02
PFTeDA	µg/l	< 0,02	< 0,02	< 0,02
PFHxDA	µg/l	< 0,02	< 0,02	< 0,02
PFODA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated sulfonic acids:

PFBS	µg/l	< 0,02	< 0,02	< 0,02
PFPeS	µg/l	< 0,02	< 0,02	< 0,02
PFHxS	µg/l	< 0,02	< 0,02	< 0,02
PFHpS	µg/l	< 0,02	< 0,02	< 0,02
PFOS linear	µg/l	< 0,02	< 0,02	< 0,02
PFOS branched	µg/l	< 0,02	< 0,02	< 0,02
PFDS	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - precursors:

4:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
6:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTS	µg/l	< 0,1	< 0,1	< 0,1
10:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
PFOSA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/l	< 0,5	< 0,5	< 0,5
4H-PFUnDA	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTUCA	µg/l	< 0,05	< 0,05	< 0,05
9CI-PF3ONS (F53-B)	µg/l	< 0,02	< 0,02	< 0,02
ADONA	µg/l	< 0,02	< 0,02	< 0,02
EtFOSA	µg/l	< 0,05	< 0,05	< 0,05
EtFOSAA	µg/l	< 0,02	< 0,02	< 0,02
MeFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSAA	µg/l	< 0,1	< 0,1	< 0,1
P37DMOA	µg/l	< 0,5	< 0,5	< 0,5
PFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSA	µg/l	< 0,05	< 0,05	< 0,05
MeFBSAA	µg/l	< 0,02	< 0,02	< 0,02
8:2 DiPAP	µg/l	< 0,1	< 0,1	< 0,1
HFPO-DA (GenX)	µg/l	< 0,02	< 0,02	< 0,02

CERTIFICATE

Project code : 1874935
Your Project Description : 25-04082
Client : Eurofins Chemtest Ltd

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8641181 = 1928343 BH104

8641244 = 1928344 BH109

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Client sampling date	:	03/02/2025	03/02/2025	03/02/2025
Date of receipt	:	11/02/2025	11/02/2025	11/02/2025
Startdate	:	11/02/2025	11/02/2025	11/02/2025
Reference number	:	8641181	8641244	8641245
Your Matrix	:	Water	Water	Water

som PFOA	µg/l	0,03	0,03	0,03
sum PFOS	µg/l	0,03	0,03	0,03

C E R T I F I C A T E

Project code	:	1874935
Your Project Description	:	25-04082
Client	:	Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identificaton, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

C E R T I F I C A T E

Project code : 1874935
Your Project Description : 25-04082
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHhA	PFHhA (perfluoroheptanoic acid)
PFHhS	PFHhS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)

Final Report

Report No.: 25-05493-1

Initial Date of Issue: 27-Feb-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex Waters (PFAS V2)

Quotation No.: **Date Received:** 17-Feb-2025

Order No.: 010467 **Date Instructed:** 17-Feb-2025

No. of Samples: 3

Turnaround (Wkdays): 9 **Results Due:** 27-Feb-2025

Date Approved: 27-Feb-2025 **Subcon Results Due:** 10-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex Waters (PFAS V2)

Client: E3P		Chemtest Job No.:				25-05493	25-05493	25-05493
Quotation No.:		Chemtest Sample ID.:				1933983	1933984	1933985
		Client Sample ID.:				BH101	BH106	BH107
		Sample Type:				WATER	WATER	WATER
		Sample Sub Type:						
		Date Sampled:				12-Feb-2025	12-Feb-2025	12-Feb-2025
		Time Sampled:				12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
PFAS in Waters (Subcon)		SN			0.0200000	See attached	See attached	See attached
Perfluorooctanoic Acid (PFOA) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached
Perfluorooctyl sulfonate (PFOS) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached

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A - Date of sampling not supplied

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+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

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customerservices@chemtest.com

Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-05493
Our reference : Project 1880900
Validation Ref. : 1880900_certificaat_v1
Verificationcode : CBGE-PKTK-YBWW-PGZX
Enclosure(s) : 3 table(s) + 1 supplement(s)

Amsterdam, 27 February 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

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The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

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Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

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Eurofins Omegam B.V.
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NL-1114 AD Amsterdam-Duivendrecht
Netherlands

T +31-(0)20-597 66 80
CSOmegam@etbnl.eurofins.com
www.eurofins.nl/en

IBAN NL 16 BNPA 0227667980
Swiftaddress BNPANL2A
VAT: NL8139.67.132.B01
Trade register No. 34215654

CERTIFICATE

Project code : 1880900
 Your Project Description : 25-05493
 Client : Eurofins Chemtest Ltd

Your Sample identification

8659317 = 1933983 BH101

8659318 = 1933984 BH106

8659319 = 1933985 BH107

Client sampling date	:	12/02/2025	12/02/2025	12/02/2025
Date of receipt	:	21/02/2025	21/02/2025	21/02/2025
Startdate	:	21/02/2025	21/02/2025	21/02/2025
Reference number	:	8659317	8659318	8659319
Your Matrix	:	Water	Water	Water

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

PFBA	µg/l	< 0,02	< 0,02	< 0,02
PFPeA	µg/l	< 0,02	< 0,02	< 0,02
PFHxA	µg/l	< 0,02	< 0,02	< 0,02
PFHpA	µg/l	< 0,02	< 0,02	< 0,02
PFOA linear	µg/l	< 0,02	< 0,02	< 0,02
PFOA branched	µg/l	< 0,02	< 0,02	< 0,02
PFNA	µg/l	< 0,02	< 0,02	< 0,02
PFDA	µg/l	< 0,02	< 0,02	< 0,02
PFUnDA	µg/l	< 0,02	< 0,02	< 0,02
PFDoDA	µg/l	< 0,02	< 0,02	< 0,02
PFTTrDA	µg/l	< 0,02	< 0,02	< 0,02
PFTeDA	µg/l	< 0,02	< 0,02	< 0,02
PFHxDA	µg/l	< 0,02	< 0,02	< 0,02
PFODA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated sulfonic acids:

PFBS	µg/l	< 0,02	< 0,02	< 0,02
PFPeS	µg/l	< 0,02	< 0,02	< 0,02
PFHxS	µg/l	< 0,02	< 0,02	< 0,02
PFHpS	µg/l	< 0,02	< 0,02	< 0,02
PFOS linear	µg/l	< 0,02	< 0,02	< 0,02
PFOS branched	µg/l	< 0,02	< 0,02	< 0,02
PFDS	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - precursors:

4:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
6:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTS	µg/l	< 0,1	< 0,1	< 0,1
10:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
PFOSA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/l	< 0,5	< 0,5	< 0,5
4H-PFUnDA	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTUCA	µg/l	< 0,05	< 0,05	< 0,05
9CI-PF3ONS (F53-B)	µg/l	< 0,02	< 0,02	< 0,02
ADONA	µg/l	< 0,02	< 0,02	< 0,02
EtFOSA	µg/l	< 0,05	< 0,05	< 0,05
EtFOSAA	µg/l	< 0,02	< 0,02	< 0,02
MeFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSAA	µg/l	< 0,1	< 0,1	< 0,1
P37DMOA	µg/l	< 0,5	< 0,5	< 0,5
PFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSA	µg/l	< 0,05	< 0,05	< 0,05
MeFBSAA	µg/l	< 0,02	< 0,02	< 0,02
8:2 DiPAP	µg/l	< 0,1	< 0,1	< 0,1
HFPO-DA (GenX)	µg/l	< 0,02	< 0,02	< 0,02

CERTIFICATE

Project code : 1880900
 Your Project Description : 25-05493
 Client : Eurofins Chemtest Ltd

Your Sample identification

8659317 = 1933983 BH101

8659318 = 1933984 BH106

8659319 = 1933985 BH107

Client sampling date	:	12/02/2025	12/02/2025	12/02/2025
Date of receipt	:	21/02/2025	21/02/2025	21/02/2025
Startdate	:	21/02/2025	21/02/2025	21/02/2025
Reference number	:	8659317	8659318	8659319
Your Matrix	:	Water	Water	Water

som PFOA	µg/l	0,03	0,03	0,03
sum PFOS	µg/l	0,03	0,03	0,03

C E R T I F I C A T E

Project code	:	1880900
Your Project Description	:	25-05493
Client	:	Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identificaton, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

C E R T I F I C A T E

Project code : 1880900
Your Project Description : 25-05493
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHhA	PFHhA (perfluoroheptanoic acid)
PFHhS	PFHhS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)

Final Report

Report No.: 25-06715-1

Initial Date of Issue: 07-Mar-2025

Re-Issue Details:

Client E3P

Client Address: Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contact(s): idiack@e3p.co.uk; Mwilson@e3p.co.uk

Project Glen Dimplex, Prescott (PFAS 3)

Quotation No.: **Date Received:** 26-Feb-2025

Order No.: 010467 **Date Instructed:** 26-Feb-2025

No. of Samples: 3

Turnaround (Wkdays): 8 **Results Due:** 07-Mar-2025

Date Approved: 07-Mar-2025 **Subcon Results Due:** 19-Mar-2025

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: Glen Dimplex, Prescott (PFAS 3)

Client: E3P		Chemtest Job No.:				25-06715	25-06715	25-06715
Quotation No.:		Chemtest Sample ID.:				1939158	1939159	1939160
		Client Sample ID.:				BH104	BH107	BH112
		Sample Type:				WATER	WATER	WATER
		Sample Sub Type:						
		Date Sampled:				25-Feb-2025	25-Feb-2025	25-Feb-2025
		Time Sampled:				12:00	12:00	12:00
Determinand	HWOL Code	Accred.	SOP	Units	LOD			
PFAS in Waters (Subcon)		SN			0.0200000	See attached	See attached	See attached
Perfluorooctanoic Acid (PFOA) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached
Perfluorooctyl sulfonate (PFOS) (Subcon)		SN		µg/l	N/A	See Attached	See Attached	See Attached

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at $\leq 30^{\circ}\text{C}$ prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Attn. Mr. J. King
Depot Road 11
GB-CB8 0AL NEWMARKET
GROOT BRITTANIE

Your reference : 25-06715
Our reference : Project 1885994
Validation Ref. : 1885994_certificaat_v1
Verificationcode : HBES-YMNT-CBMC-FKCB
Enclosure(s) : 3 table(s) + 1 supplement(s)

Amsterdam, 7 March 2025

I hereby enclose the results of the laboratory tests that have been carried out on your request on the samples that you supplied to us.

I would like to point out to you that the results apply only to the samples supplied, such as these were presented for testing.

The research, with the exception of any outsourced research, was carried out by Eurofins Omegam. Information about the used analysis method(s) can be found in our customer portal My Lab under "Info and Docs".

Do also note that the enclosed report may not be copied or reproduced in any way except in its entirety. I trust that we have completed your order as agreed and to your full satisfaction. If you have any questions reading this report, then please don't hesitate to contact our Customer Service.

Yours sincerely,
On behalf of Eurofins Omegam,



BSc J. Tukker
Production manager

Conditions of delivery of Eurofins Omegam have been registered.
This certificate may not be reproduced other than in full, except with the prior written approval of Eurofins Omegam.

Eurofins Omegam B.V.
H.J.E. Wenckebachweg 120
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Netherlands

T +31-(0)20-597 66 80
CSOmegam@etbnl.eurofins.com
www.eurofins.nl/en

IBAN NL 16 BNPA 0227667980
Swiftaddress BNPANL2A
VAT: NL8139.67.132.B01
Trade register No. 34215654

CERTIFICATE

Project code : 1885994
 Your Project Description : 25-06715
 Client : Eurofins Chemtest Ltd

Your Sample identification

8675269 = 1939158 BH104

8675270 = 1939159 BH107

8675271 = 1939160 BH112

Client sampling date	:	25/02/2025	25/02/2025	25/02/2025
Date of receipt	:	04/03/2025	04/03/2025	04/03/2025
Startdate	:	04/03/2025	04/03/2025	04/03/2025
Reference number	:	8675269	8675270	8675271
Your Matrix	:	Water	Water	Water

Organic compounds - per- and polyfluoroalkylsubstances (PFAS) HPLC-MS/MS

Perfluorinated carboxylic acids:

PFBA	µg/l	< 0,02	< 0,02	< 0,02
PFPeA	µg/l	< 0,02	< 0,02	< 0,02
PFHxA	µg/l	< 0,02	< 0,02	< 0,02
PFHpA	µg/l	< 0,02	< 0,02	< 0,02
PFOA linear	µg/l	< 0,02	< 0,02	< 0,02
PFOA branched	µg/l	< 0,02	< 0,02	< 0,02
PFNA	µg/l	< 0,02	< 0,02	< 0,02
PFDA	µg/l	< 0,02	< 0,02	< 0,02
PFUnDA	µg/l	< 0,02	< 0,02	< 0,02
PFDODA	µg/l	< 0,02	< 0,02	< 0,02
PFTTrDA	µg/l	< 0,02	< 0,02	< 0,02
PFTeDA	µg/l	< 0,02	< 0,02	< 0,02
PFHxDA	µg/l	< 0,02	< 0,02	< 0,02
PFODA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated sulfonic acids:

PFBS	µg/l	< 0,02	< 0,02	< 0,02
PFPeS	µg/l	< 0,02	< 0,02	< 0,02
PFHxS	µg/l	< 0,02	< 0,02	< 0,02
PFHpS	µg/l	< 0,02	< 0,02	< 0,02
PFOS linear	µg/l	< 0,02	< 0,02	< 0,02
PFOS branched	µg/l	< 0,02	< 0,02	< 0,02
PFDS	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - precursors:

4:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
6:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTS	µg/l	< 0,1	< 0,1	< 0,1
10:2 FTS	µg/l	< 0,05	< 0,05	< 0,05
PFOSA	µg/l	< 0,02	< 0,02	< 0,02

Perfluorinated alkyl substances - remainder:

HPFHpA	µg/l	< 0,5	< 0,5	< 0,5
4H-PFUnDA	µg/l	< 0,05	< 0,05	< 0,05
8:2 FTUCA	µg/l	< 0,05	< 0,05	< 0,05
9CI-PF3ONS (F53-B)	µg/l	< 0,02	< 0,02	< 0,02
ADONA	µg/l	< 0,02	< 0,02	< 0,02
EtFOSA	µg/l	< 0,05	< 0,05	< 0,05
EtFOSAA	µg/l	< 0,02	< 0,02	< 0,02
MeFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSAA	µg/l	< 0,1	< 0,1	< 0,1
P37DMOA	µg/l	< 0,5	< 0,5	< 0,5
PFBSA	µg/l	< 0,02	< 0,02	< 0,02
MeFOSA	µg/l	< 0,05	< 0,05	< 0,05
MeFBSAA	µg/l	< 0,02	< 0,02	< 0,02
8:2 DiPAP	µg/l	< 0,1	< 0,1	< 0,1
HFPO-DA (GenX)	µg/l	< 0,02	< 0,02	< 0,02

CERTIFICATE

Project code : 1885994
 Your Project Description : 25-06715
 Client : Eurofins Chemtest Ltd

Your Sample identification

8675269 = 1939158 BH104

8675270 = 1939159 BH107

8675271 = 1939160 BH112

Client sampling date	:	25/02/2025	25/02/2025	25/02/2025
Date of receipt	:	04/03/2025	04/03/2025	04/03/2025
Startdate	:	04/03/2025	04/03/2025	04/03/2025
Reference number	:	8675269	8675270	8675271
Your Matrix	:	Water	Water	Water

som PFOA	µg/l	0,03	0,03	0,03
sum PFOS	µg/l	0,03	0,03	0,03

C E R T I F I C A T E

Project code	:	1885994
Your Project Description	:	25-06715
Client	:	Eurofins Chemtest Ltd

Notes related to analyses

General comments

The following information has been provided by the client if applicable:

Project description, Sample identificaton, Client sampling date, Client Matrix, Sample depth, Pot number (Barcode), Field data, Field observations and sampling data. The client sampling date can affect the validity of the results.

Quantification of branched PFOS/POA is based on DIN 38414-14.

Summation of concentrations for group parameters

Summation is calculated according to AS3000 protocol, paragraph 2.5.2 and appendix 3.

C E R T I F I C A T E

Project code : 1885994
Your Project Description : 25-06715
Client : Eurofins Chemtest Ltd

Appendix Index PFAS

PFAS component	Full name PFAS component
10:2 FTS	10:2 FTS (10:2 Fluorotelomer sulfonic acid)
4:2 FTS	4:2 FTS (4:2 Fluorotelomer sulfonic acid)
4H-PFUnDA	4H-PFUnDA (2H,2H,3H,3H-Perfluoroundecanoic acid)
6:2 FTS	6:2 FTS (6:2 Fluorotelomer sulfonic acid)
8:2 DiPAP	8:2 DiPAP (8:2 Fluorotelomer phosphate diester)
8:2 FTS	8:2 FTS (8:2 Fluorotelomer sulfonic acid)
8:2 FTUCA	8:2 FTUCA (8:2 Fluorotelomer unsaturated carboxylic acid)
9Cl-PF3ONS (F53-B)	9Cl-PF3ONS (F53-B) (9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid)
ADONA	ADONA (ammonium 4,8-dioxa-3H-perfluorononanoate)
EtFOSA	EtFOSA (N-ethyl perfluorooctanesulfonamide)
EtFOSAA	EtFOSAA (perfluorooctanesulfonylamide(N-ethyl)acetate)
HPFHpA	HPFHpA (7H-perfluoroheptanoic acid)
MeFBSA	MeFBSA (N-methylperfluorobutanesulfonylamide)
MeFBSAA	MeFBSAA (perfluorobutanesulfonylamide(N-methyl)acetate)
MeFOSA	MeFOSA (N-methyl perfluorooctanesulfonamide)
MeFOSAA	MeFOSAA (N-methyl perfluorooctanesulfonamidoacetic acid)
P37DMOA	P37DMOA (perfluoro-3,7-dimethyloctanoic acid)
PFBA	PFBA (perfluorobutanoic acid)
PFBS	PFBS (perfluorobutanesulfonic acid)
PFBSA	PFBSA (perfluorobutanesulfonamide)
PFDA	PFDA (perfluorodecanoic acid)
PFDoDA	PFDoDA (perfluorododecanoic acid)
PFDS	PFDS (perfluorodecanesulfonic acid)
PFHhA	PFHhA (perfluoroheptanoic acid)
PFHhS	PFHhS (perfluoroheptanesulfonic acid)
PFHxA	PFHxA (perfluorohexanoic acid)
PFHxDA	PFHxDA (perfluorohexadecanoic acid)
PFHxS	PFHxS (perfluorohexanesulfonic acid)
PFNA	PFNA (perfluorononanoic acid)
PFOA branched	PFOA branched (perfluorooctanoic acid)
PFOA linear	PFOA linear (perfluorooctanoic acid)
PFODA	PFODA (perfluorooctadecanoic acid)
PFOS branched	PFOS branched (perfluorooctanesulfonic acid)
PFOS linear	PFOS linear (perfluorooctanesulfonic acid)
PFOSA	PFOSA (perfluorooctanesulfonamide)
PFPeA	PFPeA (perfluoropentanoic acid)
PFPeS	PFPeS (perfluoropentanesulfonic acid)
PFTeDA	PFTeDA (perfluorotetradecanoic acid)
PFTTrDA	PFTTrDA (perfluorotridecanoic acid)
PFUnDA	PFUnDA (perfluoroundecanoic acid)

Appendix IX: Geotechnical Testing Results



TEST REPORT

Client e3p

Address Taylor Road
Trafford Park
Urmston
Manchester
M41 7JQ

Contract Glen Dimplex,
Prescott

Job Number MRN 25005/29
Date of Issue 27 February 2025
Page 1 of 30

Approved Signatories

S J Hutchings, O P Davies

Notes

- 1 All remaining samples and remnants from this contract will be disposed 28 days from the date of this report unless you notify us to the contrary.
- 2 Result certificates, in this report, not bearing a UKAS mark, are not included in our UKAS accreditation schedule.
- 3 Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation.
- 4 Certified that the samples have been examined and tested in accordance with the terms of the contract/order and unless otherwise stated conform to the standards/specifications quoted.
- 5 The results included within the report are representative of the samples submitted for analysis.
- 6 This certificate should not be reproduced, except in full, without the express permission of the laboratory.



