GEOLOGICAL
GEOTECHNICAL
GEOENVIRONMENTAL
DATA ACQUISITION
CONSULTANCY

Phase 2 Intrusive Site Investigation Report

LOCATION	Lumb Lane, Huddersfield, HD4 6SZ
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FOR	Marsden Contracting c/o North Park (Birchencliffe) Ltd.
CLIENT REF.	
OUR REF.	G25097

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1. Introduction

In accordance with your instruction, Geoinvestigate Limited has carried out an intrusive site investigation at Lumb Lane, Huddersfield, HD4 6SZ.

A Phase 1 Desk Study has previously been completed by Geoinvestigate Limited (G25267 Rev A, September 2025). The most pertinent findings of the desk study comprised the following:

Site Suitability	**Desk Study Finding**	**Preliminary Assessment**
Normal Foundations	Bedrock expected to be present at shallow depth with possible thin drift deposits. Consideration should be made to vegetation influence if clay soils are encountered.	Likely to be suitable
Soakaways	Sandstone bedrock unlikely to offer sufficient permeability.	Unlikely to be suitable
Potential Risks	**Desk Study Finding**	**Preliminary Risk Assessment**
Radon Gas	Less than 1% of properties affected	Very Low
Chemical Contamination	Historical nearby and on-site land uses potentially giving rise to a range of inorganic and organic contaminants including asbestos, metals/metalloids, PAHs and petroleum hydrocarbons.	Low to Moderate
Hazardous Gas	Unlikely to be any significant potential source of hazardous gas.	Low
Ground Instability / subsidence	Potential for vegetation influence on shrink-swell clays which may be present, including risk of soil heave.	Negligible
	Potential for significant deposits of compressible made/infilled ground. Possibly some limited (<1m deep) made ground.	Low

NB. Arbitrary potential hazard assessment: High (Red), Moderate (Amber), Low (Yellow), Very Low (Green), Negligible (uncoloured)

It is proposed to construct a new residential development of No.4 dwellings at the site with associated soft landscaping (including private gardens) and hardstanding access roads and parking. The boundary of the current study area and the proposed developmental layout are presented on the site plan included within Appendix 1 of this report.

The purpose of this Phase 2 investigation has been to establish the true nature of the ground conditions at the site with regard to the potential contamination and geotechnical risks that have been identified during preliminary research, and to determine appropriate foundation solutions for the proposed new structure(s).

The report is carried out generally in accordance with BS 10175 (2011) and Land Contamination Risk Management (LCRM, 2020), and presents factual records of the site work, the ground conditions encountered and laboratory test results.

The recommendation, interpretation and summary expressed in this report are based on the strata observed in the exploratory holes. No responsibility is taken for conditions that have not been revealed by the exploratory holes, or which occur between them. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative, and liability cannot be accepted for its accuracy.

2. Scope of Phase 2 Investigation

2.1 Scope of Works

Given the above, the following investigation was carried out to assess the potential risks to the proposed development:

- Five (5) boreholes (ref. BH1 to BH5) were undertaken at the site to depths of between 0.90m and 1.90m below ground level (bgl) with associated soil sampling, logging and supervision of the works by a suitably qualified geo-environmental engineer. The boreholes were commenced using windowless sampling techniques with an Archway Dart mini drilling rig.

- Four (4) hand excavated trial pits (re. TPA to TPD) to provide additional information on near-surface ground conditions and to collect additional samples for contamination analysis, including from proposed soft landscaping and/or garden areas and locations inaccessible to the drilling rig.

- Geotechnical testing comprising twenty-one (21) moisture content determinations, four (4) Atterberg Limit plasticity tests, and a number of water-soluble sulphate concentrations and pH tests to allow suitable foundations and concrete design advice, including assessment of the shrinkage potential of any clay soils.

- Contamination analyses of five (5) samples of topsoil and made ground recovered at depths of 0.20m. Analysis was variably undertaken for a general suite of potential metal/metalloid contaminants, polycyclic aromatic hydrocarbons (PAHs) and asbestos. Chemical analyses were based on the attending engineer's assessment of soils and ground conditions at the site together with desk study findings. Leachate from two (2) of these samples was tested to check the mobility of potential contaminants given the likely presence of permeable strata and shallow groundwater.

- Provision of a factual and interpretative report including site plan, borehole logs, trial pit logs, geotechnical and contamination soil analysis results, advice on the contamination situation at the site, appropriate foundation advice, and advice regarding any remediation and validation works that may be necessary.

The trial pit and borehole positions are shown on the plan provided in Appendix 1.

The excavations were sampled and logged at site by a geoenvironmental engineer and the ground conditions encountered are described on the trial pit and borehole logs also provided in Appendix 1.
The results of geotechnical soil testing and soil moisture profiles are included in Appendix 2.

The results of the contamination testing are included in Appendix 3 (Eurofins Chemtest Ltd. report no. 26-09094).

2.2 Sampling Rationale

The borehole positions were chosen to give an indication of the ground conditions generally throughout the site, both in terms of geotechnical appraisal and assessment of soil contamination. The soils encountered in the boreholes are considered to be broadly representative of soils throughout the site. The hand excavated trial pit positions were specifically chosen to target proposed areas of soft landscaping or gardens.

3. Phase 2 Investigation Findings

3.1 Ground Conditions

3.1.1 Windowless Sample Boreholes

The ground conditions were relatively uniform across the site and comprised surface made ground or topsoil underlain by natural strata, predominantly comprising an upper cohesive band and a lower granular band, followed by shallow sandstone bedrock.

The surface made ground encountered in BH1 and BH2 comprised compact sandy and clayey gravel fill with fine to coarse fragments of sandstone and brick, as well as brick cobbles. This was found to 0.15m (BH2) and 0.30m (BH1). BH3 and BH4 encountered similar made ground to each other also in the form of loose, brown, gravelly sand with fine to coarse fragments of sandstone, brick, pot and locally to BH4, pea gravel. This extended to 0.15m in BH4 and 0.20m in BH5. In initial topsoil found in BH3 to 0.30m depth comprised firm very sandy and slightly gravelly clay with fine to coarse sandstone and coal fragments. Only BH1 did further made ground extend to a maximum depth of 0.40m and consisted of a thin band of loose, dark brown slightly gravelly and clayey sand with fine to coarse fragments of sandstone. This thin band was noted to potentially be an old, buried topsoil layer.

Below the made ground natural ground generally comprised of an initial horizon of sandy gravelly clay soils, followed by basal granular soils before refusal was found in each position on shallow sandstone bedrock. The initial natural soils comprised stiff, sandy and gravelly clay with fine to coarse gravel fragments of sandstone. This upper cohesive horizon extended to a maximum depth of 1.10mbgl (BH4). Below this initial clay in BH4 and BH5, and directly below the made ground in BH1, was a lower band of medium dense, gravelly and slightly clayey sand with fine to coarse gravel of sandstone. This medium dense gravelly sand was found to depths of 0.40m (BH1) and 1.80m (BH4). In BH2 and BH3, the basal horizon of granular material comprised a dense, sandy and clayey gravel of fine to coarse sandstone. This was found from depths of 0.60m (BH3) to 1.10m (BH2). Finally, at the base of each borehole, a thin band of extremely weak, distinctly weathered light grey sandstone was found to a maximum depth of 1.90m (BH4).

