

PHASE II GEO-ENVIRONMENTAL ASSESSMENT REPORT

The Homestead, Hurst Knowle, Rev B

March 2022



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Proposed Site at The Homestead Hurst Knowle Huddersfield

Phase II Geo-Environmental Assessment Report

This report was produced by HSP Consulting Engineers Ltd for Frank Shaw Associates Ltd on behalf of Kirklees Council as the Phase II Geo-environmental Assessment Report for the proposed redevelopment of The Homestead, Hurst Knowle, Huddersfield to identify possible areas of contamination and provide an assessment of potential ground related development constraints.

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Issue & Revision History

Revision	Status	Originated	Checked	Approved	Date
-	INTERIM	K. Murray BSc (Hons), MSc FGS, ProfGradIMMM	J. P. Bridgman BSc (Hons), CGeol, FGS	H.Pratt B.Eng (Hons), C.Eng, F.Cons.E, M.I.C.E., MI Mgt.	05.11.2020
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B	FINAL	K. Murray BSc (Hons), MSc FGS, ProfGradIMMM	J. P. Bridgman BSc (Hons), CGeol, FGS	H.Pratt B.Eng (Hons), C.Eng, F.Cons.E, M.I.C.E., MI Mgt.	10.03.2022
Project Number: C3257				Document Reference: C3257/PII	

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Executive Summary

HSP Consulting has been commissioned by Frank Shaw Associates Ltd on behalf of Kirklees Council to provide a Phase II Geo-environmental Assessment report providing information on likely constraints to the development of the site, parameters for design and recommendations for any mitigation measures should they be required.

The site is called 'The Homestead' located on land off Hurst Knowle Road approximately 2km south east of Huddersfield town centre. The proposals for the site are to replace the existing building with a 25 place facility for Dementia day care. There will be no change of use to the site.

Some Made Ground materials were anticipated across the site area based on the current site profile and use. The site is shown on the BGS mapping to be devoid of superficial deposits and underlain by the bedrock of the Pennine Lower Coal Measures Group which is designated as a Secondary A Aquifer.

The ground investigation has proved Made Ground materials in all exploratory holes to a maximum depth of 2.4m bgl in the south of the site and to shallower depths of 0.5m bgl in the north of the site. Underlying the Made Ground, very stiff slightly sandy clay (weathered bedrock) was encountered in the eastern and southern section of the site and proved to depths of 0.9m and 2.6m bgl. Extremely weak brown and grey mottled mudstone or yellowish brown sandstone was encountered below any Made Ground materials or clay deposits and proved to 3.18m bgl in WS7.

No groundwater strikes were recorded during drilling. Groundwater monitoring results indicate groundwater levels range from 0.43m and 2.77m bgl within the natural deposits and are likely to be perched water.

No development layout plans have been provided at this stage. It is unlikely that the Made Ground materials are suitable as a founding horizon due to the variation in strength and composition. Traditional strip or pad foundations could be utilised within the underlying natural deposits of the Pennine Lower Coal Measures within the mudstone/sandstone rock to a net allowable bearing pressure of 200kN/m² to limit total settlements to less than 25mm. Alternatively, the stiff to very stiff clays of the weathered Pennine Coal Measures could be utilised in the northern section of the site to a reduced allowable bearing pressure of 150kN/m² to limit total settlements to less than 25mm.

The concentrations of potential contaminants recorded at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the development. Proposed soft landscaping is likely to require topsoil import as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect.

Results of sulphate testing in accordance with BRE Special Digest 1 indicate a Design Sulphate Class for the site of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1.



Based on the chemical analysis report it is considered that specialist materials are unlikely to be required for water supply pipes. However, confirmation of water supply pipes should be sought from utility providers.

Ground gas concentrations have been monitored on six occasions over a twelve week period from the 19th September to the 1st December 2020. Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 2 due to carbon dioxide concentrations greater than 5% and methane concentrations greater than 1%. Based on a classification of CS2, ground gas protection measures are required for the proposed redevelopment.

The executive summary contains an overview of key findings and conclusions. However, no reliance should be placed on the executive summary until the whole of the report has been read. Other sections of the report may contain information which puts into context the findings noted within the executive summary.

1. Introduction

1.1 Background

Frank Shaw Associates are assessing the feasibility of a new dementia day care facility on the site. It is understood proposals are to replace the existing building with a 25 place facility for Dementia day care. There will be no change of use to the site.

1.2 Client Brief & Scope

HSP Consulting has been commissioned by Frank Shaw Associates Limited to undertake an intrusive ground investigation at the site to investigate the existing ground conditions and provide information on likely constraints to the redevelopment, parameters for design and recommendations for any mitigation measures.

The report presents the following information:

- details of the ground investigation undertaken and the ground conditions encountered,
- details and results of the geotechnical testing and contamination analysis,
- recommendations for mitigating constraints to the proposed development where appropriate and providing parameters for foundation design.

Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites.

1.3 Report Objectives

The objectives of this report are to:

- establish the geological and hydrogeological conditions using existing available/published information;
- summarise available information and identify site specific geotechnical and environmental hazards which may place a constraint upon the proposed site use;
- produce an updated Conceptual Site Model identifying potential pollution linkages between sources of contamination, pathways and receptors.

1.4 Limitations

The recommendations made in this report are based on the findings of the intrusive ground investigation undertaken by HSP Consulting Ltd on the 2nd September 2020.

2. Review of Existing Information & Geoenvironmental Setting

2.1 Previous Reports

HSP Consulting Ltd has previously produced a Phase I Desk Study report for the site:

- C3257/PI – The Homestead, Hurst Knowle, Huddersfield - Phase I Geo-Environmental Desk Study Report, September 2020. (Ref. 1)

2.2 The Site

2.2.1 Location

The site is located off Hurst Knowle road, approximately 2km east of Huddersfield town centre. The approximate National Grid Reference for the centre of the site is (NGR) 417229, 415786. A Site Location Plan is included in Appendix I.

2.2.2 Description

The site is broadly rectangular in shape and is approximately 0.63Ha in area. Access is gained off Hurst Knowle Road to the east.

The site is currently used as a day care centre for Dementia care and comprises one large building 'The Homestead' located centrally surrounded by communal gardens and two small parking areas. The building occupies approximately $\frac{1}{4}$ of the site area and is a traditional 2 storey brick building with tiled roof. The two small car parks are located adjacent to the north and south of the building. Both are accessed from Hurst Knowle Road via separate driveways. The driveways and car parks are laid to tarmac which were noted to be in good condition with some patched areas noted on the driveway to the southern carpark. Paving slabs are located around the perimeter of the building providing pathways and patio areas and plastic and metal waste bins are located to the north of the building.