Andrew House, Hadfield Street, Dukinfield, Cheshire SK16 4QX Tel: 0161 475 0870
Email: enquiries@murrayrix.com Website: www.murrayrix.com

Also at: London: 020 8523 1999

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TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016

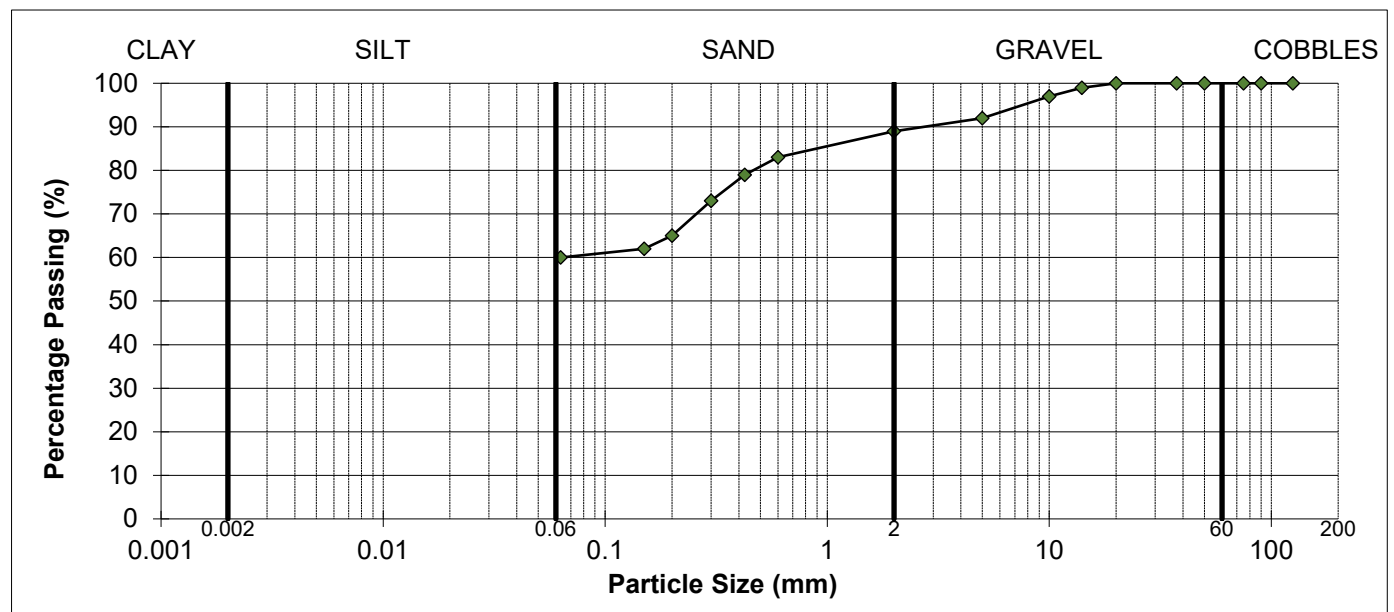
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH103 3.50-4.50	DATE SAMPLED	Not advised
LAB SAMPLE No	5016506	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty very sandy gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	92	
90	100		2	89	80-100
75	100		0.6	83	
50	100		0.425	79	
37.5	100		0.3	73	
20	100		0.2	65	
14	99		0.15	62	
10	97		0.063	60	15-100



SOIL FRACTIONS			
COBBLES	0%	SAND	29%
GRAVEL	11%	SILT / CLAY	60%
As received water content		10.9%	

REMARKS

Sample complies with the advised grading specification for a 2A/2B material (SHW, Feb 2017)

SIGNED



NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

TEST CERTIFICATE
PARTICLE SIZE DISTRIBUTION
BS EN ISO 17892-4:2016

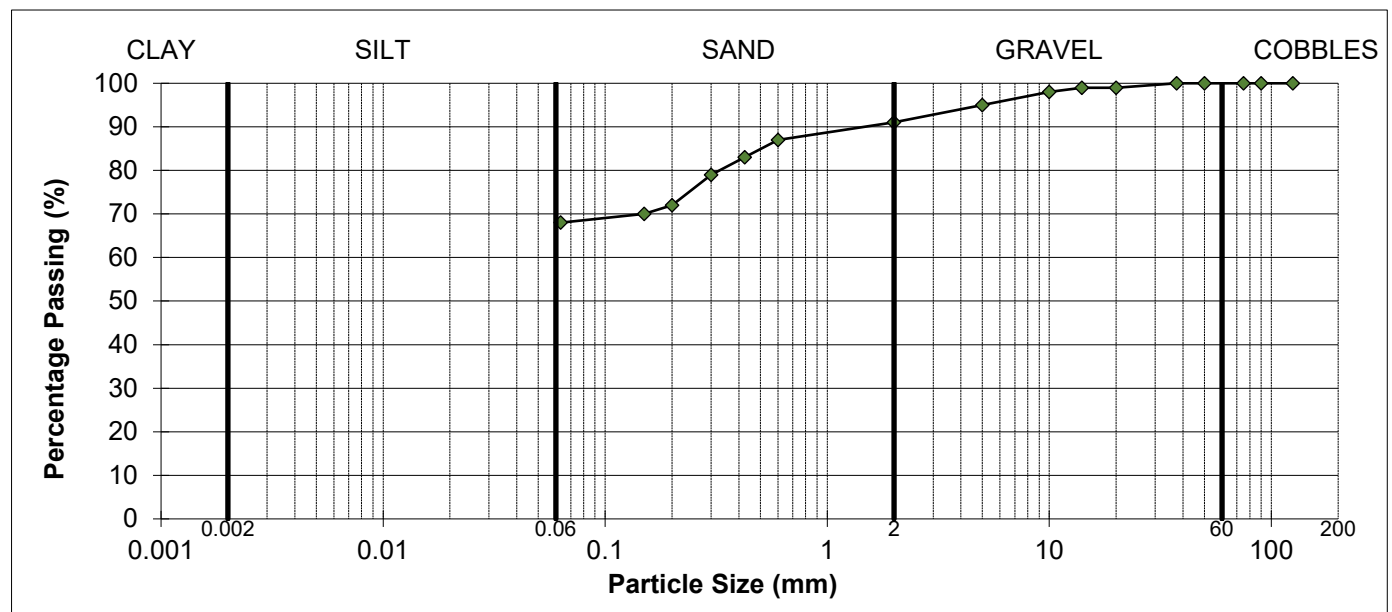
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH201 3.00-4.00	DATE SAMPLED	Not advised
LAB SAMPLE No	5016524	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	95	
90	100		2	91	80-100
75	100		0.6	87	
50	100		0.425	83	
37.5	100		0.3	79	
20	99		0.2	72	
14	99		0.15	70	
10	98		0.063	68	15-100



SOIL FRACTIONS			
COBBLES	0%	SAND	23%
GRAVEL	9%	SILT / CLAY	68%
As received water content		21.3%	

REMARKS

Sample complies with the advised grading specification for a 2A/2B material (SHW, Feb 2017)

SIGNED



NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

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PARTICLE SIZE DISTRIBUTION

BS EN ISO 17892-4:2016

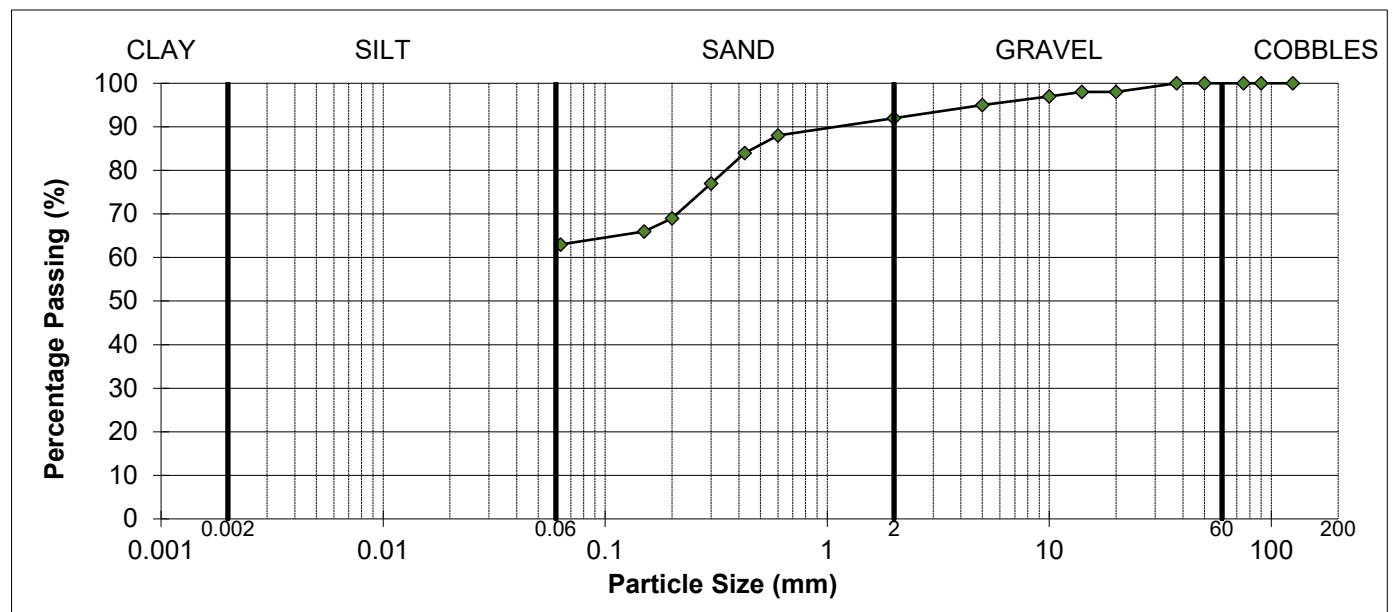
Determination of Water Content in accordance with BS EN ISO 17892-1:2014+A1:2022 (Oven Dry)

CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH202 4.00-5.00	DATE SAMPLED	Not advised
LAB SAMPLE No	5016526	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty sandy slightly gravelly CLAY
ADVISED SOURCE	Site Investigation Sample

Sieve Size (mm)	% Passing (%)	Specification (%)	Sieve Size (mm)	% Passing (%)	Specification (%)
125	100	100	5	95	
90	100		2	92	80-100
75	100		0.6	88	
50	100		0.425	84	
37.5	100		0.3	77	
20	98		0.2	69	
14	98		0.15	66	
10	97		0.063	63	15-100



SOIL FRACTIONS			
COBBLES	0%	SAND	29%
GRAVEL	8%	SILT / CLAY	63%
As received water content		21.3%	

REMARKS

Sample complies with the advised grading specification for a 2A/2B material (SHW, Feb 2017)

SIGNED



NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

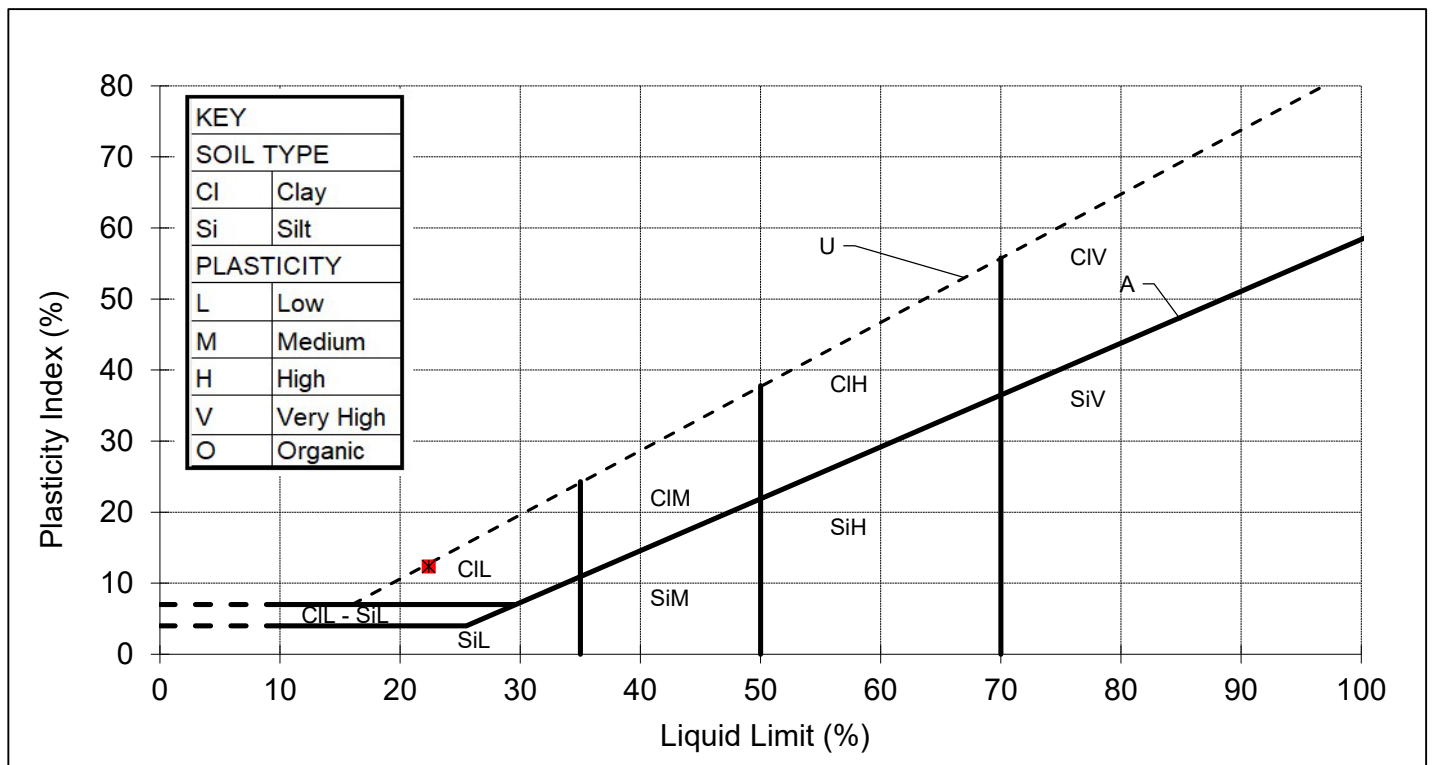
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH101 2.00-2.45	DATE SAMPLED	Not advised
SAMPLE No.	5016501	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.5	22.2	1.010	
Determination 2 (avg)	19.2	22.1		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10.9	22	10	12	85



REMARKS

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NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

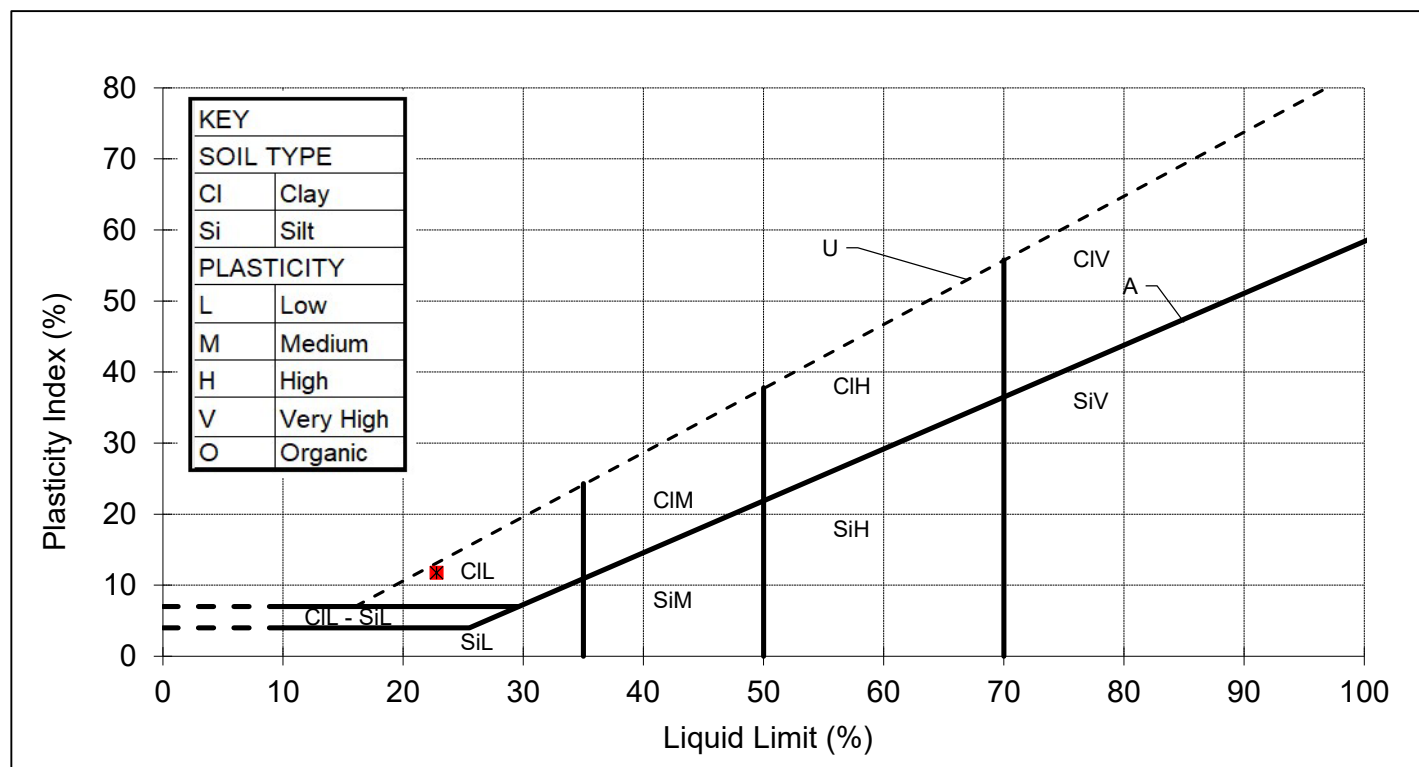
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH102 4.00-4.45	DATE SAMPLED	Not advised
SAMPLE No.	5016503	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.4	22.3	1.029	
Determination 2 (avg)	17.8	22.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10.6	23	11	12	88