Hand shear vane tests returned values between 90kN/m^2 and 96kN/m^2 in the upper clay stratum at depths of between 0.50m and 1.00m, indicating generally stiff conditions.

Standard Penetration Tests (SPTs) were undertaken within the natural granular strata and at the base of each borehole. Within the granular material, SPT N_{300} values were between N=30 and N=41 were

recorded, indicating generally dense conditions. Testing in the sandstone bedrock consistently returned N values of N>50, indicating very dense conditions.

No ground water was recorded during the works.

3.1.2 Hand Excavated Trial Pits

Trial pits TPA to TPD all encountered broadly similar conditions to the boreholes. The initial made ground/topsoil comprising a sandy gravel or gravelly sand extended to depths of between 0.20m (TPB & TPD) and 0.30m (TPA & TPC). Natural stiff, sandy and gravelly clay subsoils then extended to the full depth of the excavations which were terminated at depths of between 0.50m and 0.60m.

The trial pits all remained stable and dry on completion.

3.2 Soil Moisture, Plasticity Testing and Vegetation Influence.

Borehole moisture profiles are presented in Appendix 2. Moisture contents between 6.4% and 36.0%. Atterberg Limit testing returned Plasticity Indices (PIs) between 21.6% and 26.1%. The cohesive soils are classified as Clay of Low High (CH) Plasticity according to BS 5930. This corresponds to Medium Shrinkage Soils (volume change potential) according to NHBC Section 4.2 Building Near Trees.

The moisture profiles indicate that vegetation related moisture depletion may extend to depths of 1.50m. Therefore, and given the above and the considerable vegetation currently onsite, it is considered that there is an elevated potential risk of seasonal soil volumetric changes attributable to vegetation. Subsequently, it is recommended that foundations are designed to mitigate against this accordingly.

It is also feasible that some vegetation removal may take place within or close to proposed building footprints. As such, precautions are recommended for new foundations to protect against soil heave.

4. Contamination Testing

As mentioned in Section 1, the use of the study site itself and construction and demolition works within the site might comprise the most viable potential sources of contamination at the site.

The soils most likely to contain contamination were expected to be the made ground deposits, but contamination could feasibly also occur throughout the full thickness of the natural subsoils which was encountered in the boreholes and trial pits to a maximum depth of 1.80m.

Soils close to surface would be the most relevant regarding human health risk assessment though analysis of leachate from the made ground was also considered appropriate to ensure no risk to local ground and surface waters exists through potential contaminant leaching and mobilisation.

Other than the presence of occasional brick and pot fragments, the topsoil and made ground showed no obvious visual or olfactory evidence of potential contamination or contaminative materials. However,

given the site's history, the potential for contamination to have affected the site could not be ruled out without soil analyses.

To ensure representation and characterisation of all relevant soil types, the analyses included:

- Samples of topsoil from BH3 and TPB.
- Samples of the largely granular near-surface made ground stratum from BH1, TPC and TPD.

Based on the findings of the site works, five (5) samples of topsoil and made ground from depths of between 0.20m recovered from across the site were tested for a range of substances. These samples were tested for a range of substances, depending on their origin, the requirements of the investigation, and the assessment of the attending engineer. Test suites variably included metals/metalloids, PAHs, and asbestos. Leachate from two (2) of the samples was analysed also to determine if there might be any risk of mobile contamination, with testing including TPH where appropriate.

The results of the contamination testing are included in Appendix 3 of this report (Eurofins Chemtest Ltd. report no. 26-09094) and have been used in the following contamination risk assessment.

5. Risk Assessment

5.1 Method

Geoinvestigate Ltd. uses a combination of assessment criterion provided by the Environment Agency, DEFRA and by the Chartered Institute of Environmental Health in order to assess the presence of potentially harmful chemicals within soils and water. These include: Environment Agency Environmental Quality Standards (EQSs), Site Specific Assessment Criteria (SSAC) generated using CLEA software version 1.06 site specific risk assessment modelling, DEFRA Category 4 Screening Levels (C4SLs), and Land Quality Management / Chartered Institute of Environmental Health (LQM/CIEH) Safe for Use Levels (S4ULs).

As the site is to be developed as residential dwellings, it falls within the residential end-use category. As it is possible that persons living on the site may cultivate vegetables / fruit for consumption, consideration to this end is also necessary.
No site-specific assessment criteria (SSAC) have been created for the site as no unusual circumstances (i.e., occupation periods etc.) are considered to be present/likely at the site that would render the generic residential assessment criteria unsuitable.

The results of the contamination testing that has been carried out have been compared to the soil quality values from the above sources. Where they fall below these limit values, they have been deemed safe for a residential end use.

An appraisal of the chemical results and relevant limits is set out in the Contamination Risk Assessment that follows.

5.2 Contamination Risk to Sensitive Receptors

5.2.1 Human Health

Made ground was encountered to a maximum depth of 0.40m, this was underlain by an upper layer of cohesive natural clay subsoils followed by a band of granular deposits.

No visual and/or olfactory evidence of contamination was found in any of the encountered soils, including no visible evidence of asbestos contamination.

As discussed earlier in the report, levels of determinands have been compared to the soil assessment criteria for residential end-use, as published by DEFRA and LQM/CIEH, with DEFRA C4SLs taking priority where more than one target value exists due to their "more pragmatic whist still strongly precautionary" nature (quote from SP1010 C4SL Policy companion Document).

A mean Soil Organic Matter Content (SOM) of 5.04% was returned from the soil analyses. Therefore, the LQM/CIEH GAC for PAHs and other hydrocarbons were chosen using the highest Soil Organic Matter (SOM) option of 6.0%, which is considered the most representative (and a conservative) value for the samples returned.

A summary of the results is shown in Table 1 below.

Table 1: Summary of Chemical Determinands in Soil

Determinand	Units	Limits of Detection	Total Samples	Returned Concentrations		Threshold Ranges S4UL / C4SL	
				Min	Max	Min	Max
pH	pH Unit	N/a	5	6.7	8.6	-	-
Water Soluble Sulphate	g/l	<1.25	5	0.017	0.42	-	-
Moisture Content	%	< 0.01	5	8.6	24	-	-
Organic Matter	%	< 0.1	5	1.6	12	-	-
Metals							
Arsenic	mg/kg	<1	5	4	26	37	37
Boron (Water Soluble)	mg/kg	< 1	5	<0.2	1	290	290
Cadmium	mg/kg	< 0.2	5	<0.2	0	11	11
Copper	mg/kg	< 4	5	16	48	2400	2400
Chromium III	mg/kg	< 2	5	15	33	910	910
Hexavalent Chromium	mg/kg	< 1.8	5	<1.8	< 1.8	6	6
Free Cyanide	mg/kg	< 1	5	<1	< 1	140	140
Total Cyanide	mg/kg	< 1	5	<1	< 1	140	140
Lead	mg/kg	< 1	5	15	70	200	200
Mercury	mg/kg	< 0.3	5	<0.3	0	410	410
Nickel	mg/kg	< 1	5	13	30	120	180
Selenium	mg/kg	< 1	5	<1	1	250	250
Zinc	mg/kg	< 1	5	51	120	3700	3700
Asbestos Screen	-	-	5	Not Detected		Detection	