The majority of the remaining site area is occupied by communal landscaping and comprises an extensive grassed area in the south of the site behind a row of mature trees. A further raised grassed area is located in the northeast corner of the site which slopes down to the northern car park. Several bushes and shrubs are located adjacent to the southern carpark.

No sign of staining was noted around the site.

The northern and western site boundaries of the site are marked by a 0.3m barrier. The southern boundary is marked by a 1.3m high hedge or 0.5m fence/stone wall. A brick wall defines the eastern site boundary. A 3m hedge is noted along the northern and part of the western site boundary.

A topographical survey of the site shows levels fall from the west to the east varying from 115.42m AOD to 111.94m AOD a fall of approximately 3.5m. Some reprofiling of the site has taken place to provide a level platform for the existing building. A raised grass area is located

in the northwest corner with levels around 116m AOD falling to 113.65m AOD within the carpark located at the bottom of the slope.

2.2.3 Surrounding Land Use

The main features of interest identified are:

North: Residential housing and gardens
East: Hurst Knowle Road with Fernside Park beyond
South: Residential housing and gardens
West: Residential housing and gardens

2.2.4 Proposed End Use

Kirklees Council propose to replace the existing building on site to provide a 25 place facility for Dementia day care. At the time of writing this report no plans have been made available. It is assumed there will be no change of use to the site.

2.3 Geology

2.3.1 Made Ground

The BGS mapping does not indicate any Made Ground/Artificial Ground on site. However, the site appears to have been reprofiled and therefore some Made Ground may be encountered.

2.3.2 Superficial Deposits

The BGS superficial mapping indicates no superficial deposits beneath the site.

2.3.3 Bedrock Geology

BGS bedrock mapping indicates the site is underlain by mudstones, siltstone and sandstone of the Pennine Lower Coal Measures Group of the Westphalian age. The eastern half of the site is shown to be underlain by the Pennine Lower Coal Measures Formation described by the BGS as *'interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part and more numerous and thicker coal seams in the upper part'*, and the western half of the site is shown to be underlain by the Greenmoor Rock described as *'fine-grained thinly bedded, ripple cross laminated sandstone.'*

2.4 Pertinent Site Sensitivity Information

Based on the information collated for the desk study, the geo-environmental setting of the site is summarised as follows:

- The site was undeveloped, being shown as fields with a stream (southern section) on historical mapping until 1957 where the site became a vacant parcel of land. A possible stream shown on earlier mapping is no longer shown. By this time residential development had taken place within the immediate surrounding area to the north, south and west. Sometime between 1961 and 1968 the site was developed where it was occupied by The Homestead. The current layout has not changed since this time with a building occupying the central section of site with communal gardens surrounding to

the north and south. Some reprofiling of the ground in the north western corner of the site was shown on the 1968 historical map.

- Historically the surrounding land use has been residential.
- Made Ground is not indicated within the site boundary on the published geological mapping. However, given the site is occupied by a building some Made Ground is likely to be encountered.
- It is unlikely any coal mining related features will impact the stability of the site.
- No superficial deposits are expected on site. The site is underlain by bedrock geology of mudstone, siltstone and sandstone of the Pennine Lower Coal Measures Group comprising the Greenmoor Rock in the west and the Pennine Lower Coal Measures Formation in the east.
- The Pennine Lower Coal Measures Group bedrock geology is designated as a Secondary A Aquifer with soils classified as high vulnerability. The site is not located within a Source Protection Zone and there are no groundwater abstraction licences within 500m of the site.
- The site is at low to high risk of surface water flooding in the southern section only. There is negligible risk to the site from groundwater flooding.
- No Historical or Active Landfill Sites or Licensed Waste Management Facilities have been recorded within a 1000m radius of the site.

Based on the above, the environmental sensitivity of the site can be considered to be Low at this stage.

3. Fieldwork & Factual Information

Site work was carried out on the 2nd September 2020. Where applicable, the fieldwork was undertaken in accordance with BS5930:2015 Code of Practice for Site Investigations (Ref. 5) and BS10175:2011+A1:2013 Investigation of Potentially Contaminated Sites (Ref. 7).

The exploratory holes were positioned to provide general coverage across the site area, to provide information for foundation design and obtain representative soil samples for geotechnical and geo-environmental analysis.

3.1 Exploratory Methods

The exploratory methods are detailed in the table below.

Table 1 – Exploratory Hole Methods

Type	Quantity	Maximum Depth (m)	Details
Windowless Sampling Borehole	2	2.05 - 3.18	WS1, WS2 and WS4
	4	0.56 - 1.28	WS3, WS5 – WS7
Mexecone Probe	2	0.45	MP1 to MP2

The exploratory holes were logged and sampled by an Engineer from HSP Consulting Ltd and the logs are presented in Appendix II. The exploratory hole locations are shown on the Site Investigation Layout Plan presented in Appendix III.

Fragmentary bulk disturbed, and undisturbed samples were recovered from materials revealed within all the exploratory holes. Geo-environmental samples, placed in plastic tubs and glass jars supplied by the laboratory, were also obtained specifically for chemical analysis. The samples were taken to UKAS accredited laboratories for further examination and testing.

3.2 In-situ Testing

3.2.1 Standard Penetration Tests

Standard Penetration Tests (SPTs) were carried out at 1.00m intervals and at the base in the windowless sample boreholes. The SPTs were undertaken in accordance with BS 1377:1990 and the results are included on the appended borehole logs (Appendix II).

3.3 Laboratory Testing

The laboratory testing schedules were prepared by HSP Consulting Ltd.

3.3.1 Geotechnical Testing

Geotechnical testing has been scheduled to be undertaken by a UKAS accredited laboratory as part of the works at the site:

- Plasticity indexes
- Natural moisture content

The laboratory testing was carried out by Professional Soils Laboratory Ltd (UKAS accredited, laboratory No.4043) in accordance with BS1377:1990 using calibrated equipment specifically for the British Standard.

3.3.2 Chemical Analysis

The geo-environmental samples retained specifically for chemical analysis were stored in cooled containers until delivery to the laboratory by courier.