REMARKS

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NAME

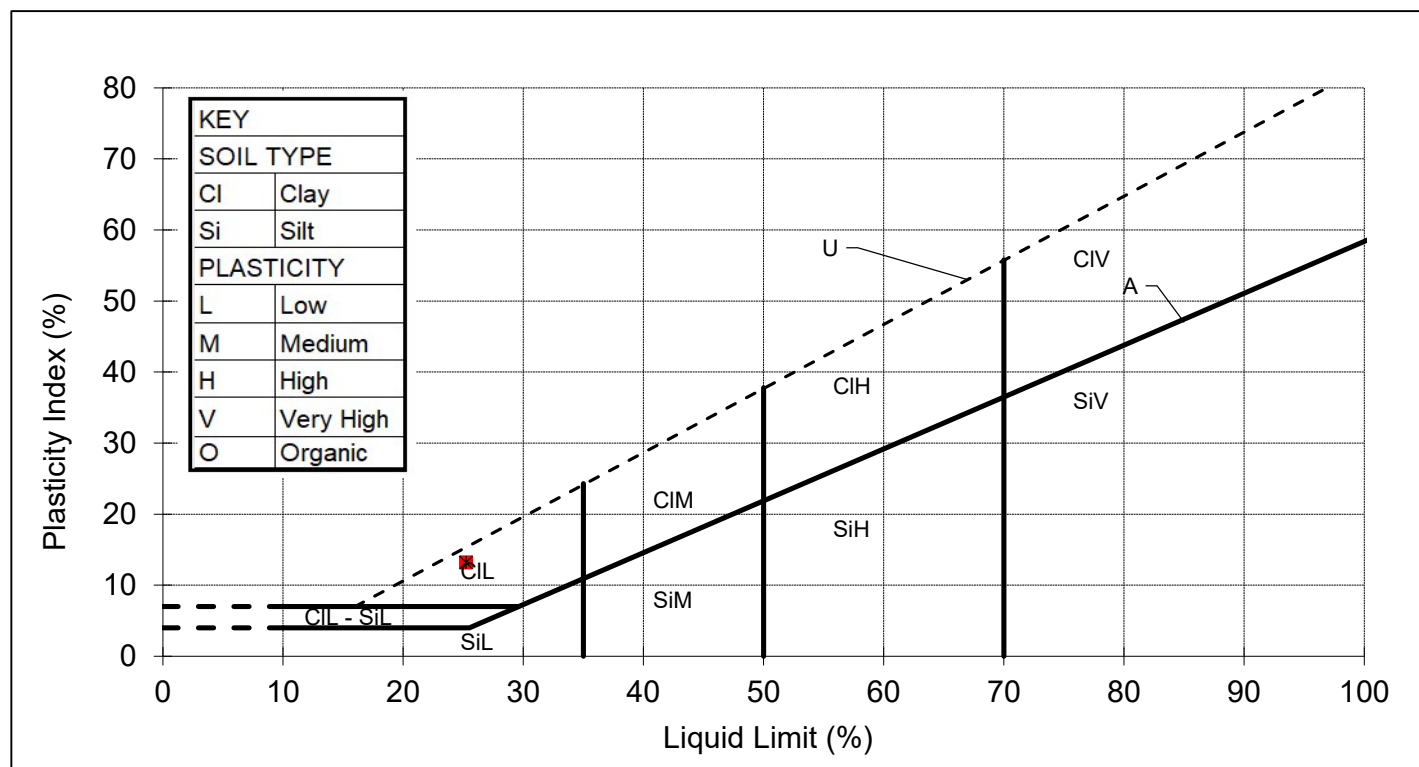
O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

1580

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022



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MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

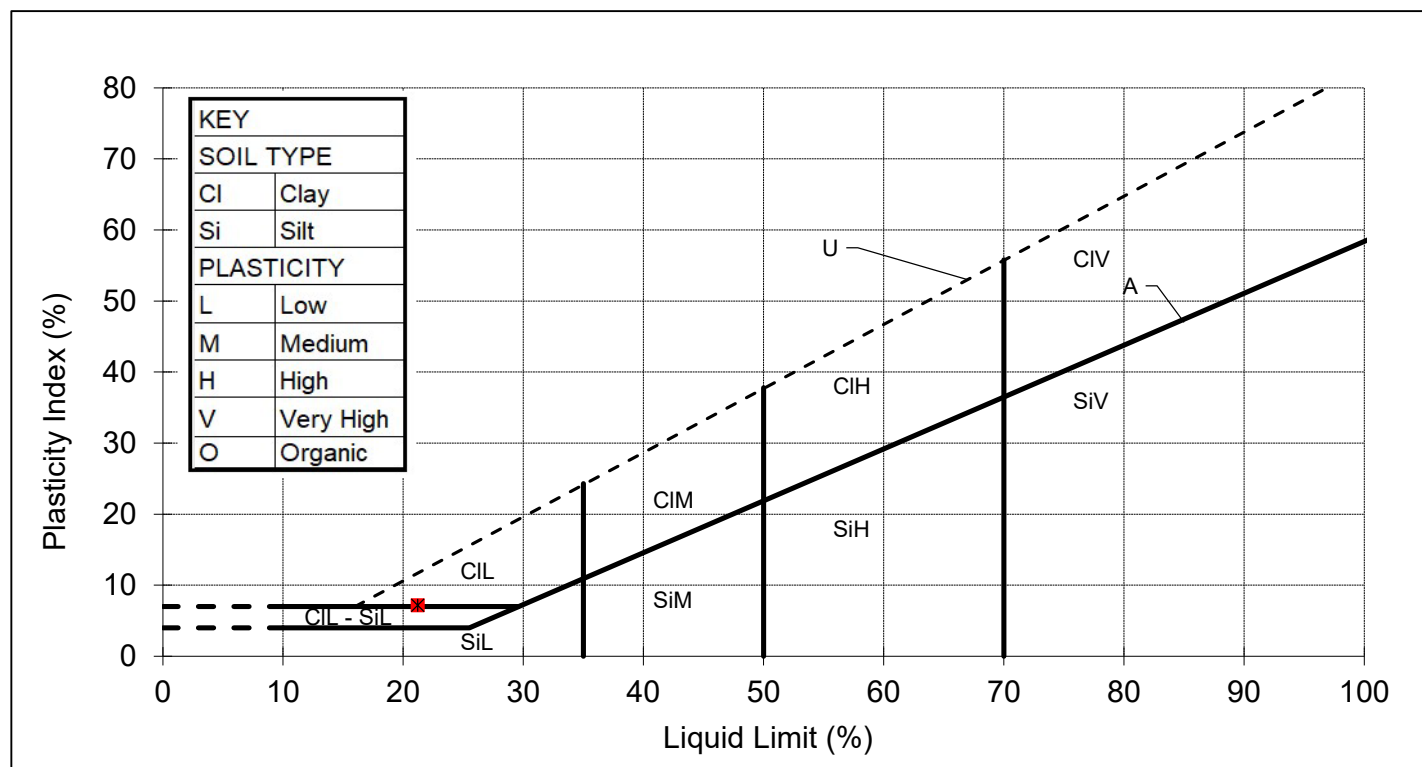
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH104 3.00-3.45	DATE SAMPLED	Not advised
SAMPLE No.	5016507	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)	Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.5	20.8	
Determination 2 (avg)	17.9	20.5	

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
20.6	21	14	7	84



REMARKS

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NAME

O.P. Davies BA (Hons)
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27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

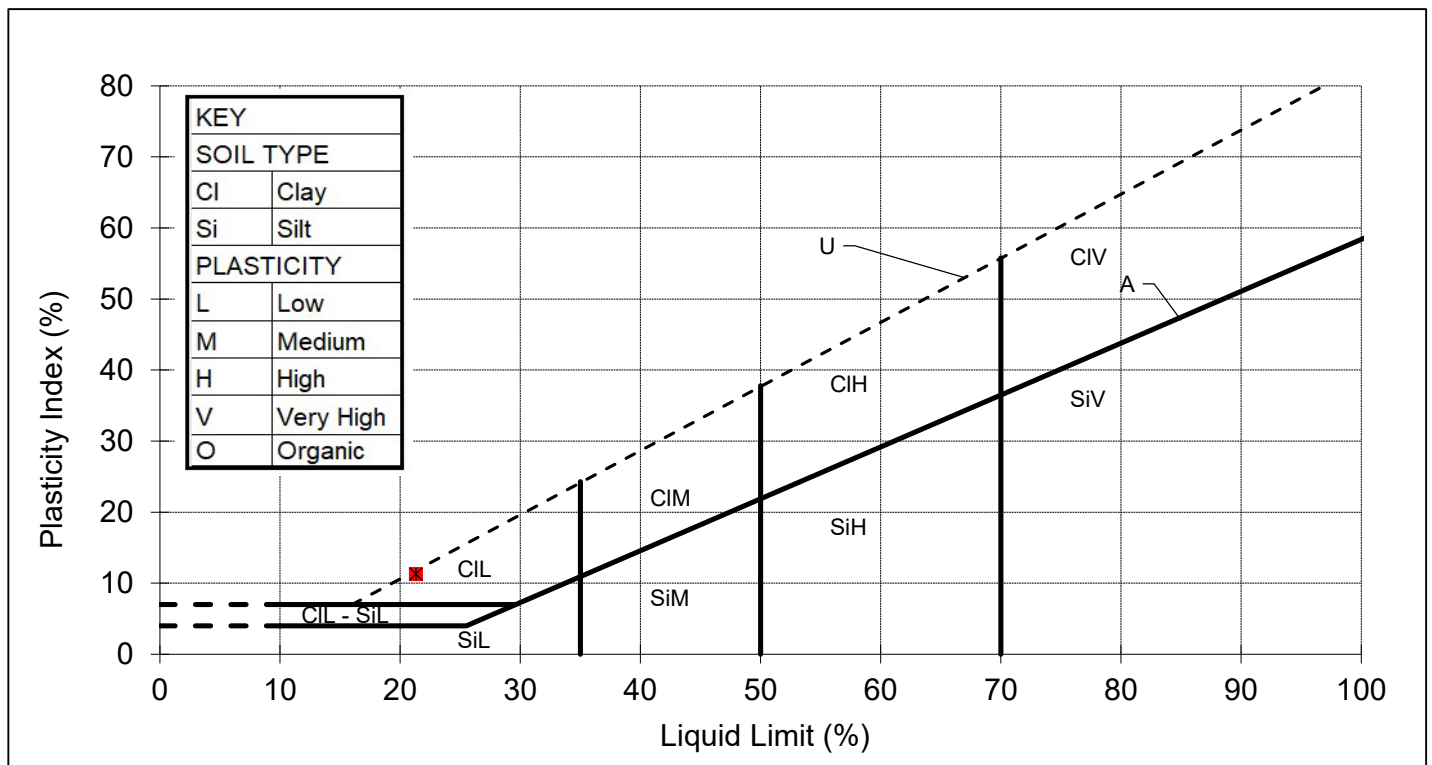
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH105 5.00-5.45	DATE SAMPLED	Not advised
SAMPLE No.	5016510	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.2	21.8	0.981	
Determination 2 (avg)	21.2	21.6		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10.3	21	10	11	92



REMARKS

SIGNED

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27-Feb-25

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

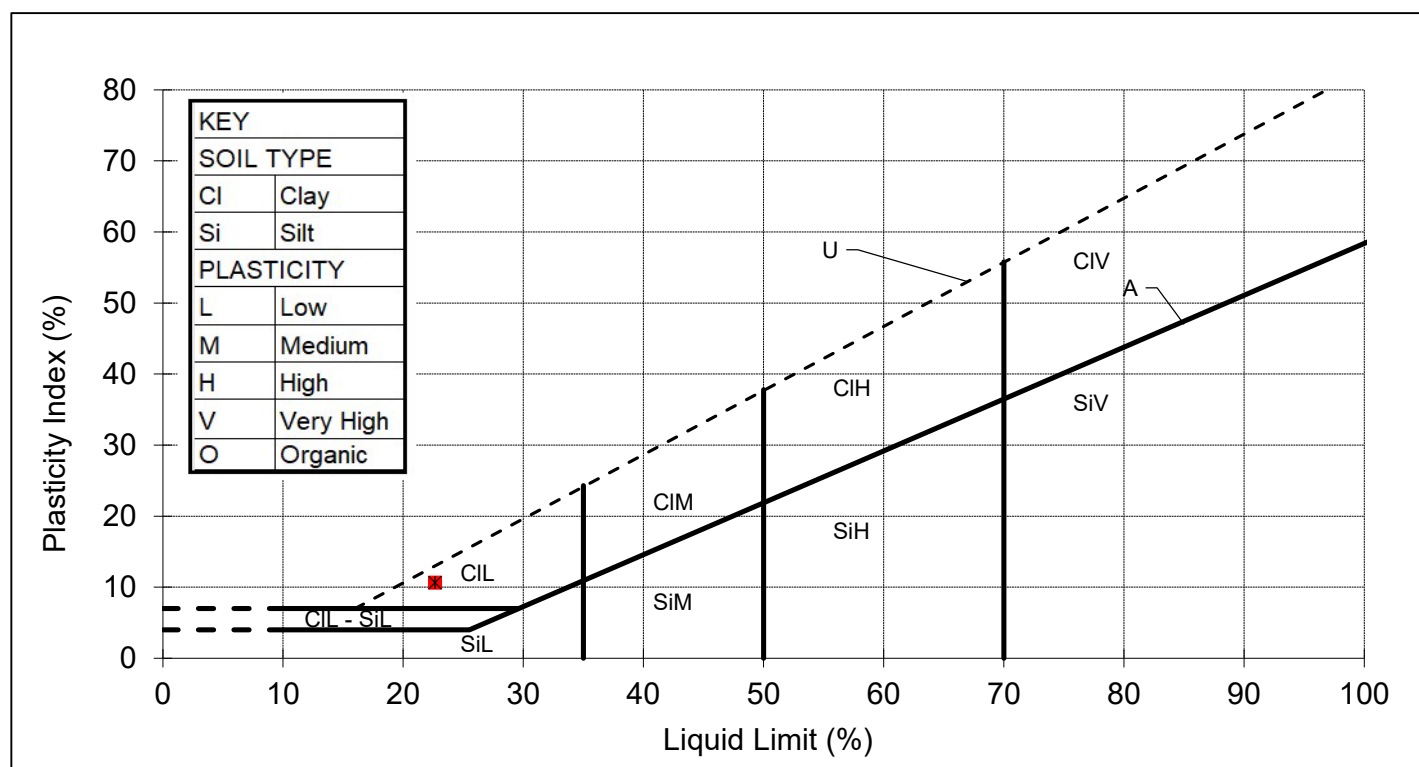
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH106 3.60-3.70	DATE SAMPLED	Not advised
SAMPLE No.	5016512	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	22.4	23.2	0.966	
Determination 2 (avg)	22.6	23.7		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
11.9	23	12	11	87



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

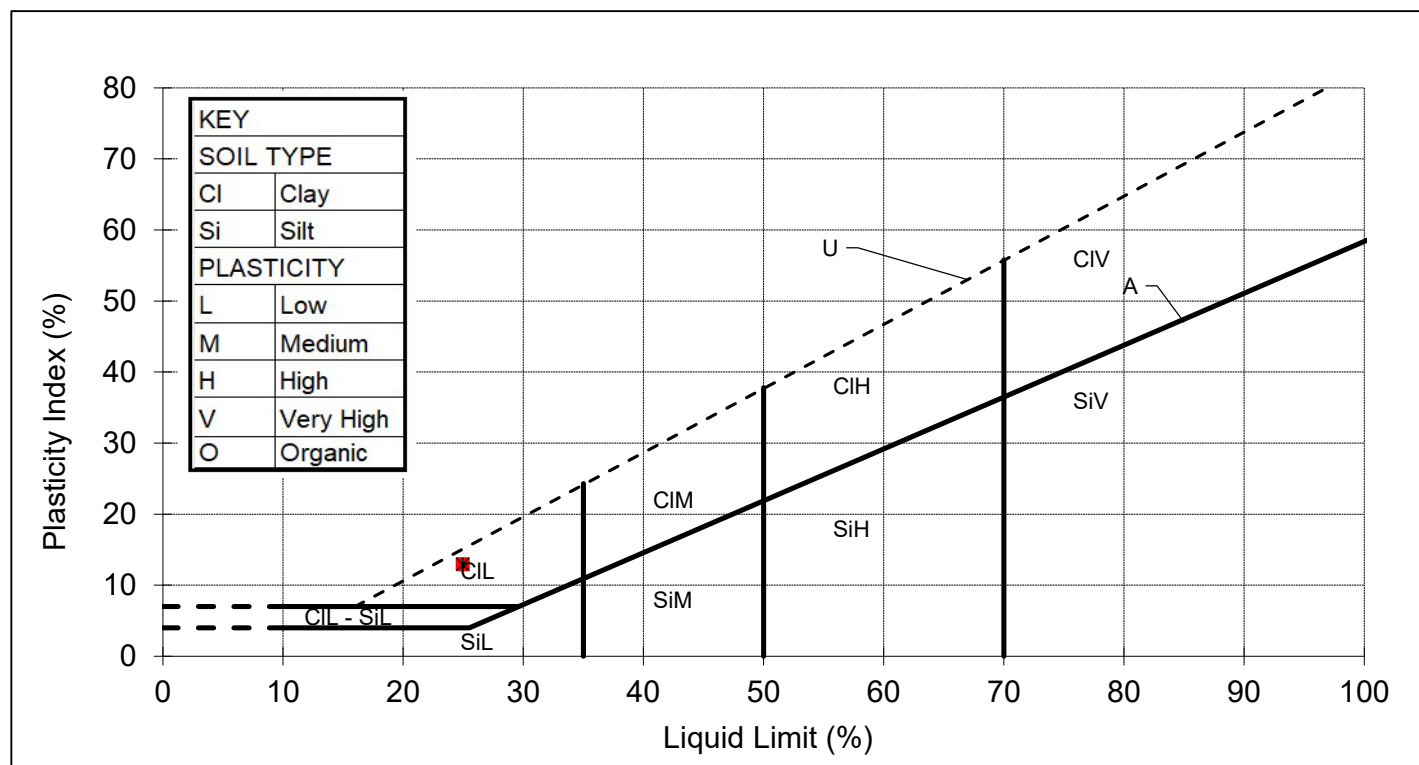
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH107 2.00-2.45	DATE SAMPLED	Not advised
SAMPLE No.	5016513	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.4	25.1	0.996	
Determination 2 (avg)	20.1	25.0		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
15.4	25	12	13	85