Table 1ctd: Summary of Chemical Determinands in Soil

Determinand	Units	Limits of Detection	Total Samples	Returned Concentrations		Threshold Ranges S4UL / C4SL	
				Min	Max	Min	Max
Organics							
Total Phenols	mg/kg	< 1	5	<1	0.46	120	380
Naphthalene	mg/kg	< 0.05	5	<0.05	< 0.05	2.3	13
Acenaphthylene	mg/kg	< 0.05	5	<0.05	< 0.05	170	920
Acenaphthene	mg/kg	< 0.05	5	<0.05	0.07	210	1100
Fluorene	mg/kg	< 0.05	5	<0.05	< 0.05	170	860
Phenanthrene	mg/kg	< 0.05	5	<0.05	0.64	95	440
Anthracene	mg/kg	< 0.05	5	<0.05	0.2	2400	11000
Fluoranthene	mg/kg	< 0.05	5	<0.05	1.4	280	890
Pyrene	mg/kg	< 0.05	5	<0.05	1.3	620	2000
Benzo[a]anthracene	mg/kg	< 0.05	5	<0.05	0.58	7.2	13
Chrysene	mg/kg	< 0.05	5	<0.05	0.65	15	27
Benzo[b]fluoranthene	mg/kg	< 0.05	5	<0.05	0.68	2.6	3.7
Benzo(k)Fluoranthene	mg/kg	< 0.05	5	<0.05	0.27	77	100
Benzo[a]pyrene	mg/kg	< 0.05	5	<0.05	0.51	5	5
Indeno(1,2,3-c,d)Pyrene	mg/kg	< 0.05	5	<0.05	0.39	27	41
Dibenz(a,h)anthracene	mg/kg	< 0.05	5	<0.05	0.07	0.24	0.3
Benzo[g,h,i]perylene	mg/kg	< 0.05	5	<0.05	0.27	320	350
Total Of 16 PAH's	mg/kg	< 0.08	5	<0.05	7	-	-
Ali >C5-C6	mg/kg	< 0.02	5	<0.01	< 0.02	42	160
Ali >C6-C7	mg/kg	< 0.02	5	<0.01	< 0.02	100	530
Ali >C7-C8	mg/kg	< 0.02	5	<0.01	< 0.02	100	530
Ali >C8-C10	mg/kg	< 0.05	5	<1	< 0.05	27	150
Ali >C10-C12	mg/kg	< 1	5	<2	< 1	130	760
Ali >C12-C16	mg/kg	< 2	5	<8	11	1100	4300
Ali >C16-C21	mg/kg	< 8	5	<8	47	65000	110000
Ali >C21-C35	mg/kg	< 8	5	3.2	97	65000	110000
Ali >C35-C40	mg/kg	< 8.4	5	<10	< 8.4	65000	110000
Ali >C40-C44	mg/kg	< 8.5	5	<0.01	< 8.5	-	-
Ali >C5-44	mg/kg	< 10	5	<0.01	< 10	-	-
Aro >C5-C7	mg/kg	< 0.01	5	<0.02	< 0.01	70	300
Aro >C7-C8	mg/kg	< 0.01	5	<1	< 0.01	130	660
Aro >C8-C10	mg/kg	< 1	5	<2	< 1	34	190
Aro >C10-C12	mg/kg	< 1	5	<10	< 1	74	380
Aro >C12-C16	mg/kg	< 2	5	<8	7.8	140	660
Aro >C16-C21	mg/kg	< 10	5	2.3	54	260	930
Aro >C21-C35	mg/kg	< 10	5	3.5	17	1100	1700
Aro >C35-C40	mg/kg	< 8.4	5	10	10	1100	1700

The analyses have returned low/negligible concentrations without exception.

As such, the site is deemed to be fit for purpose for its proposed residential land use, and no remedial works will be required prior to redevelopment.

5.2.2 Controlled Waters

Given the possible historical contamination sources, the presence of relatively shallow groundwater, and permeable deposits below the site, leachate was analysed from two (2) samples to investigate possible contaminant mobility. These samples were obtained from BH1 (0.20m) and TPD (0.20m).

The leaching test is an aggressive test (de-ionised water) and is not in aqueous equilibrium (steady state) with the solid sample, this may cause overestimation of the aqueous phase concentrations compared to groundwater in contact with the same contaminated soils and therefore may not give results that are an accurate representation of the groundwater risk on site. Further to this, the leaching test was actually developed for inorganic constituents, with the leaching of organics being poorly understood, and again may not be representative of their presence. The main risk is expected to be from inorganic contaminants.

Levels for domestic water supply, or the protection of aquatic life levels, as published by the Environment Agency are presented as the assessment criteria, but these are not strictly target values. They are not directly applicable to leachates because these standards would represent the total concentration in the receiving water bodies following mixing and attenuation of the leached contaminants. As such, the standards are included as an example of good water quality for consideration of how leachable contamination might affect such waters.

A Summary of the leachate testing is shown in table 2 below.

Table 2: Chemical Determinands in Leachate

Determinant	Units	LOD	Total Samples	Returned Concentrations		Recommended Thresholds	
				Min	Max	Risks to Groundwater	Risks to Surface Water
Inorganics							
pH at 20C	-	n/a	2	7.00	8.00	5.5 - 10 (UKDWS)	
Arsenic (dissolved)	µg/l	<1	2	0.43	4.40	10	50
Cadmium (dissolved)	µg/l	<0.08	2	<0.08	<0.08	5	0.45 - 1.5
Chromium (dissolved)	µg/l	<0.4	2	<0.4	<0.4	50	3.4
Copper (dissolved)	µg/l	<0.7	2	1.60	5.30	2000	1 - 28
Lead (dissolved)	µg/l	<1	2	<1	<1	10	7.2
Mercury (dissolved)	µg/l	<0.5	2	<0.5	<0.5	20	20
Nickel (dissolved)	µg/l	<0.3	2	0.77	1.60	20	20
Selenium (dissolved)	µg/l	<4	2	<4	<4	10	10
Zinc (dissolved)	µg/l	<0.4	2	<0.4	<0.4	3750	8 - 125
Total Phenols	µg/l	<10	2	<10	<10	50	7.7
Organics							
Cyanide (Total)	µg/l	<0.01	2	<10	<10	250000	250000
Cyanide (Free)	µg/l	<0.01	2	<10	<10	-	-
Naphthalene	µg/l	<0.01	2	<0.01	<0.01	70	-
Acenaphthylene	µg/l	<0.01	2	<0.01	<0.01	210	-
Acenaphthene	µg/l	<0.01	2	<0.01	<0.01	210	-
Fluorene	µg/l	<0.01	2	<0.01	<0.01	140	-
Phenanthrene	µg/l	<0.01	2	<0.01	<0.01	43.8	-
Anthracene	µg/l	<0.01	2	<0.01	<0.01	1050	0.4

Table 2ctd: Chemical Determinands in Leachate

Determinant	Units	LOD	Total Samples	Returned Concentrations		Recommended Thresholds	
						Risks to Groundwater	Risks to Surface Water
Fluoranthene	µg/l	<0.01	2	<0.01	<0.01	43.8	1
Pyrene	µg/l	<0.01	2	<0.01	<0.01	105	-
Benzo[a]anthracene	µg/l	<0.01	2	<0.01	<0.01	0.543	-
Chrysene	µg/l	<0.01	2	<0.01	<0.01	1.09	-
Benzo[b]fluoranthene	µg/l	<0.01	2	<0.01	<0.01	0.137	-
Benzo[k]fluoranthene	µg/l	<0.01	2	<0.01	<0.01	3.61	-
Benzo[a]pyrene	µg/l	<0.01	2	<0.01	<0.01	0.01	0.1
Indeno(1,2,3-c,d)Pyrene	µg/l	<0.01	2	<0.01	<0.01	1.55	-
Dibenz(a,h)Anthracene	µg/l	<0.01	2	<0.01	<0.01	0.011	-
Benzo[g,h,i]perylene	µg/l	<0.01	2	<0.01	<0.01	12	-
Total Of 16 PAH's	µg/l	<0.01	2	<0.01	<0.01	-	-

As can be seen from Table 2 and the detailed results presented in Eurofins Chemtest Ltd. report no. 26-09094 (Appendix 3), soils at the site have generally been shown to not be leaching any potential contaminants at levels that would be expected to have any significant impact on local ground and surface water bodies.