Chemical analysis was scheduled on eleven soil samples for the presence of a selected suite of potential contaminants as outlined in the tables below:

Table 2 – Scheduled chemical analyses on soils

Exploratory Hole Location & Depth (m)	Sample Description
WS1 - 0.60	MADE GROUND ¹
WS2 - 0.35	MADE GROUND ¹
WS3 - 0.25	MADE GROUND ^{1,3}
WS4 - 0.1	MADE GROUND ^{1,3}
WS7 - 0.4	MADE GROUND ^{1,4}
WS5 - 0.25	SANDSTONE ³
WS6 – 0.2	MADE GROUND ³
WS7 – 0.45	MADE GROUND ²
WS2 – 0.8	MADE GROUND ²
WS4 – 0.45	CLAY ²
WS6 – 0.5	CLAY ²

¹ HSP Standard Suite, ² BRE Short Suite, ³ Asbestos Screen, ⁴ Organic Matter

Metals	Cadmium	Chromium (III & VI)	Copper
	Lead	Mercury	Nickel
	Zinc		
Semi Metals and Non-metals	Arsenic	Boron	Selenium
Others	pH		
Inorganic Chemicals	Cyanide	Sulphate	Sulphide
Organic Chemicals	PAH (US EPA 16)	TPH (CWG)	Phenol

The contamination analysis was carried out by Chemtest Ltd (UKAS accredited, laboratory No. 2183) during the period 8th and 14th September 2020. The results are presented in Appendix IV.

3.4 Ground Conditions

3.4.1 Published Geology

The published geology indicates the site is underlain by bedrock deposits of the Pennine Lower Coal Measures Group as described in section 2.3 above.

3.4.2 Ground Conditions on site or General Geology & Revealed Strata

The exploratory hole data confirms the published information. The strata generally comprises:

Table 3 – Encountered Ground Conditions

Strata		Depth Range (mbegl)	Maximum Thickness (m)	Description
Anthropogenic	MADE GROUND	G.L – 0.35	0.35	MADE GROUND – sandy gravelly clayey topsoil. Gravel is fine to coarse angular to subrounded mixed lithology, brick, occasional porcelain and concrete.
		0.25 – 1.85	1.50	MADE GROUND – sandy gravelly CLAY. Gravel is fine to medium angular to subrounded brick, concrete, porcelain
		0.60 – 0.75	0.15	MADE GROUND – sandy GRAVEL
		0.10 – 0.40	0.30	MADE GROUND – sandy gravel of concrete and tarmac.
Bedrock	WEATHERED PENNINE LOWER COAL MEASURES GROUP	0.35 – 2.60	1.50	Stiff greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular mudstone.
	PENNINE LOWER COAL MEASURES GROUP	0.45 - >3.18	>0.50	Extremely weak weathered MUDSTONE or SANDSTONE

3.5 Groundwater Levels

No groundwater was encountered in any of the boreholes during drilling.

Groundwater levels were recorded between 0.43m and 2.77m begl within the window sample borehole monitoring standpipes during the gas monitoring visit between the 19th September and 1st December 2020.

3.6 Ground Gas Monitoring

Sources of potential ground gas have been identified (Ref. 1) locally including Made Ground on site. Gas monitoring installations were constructed within three of the boreholes at the site (WS1, WS2, WS4). Each well has been constructed using 50mm diameter HDPE pipe. All of the borehole installations have a 6mm pea gravel surround to the slotted pipe with a bentonite seal above and a gas tap. The covers are cemented flush with ground level and are lockable stopcock covers.

HSP Consulting uses a GFM 430 Gas Analyser. Prior to its use a calibration check can be performed against gas readings in air. It is recommended that this check is undertaken once on each day the analyser is used.

The results of the ground gas monitoring undertaken are discussed in Section 5.5 below.

3.7 Visual and Olfactory Evidence of Contamination

There was no obvious visual or olfactory contamination noted during the ground investigation.

4. Geotechnical Assessment

4.1 Detailed Ground Model

For the purpose of this foundation assessment the information gained from the windowless sample boreholes has been utilised. The borehole logs are presented in Appendix II.

4.1.1 Made Ground

Made Ground materials were encountered in all exploratory locations and proved to a maximum depth of 2.4m bgl. In the north of the site the Made Ground materials were encountered to shallower depths of 0.5m bgl. The Made Ground materials varied in strength and composition across the site but in general the materials in the north of the site comprised dark brown sandy gravelly topsoil with gravel of brick, porcelain and concrete or asphalt concrete overlying yellowish sandy gravel subbase.

In the south of the site Made Ground materials generally comprised brown and grey slightly sandy gravelly clay with gravel of fine to medium angular to subrounded mixed lithology and coal fragments proved to a maximum depth of 2.4m bgl. Rootlets were encountered throughout from 1.7m to 2.0m bgl in WS1.

4.1.2 Pennine Lower Coal Measures Group

Bedrock deposits of the Pennine Lower Coal Measures Group were encountered below the Made Ground in all the exploratory locations. In boreholes WS1, WS2, WS4 and WS7 (eastern and southern section) the deposits comprised an upper weathered section of very stiff yellowish brown slightly sandy clay with gravel of fine to coarse sandstone or mudstone proved to depths of 0.9m and 2.6m bgl. The weathered section was absent in the remaining boreholes.

Extremely weak brown and grey mottled mudstone or yellowish brown sandstone was encountered below any Made Ground materials or clay deposits and proved to 3.18m bgl in WS7.

4.1.3 In-situ Testing and Assessment

A series of Standard Penetration Tests (SPT's) were undertaken within all the boreholes. Where tests have been within the Made Ground materials these have been omitted from the foundation assessment. The following table summarises the N values at depth across the site within the natural strata.

Table 4 – SPT N Values

Depth (m)	Range of 'N' Values	Description
1	N/A	MADE GROUND
1 - 2	19 - 20	CLAY (WEATHERED PENNINE LOWER COAL MEASURES)
0.45 - 3	50	MUDSTONE/SANDSTONE (PENNINE LOWER COAL MEASURES)

Four Plasticity Index tests have been undertaken to confirm the visual description and engineering behaviour of the soils. The results are included in Appendix V.

The results indicate compliance with the definition of soils of low to very high plasticity (CL - CV) for soils which plot above the A-Line after the classification system of BS5930: 2015. These soils are generally considered to be of Low to Medium Volume Change Potential in accordance with the National House Building Council (NHBC) Standards, Chapter 4.2: 2007.