REMARKS

SIGNED

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(Director / Head of Laboratory)

DATE

27-Feb-25

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

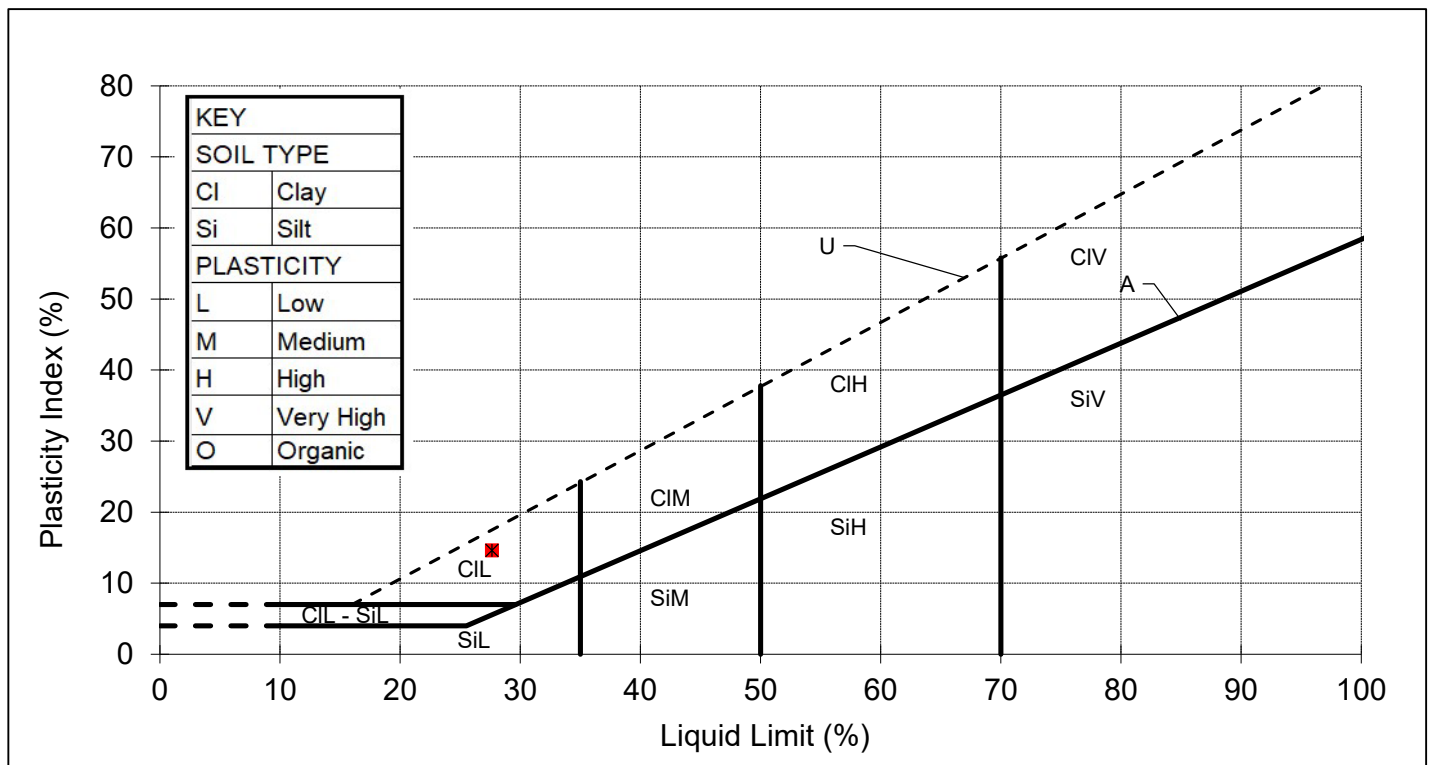
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH108 3.00-3.45	DATE SAMPLED	Not advised
SAMPLE No.	5016516	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.5	27.0	1.020	
Determination 2 (avg)	18.9	27.2		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
16.4	28	13	15	96



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

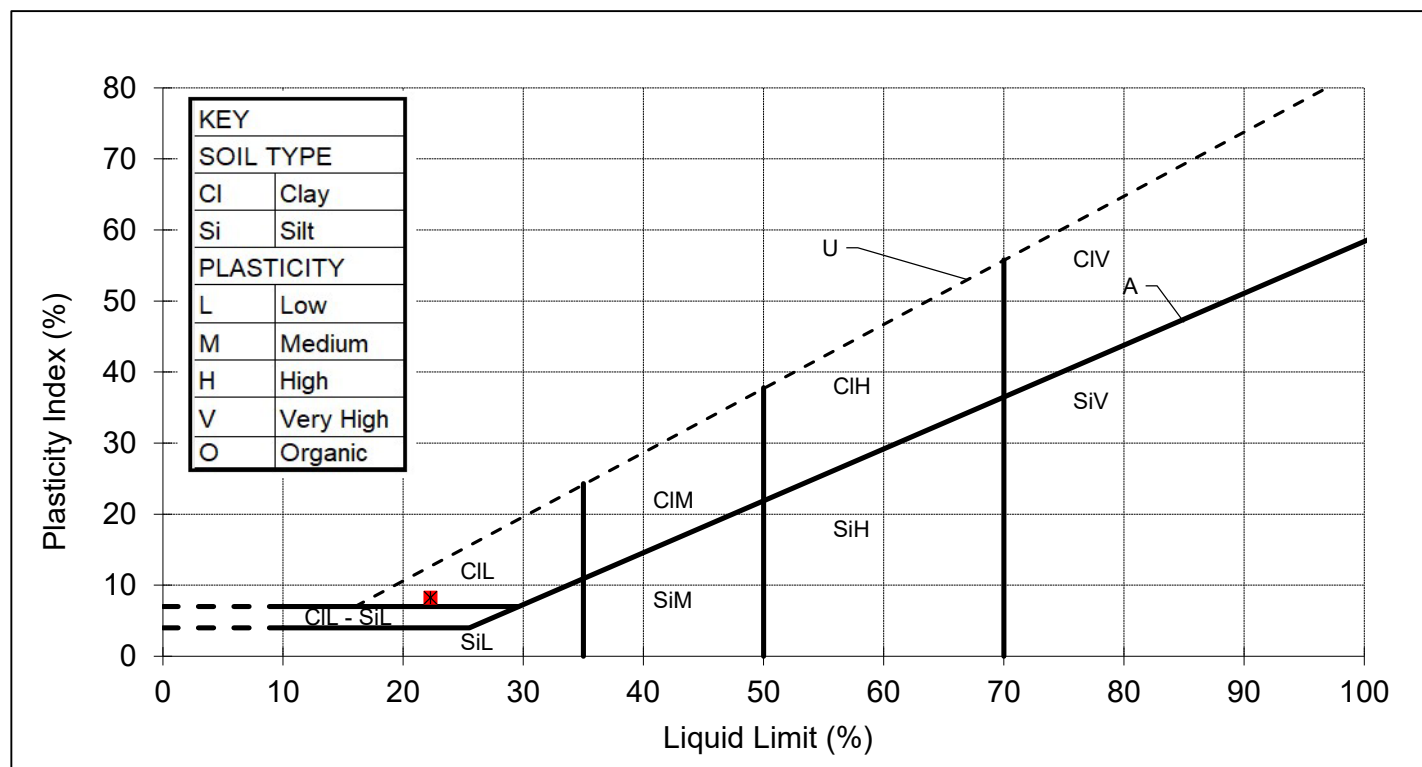
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH109 2.00-2.45	DATE SAMPLED	Not advised
SAMPLE No.	5016517	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)	Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	21.5	22.8	
Determination 2 (avg)	21.2	22.7	

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
16.8	22	14	8	89



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD
PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

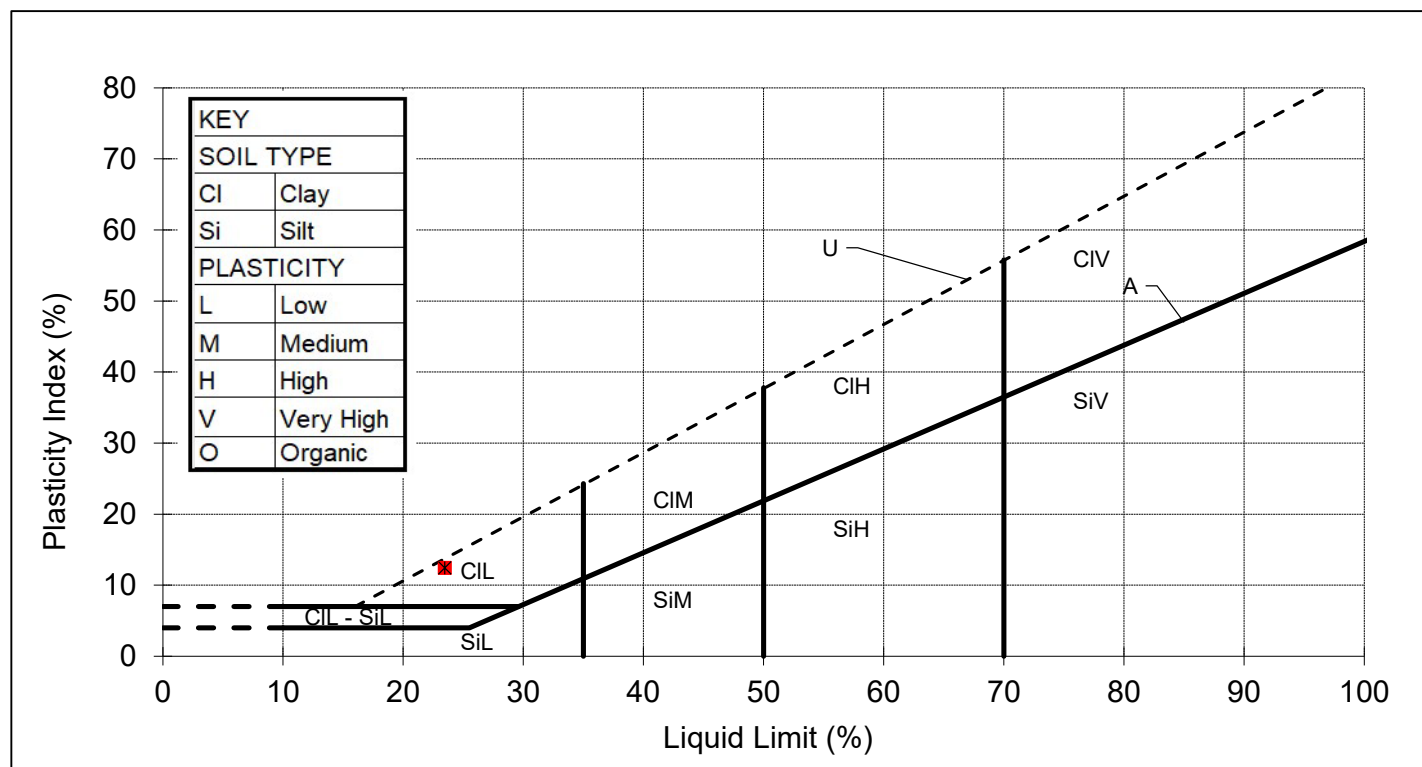
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH110 3.00-3.45	DATE SAMPLED	Not advised
SAMPLE No.	5016519	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)	Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	23.5	
Determination 2 (avg)	20.0	23.4	

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
12.6	23	11	12	94



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

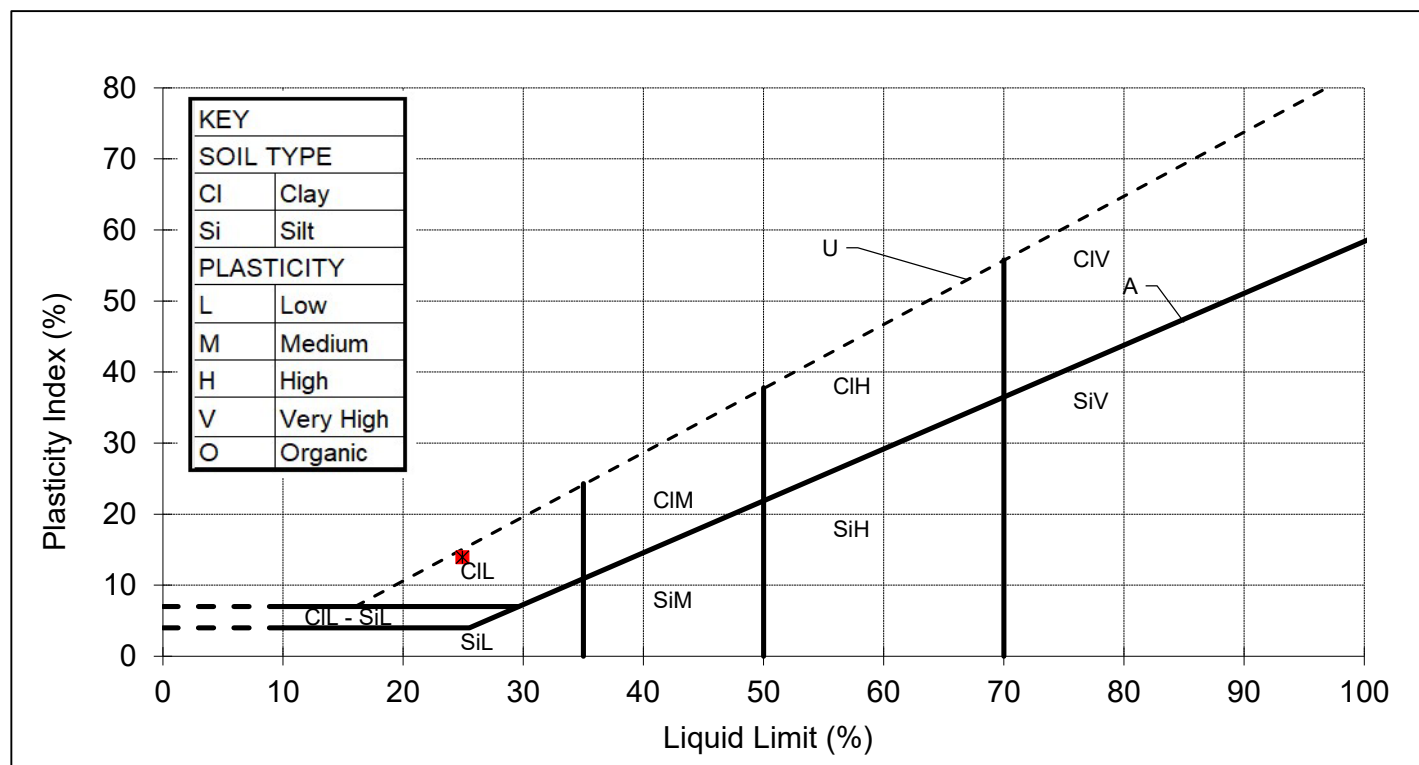
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH111 2.00-2.45	DATE SAMPLED	Not advised
SAMPLE No.	5016521	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.9	24.5	1.018	
Determination 2 (avg)	18.7	24.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10.1	25	11	14	83