When considering attenuation during migration and dilution in receiving water bodies it is highly unlikely that even the total leachable quantity of contaminants would have any measurable effect on receiving water bodies.

Some leachates returned elevated copper concentrations which exceed the lowest threshold of the assessment criteria options (of several possible choices). These lowest options relate to freshwater with very low calcium carbonate content (<50mgl-1 which is unlikely in water of pH 7.0 to 8.0 as measured for these leachates (Low CaCO3 content would be expected to more likely in more acidic waters than this). Though no data has been collected regarding the calcium carbonate contact of local waters and underlying groundwater, the low concentrations and consequently extremely minor nature of any possible exceedances of lower target values suggests that these results do not represent any noteworthy risk to underground or surface waters.

The clay present at depth across the site should significantly reduce any sub-surface migration and processes including dilution, attenuation and biodegradation will reduce the concentration of contamination.

5.3 Hazardous Gas / Ground Gas

5.3.1 Gas Regime

Made ground deposits have been found to be consistently shallow (≤1.0m) across the site. In addition, no records of other potential sources of hazardous gas have been identified (such as landfills, shallow coal mining or organic natural deposits).

Given the absence of any plausible source/pathway/receptor for hazardous gas, no ground gas monitoring has been considered necessary at the site, and there is not considered to be any noteworthy gas risk to the proposed development. In line with CLAIRE Research Bulletin 17 "A Pragmatic Approach to Ground Gas Risk Assessment", no ground gas monitoring or protection measures will be required for the proposed development.

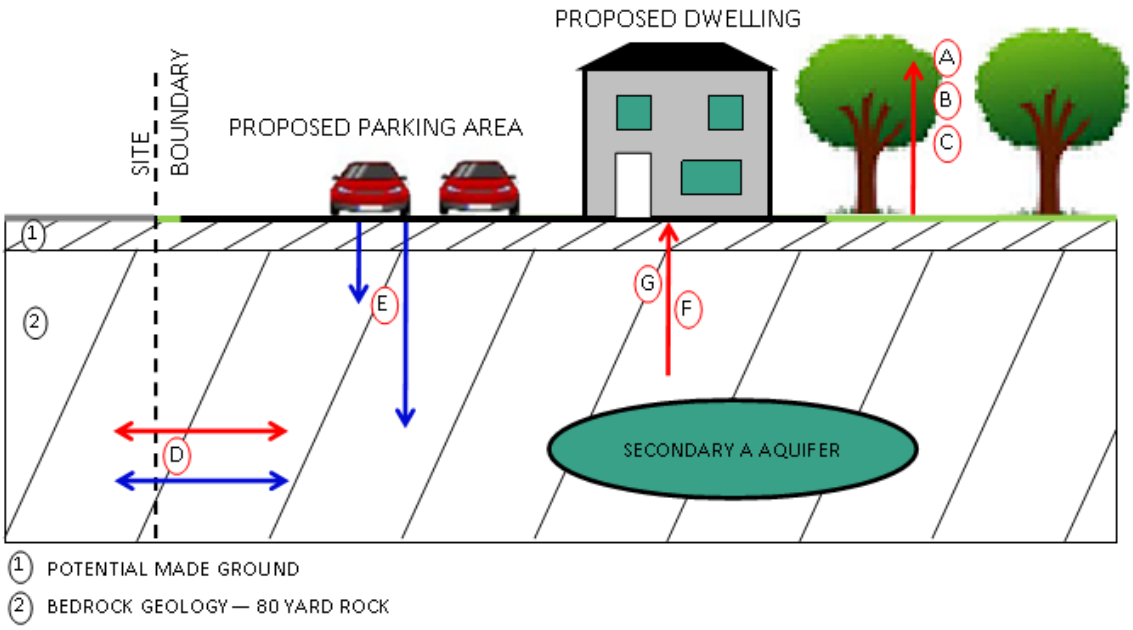
5.3.2 Radon Gas

As confirmed by the Phase 1 desk study report, the site is in an area where less than 1% of properties are above the radon action level. Therefore, no radon protection measures will be required in the new structure(s).

6. Conceptual Ground Hazard Model (CGHM)

The conceptual ground hazard model (CGHM) presented below shows the potential hazards and pollutant linkages which have been considered at the site, all of which are considered to have been satisfactorily disproven.

Figure 1: CGHM – Conceptual cross section of site including a Source, Pathway and Receptor Model



IDENTIFIED HAZARDS Including Potential CONTAMINATION SOURCES

-Made ground services and utilities associated with former nursery and retained ground onsite

-Possible contamination form kerosene tank and associated heating boiler

-Potential contamination from historical site use

IDENTIFIED RECEPTORS and ASSOCIATED PATHWAY

A— End Users through Direct Contact / Inhalation / Ingestion. Buildings and hard standing will encompass most of the site, removing any pathway to end users through direct contact in these areas.

B— Plants and Trees through uptake, possible given the intended end use of the site.

C— End Users through cultivation and consumption of vegetables / fruit. Possible given the intended end use of the site.

D— Neighbouring Sites through lateral migration (in soil and water, including surface water run off).

E— Ground water through leaching of sub-soil.

F— Buildings and services through direct contact. Buildings and hard standing will encompass some of the site, removing any pathway to end users through direct contact in these areas.

Linkages A to F considered disproven, due to acceptable levels of contaminants returned through testing

G— End users and buildings through ground gas migration. Buildings and hard standing will encompass some of the site, removing any pathway to end users through direct contact in these areas.

Phase 1 Desk Study considered there were few viable ground gas sources to the site and the SI works returned minimal thickness of made ground at the site

7. Conclusions

7.1 Soil & Water Contamination

Soil and leachate analysis results have confirmed that no noteworthy or significant contamination risk exists to potential receptors either within or close to the site (including water receptors).

As such, no remedial works will be required prior to the redevelopment of the site.

Though unlikely, if the development plan were to change significantly, or obvious evidence were uncovered during groundworks of potential contamination that has hitherto not been encountered, then both Geoinvestigate Ltd. and the local planning authority should be notified and, if appropriate, redevelopment works halted/postponed while further assessment and/or remediation work is undertaken.

7.2 Hazardous Gas / Ground Gas

The findings of the Phase 1 desk study and the absence of any significant made ground or natural organic soils at the site confirm that there is no noteworthy potential ground gas risk (including consideration of radon).

No ground gas monitoring was considered necessary, and no ground gas protection will be required in the proposed new structure(s). This includes Radon Protection barriers.

The complete absence of any visual or olfactory evidence of hydrocarbon contamination, coupled with the very favourable soil analysis results in that regard, also confirm that no hydrocarbon vapour risk exists at the site.