Table 5 - Plasticity and Volume Change Potential

Sample Ref:	Laboratory Material Descriptions	LL (%)	PL (%)	PI (%)	% passing 425µm	Modified PI (%)*	Soil Class	MC (%)
WS1 1.3m	Gravelly sandy very silty CLAY	41	26	15	80	12	CI	22
WS2 1.6m	Very silty CLAY	71	34	37	100	37	CV	37
WS4 1.1m	Silty CLAY	38	21	17	98	17	CI	15
WS6 0.8m	Gravelly very sandy CLAY	34	19	15	60	9	CL	17

The results are included in Appendix V.

4.2 Earthworks

Significant earthworks operations are not expected at the site. Any Made Ground arisings generated on site may be suitable for use as non-structural fill (ie beneath suspended floor slab) subject to appropriate testing and assessment.

4.3 Excavations

Excavations to proposed formation level for new foundations and infrastructure should be feasible using standard excavation plant and equipment. Random and potentially severe falls should be anticipated in Made Ground materials from the faces of near vertically sided unsupported excavations carried out at the site. Where personnel are required to enter near vertically sided excavations, it is considered that full support should be provided to the full depth of all excavations. Please see Section 5.5 below for ground gas monitoring recommendations with regards depleted oxygen.

It is recommended that all support systems are continually assessed by fully trained or experienced personnel.

No groundwater strikes were recorded in any of the boreholes during their formation. Groundwater monitoring results indicate groundwater levels range from 0.43m and 2.77m bgl within the natural deposits and are likely to be perched water within the gravelly clay. It should be noted that groundwater levels may vary due to seasonal variations or other effects.

Groundwater issues may occur at shallow depths within the Made Ground materials and shallow natural deposits as slight inflows that would be best dealt with by traditional sump and pump dewatering.

4.4 Foundations

The proposals for the site are to replace the existing building with a 25 place facility for Dementia day care with some carparking and soft landscaping. No development layout plans have been provide at this stage.

All foundations will need to be taken down below any Made Ground as in its current state it is not considered a suitable founding stratum due to its variability in composition and state of compaction therefore implying unacceptable total and differential settlements likely to occur under loaded conditions.

Traditional strip or pad foundations could be utilised within the underlying natural deposits of the Pennine Lower Coal Measures within the mudstone/sandstone rock. It is recommended that foundations are placed at least 200mm into the sandstone/mudstone encountered at minimum depths of between 0.5m to 1.0m begl in the centre of the site and minimum depths of 1.5m to 2.6m begl in the north east corner and south of the site. A net allowable bearing pressure of 200kN/m² could be utilised for foundations placed 200mm into the mudstone/sandstone bedrock to limit total settlements to less than 25mm and to maintain differential settlements to acceptable limits.

Alternatively the stiff to very stiff clays of the weathered Pennine Lower Coal Measures could be utilised in the northern section of the site although a reduced allowable bearing pressure of 150kN/m² would be recommended at a minimum founding depth of 0.75m begl to limit total settlements to less than 25mm and to maintain differential settlement to acceptable limits.

Foundations should be suitably reinforced where they straddle a clay/rock boundary to minimise differential settlement. Locally foundations may need to be deepened/stepped should localised softer clay deposits be encountered, subject to the selected founding strata.

The table below shows the indicative allowable bearing pressure (ABP) that could be achieved using strip or pad foundations.

A number of the tests were advanced in Made Ground and therefore have been omitted from the assessment. An ABP has been calculated using an average of the SPT results in the natural soils excluding anomalies.

Table 6 – Allowable Bearing Capacity

Depth (m)	SPT (N ₁) ₆₀ Value	Eurocode 7 Soil Strength Description	Consistency (BS5930) Description	Approximate ABP (kN/m ²) – 0.60m wide strip footing	Approximate ABP (kN/m ²) – 2x2m pad footing
1.0 – 2.0	19-20	High	Stiff	150	150
2.6 – 3.0	50	Very High	Hard/Extremely Weak	200	200

4.5 Ground Floor Slab

In the central area of the site where Made Ground materials have been encountered at depths less than 600mm, a ground bearing floor slab could be utilised.

Where Made Ground materials are more than 600mm it is recommended that Made Ground is removed, re-laid and compacted in layers, if considered suitable, or replaced with granular fill or a suspended floor slab is recommended.

4.6 Concrete Classification

The results of sulphate and pH testing carried out on selected soil samples taken during this investigation have been compared with the recommendations outlined in BRE Special Digest 1, Part 1: 2005.

The guidelines given in BRE Special Digest 1 are based upon a site classification relating to its previous usage. It is considered appropriate to define this site as a 'brownfield site' location for the purposes of concrete classification.

On the basis of the above, it is considered appropriate to adopt a basic Design Sulphate Class for the Made Ground and underlying natural soils of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1.

4.7 Pavement Design

Two in-situ MEXE probe tests were conducted across the site. From this an indicative California Bearing Ratio (CBR) can be provided. The results can be found in Appendix VI.

Following guidance provided within 'Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 2' the CBR value chosen for design should be the minimum measured value, not the average.

The MEXE results were variable due to the near surface soils being Made Ground and therefore the maximum readings could be overstated due to gravels and cobbles, with the CBR values recorded ranging between 2% and 14%. The results of plasticity tests on the cohesive materials indicate a CBR Value of 4 - 5%. This should be confirmed by further testing once the development is at formation level.

4.8 Infiltration Drainage

No infiltration testing has been undertaken as part of this investigation. The intrusive works have confirmed stiff clay overlying mudstone/sandstone bedrock below any Made Ground.

Made Ground was encountered across the site at variable depths between 1.5m and 2.6m. Infiltration drainage would not be considered suitable within the Made Ground materials. Additionally, the natural fine deposits of the Pennine Lower Coal Measures Group observed on site are unlikely to be suitable for infiltration drainage.

5. Environmental Assessment

5.1 Introduction

The approach to the human health risk assessment reported here follows the principals given in the Land Contamination Risk Management (LCRM) Guidance <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm> i.e. application of the following assessment hierarchy:

- Tier 1 risk screening by establishment of potential pollutant linkages, i.e. the preliminary conceptual site model (PCSM), or
- Tier 2 generic quantitative assessment using generic assessment criteria (GACs) that represent 'acceptably low' risk, or
- Tier 3 quantitative risk assessment using site specific assessment criteria (SSACs) that represent 'unacceptable risk', or where generic assessment criteria are not available, or they are not applicable to the CSM.