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

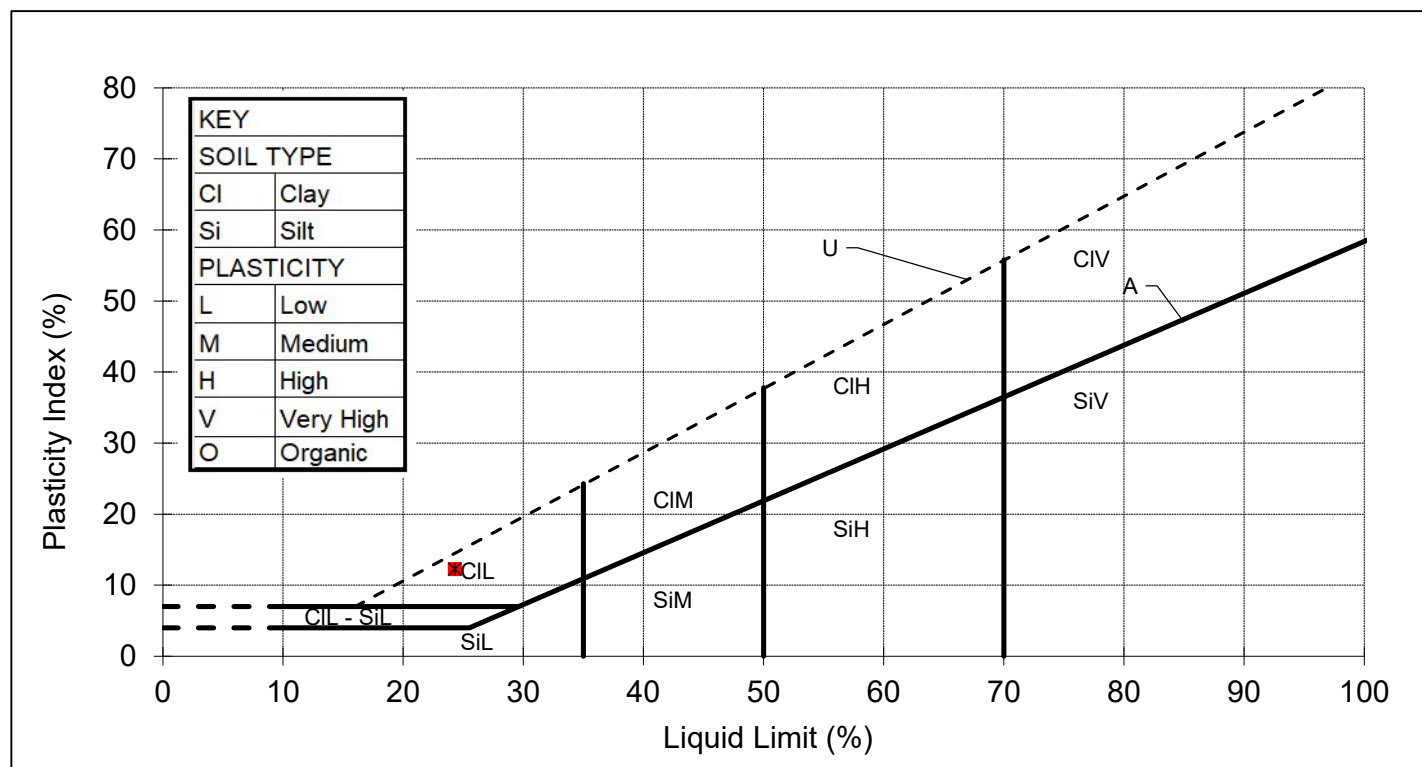
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH112 5.00-5.45	DATE SAMPLED	Not advised
SAMPLE No.	5016523	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)	Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	19.5	24.2	
Determination 2 (avg)	19.4	24.0	

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
14.6	24	12	12	88



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

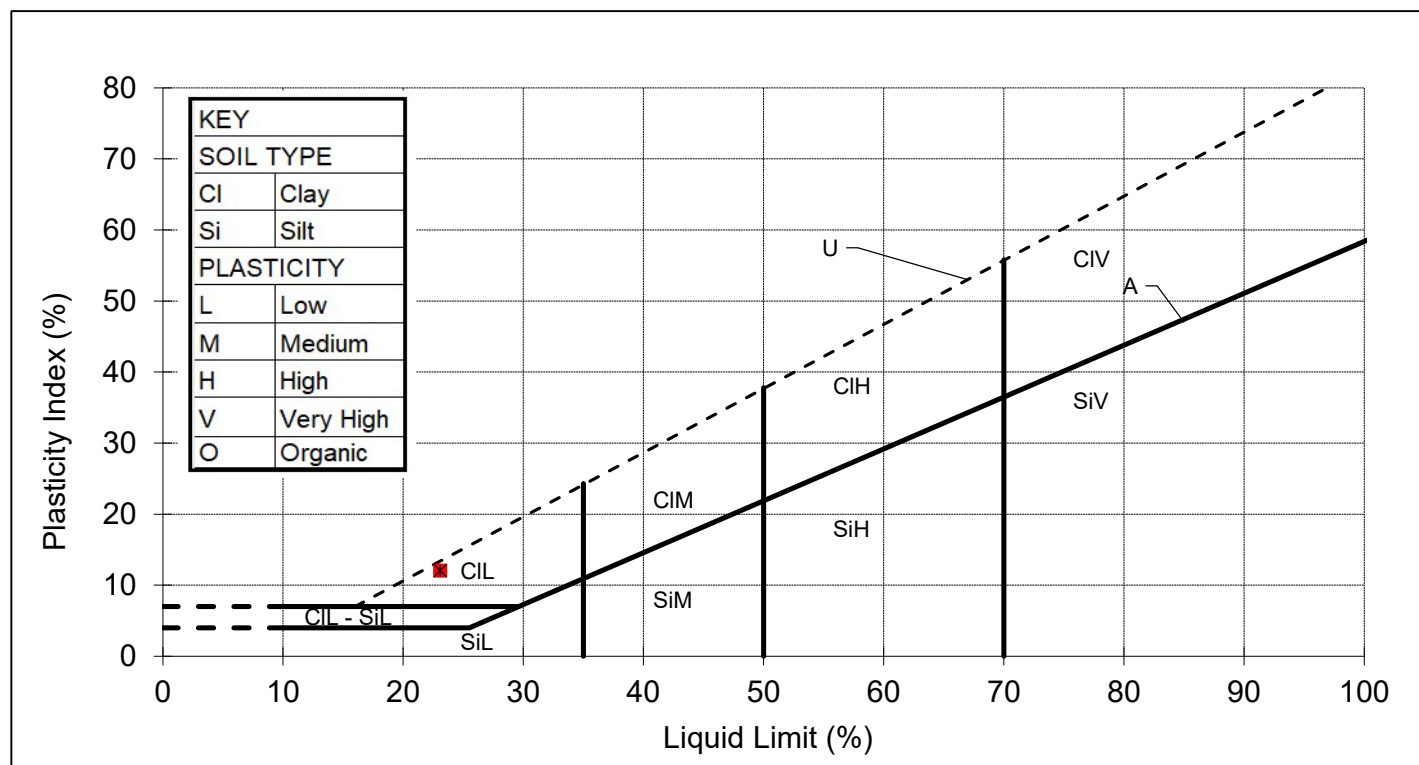
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH201 4.00-4.45	DATE SAMPLED	Not advised
SAMPLE No.	5016525	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)	Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	18.6	22.8	
Determination 2 (avg)	18.5	22.4	

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
10.3	23	11	12	80



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
(Director / Head of Laboratory)

DATE

27-Feb-25

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
TEL 0161 475 0870



TEST CERTIFICATE

LIQUID LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.3 (30° FALL CONE) 1 POINT METHOD

PLASTIC LIMIT BS EN ISO 17892-12:2018+A2:2022 Clause 5.5

WATER CONTENT METHOD BS EN ISO 17892-1:2014+A1:2022

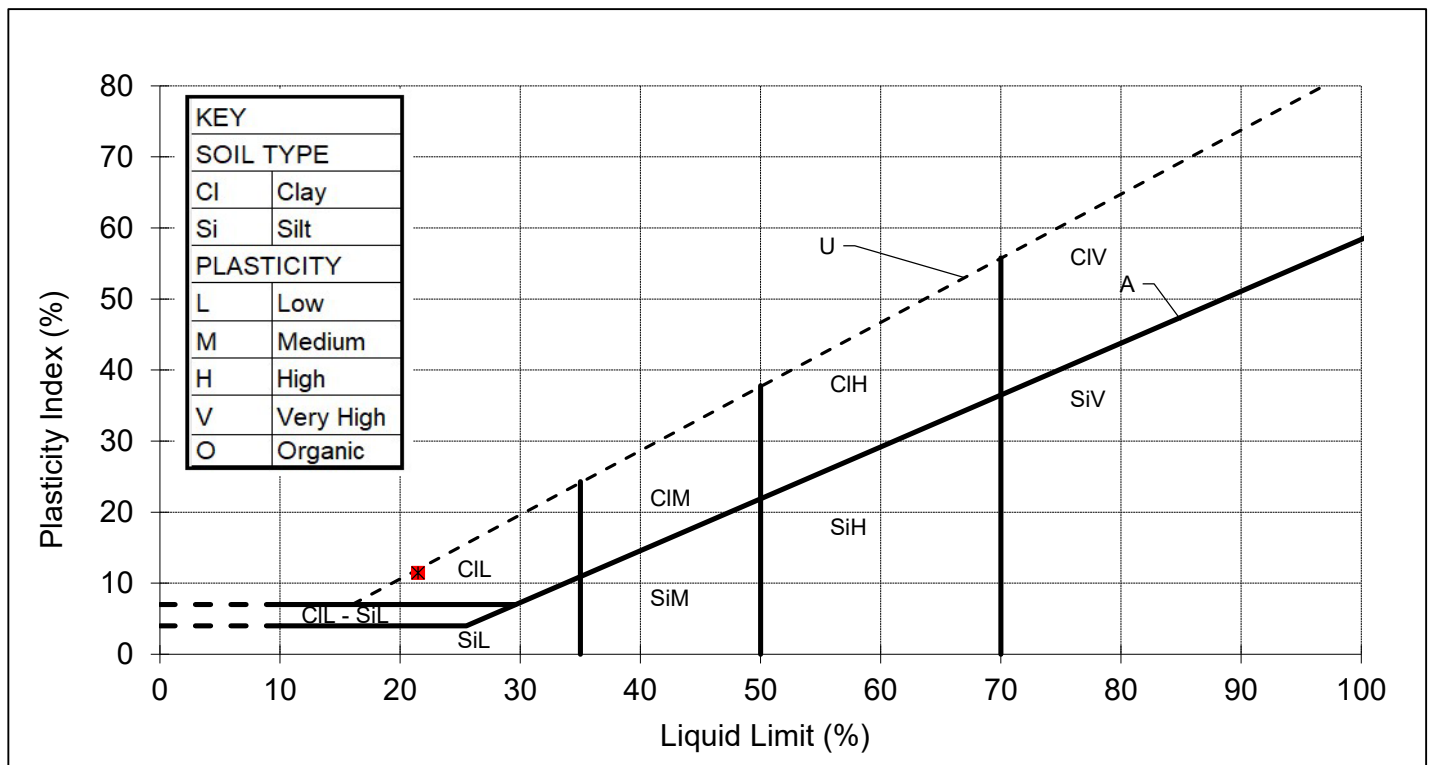
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH203 4.00-4.45	DATE SAMPLED	Not advised
SAMPLE No.	5016528	DATE RECEIVED	06-Feb-25
DATE TESTED	07-Feb-25	SAMPLED BY	Client

MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample	WATER CONTENT	Increasing
SAMPLE HISTORY	Natural State	% RET. 425um BY	Wet Sieved

Test Readings mm (average)		Water Content %	Correction Factor	Correction factor from Clayton and Jukes 1978
Determination 1 (avg)	20.0	21.5	0.999	
Determination 2 (avg)	20.1	21.5		

Natural Water Content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 425 micron (%)
12.1	21	10	11	87



REMARKS

SIGNED

NAME

O.P. Davies BA (Hons)
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DATE

27-Feb-25

MURRAY RIX

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

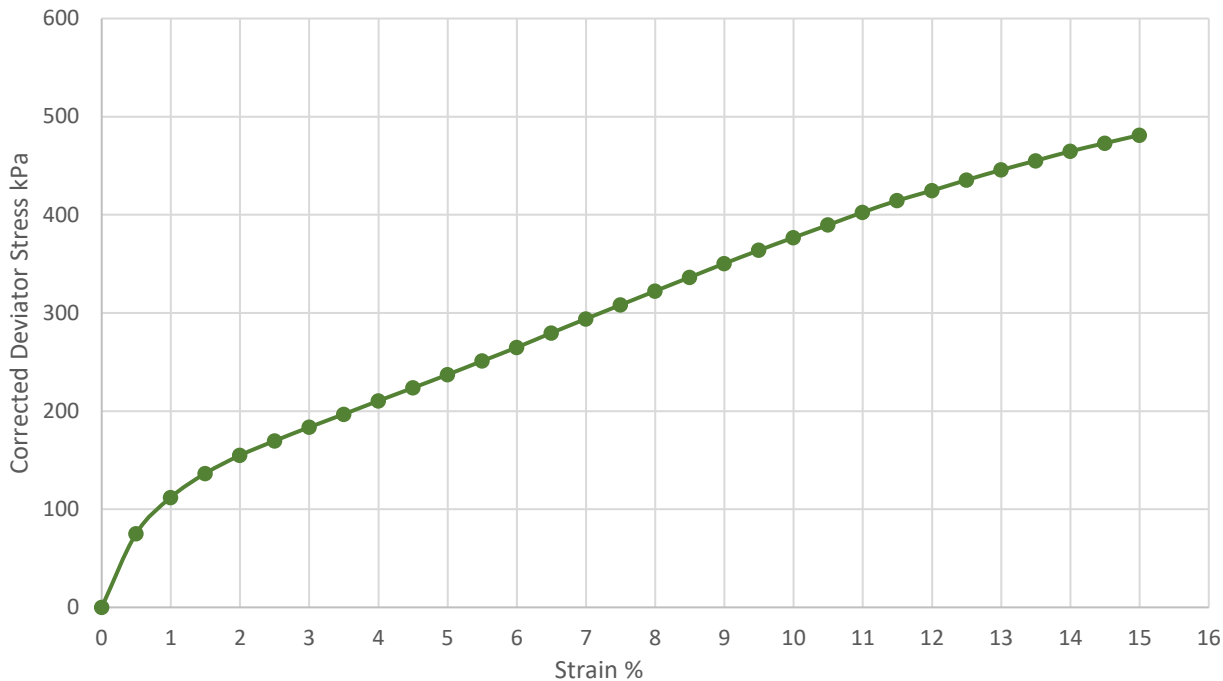
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH201 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016525	DATE RECEIVED	06-Feb-25
DATE TESTED	12-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

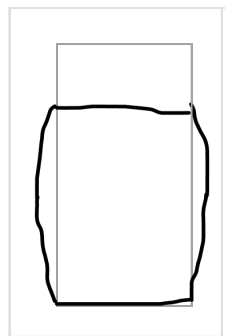
Specimen Location		Sample Length (mm)	390	Specimen depth from top of Sample (mm)	40
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	201	Specimen Water Content (%)	10.3
		Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.27
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	2.06
		Membrane Correction	3.39		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
85	15.0	2.0	481	241

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 27 February 2025

MURRAY RIX

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DUKINFIELD, CHESHIRE SK16 4QX
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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

BS EN ISO 17892-8:2018

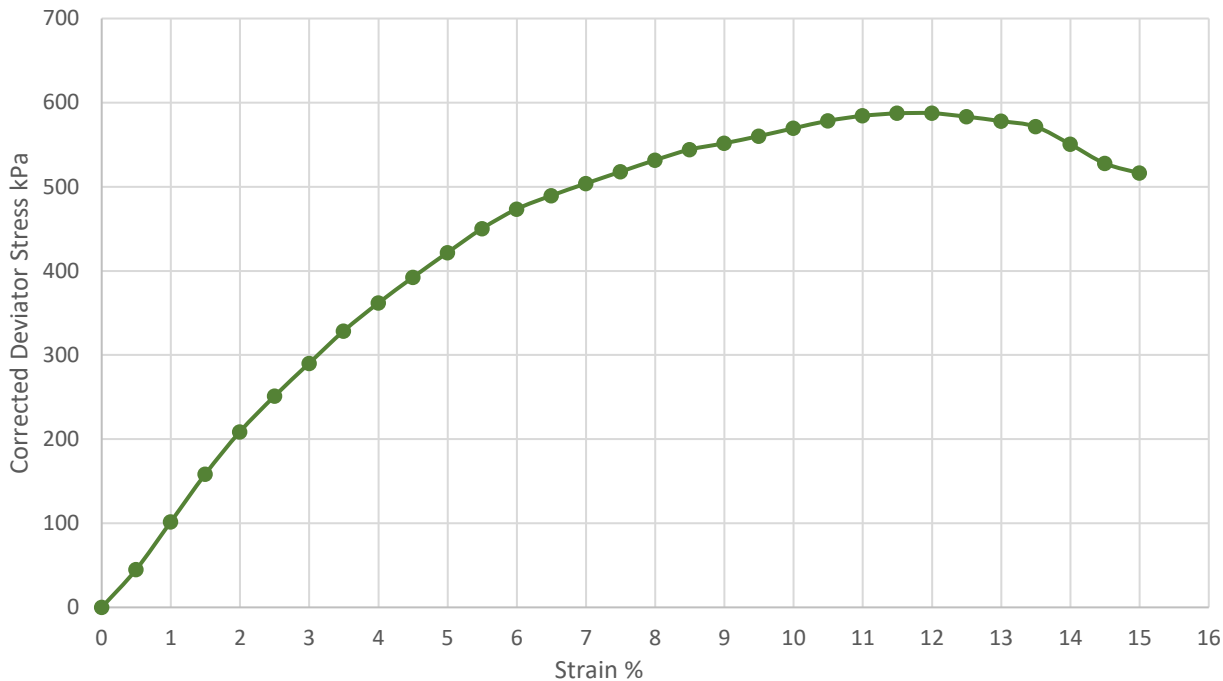
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH202 6.00-6.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016527	DATE RECEIVED	06-Feb-25
DATE TESTED	12-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

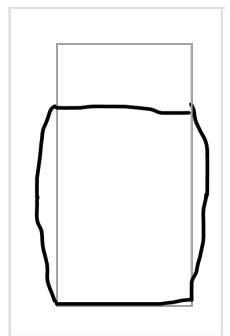
Specimen Location		Sample Length (mm)	50	Specimen depth from top of Sample (mm)	50
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	201	Specimen Water Content (%)	8.8
		Specimen Diameter (mm)	101	Specimen Bulk Density (Mg/m3)	2.27
		Membrane Thickness (mm)	0.4	Specimen Dry Density (Mg/m3)	2.09
		Membrane Correction	3.39		

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
SINGLE STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
135	12.0	2.0	587	294

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
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Date 27 February 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