7.3 Foundation Design

The encountered ground conditions comprised shallow made ground underlain by medium dense sandy gravel or stiff clay followed by comparatively shallow sandstone rock.

Therefore, to ensure long term stability and to guard against seasonal shrinkage and swelling, foundations should extend into the competent sandstone at a depth of between 1.00m to 1.50m across site (according to individual borehole depths). Foundations seated on the rock may be designed to a safe net bearing pressure of 150kN/m², based on the lowest SPT N Value of N=>50 returned. Providing the safe bearing capacity is not exceeded settlement would be anticipated to be less than 25mm.

Following removal of the weaker made ground and granular soils, the natural sandy gravel and / or sandstone rock would provide a suitable base for construction of lightly loaded ground bearing floor slabs. However, any clay soils should be removed and replaced to reduce the potential soil heave risk. Furthermore, where vegetation is present within the proposed building footprints, anti-heave compressible material should be placed within the internal faces of external walls and the affected properties should incorporate suspended floors, with a minimum 150mm void.

Groundwater was not encountered during the investigation; therefore, it is not likely that groundwater ingress will pose an issue during the forming of foundation excavations. However, all excavations should be monitored during construction for groundwater ingress, particularly after periods of heavy and/or prolonged rainfall, and mitigated accordingly, i.e., via sumps and pumping.

7.4 Concrete Design

The results of chemical analyses of the fill returned Water Soluble Sulphate levels of between 17mgl^{-1} and 420mgl^{-1} and pH levels of between 6.7 and 8.6. Additionally, the site is inferred to classify as brownfield soils with no mobile water.

On this basis concrete in contact with the ground may be designed to ACEC Class DS-1 AC-1s of "BRE Special Digest 1 – Concrete in aggressive ground".

END OF REPORT

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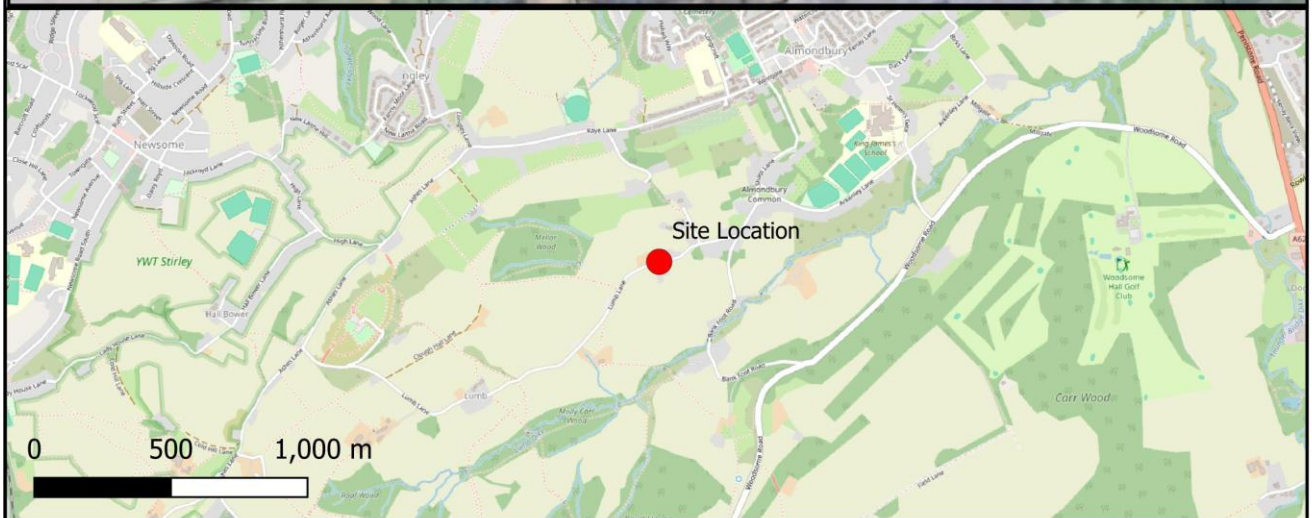
APPENDIX 1

Site Plans

and

Exploratory Hole Logs



CLIENT: North Park (Birchencliffe)	TITLE: Site Plan	Legend: Site Boundary; Hand Dug Trial Pit; Window Samples
PROJECT: Lumb Lane, Hunddersfield, HD4 6SZ	Notes:	
PROJECT NUMBER: G26097	SCALE: NTS; DRAWN: JB DATE: 26/03/26; CHECK: LR DATE: 26/03/26; REV: 0 DATE: 20/02/26	GeoInvestigate Ltd, Terry Dicken Indsutrial Estate, Ellerback Way, Stokesley, TS9 7AE

GEO INVESTIGATE
Borehole Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

BH 1
Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
	MADE GROUND Compact brown clayey sandy gravel. Gravel is fine to coarse of sandstone and brick. Cobbles noted.	300			O	Cv kN/m2			0.25
0.30									
0.40	MADE GROUND Loose dark brown slightly gravelly clayey sand. Gravel is fine to coarse of sandstone. Possible old buried topsoil.	100			O				0.50
	Medium dense orangish brown mottled grey in places slightly clayey in places gravelly SAND. Gravel is fine to coarse of sandstone.	1300			S-O		1.00m - 1.45m 4/4/5/6/7/12 N=30		0.75 1.00 1.25
1.70					O				1.50
1.90	Extremely weak light grey SANDSTONE.	200			S-O		1.90m - 2.05m 41/45 N=86/150mm		1.75 1.90
	Borehole terminated at 1.90m due to refusal								
					O				5.00

Remarks:
Casing to 1.00m
Dynamic windowless sampling by Terrier Rig to 1.90 mbgl
Borehole remained dry on completion

Key:
Slotted Pipe
Plain Pipe
Bentonite
Gravel Filter

O Disturbed sample
Cv Shear vane
W Water sample
S Standard Penetration Test
C Cone Penetration Test

BH 1

GEO INVESTIGATE
Borehole Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

BH 2
Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.15	MADE GROUND Compact brown clayey sandy gravel. Gravel is fine to coarse of sandstone and brick. Cobbles noted.	150			O	Cv kN/m2			0.25
0.60	Stiff dark grey and brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone.	450			Cv-O	96			0.50
1.10	Dense brown clayey sandy GRAVEL. Gravel is fine to coarse of sandstone.	500			S-O		1.00m - 1.45m 8/12/14/28/30/36 N=>50		0.75 1.00
1.20	Extremely weak light grey SANDSTONE.	100			O				1.20
	Borehole terminated at 1.20m due to refusal								

Remarks:
Casing to 1.00m
Dynamic windowless sampling by Terrier Rig to 1.20 mbgl
Borehole remained dry on completion

Key:
Slotted Pipe
Plain Pipe
Bentonite
Gravel Filter

O Disturbed sample
Cv Shear vane
S Standard Penetration Test
C Cone Penetration Test

BH 2

GEO INVESTIGATE

Borehole Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

BH 3

Sheet No 1 of 1

Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
	TURF / TOPSOIL Firm dark brown very sandy gravelly clay. Gravel is fine to coarse of sandstone and occasional coal.	300			O	Cv kN/m2			0.25
0.30	Stiff orangish brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone.	300			Cv-O	92			0.50
0.60	Dense light brown clayey sandy GRAVEL. Gravel is fine to coarse of sandstone.	200					0.90m - 1.05m		0.75
0.80	Extremely weak light grey SANDSTONE.	100			S-O		36/41		0.90
0.90	Borehole terminated at 0.90m due to refusal						N=78/150mm		