The results of laboratory analysis have been screened against GACs including the Defra Category 4 Screening Levels (C4SL) and LQM and CIEH S4ULs for Human Health Risk Assessment (Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3180. All rights reserved). (Refs 13 and 12 respectively).

The standard exposure scenario of residential without plant uptake has been used to identify potential exposure pathways for human health receptors. Controlled water, flora and fauna and property receptors have also been included within the CSM. Once final development plans have been submitted a review of the data may be required to ensure the most relevant exposure scenario has been used.

It should be noted that organic contamination (PAH, TPH and BTEX) have been screened against the GAC for 1% Soil Organic Matter (SOM).

The assessment of PAHs is undertaken using the surrogate marker approach; recommended by Health Protection Agency (2010) guidance, providing the PAH profile is sufficiently similar to the coal tars tested by Culp et al (1998). Where PAH profile is not sufficiently coal tar like the TEF method is adopted using the LQM and CIEH S4ULs. Prior to assessment a PAH profile is generated for all samples analysed for PAH using the LQM PAH Profiling Tool v1.3, the graphical output is presented in Appendix IV.

5.2 Assessment of Soil Analysis Results

Five samples, as detailed in section 3.3.2, were scheduled for analysis from the development area. These provide a basis for characterising the soils to outline the potential impacts on human health and any environmental receptors from any contamination found.

The screening process for on-site human health receptors show that the GACs for a residential without plant uptake setting were not exceeded.

Four of the soil samples were submitted for an asbestos screen and identification. No asbestos has been identified.

The concentrations of potential contaminants recorded within the soils at the site indicates an acceptably low risk and therefore mitigation measures are not required as part of the development. In areas of any soft landscaping topsoil will need to be imported as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect. Any soils imported to site for landscaping purposes should be suitable for the intended use and accompanied by the appropriate analysis and assessment, which will depend on the source site.

Should any obvious evidence of unexpected contamination be encountered during the redevelopment works it should be reported to HSP so that an inspection can be made and appropriate sampling and assessment work be carried out.

Appropriate health and safety precautions should be adopted during any excavation works to avoid exposure to potentially contaminated soils and dust. Consideration should be given to the HSE document HSG 66 'Protection of workers and the General Public during Redevelopment of Contaminated Land'.

The approval of the local Environmental Health Officer should be sought with respect to the soil contamination assessment and mitigation proposals.

5.3 Water Supply

The environmental testing for the site has been compared to the following document in order to assess the most appropriate pipe material that should be used upon the site for mains water supply:

'Guidance for the selection of water supply pipes to be used in Brownfield sites – UK Water Industry Research – Ref: 10/WM/03/21.'

Based on the chemical analysis report it is considered that specialist materials are unlikely to be required for water supply pipes at the site due to the low levels of contaminants recorded. However, confirmation of supply pipes should be sought from utility providers.

5.4 Waste Classification

The results of the chemical testing have been assessed using web-based software for classifying hazardous waste, using HazWasteOnline™. The materials tested are likely to be classified as non-hazardous waste.

Please note the above classification provides an indication of how the material should be classified for removal off site; however, this should be used at your approved waste handler's discretion and further testing may be required prior to any offsite disposal.

The results are included in Appendix VIII.

5.5 Ground Gas Risk Assessment

Sources of potential ground gases have been identified in the desktop report and during the ground investigation in the form of Made Ground in excess of 1m on site. Ground gas concentrations have been monitored on six times over a twelve week period from the 19th September to the 1st December 2020 in order to obtain an indication of the ground gas regime at the site.

The results identified one elevated methane concentration in (WS2) during the 2nd visit. This result was atypical with previous and later events recording negligible concentrations in the same standpipe.

Carbon dioxide has been recorded at a maximum steady concentration of between 0.4% and 16.8% vol in air. Boreholes WS1 and WS2 recorded steady state oxygen concentrations ranging from 0.1% (depleted) to 20.6% during the six monitoring visits. Oxygen concentrations were recorded near atmospheric (20.6%) to slightly depleted (17.5%) in WS4. Carbon Monoxide was recorded at a peak concentration of 4ppm and Hydrogen Sulphide was recorded at a peak concentration of 2ppm. No positive gas flows have been recorded during the monitoring visits.

From the results above, the maximum steady state gas screening value for the site is 0.0168 l/hr.

The results have been assessed in line with the guidance provided in BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings (Ref 15) and CIRIA Document C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings' (Ref 16). Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document indicates the site falls in a Characteristic Situation 2.

Depleted oxygen levels were observed within a number of the boreholes during the monitoring. This poses a risk of asphyxiation to construction and maintenance workers in confined spaces such as excavations or manhole chambers. A confined spaces risk assessment should be carried out prior to working in any buried structures or excavations.

5.6 Updated Conceptual Site Model

Based on the findings of this site investigation and information freely available online, a conceptual site model has been produced and is presented in the table below.

Table 8 - Updated Conceptual Site Model.

Source	Pathway	Receptor	Consequence	Probability	Risk	Comments
On site S1: Historical and Contemporary land use: Made Ground associated with development and reprofiling of the site for the care unit	P1: Human uptake pathways	R1: End Users R2: Construction and maintenance workers	Mild	Low	Very Low	Concentrations of contaminants of concern are below the relevant GACs within the near surface deposits sampled across the site and therefore the risk is considered to be VERY LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. P3: Migration of contaminants along preferential pathways (man- made). P4: Surface runoff.	R3: Controlled Water: Groundwater R4: Controlled Water: Surface Water	Mild	Low	Low	The bedrock geology is classified as Secondary A Aquifer. No surface water features on site or in the immediate surrounding area. Surface water flooding possible in the south of site. No concentrations above the relevant GACs have been identified within the soils. The risk is considered to be LOW.
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. P3: Migration of contaminants along preferential pathways (man- made). P4: Surface runoff.	R1: End Users R2: Construction and maintenance workers	Minor	Unlikely	Very Low	Due to the low concentration of recorded contaminants and the distance of potential off-site sources, the risk is considered to be VERY LOW.
Off site S2: Historical and Contemporary land use: Nurseries	P5: Vertical and lateral migration of ground gases and/or vapour.	R1: End Users	Mild	Low	Low	Ground gas concentrations have been monitored on six occasions over a twelve week period. The results indicate the site is characterised as CS2 as outlined in BS8485:2015+A1 2019. The risk is considered to be LOW where gas protection measures are adopted. *
	P2: Horizontal and vertical migration of contaminants through potentially permeable soils and rocks. P3: Migration of contaminants along preferential pathways (man- made). P4: Surface runoff. P5: Vertical and lateral migration of ground gases and/or vapour.	R5: Property, services and substructures R6: Adjacent Residential/Commercial Properties	Mild	Low	Low	Testing indicates the soils are not aggressive to concrete with a Design Sulphate Class of DS-1 together with an Aggressive Chemical Environment for Concrete (ACEC) of AC-1. The risk is considered to be VERY LOW. The chemical analysis of the soils indicate specialist materials are unlikely to be required for water supply pipes at the site. The risk is considered to be VERY LOW. *See above comment regarding ground gas protection measures.
	P6: Root uptake.	R6: Proposed Flora and fauna	Mild	Low	Low	Minimal landscaping is anticipated on site. The risk at this stage of uptake to proposed flora and fauna is LOW.