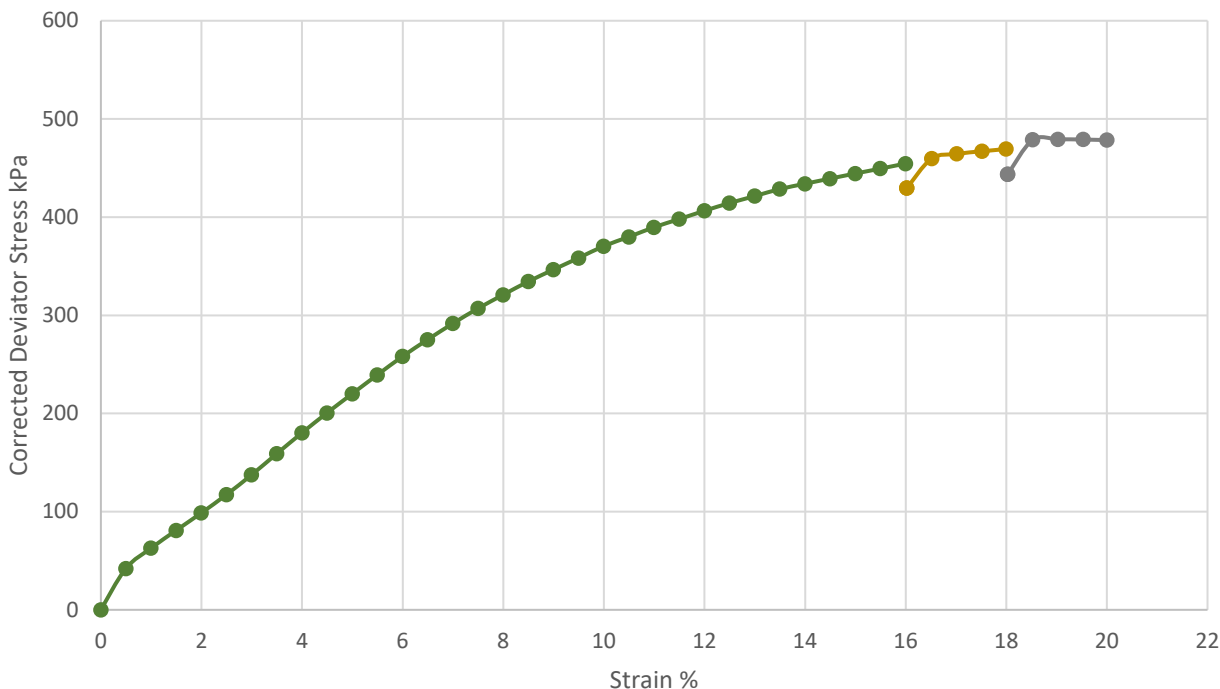
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH101 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016502	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

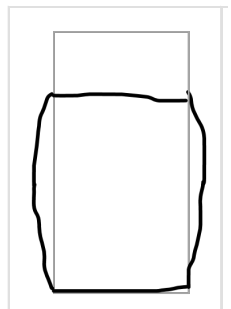
Specimen Location	Sample Length (mm)	390	Specimen depth from top of Sample (mm)	60
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Moisture Content (%)	9.8
	Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.30
	Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	2.09
	Membrane Correction	1.28	1.39	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
42	16	2	449.4	225
85	18	2	467.1	234
170	19	2	479.3	240

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
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Signed

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

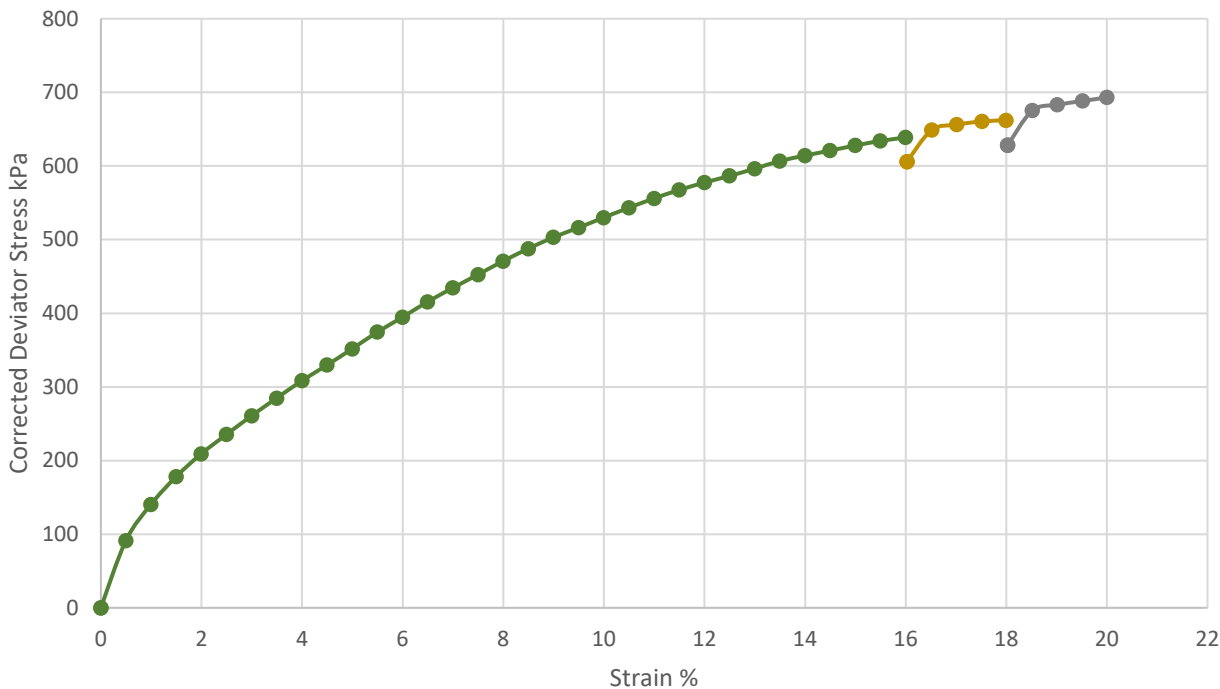
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH102 5.00-5.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016504	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

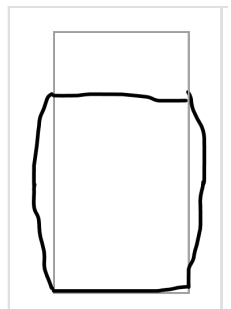
Specimen Location	Sample Length (mm)	325	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Moisture Content (%)	9.8
	Specimen Diameter (mm)	99	Specimen Bulk Density (Mg/m3)	2.23
	Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	2.03
	Membrane Correction	1.29	1.40	1.52

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
52	16	2	634.0	317
105	18	2	660.6	330
210	20	2	688.3	344

Remarks/Abnormalities

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

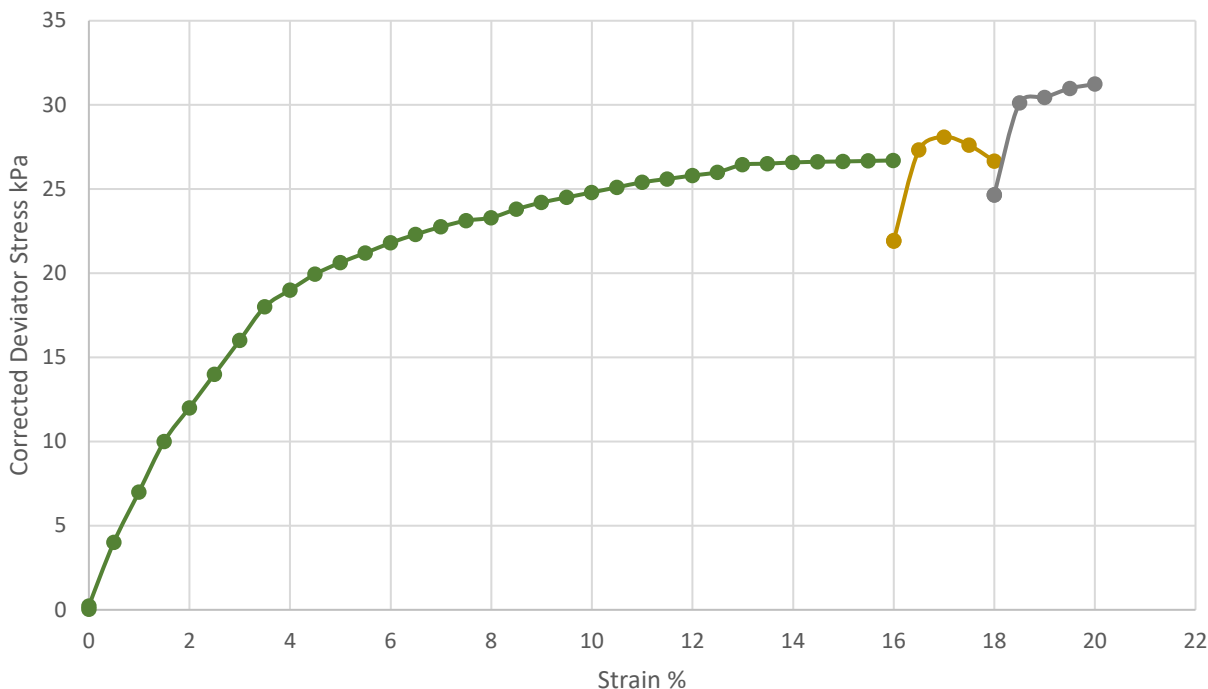
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH105 3.00-3.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016509	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

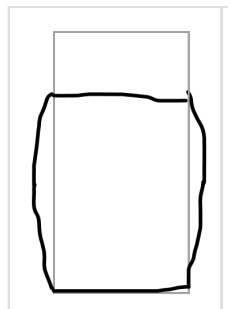
Specimen Location	Sample Length (mm)	380	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	200	Specimen Moisture Content (%)	16.1
	Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m ³)	2.14
	Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m ³)	1.84
	Membrane Correction	1.07	1.25	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength c_u (kPa)
32	16	2	26.7	13
65	18	2	28.1	14
130	20	2	31.2	16

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
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Date 27 February 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

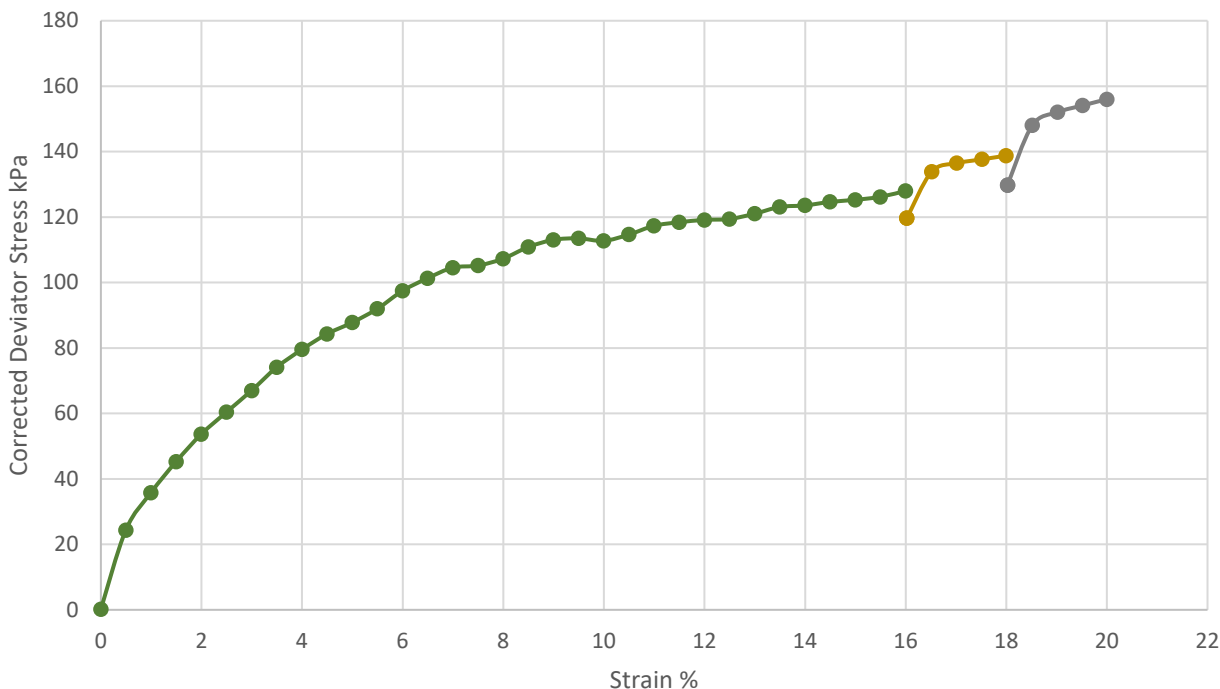
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH106 3.10-3.50	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016511	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

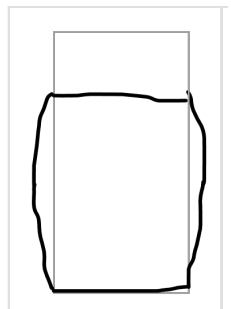
Specimen Location		Sample Length (mm)	410	Specimen depth from top of Sample (mm)	50
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	201	Specimen Moisture Content (%)	15.0
		Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.28
		Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	1.98
		Membrane Correction	1.28	1.39	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
33	16	2	126.2	63
66	18	2	137.7	69
132	20	2	154.1	77

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

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Date 27 February 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

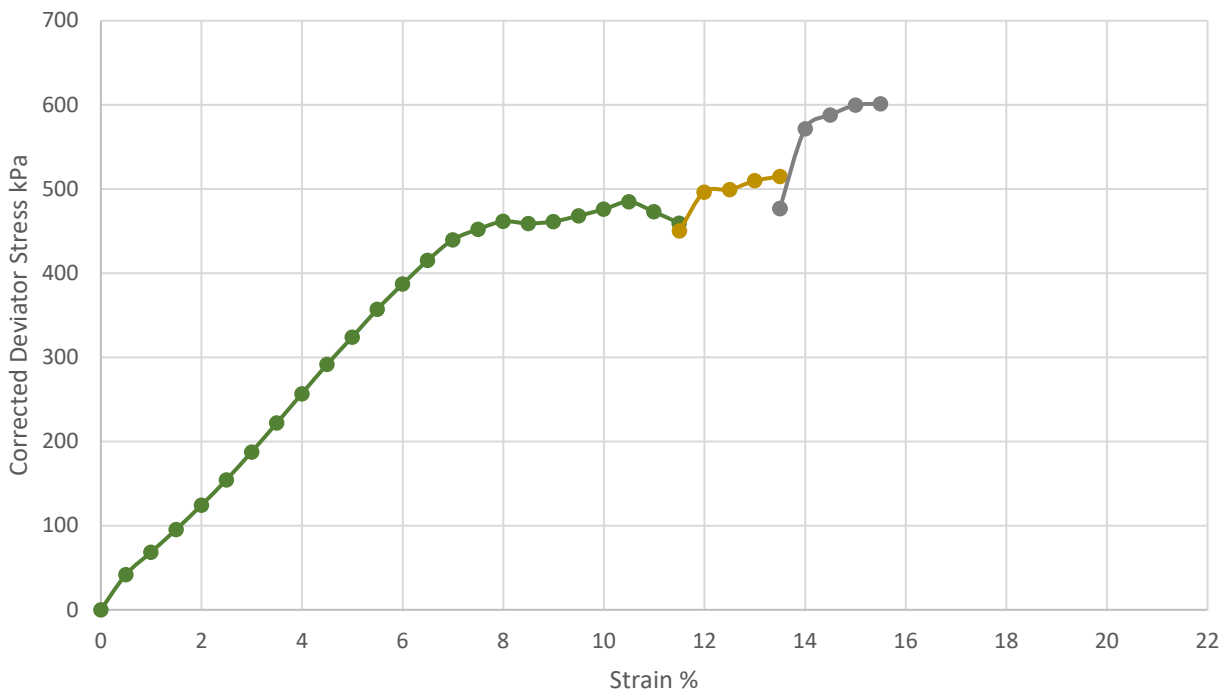
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH108 2.00-2.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016515	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

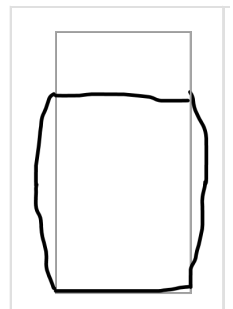
Specimen Location	Sample Length (mm)	390	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	201	Specimen Moisture Content (%)	9.6
	Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.25
	Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	2.06
	Membrane Correction	1.19	1.39	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
22	11	2	484.8	242
45	14	2	515.0	257
90	16	2	601.2	301

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 27 February 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

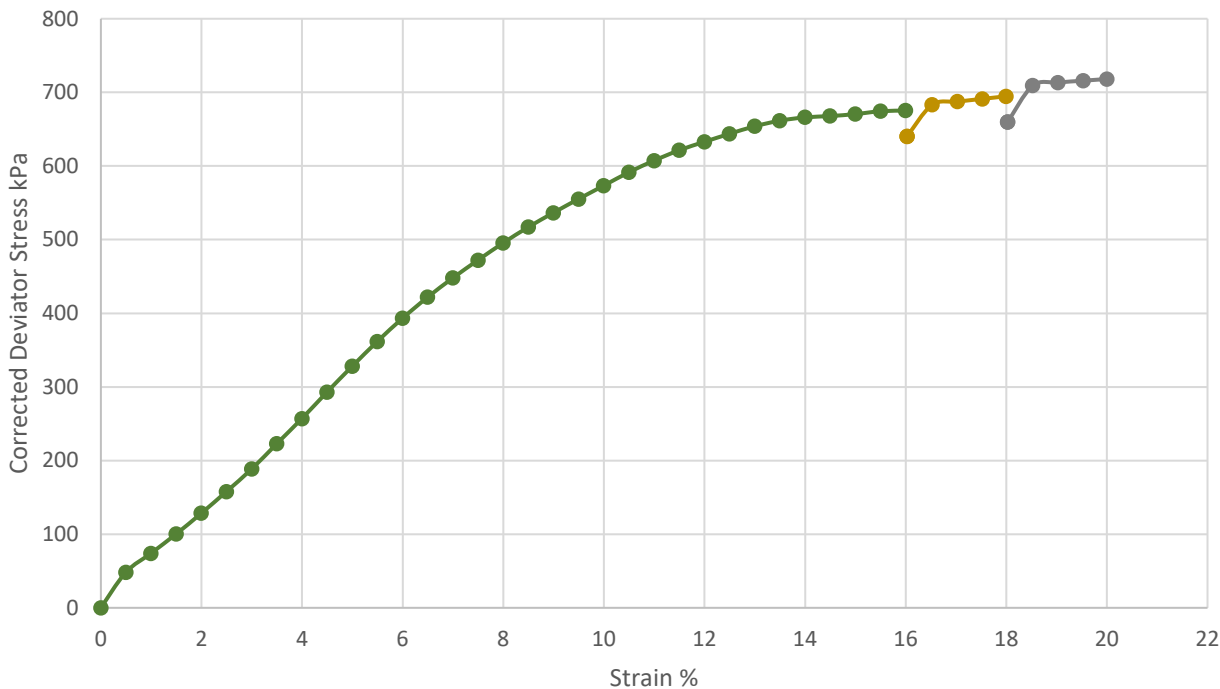
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH109 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016518	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