Remarks:
Casing to 0.90m
Dynamic windowless sampling by Terrier Rig to 0.90 mbgl
Borehole remained dry on completion

Key:
Slotted Pipe
Plain Pipe
Bentonite
Gravel Filter

O Disturbed sample
Cv Shear vane
W Water sample
S Standard Penetration Test
C Cone Penetration Test

BH 3

GEO INVESTIGATE

Borehole Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

BH 4

Sheet No 1 of 1

Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
0.15	MADE GROUND Loose brown gravelly sand. Gravel is fine to coarse of sandstone, brick pea gravel and occasional pot.	150			O	Cv kN/m2			0.25
1.10	Stiff orangish brown mottled grey sandy gravelly CLAY. Gravel is fine to coarse of sandstone.	950			Cv-O Cv-O	90 94			0.50 0.75 1.00
1.80	Dense orangish brown slightly clayey gravelly SAND. Gravel is fine to coarse of sandstone.	700			O		1.90m - 2.35m		1.25 1.50 1.75
1.90	Extremely weak light grey SANDSTONE.	100			O		14/10/16/19/24/30		1.90
	Borehole terminated at 1.90m due to refusal						N=>50		

Remarks:
Casing to 1.00m
Dynamic windowless sampling by Terrier Rig to 1.90 mbgl
Borehole remained dry on completion

Key:

- Slotted Pipe
- Plain Pipe
- Bentonite
- Gravel Filter

O Disturbed sample
Cv Shear vane
W Water sample
S Standard Penetration Test
C Cone Penetration Test

BH 4

GEO INVESTIGATE

Borehole Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

BH 5

Sheet No 1 of 1

Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Gas Well	Sample	Test Type Result	SPT N Value (Depth)	Depth to Water	Depth (m)
						Cv kN/m2			
0.20	MADE GROUND Loose brown gravelly sand. Gravel is fine to coarse of sandstone, brick and occasional pot.	200			O				0.25
0.70	Stiff orangish brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone.	500			Cv-O	94			0.50
									0.75
1.30	Dense orangish brown slightly clayey gravelly SAND. Gravel is fine to coarse of sandstone.	600			S-O		1.00m - 1.45m 5/6/6/10/11/14 N=41		1.00
									1.25
1.50	Extremely weak light grey SANDSTONE.	200			O		1.50m - 1.65m 29/35 N=64/150mm		1.50
	Borehole terminated at 1.50m due to refusal								

Remarks:
Casing to 1.00m
Dynamic windowless sampling by Terrier Rig to 1.50 mbgl
Borehole remained dry on completion

Key:

- Slotted Pipe
- Plain Pipe
- Bentonite
- Gravel Filter

O Disturbed sample
Cv Shear vane
W Water sample
S Standard Penetration Test
C Cone Penetration Test

BH 5

GEO INVESTIGATE

Trial Pit Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

TP-A

Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick-ness	Legend	Sample	Test Type Result	Depth to Water	Depth (m)
	MADE GROUND: Light brown sandy gravel Gravel is fine to coarse of sandstone. Cobb and/or boulders of sandstone noted.	300		O	Cv kN/m^2		0.10 0.20 0.30
0.30	Stiff light orangish brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone	300		O			0.40 0.50 0.60
0.60	Trial pit terminated at 0.60m.						

Remarks:
Trial Pit excavated to a maximum depth of 0.60 mbgl
Trial Pit remained dry on completion

Key:
O Disturbed sample
Cv Shear vane
W Water sample

TP-A

GEO INVESTIGATE

Trial Pit Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

TP -B

Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Sample	Test Type Result	Depth to Water	Depth (m)
	MADE GROUND: Dark brown gravelly sand Gravel is fine to coarse of sandstone and brick. (Topsoil).	200			Cv kN/m^2		0.10
0.20				O			0.20
	Stiff light orangish brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone	300					0.30
							0.40
0.50				O			0.50
	Trial pit terminated at 0.50m.						

Remarks:
Trial Pit excavated to a maximum depth of 0.50 mbgl
Trial Pit remained dry on completion

Key:
O Disturbed sample
Cv Shear vane
W Water sample

TP -B

GEO INVESTIGATE

Trial Pit Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

TP -C

Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Sample	Test Type Result	Depth to Water	Depth (m)
	MADE GROUND: Light brown sandy gravel Gravel is fine to coarse of sandstone. Cobb and/or boulders of sandstone and brick no	300		O	Cv kN/m^2		0.10 0.20 0.30
0.30	Stiff light orangish brown sandy gravelly CLAY. Gravel is fine to coarse of sandstone	300		O			0.40 0.50 0.60
0.60	Trial pit terminated at 0.60m.						

Remarks:
Trial Pit excavated to a maximum depth of 0.60 mbgl
Trial Pit remained dry on completion

Key:
O Disturbed sample
Cv Shear vane
W Water sample

TP -C

GEO INVESTIGATE

Trial Pit Log

Client Ref:
Our Ref: G26097
Date: 19/03/2026
Location: Lumb Lane, Huddersfield HD4 6SZ
Comments:

TP -D

Sheet No 1 of 1
Drilled by: CD
Logged by: AM

Depth (m)	Description of Strata	Thick -ness	Legend	Sample	Test Type Result	Depth to Water	Depth (m)
	MADE GROUND: Light brown sandy gravel				Cv kN/m^2		
	Gravel is fine to coarse of sandstone. Cobb	200					0.10
0.20	and/or boulders of sandstone and brick no			O			0.20
	Stiff light orangish brown sandy gravelly						
	CLAY. Gravel is fine to coarse of sandstone	300					0.30
							0.40
0.50				O			0.50
	Trial pit terminated at 0.50m.						

Remarks:
Trial Pit excavated to a maximum depth of 0.50 mbgl
Trial Pit remained dry on completion