6. Development Constraints and Recommendations for Further Work

6.1 Development Constraints

The desk study and ground investigation have identified the following development constraints at the site:

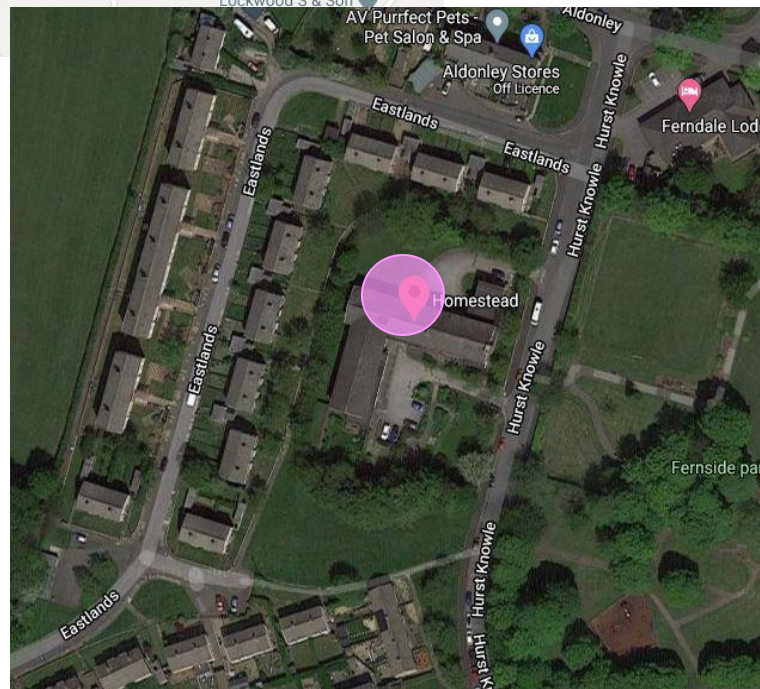
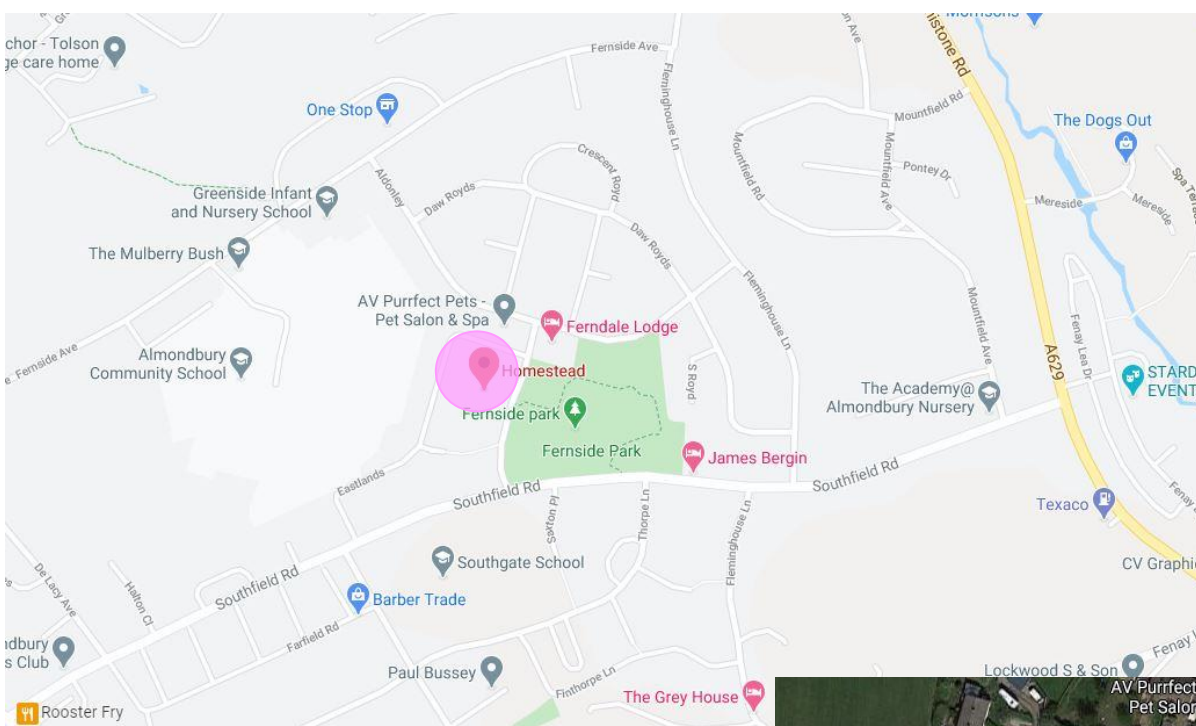
Comparison of the steady state gas screening value with Table 8.5 of the CIRIA document (Ref 16) indicates the site falls in a Characteristic Situation 2. Based on a classification of CS2 ground gas protection measures are required in accordance with BS8485:2015 + A1:2019 (Ref 15) for the proposed redevelopment, subject to Local Authority approval.

Proposed soft landscaping is likely to require topsoil import as materials on site are unlikely to meet the requirements of the British Standards / Landscape Architect.