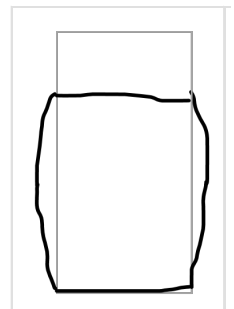
Specimen Location	Sample Length (mm)	380	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed
	Specimen Length (mm)	201	Specimen Moisture Content (%)	9.3
	Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.32
	Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	2.12
	Membrane Correction	1.28	1.39	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
42	16	2	674.4	337
85	18	2	691.2	346
170	20	2	715.9	358

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
(Director / Head of Laboratory)

Signed

Date 27 February 2025

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TEST CERTIFICATE

UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION
BS 1377 : PART 7: Clause 9 Multi Stage

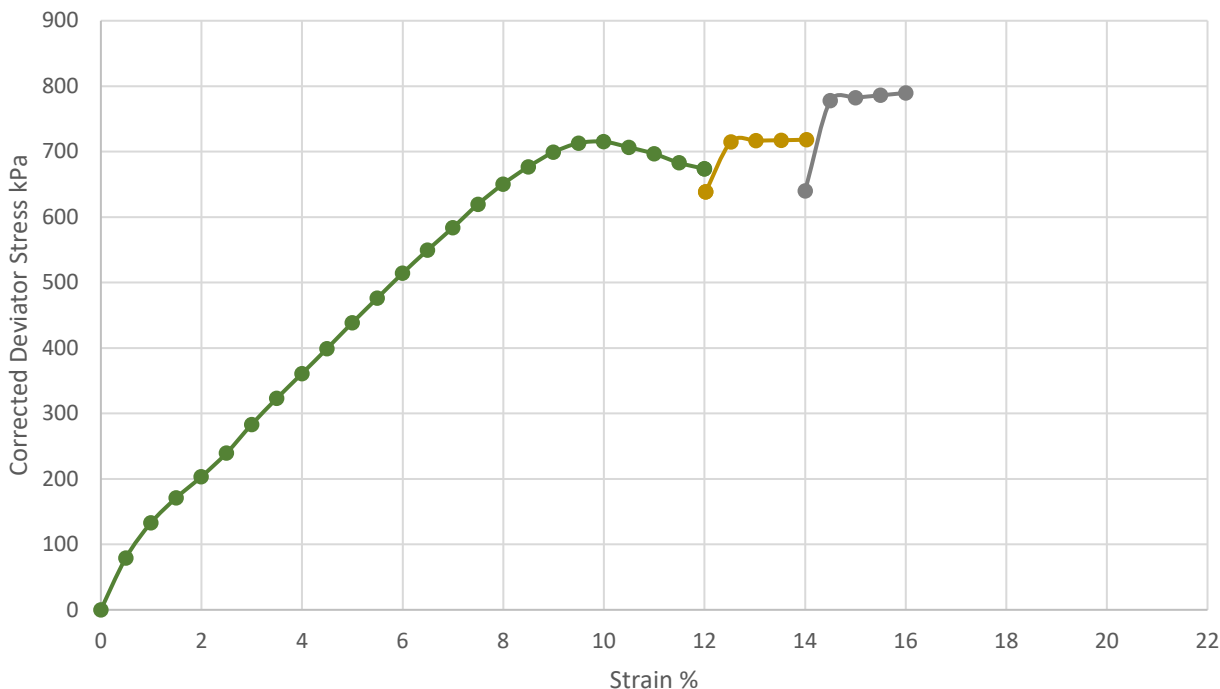
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH110 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016520	DATE RECEIVED	06-Feb-25
DATE TESTED	11-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

INITIAL CONDITIONS

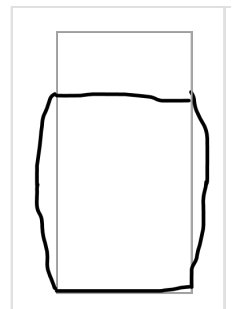
Specimen Location		Sample Length (mm)	390	Specimen depth from top of Sample (mm)	50
		Sample Orientation	Vertical	Specimen Condition	Undisturbed
		Specimen Length (mm)	200	Specimen Moisture Content (%)	9.0
		Specimen Diameter (mm)	100	Specimen Bulk Density (Mg/m3)	2.19
		Membrane Thickness (mm)	0.40	Specimen Dry Density (Mg/m3)	2.01
		Membrane Correction	1.04	1.37	1.51

CORRECTED DEVIATOR STRESS vs AXIAL STRAIN



TEST TYPE
MULTI STAGE

SKETCH OF
SPECIMEN AT
FAILURE



PLASTIC

Cell Pressure (kPa)	Failure Strain (%)	Rate of Strain (%/min)	Corrected Deviator Stress (kPa)	Shear Strength Cu (kPa)
42	10	2	715.2	358
85	14	2	718.3	359
170	16	2	786.0	393

Remarks/Abnormalities

Name O.P. Davies BA (Hons)
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Signed

Date 27 February 2025

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TEST CERTIFICATE

INCREMENTAL LOADING OEDOMETER TEST
BS EN ISO 17892-5:2017

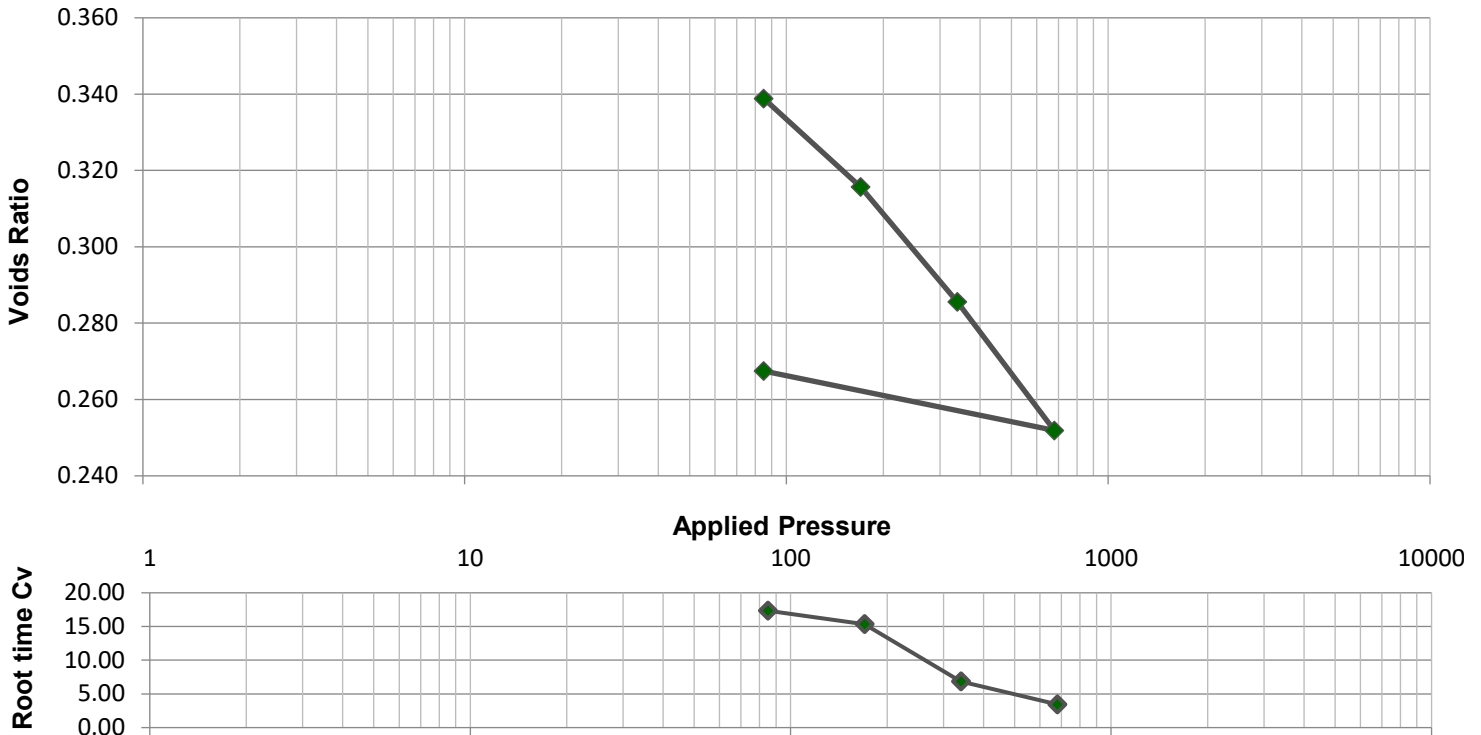
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH104 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016508	DATE RECEIVED	06-Feb-25
DATE TESTED	17-Feb-25	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

Specimen Location	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS					Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m ² /MN	Temp °C	Cv t90 root m ² /yr	Cv t50 log m ² /yr
Height	19.9 mm	Particle density	2.60	Ass	1	85	19.37	0.339	0.29	20	17.34	16.77
Diameter	69.4 mm	Initial void ratio	0.37		2	170	19.03	0.316	0.20	20	15.34	14.86
Weight wet	161.8 g	Deg. of sat.	96 %		3	340	18.60	0.286	0.13	20	6.86	6.06
Water cont.*	13.8 %	Swell. press.	0 kN/m ²		4	680	18.11	0.252	0.08	20	3.44	3.33
Bulk Density	2.16 Mg/m ³	Dry density	1.89 Mg/m ³		5	85	18.34	0.267	0.02	20		
					6							
					7							

*determined from specimen trimmings



REMARKS

NAME O.P. Davies BA (Hons)
(Director / Head of Laboratory)

SIGNED

DATE 27-Feb-25

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TEST CERTIFICATE INCREMENTAL LOADING OEDOMETER TEST BS EN ISO 17892-5:2017

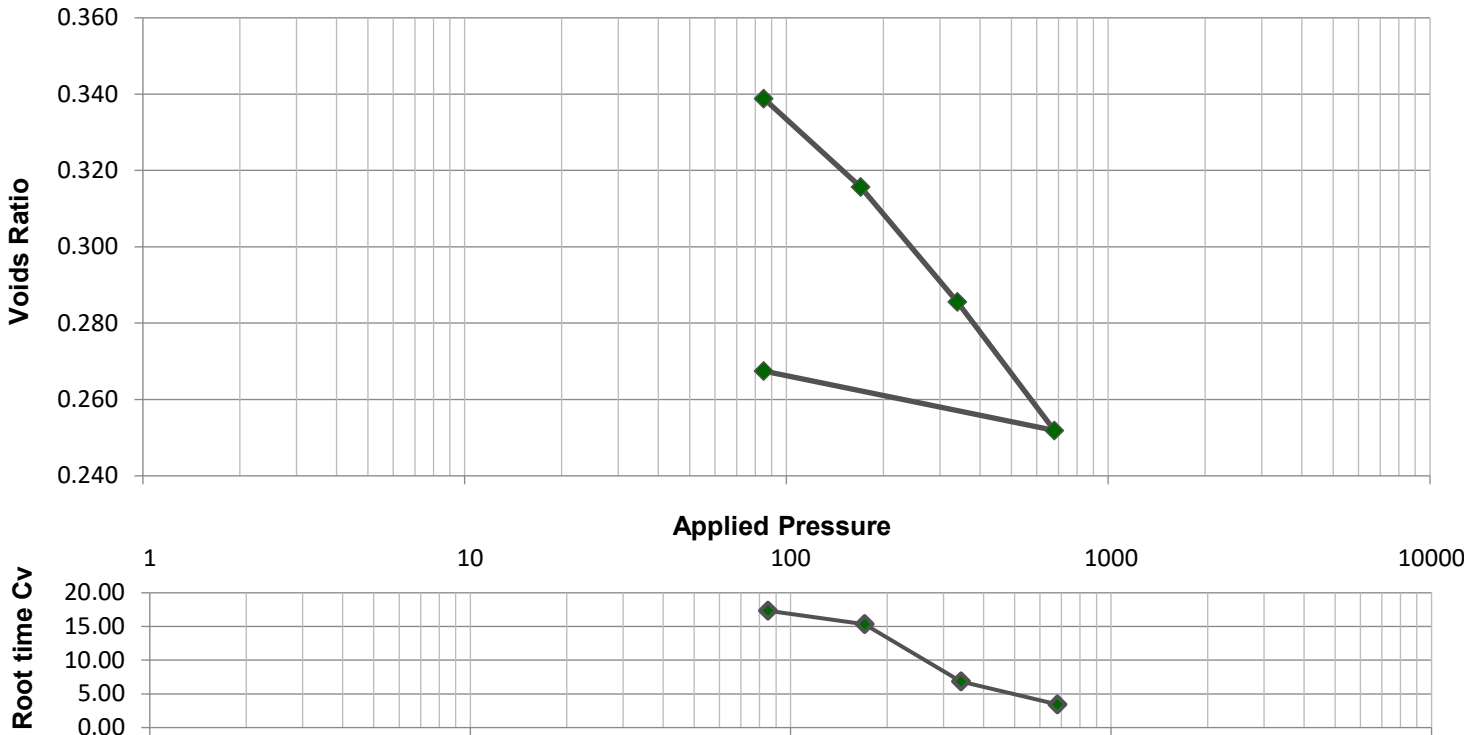
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH107 3.00-3.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016514	DATE RECEIVED	06-Feb-25
DATE TESTED	17-Feb-25	SAMPLED BY	Client
MATERIAL	Grey brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

Specimen Location	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS					Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m ² /MN	Temp °C	Cv t90 root m ² /yr	Cv t50 log m ² /yr
Height	19.9 mm	Particle density	2.60	Ass	1	85	19.37	0.339	0.29	20	17.34	16.77
Diameter	69.4 mm	Initial void ratio	0.37		2	170	19.03	0.316	0.20	20	15.34	14.86
Weight wet	161.8 g	Deg. of sat.	96 %		3	340	18.60	0.286	0.13	20	6.86	6.06
Water cont.*	13.8 %	Swell. press.	0 kN/m ²		4	680	18.11	0.252	0.08	20	3.44	3.33
Bulk Density	2.16 Mg/m ³	Dry density	1.89 Mg/m ³		5	85	18.34	0.267	0.02	20		
					6							
					7							

*determined from specimen trimmings



REMARKS

NAME O.P. Davies BA (Hons)
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DATE 27-Feb-25

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TEST CERTIFICATE

INCREMENTAL LOADING OEDOMETER TEST
BS EN ISO 17892-5:2017

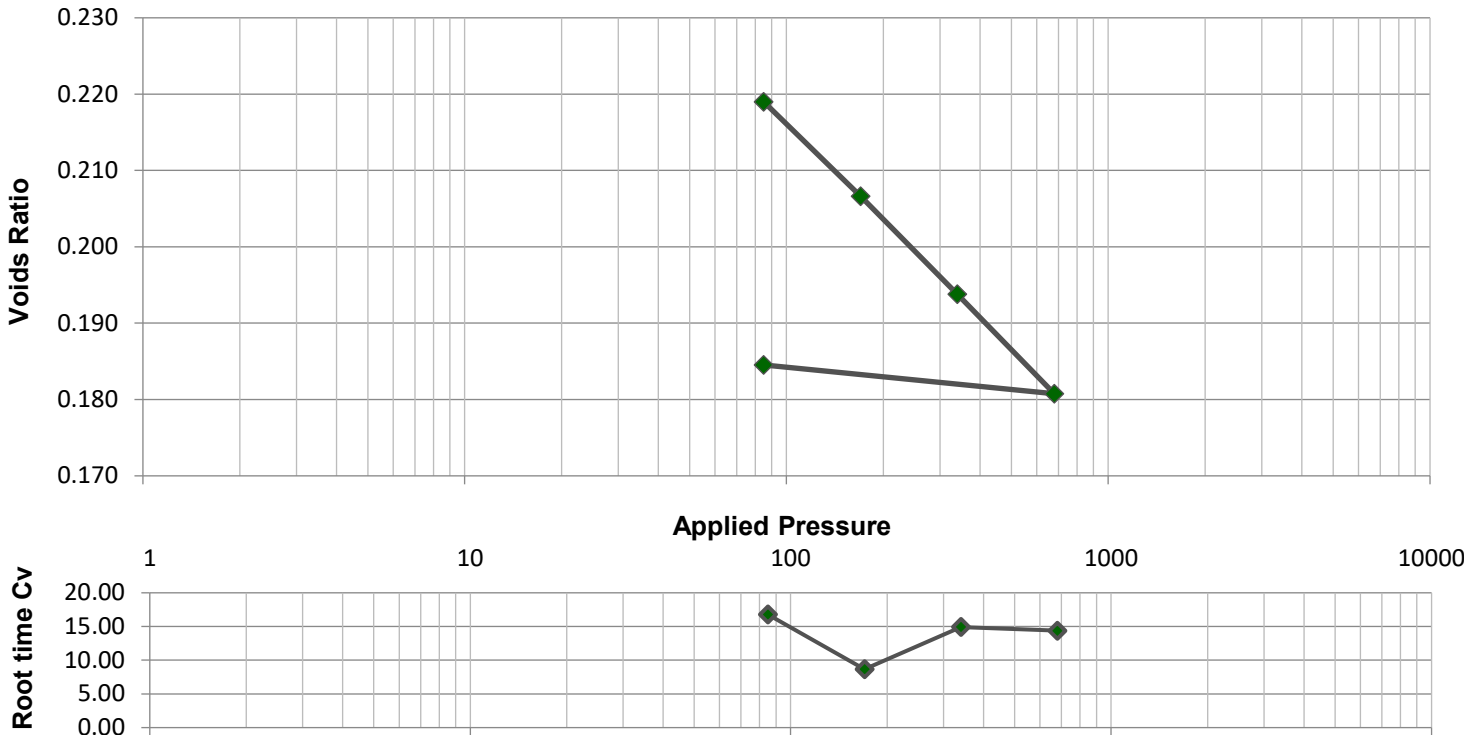
CLIENT	e3p
SITE	Glen Dimplex, Prescott
JOB NUMBER	MRN 25005/29

SAMPLE LABEL	BH111 4.00-4.45	DATE SAMPLED	Not advised
LAB SAMPLE No.	5016522	DATE RECEIVED	06-Feb-25
DATE TESTED	17-Feb-25	SAMPLED BY	Client
MATERIAL	Brown silty slightly sandy slightly gravelly CLAY		
ADVISED SOURCE	Site Investigation Sample		

Specimen Location	Sample Length (mm)	450	Specimen depth from top of Sample (mm)	50
	Sample Orientation	Vertical	Specimen Condition	Undisturbed