Key:
O Disturbed sample
Cv Shear vane
W Water sample

TP -D

APPENDIX 2

Geotechnical Testing

Geotechnical Test Results

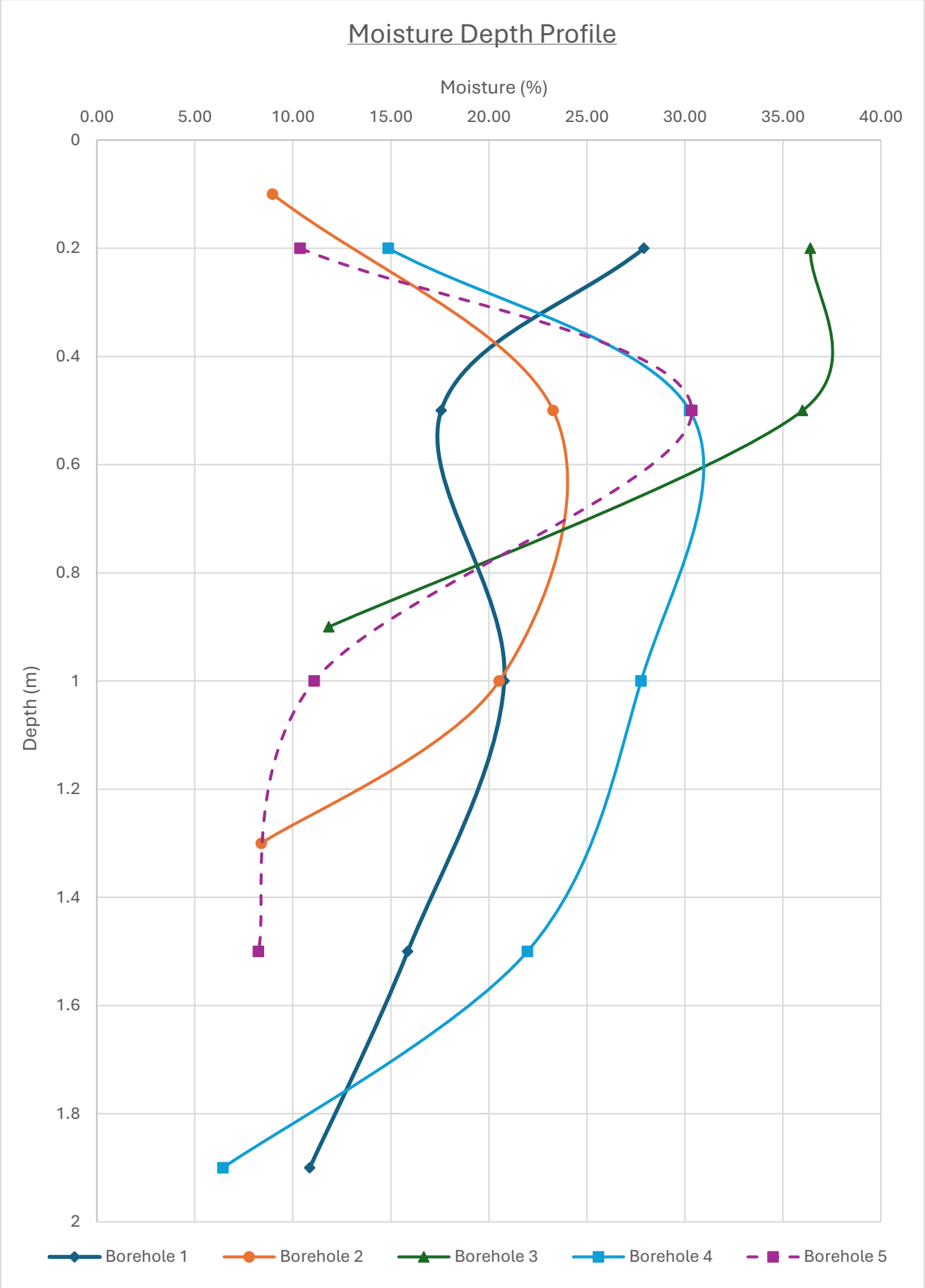
Our Ref: G26097
Your Ref:
Location: Lumb Lane, Huddersfield HD4 6SZ

TP / BH No.	Sample Depth (m)	Insitu Moisture Content (%)	% Passing BS 425 Micron Sieve	Corrected Moisture Content (%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Classification BS5930 [1999]
1	0.20	27.9						
	0.50	17.6						
	1.00	20.8						
	1.50	15.9						
	1.90	10.9						
2	0.10	9.0						
	0.50	23.3	91.2	25.6	29.5	51.1	21.6	CH
	1.00	20.5						
	1.30	8.4						
3	0.20	36.4						
	0.50	36.0	91.9	39.2	33.4	59.5	26.1	CH
	0.90	11.8						

Geotechnical Test Results

Our Ref: G26097
Your Ref:
Location: Lumb Lane, Huddersfield HD4 6SZ

TP / BH No.	Sample Depth (m)	Insitu Moisture Content (%)	% Passing BS 425 Micron Sieve	Corrected Moisture Content (%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Classification BS5930 [1999]
4	0.20	14.9						
	0.50	30.2						
	1.00	27.8	91.7	30.3	31.7	55.0	23.3	CH
	1.50	22.0						
	1.90	6.4						
5	0.20	10.4						
	0.50	30.4	95.4	31.9	33.5	58.1	24.6	CH
	1.00	11.1						
	1.50	8.2						


Moisture Depth Profile
Moisture (%)
0.00
5.00
10.00
15.00
20.00
25.00
30.00
35.00
40.00
Depth (m)
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
Borehole 1
Borehole 2
Borehole 3
Borehole 4
Borehole 5

APPENDIX 3

Chemtech Analytical Test Report

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: cs@etuki.eurofins.com

Final Report

Report No.:	26-09094-1
Initial Date of Issue:	13-Apr-2026
Re-Issue Details:	
Client	*Geo Investigate Ltd*
Client Address:	*Units 4 & 5 Terry Dicken Industrial* *Ellerbeck Way* *Stokesley* *North Yorkshire* *TS9 7AE*
Contact(s):	*Enquiries* *Laura Robbins*
Project	*Lumb Lane, Almondbury*
Quotation No.:	*Q25-37991*
Date Received:	24-Mar-2026
Order No.:	G26097
Date Instructed:	24-Mar-2026
No. of Samples:	*5*
Turnaround (Wkdays):	10
Results Due:	08-Apr-2026
Date Approved:	13-Apr-2026
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 - Leachate

Project: Lumb Lane, Almondbury

Client: Geo Investigate Ltd				**Chemtest Job No.:**		26-09094	26-09094
Quotation No.: Q25-37991				**Chemtest Sample ID.:**		2100654	2100658
Order No.: G26097				*Client Sample Ref.:*		*BH1*	*TPD*
				Client Reference:		*BH1*	*TPD*
				Sample Type:		*SOIL*	*SOIL*
				Top Depth (m):		*0.20*	*0.20*
				Date Sampled:		*19-Mar-2026*	*19-Mar-2026*
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
pH at 20C	U	1010	10:1		4.0	8.0	7.0
Sulphur	N	1220	10:1	mg/l	1.0	< 1.0	7.7
Sulphate	U	1220	10:1	mg/l	1.0	< 1.0	23
Cyanide (Total)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Cyanide (Free)	U	1300	10:1	mg/l	0.050	< 0.050	< 0.050
Thiocyanate	U	1300	10:1	mg/l	0.50	< 0.50	< 0.50
Sulphide	N	1325	10:1	mg/l	0.050	< 0.050	< 0.050
Arsenic (Dissolved)	U	1455	10:1	µg/l	0.20	0.43	4.4
Boron (Dissolved)	U	1455	10:1	µg/l	10.0	< 10	19
Cadmium (Dissolved)	U	1455	10:1	µg/l	0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	10:1	µg/l	0.50	0.60	< 0.50
Copper (Dissolved)	U	1455	10:1	µg/l	0.50	1.6	5.3
Mercury (Dissolved)	U	1455	10:1	µg/l	0.05	< 0.05	< 0.05
Nickel (Dissolved)	U	1455	10:1	µg/l	0.50	0.77	1.6
Lead (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	10:1	µg/l	0.50	< 0.50	< 0.50
Zinc (Dissolved)	U	1455	10:1	µg/l	2.5	< 2.5	13
Naphthalene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Acenaphthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluorene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Phenanthrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Chrysene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	1800	10:1	µg/l	0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	1800	10:1	µg/l	2.0	< 2.0	< 2.0
Total Phenols	U	1920	10:1	mg/l	0.030	< 0.030	< 0.030