7. References

1. C3257/PI – The Homestead, Hurst Knowle, Huddersfield - Phase I Geo-Environmental Desk Study Report, September 2020.
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3. British Geological Survey Lexicon Search - <http://www.bgs.ac.uk/lexicon/>
4. Department of the Environment Industry Profiles.
5. Site Investigation in Construction, Volume 3, Specification for Ground Investigation 2nd Edition.
6. BS 5930:2015 Code of Practice for Site Investigations.
7. BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)
8. BS10175:2011 +A1:2013 Investigation of Potentially Contaminated Sites - Code of Practice.
9. NHBC Standards, Chapter 4.2, Building near trees.
10. Nathanail, C.P., McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.
11. Department for Environment, Food and Rural Affairs and Contaminated Land: Applications in Real Environments (CL:AIRE) (December 2013). SP1010: Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination.
12. BRE Special Digest 1:Concrete in Aggressive Ground, 2005, Building Research Establishment.
13. CL:AIRE The definition of Waste: Development Industry Code of Practice, 2008.
14. NHBC & RSK Group Plc, March 2007. Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present. Ed 4.
15. BS8485:2015 + A1:2019 Code of Practice of the design of protective measures for methane and carbon dioxide ground gas for new buildings
16. CIRIA C665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'
17. Department for Environment, Food and Rural Affairs and Contaminated Land: Applications in Real Environments (CL:AIRE) (December 2013). SP1010: Appendix E Provisional C4SLs for Benzo(a)pyrene as a surrogate marker for PAHs.
18. www.environment-agency.gov.uk
19. Environment Agency, Freshwater Environmental Quality Standards (EQS) contained in the Hydrogeological Risk Assessment for Landfills and the Derivation of Groundwater Control and Trigger Levels, 2015.
20. HMSO, Water Supply (Water Quality) Regulations, 2002.
21. CIRIA C735 'Good practice on the testing verification of protection systems for buildings against hazardous ground gas

Appendix I



DO NOT SCALE
NOTES:



 - Approximate Site Location



Lawrence House, Meadowbank Way,
Eastwood, Nottingham, NG16 3SB
Tel: 01773 535 555 Fax: 0870 600 6091
www.hspconsulting.com

CLIENT:
Frank Shaw Associates Ltd

PROJECT:
The Homestead Hurst Knowle Road, Huddersfield

TITLE:
Site Location Plan

SCALE@SIZE :	ISSUE:
NTS	FINAL

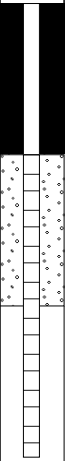
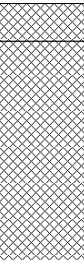
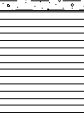
DESIGN/DRAWN:	DATE:
KM	Sep 2020

PROJECT No:	DRAWING No:
C3257	001

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Appendix II

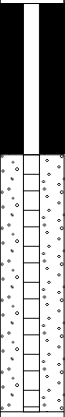
				Borehole Log			Borehole No. WS01 Sheet 1 of 1	
Project Name: Homestead				Project No. C3257		Co-ords: -		Hole Type WS
Location: Hurst Knowle Road				Level:		Scale 1:50		
Client: Frank Shaw Associates				Dates: 02/09/2020 -		Logged By HEB		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	TJ	N=7 (2,2/1,2,2,2)	0.25		MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick, occasional porcelain and concrete.	1	
		0.60	TJ						
		0.90	B						
		1.00							
		1.30	B				MADE GROUND - Brown and slightly grey mottled slightly sandy gravelly clay. Gravel is fine to medium and subrounded to angular of mixed lithology and coal fragments. (reworked ground)		
		1.80	D	N=20 (0,2/3,3,6,8)	1.70		MADE GROUND - Grey slightly sandy clay. Rootlets throughout.	2	
		2.00			2.00				Stiff greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse and angular of mudstone.
		2.70	D		2.50		Extremely weak brown and grey mottled weathered MUDSTONE. Recovered as very gravelly CLAY.	3	
	3.00		3.18	End of borehole at 3.18 m					
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks
 1. Borehole terminated on SPT refusal at 3.00m depth.



				Borehole Log				Borehole No. WS02 Sheet 1 of 1	
Project Name: Homestead				Project No. C3257		Co-ords: -		Hole Type WS	
Location: Hurst Knowle Road				Level:		Scale 1:50			
Client: Frank Shaw Associates				Dates: 02/09/2020 -		Logged By HEB			

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.35	TJ		0.25		MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick, occasional porcelain and concrete.		
		0.80	TJ		0.60		MADE GROUND - Grey sandy gravel. Gravel is fine to coarse and angular of mixed lithology, brick and concrete.		
		0.90	B		0.75				
		1.00		N=8 (3,2/1,3,2,2)					
		1.25	D		1.30		MADE GROUND - Dark brown sandy gravelly clay. Gravel is fine to coarse and subrounded to angular of mixed lithology. (reworked ground)	1	
		1.60	B				MADE GROUND - Brown and grey mottled gravelly sandy clay. Gravel is fine to coarse and subrounded to angular of sandstone.		
		2.00		N=10 (0,0/0,1,2,7)			MADE GROUND - Grey slightly gravelly sandy clay. Gravel is fine to medium and subrounded to angular of mudstone, sandstone and porcelain.	2	
					2.40		Very stiff yellowish brown sandy gravelly CLAY. Gravel is fine to coarse and angular of sandstone.		
		2.70		50 (25,/50 for 150mm)	2.60		Extremely weak yellowish brown SANDSTONE. Recovered as sandy gravel.	3	
					2.85		End of borehole at 2.85 m		

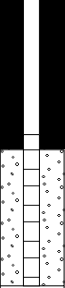
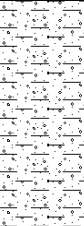
4
5
6
7
8
9
10

Remarks
 1. Borehole terminated on SPT refusal at 2.70m depth.