INITIAL CONDITIONS					Load No.	Applied Pressure kPa	Sample Height mm	Void Ratio	Mv m ² /MN	Temp °C	Cv t90 root m ² /yr	Cv t50 log m ² /yr
Height	19.9 mm	Particle density	2.60	Ass	1	85	19.06	0.219	0.49	20	16.77	16.85
Diameter	69.2 mm	Initial void ratio	0.27		2	170	18.87	0.207	0.12	20	8.66	9.26
Weight wet	168.6 g	Deg. of sat.	97 %		3	340	18.67	0.194	0.06	20	14.93	15.23
Water cont.*	10.2 %	Swell. press.	0 kN/m ²		4	680	18.46	0.181	0.03	20	14.39	13.64
Bulk Density	2.25 Mg/m ³	Dry density	2.04 Mg/m ³		5	85	18.52	0.185	0.01	20		
					6							
					7							

*determined from specimen trimmings



REMARKS

NAME O.P. Davies BA (Hons)
(Director / Head of Laboratory)

SIGNED

DATE 27-Feb-25

Appendix X: Origin of Chemical Assessment Criteria





CONSTITUENT	ORIGIN OF RISK ASSESSMENT VALUE
Arsenic	2014 LQM/CIEH S4ULs
Cadmium	2014 LQM/CIEH S4ULs
Chromium	2014 LQM/CIEH S4ULs
Lead	PROVISIONAL C4SL
Mercury	2014 LQM/CIEH S4ULs – methylmercury
Nickel	2014 LQM/CIEH S4ULs
Selenium	2014 LQM/CIEH S4ULs
Copper	2014 LQM/CIEH S4ULs
Zinc	2014 LQM/CIEH S4ULs
Cyanide – Total	2014 LQM/CIEH S4ULs
Phenols – Total	2014 LQM/CIEH S4ULs
Naphthalene	General assessment criteria (GAC) developed by CIEH/LQM Suitable 4 Use Levels with supporting data from SR3, SR7 and existing Tox report where applicable. 1% SOM.
Acenaphthylene	
Acenaphthene	
Fluorene	
Phenanthrene	
Anthracene	
Fluoranthene	
Pyrene	
Benzo(a)Anthracene	
Chrysene	
Benzo(b/k)Fluoranthene (iii)	
Benzo(a)Pyrene	
Indeno(123-cd)Pyrene	
Dibenzo(a,h)Anthracene	
Benzo(ghi)Perylene	
TPH C5-C6 (aliphatic)	
TPH C6-C8 (aliphatic)	
TPH C8-C10 (aliphatic)	
TPH C10-C12 (aliphatic)	
TPH C21-C35 (aromatic)	

Appendix XI: Multiparameter Sonde Monitoring Results





Site: Glen Dimplex, Prescott

Job Number: 17-500

Location ID

BH101

VISIT 1

	Water Level	Depth to Base	Depth of Install						
	1.45	5.8	6						
Time	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour	
0	1.53	10.1	9.4	1308	6.35	32.5	-224.5	Clear	
5	1.55	9.8	5.7	1300	6.32	34.1	-318	Clear	
10	1.58	9.8	4.8	1296	6.28	36.1	-319	Clear	
15	1.6	9.9	4	1293	6.28	36.3	-323	Clear	
20	1.62	9.9	3.8	1289	6.27	37	-324.7	Clear	

VISIT 2

Time	Water Level	Depth to Base		SPC	pH	pHmV	ORP	Colour/ odour
	1.53	5.8						
	Water level	Temp	DO					
0	1.57	7.4	7.9	922	6.1	46	88.7	Clear
5	1.59	7	5.8	914	6.12	44.7	85.7	Clear
10	1.6	6.9	5	915	6.13	44.5	84.2	Clear
15	1.6	6.9	4.7	914	6.13	44.4	83.1	Clear
20	1.6	6.8	4.2	911	6.13	44.3	82.1	Clear

VISIT 3

Time	Water Level	Depth to Base		SPC	pH	pHmV	ORP	Colour/ odour
	1.5	5.7						
	Water level	Temp	DO					
0	1.62	10.3	18.3	1145	5.6	74.7	67	Clear
5	1.63	9.8	6.8	1178	5.54	78.1	64.1	Clear
10	1.64	9.8	4.7	1183	5.53	78.6	65.3	Clear
15	1.65	9.8	3.8	1185	5.53	78.6	68.3	Clear
20	1.65	9.8	3.4	1185	5.53	78.9	68.8	Clear

VISIT 1

Time	WL	D	Depth of Install		pH	pHmV	ORP	Colour/ odour
	5.8	6.9	8					
	Water level	Temp	DO	SPC				
0	5.85	12	18.7	1800	7.68	-42.2	50.2	Clear
5	5.87	11.3	18.5	1764	7.66	-41.3	75	Clear
10	5.89	11.1	19.4	1744	7.64	-40.1	88.3	Clear
15	5.92	11.1	17.3	1729	7.62	-39.2	103.4	Clear
20	5.95	11.8	17.4	1686	7.6	-37.7	109.3	Clear

VISIT 2

Time	WL	D	Depth of Install		pH	pHmV	ORP	Colour/ odour
	5.75	6.95						
	Water level	Temp	DO	SPC				
0	5.9	10.6	22.1	2005	7.81	-49.4	21.2	Clear
5	5.93	10.5	23.3	1962	7.79	-48.6	20.3	Clear
10	5.95	10.1	24.7	1916	7.77	-47.3	20.7	Clear
15	5.97	10.3	25.9	1899	7.77	-47.1	21.9	Clear
20								

VISIT 3

Time	WL	D	Depth of Install		pH	pHmV	ORP	Colour/ odour
	5.7	6.95						
	Water level	Temp	DO	SPC				
0	5.74	11.4	59.7	2121	7.79	-48.5	51.5	Clear
5	5.8	11.8	25.7	2085	7.79	-49.3	4.3	Clear
10	5.83	11.2	30.1	2045	7.73	-45.4	5.5	Clear
15	5.85	11.2	31.2	2017	7.7	-43.6	6.3	Clear
20	5.85	11.2	34	1963	7.65	-40.9	7.5	Clear

VISIT 1

Time	WL	D	Depth Install		pH	pHmV	ORP	Colour/ odour
	2.1	5.05	5	SPC				
	Water level	Temp	DO					
0	2.11	10	11.8	977	5.99	52.8	43.6	Clear
5	2.12	9.6	6.8	977	5.88	58.9	36	Clear
10	2.14	9.6	6.2	974	5.89	53.5	28.6	Clear
15	2.15	9.6	5.4	973	5.87	59.7	24.9	Clear
20	2.16	9.6	4.9	973	5.84	62.7	24.7	Clear
25	2.19	9.6	4.7	973	5.83	62	22.3	Clear

VISIT 2

Time	WL	D	Depth Install		pH	pHmV	ORP	Colour/ odour
	2.05	5		SPC				
	Water level	Temp	DO					
0	2.24	7.3	19	1093	6.24	33	68	Clear
5	2.24	7.8	9.4	999	6.02	50.9	57.5	Clear
10	2.25	7.7	9.1	990	6.02	50.5	77	Clear
15	2.26	8.2	7.2	980	6.01	50	82.5	Clear
20	2.26	8.4	6.9	963	6	53.6	80.6	Clear

VISIT 3

Time	WL	D	Depth Install		pH	pHmV	ORP	Colour/ odour
	2.6	5		SPC				
	Water level	Temp	DO					
0	2.81	9.4	22.4	1135	6.59	18.8	24.9	Clear
5	2.83	9.4	19.8	1119	6.59	19.4	25.3	Clear
10	2.86	9.3	18.6	1123	6.57	19.9	30.9	Clear
15	2.9	9.3	17.2	1122	6.56	20	33.7	Clear
20	2.94	9.4	16.2	1122	6.56	21.6	32.7	clear

VISIT 1

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	1.28	2.05						
	Water level	Temp						
0	1.3	8.9	20.3	1342	8.01	-60.7	251.7	Clear
5	1.33	8.7	23.5	1277	8	-60	265.4	Clear
10	1.36	8.6	20.6	1240	8	-59.9	270	Brown
15	1.39	8.6	17.8	1225	8	-60.1	272.5	Brown
20	1.4	8.4	14.6	1236	8	-59.5	273	Brown

VISIT 2

	WL	D						
	1.3	2.05						
Time	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	1.34	8.1	29.2	1212	8.07	-64.4	63.3	Clear
5	1.35	7.9	30.3	1147	8.05	-62.8	69.8	Clear
10	1.36	7.8	31.7	1075	8.05	-62.9	78.7	Clear
15	1.37	7.8	30	1030	8.06	-63	85.5	Clear
20	1.38	7.8	28.8	1037	8.06	-63.1	88.6	Clear

VISIT 3

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	1.3	2.05						
	Water level	Temp						
0	1.33	8.9	14.4	1530	7.94	-56.8	-3.5	Clear
5	1.34	8.8	25.3	1297	7.96	-57.4	-7.6	Clear
10	1.35	8.8	32.8	1134	7.95	-57.5	2.6	Clear
15	1.35	8.8	32.9	1086	7.96	-57.9	5.6	Clear
20	1.35	8.8	33.6	1046	7.96	-57.6	6.5	Clear

VISIT 1

Time	WL	D						
	1.43	2.95						
	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	1.58	9.1	36.4	1179	10.63	-207.3	94.3	Clear
5	1.61	8.7	30.1	1182	10.44	-197.4	64.5	Clear
10	1.66	8.7	28.2	1185	10.6	-205.2	43.8	Clear
15	1.71	8.7	27.3	1194	10.61	-208.1	34	Clear
20	1.74	8.8	26	1198	10.61	-204.7	29.4	Clear

VISIT 2

Time	WL	D						
	1.45	3						
	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	1.6	9	67.3	1549	10.2	-183.8	17.8	Clear
5	1.63	7.9	62.1	1556	10.27	-186.1	4.2	Clear
10	1.65	7.5	58.1	1580	10.07	-175.2	9.7	Clear
15	1.67	7.3	51.7	1605	10	-170.8	15.8	Clear
20	1.69	7.2	48.7	1626	9.92	-166.6	25.7	Clear
25	1.7	7.2	46.1	1644	9.88	-163.4	25.3	Clear
30	1.7	7.2	43.5	1648	9.89	-164.6	21.8	Clear

VISIT 3

Time	WL	D						
	1.42	2.95						
	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	1.57	6.2	40.4	1843	10.12	-178.4	-81.5	Clear
5	1.63	8	35.8	1839	10.12	-174.5	-77	Clear
10	1.67	8	33.4	1839	10.13	-173.4	-75	Clear
15	-1.7	8	32.5	1833	10.13	-173.9	-71.8	Clear
20	1.74	8.1	31.7	1834	10.12	-178.4	-70.4	Clear

VISIT 1

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	2.28	5.7						
	Water level	Temp						
0	2.32	10.9	10.1	652.6	7.3	-20.7	313.1	Clear
5	2.37	11	5.5	642.3	7.28	-18.9	306	Clear
10	2.45	11.6	4.5	643	7.25	-18.3	301.3	Clear
15	2.47	11.3	4.4	633.6	7.21	-15.9	303	Clear
20	2.49	11.1	5	627.3	7.19	-11.5	302	Clear

VISIT 2

	WL	D						
	2.3	5.7						
Time	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	2.45	9.5	9.2	651.5	7.24	-17.5	29.2	Clear
5	2.47	9.3	7.5	652.7	7.25	-17.9	28.8	Clear
10	2.47	9.3	6.9	652.7	7.25	-18.2	29.1	Clear
15	2.49	9.2	5.9	652.3	7.26	-18.5	30.2	Clear
20	2.5	9.4	5.7	652.7	7.26	-18.2	30.7	Clear

VISIT 3

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	2.4	5.7						
	Water level	Temp						
0	2.45	11.1	11.6	655.6	7.29	-20.4	-0.9	Clear
5	2.45	10.2	10.4	652.1	7.28	-19.5	-0.3	Clear
10	2.45	10	10.2	650.7	7.28	-19.4	7.3	Clear
15	2.45	9.9	8.2	649.9	7.27	-19.3	10.7	Clear
20	2.45	9.9	7.8	646.7	7.27	-19.2	9	Clear

VISIT 1

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	3	4.7						
	Water level	Temp						
0	3.14	8.7	13.2	1038	7.39	-25.8	316.1	Clear
5	3.14	8.4	13.4	1028	7.41	-27	320.6	Clear
10	3.14	8.4	11.4	1025	7.4	-26.1	321	Clear
15	3.14	8.2	9.9	1027	7.39	-25.9	319.7	Brownish
20	3.14	8.4	9.6	1026	7.39	-16.1	318.7	Brownish

VISIT 2

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	3.05	4.7						
	Water level	Temp						
0	3.16	10	12.4	1015	7.39	-26.1	85.5	Clear
5	3.22	9.3	12.1	1020	7.37	-21.7	79.5	Clear
10	3.27	9.1	12.9	1016	7.38	-25.1	76.5	Clear
15	3.31	8.9	13.4	1013	7.4	-26.4	76	Clear
20	3.34	8.4	13.6	1013	7.41	-27	70.9	Clear

VISIT 3

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	3	4.5						
	Water level	Temp						
0	3.12	5.4	15.7	1046	7.41	-26.8	-7.8	Clear
5	3.12	5	12.7	1033	7.4	-26.7	-9.8	Clear
10	3.12	8.9	11.1	1031	7.41	-26.7	-7.5	Clear
15	3.12	8.8	10.1	1028	7.41	-26.8	-0.7	Clear
20	3.12	8.9	9.7	1027	7.41	-26.8	1.8	Clear

VISIT 1

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	2.4	7.5						
	Water level	Temp						
0	2.5	9.3	7.3	4015	9.12	-123	63.9	Clear
5	2.56	8.8	4.3	4012	9.12	-122.3	71.1	Clear
10	2.62	8.7	3.1	4020	9.13	-122.8	69	Clear
15	2.65	8.8	2.3	4029	9.12	-122.7	70.1	Clear
20	2.868	8.8	1.7	4031	9.12	-122.7	75.3	Clear

VISIT 2

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	2.4	7.6						
	Water level	Temp						
0	2.8	9.1	7.7	3975	9.14	-124.1	-61.2	Clear
5	2.92	8.9	3	3970	9.14	-123.7	-68.8	Clear
10	2.95	8.7	2.1	3913	9.13	-123.5	-67.7	Clear
15	2.98	8.7	1.7	3970	9.13	-123.5	-60	Clear
20	3	8.8	1.5	3971	9.13	-123.4	-66.8	Clear

VISIT 3

Time	WL	D	DO	SPC	pH	pHmV	ORP	Colour/ odour
	3.35	7.4						
	Water level	Temp						
0	3.53	8	17.6	4007	9	-116.2	-88.5	Clear
5	3.57	8.7	11.6	4103	8.96	-114	-101.5	Clear
10	3.6	8.4	8.1	4111	8.96	-113.6	-93	Clear
15	3.66	8.4	7.1	4101	8.96	-113.2	-85.6	Clear
20	3.69	8.4	6	4097	8.95	-113.1	-86.1	Clear

VISIT 1

Time	WL	D		SPC	pH	pHmV	ORP	Colour/ odour
	4.54	15.65	16.5					
	Water level	Temp	DO					
0	4.54	9.9	7.6	1530	7.09	-9.4	-13.4	Clear
5	4.54	9.7	6.5	1539	7.1	-9.6	-12.6	Clear
10	4.54	9.7	6.4	1539	7.1	-9.8	-12.4	Clear
15	4.54	9.8	6	1540	7.1	-9.6	-13.5	Clear
20	4.54	9.7	5.2	1539	7.1	-9.6	-13.4	Clear

VISIT 2

Time	WL	D		SPC	pH	pHmV	ORP	Colour/ odour
	4.54	15.65						
	Water level	Temp	DO					
0	4.54	9.5	18.9	1548	7.09	-9	-34	Clear
5	4.54	9.5	13.1	1564	7.08	-8.7	-32.7	Clear
10	4.54	9.3	12.6	1559	7.09	-9.1	-30.7	Clear
15	4.54	9.3	16.9	1561	7.09	-9.1	-29.5	Clear
20	4.54	9.3	9.4	1562	7.09	-9.1	-29.3	Clear

VISIT 3

Time	WL	D		SPC	pH	pHmV	ORP	Colour/ odour
	4.45	15.65						
	Water level	Temp	DO					
0	4.45	11	9.3	1517	7.1	-9.5	-51.7	Clear
5	4.45	10.5	6.5	1509	7.09	-9.3	-50	Clear
10	4.45	10.4	5	1509	7.09	-9.3	-48.4	Clear
15	4.45	10.3	3.7	1509	7.09	-8.2	-47.7	Clear
20	4.45	10.3	3.5	1510	7.09	-9.2	-47.8	Clwar

VISIT 1

Time	WL	D		SPC	pH	pHmV	ORP	Colour/ odour
	6.88	11.35	15					
0	7.17	11.4	32.2	874	7.19	-14.6	-15.9	Clear
5	7.3	11.4	22.4	870	7.13	-11.3	-17.1	Clear
10	7.4	11.4	21.6	865	7.1	-9.5	-4.8	Clear
15	7.44	11.2	24.1	856	7.08	-8.5	1.8	Clear
20	7.48	11.1	24.5	853	7.07	-8.1	2.3	Clear

VISIT 2

	WL	D						
	8.3	11.35						
Time	Water level	Temp	DO	SPC	pH	pHmV	ORP	Colour/ odour
0	8.55	11.3	46.6	671.8	8.2	-66.5	95.6	Clear
5	8.68	11	41.8	672.5	8.1	-63.5	96.5	Clear
10	8.71	10.8	43.8	674.3	8.08	-65.9	94.7	Clear
15	8.72	9.5	41.5	673.2	8.1	-65.8	96	Clear
20	8.74	9.3	42.3	670.3	8.09	-65.4	97.2	Clear

VISIT 3

Time	WL		D		SPC	pH	pHmV	ORP	Colour/ odour
	Water level	Temp	7.9	11.35					
			DO						
0	8.03	10	29	763	7.34	-23.4	21.3	Clear	
5	8.06	9.5	11.7	761	7.34	-23	-2.8	Clear	
10	8.1	9.3	10.5	762	7.34	-23.1	-5.4	Clear	
15	8.13	9.2	9.3	758	7.35	-23.5	-9.6	Clear	
20	8.16	9.3	9.2	760	7.35	-23.4	-11.4	Clear	