Results - Soil

Project: Lumb Lane, Almondbury

Client: Geo Investigate Ltd				**Chemtest Job No.:**		26-09094	26-09094	26-09094	26-09094	26-09094
Quotation No.: Q25-37991				**Chemtest Sample ID.:**		2100654	2100655	2100656	2100657	2100658
Order No.: G26097				*Client Sample Ref.:*		*BH1*	*BH3*	*TPB*	*TPC*	*TPD*
				Client Reference:		*BH1*	*BH3*	*TPB*	*TPC*	*TPD*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.20*	*0.20*	*0.20*	*0.20*	*0.20*
				Date Sampled:		*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type		N	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	12	24	16	10	8.6
Soil Colour		N	2030		N/A	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Stones	Stones and Roots
Soil Texture		N	2030		N/A	Loam	Clay	Loam	Loam	Loam
pH at 20C		M	2010		4.0	8.6	7.7	6.7	7.0	7.4
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	< 0.40	< 0.40	0.88	0.60	0.91
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	0.043	0.017	0.22	0.42	0.20
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Thiocyanate		M	2300	mg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Sulphide (Easily Liberatable)		N	2325	mg/kg	0.50	18	67	4.6	4.7	5.0
Arsenic		M	2455	mg/kg	0.5	4.0	20	26	9.0	6.8
Cadmium		M	2455	mg/kg	0.10	0.12	0.17	0.17	0.11	< 0.10
Chromium		M	2455	mg/kg	0.5	20	28	33	18	15
Copper		M	2455	mg/kg	0.50	16	35	48	20	18
Mercury		M	2455	mg/kg	0.05	< 0.05	0.17	0.31	< 0.05	< 0.05
Nickel		M	2455	mg/kg	0.50	17	25	30	14	13
Lead		M	2455	mg/kg	0.50	19	66	70	15	15
Selenium		M	2455	mg/kg	0.25	0.35	0.79	0.99	0.32	< 0.25
Zinc		M	2455	mg/kg	0.50	66	110	120	51	98
Chromium (Trivalent)		N	2490	mg/kg	1.0	20	28	33	18	15
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic EPH >C10-C12	EH_2D_AL_#1	M	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	EH_2D_AL_#1	M	5002	mg/kg	2.00	11	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C16-C21	EH_2D_AL_#1	M	5002	mg/kg	2.00	47	6.8	< 2.0	< 2.0	2.3

Results - Soil

Project: Lumb Lane, Almondbury

Client: Geo Investigate Ltd				**Chemtest Job No.:**		26-09094	26-09094	26-09094	26-09094	26-09094
Quotation No.: Q25-37991				**Chemtest Sample ID.:**		2100654	2100655	2100656	2100657	2100658
Order No.: G26097				*Client Sample Ref.:*		*BH1*	*BH3*	*TPB*	*TPC*	*TPD*
				Client Reference:		*BH1*	*BH3*	*TPB*	*TPC*	*TPD*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.20*	*0.20*	*0.20*	*0.20*	*0.20*
				Date Sampled:		*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*	*19-Mar-2026*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Aliphatic EPH >C21-C35	EH_2D_AL_#1	M	5002	mg/kg	3.00	97	17	3.2	3.7	12
Aliphatic EPH >C35-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10
Aliphatic EPH >C40-C44	EH_2D_AL_#1	N	5002	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Aliphatic EPH >C10-C35	EH_2D_AL_#1	M	5002	mg/kg	7.00	160	24	< 7.0	< 7.0	14
Total Aliphatic EPH >C10-C40	EH_2D_AL_#1	N	5002	mg/kg	10.00	160	25	< 10	< 10	15
Aromatic EPH >C10-C12	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C12-C16	EH_2D_AR_#1	U	5002	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C16-C21	EH_2D_AR_#1	U	5002	mg/kg	2.00	7.8	4.7	6.9	< 2.0	< 2.0
Aromatic EPH >C21-C35	EH_2D_AR_#1	U	5002	mg/kg	2.00	25	54	16	2.3	8.0
Aromatic EPH >C35-C40	EH_2D_AR_#1	N	5002	mg/kg	1.00	17	8.9	4.3	3.5	14
Aromatic EPH >C40-C44	EH_2D_AR_#1	N	5002	mg/kg	1.00	2.3	< 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	EH_2D_AR_#1	U	5002	mg/kg	4.00	34	59	23	4.1	9.3
Total Aromatic EPH >C10-C40	EH_2D_AR_#1	N	5002	mg/kg	10.00	51	68	27	< 10	23
Total EPH >C10-C35	EH_2D_Total_#1	U	5002	mg/kg	10.00	190	82	26	< 10	23
Total EPH >C10-C40	EH_2D_Total_#1	N	5002	mg/kg	10.00	210	93	31	12	38
Organic Matter		M	2625	%	0.40	1.6	5.8	12	2.8	3.0
Naphthalene		M	5003	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene		M	5003	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene		M	5003	mg/kg	0.05	0.07	< 0.05	0.07	< 0.05	< 0.05
Fluorene		M	5003	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene		M	5003	mg/kg	0.05	0.25	0.29	0.64	< 0.05	0.10
Anthracene		M	5003	mg/kg	0.05	0.10	0.09	0.20	< 0.05	< 0.05
Fluoranthene		M	5003	mg/kg	0.05	0.80	0.56	1.4	< 0.05	0.19
Pyrene		M	5003	mg/kg	0.05	0.78	0.48	1.3	< 0.05	0.16
Benzo[a]anthracene		M	5003	mg/kg	0.05	0.33	0.21	0.58	< 0.05	0.07
Chrysene		M	5003	mg/kg	0.05	0.29	0.26	0.65	< 0.05	0.09
Benzo[b]fluoranthene		M	5003	mg/kg	0.05	0.48	0.31	0.68	< 0.05	0.11
Benzo(k)Fluoranthene		M	5003	mg/kg	0.05	0.23	0.13	0.27	< 0.05	< 0.05
Benzo[a]pyrene		M	5003	mg/kg	0.05	0.35	0.22	0.51	< 0.05	0.08
Indeno(1,2,3-c,d)Pyrene		M	5003	mg/kg	0.05	0.29	0.18	0.39	< 0.05	0.07
Dibenz(a,h)Anthracene		M	5003	mg/kg	0.05	0.07	< 0.05	0.07	< 0.05	< 0.05
Benzo[g,h,i]perylene		M	5003	mg/kg	0.05	0.23	0.13	0.27	< 0.05	< 0.05
Total Of 16 PAH's		M	5003	mg/kg	0.05	4.3	2.9	7.0	< 0.05	0.85
Total Phenols		M	2920	mg/kg	0.10	0.46	< 0.10	< 0.10	< 0.10	< 0.10

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
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine.	PL LE 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
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection	PL GW SW
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
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.	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos Quantification in Soils Sediments Ballast & Aggregate Crushed Concrete & Demolition Rubble	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline 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.	
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-diphenylcarbazide.	
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
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.	
5002	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Hexane extraction / GCxGC FID detection	
5003	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Hexane / Acetone extraction GC-MS	
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge	

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
Text example	All items indicated in italic font represent customer-supplied information that may not be independently verified by 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 ≤ 30°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.

Where analysis is performed on a dried and crushed sample, it has been prepared by crushing all of the sample. If material has been removed prior to crushing, or by request of the client, this will be stated on the report.

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.

Report Information

Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water (Non-Regulatory)
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:
cs@etuki.eurofins.com