				Borehole Log			Borehole No. WS04 Sheet 1 of 1	
Project Name: Homestead				Project No. C3257		Co-ords: -		Hole Type WS
Location: Hurst Knowle Road				Level:		Scale 1:50		
Client: Frank Shaw Associates				Dates: 02/09/2020 -		Logged By HEB		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	TJ				 MADE GROUND - Dark brown slightly sandy gravelly topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick and concrete.	1	
		0.45	TJ		0.35				
		1.00	B	N=19 (3,4/4,4,5,6)			 Firm light brown and grey mottled slightly sandy gravelly CLAY. Gravel is fine to coarse and sub angular to angular of mudstone.		
		1.10							
		1.80	D	50 (25 for 105mm/50 for 70mm)	1.85		 Extremely weak yellowish brown MUDSTONE. Recovered as sandy gravel.	2	
		1.90			2.08				End of borehole at 2.08 m
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks 1. Borehole terminated on SPT refusal at 1.90m depth.								
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				Borehole Log			Borehole No. WS05 Sheet 1 of 1	
Project Name: Homestead				Project No. C3257		Co-ords: -		Hole Type WS
Location: Hurst Knowle Road				Level:		Scale 1:50		
Client: Frank Shaw Associates				Dates: 02/09/2020 -		Logged By HEB		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10	TJ	50 (25 for 75mm/50 for 40mm)	0.25		 MADE GROUND - Brown sandy gravelly clayey topsoil. Gravel is fine to coarse and subrounded to angular of mixed lithology, brick and occasional porcelain.  Extremely weak yellowish brown SANDSTONE. Recovered as sandy gravel. End of borehole at 0.57 m	1 2 3 4 5 6 7 8 9 10	
		0.35	TJ		0.57				
		0.45							

Remarks
 1. Borehole terminated on SPT refusal at 0.45m depth.



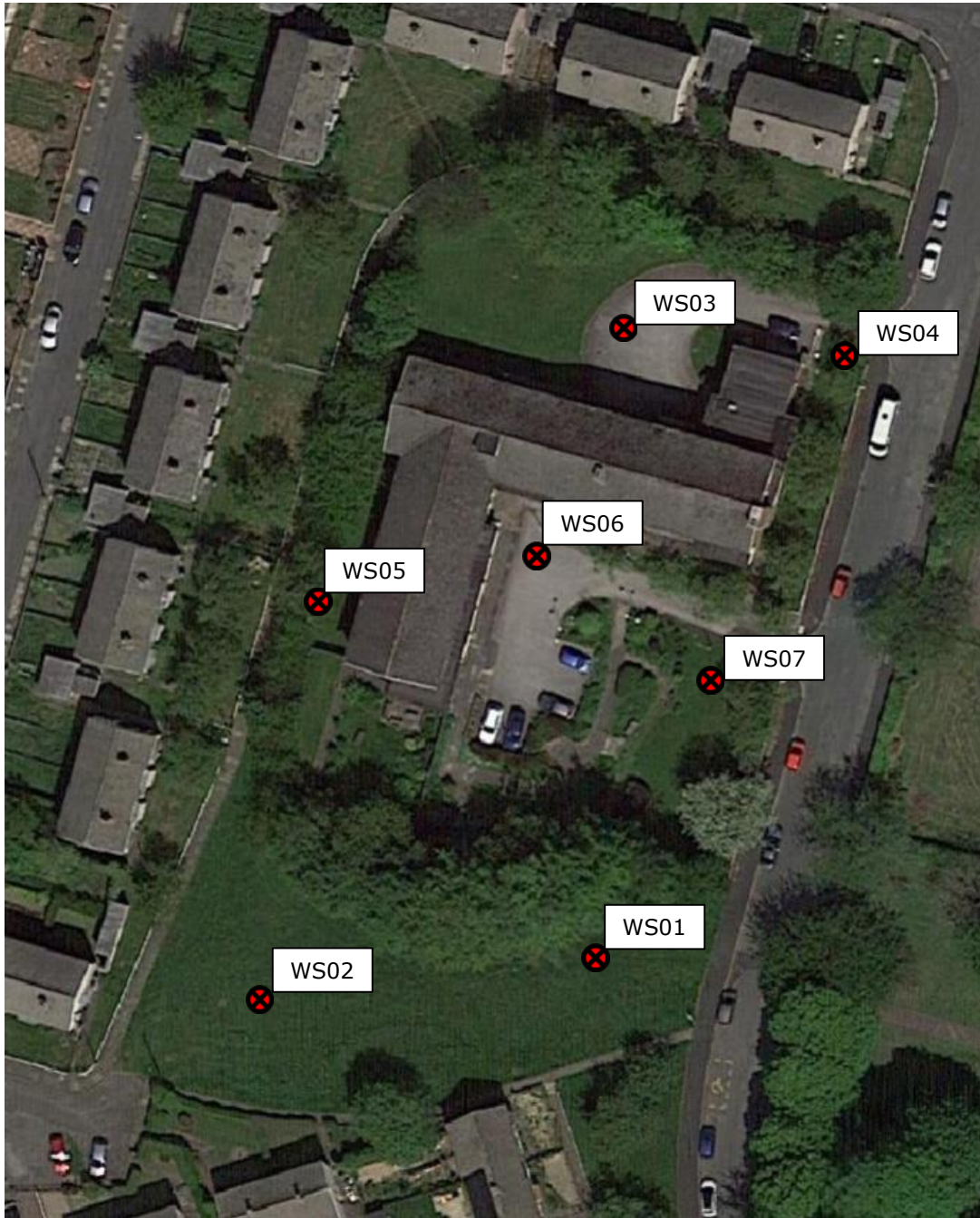
				Borehole Log			Borehole No. WS06 Sheet 1 of 1	
Project Name: Homestead				Project No. C3257		Co-ords: -		Hole Type WS
Location: Hurst Knowle Road				Level:		Scale 1:50		
Client: Frank Shaw Associates				Dates: 02/09/2020 -		Logged By HEB		

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20	TJ		0.10		MADE GROUND - Grey concrete asphalt.		
		0.50	TJ		0.40		MADE GROUND - Black sandy gravel of concrete and tarmac.		
		0.80	B				Firm to very stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse and subrounded to angular of mudstone.		
		1.00	D		0.95		Extremely weak brown and grey mottled MUDSTONE. Recovered as slightly clayey sandy gravel.	1	
		1.00		50 (12,13/50 for 40mm)	1.04			End of borehole at 1.04 m	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks 1. Borehole terminated on SPT refusal at 1.00m depth.								
--	--	--	--	--	--	--	--	---



Appendix III



DO NOT SCALE
NOTES:



- Approximate Red
Line Boundary



-Proposed Window
Sample Location



Lawrence House, Meadowbank Way,
Eastwood, Nottingham, NG16 3SB
Tel: 01773 535 555 Fax: 0870 600 6091
www.hspconsulting.com

CLIENT:

Frank Shaw Associates Ltd

PROJECT:

The Homestead – Kirklees
Dementia Care homes

TITLE:

Proposed Exploratory
Layout Plan

SCALE@SIZE :

NTS

ISSUE:

FINAL

DESIGN/DRAWN :

HEB

DATE:

Sept. 2020

PROJECT No:

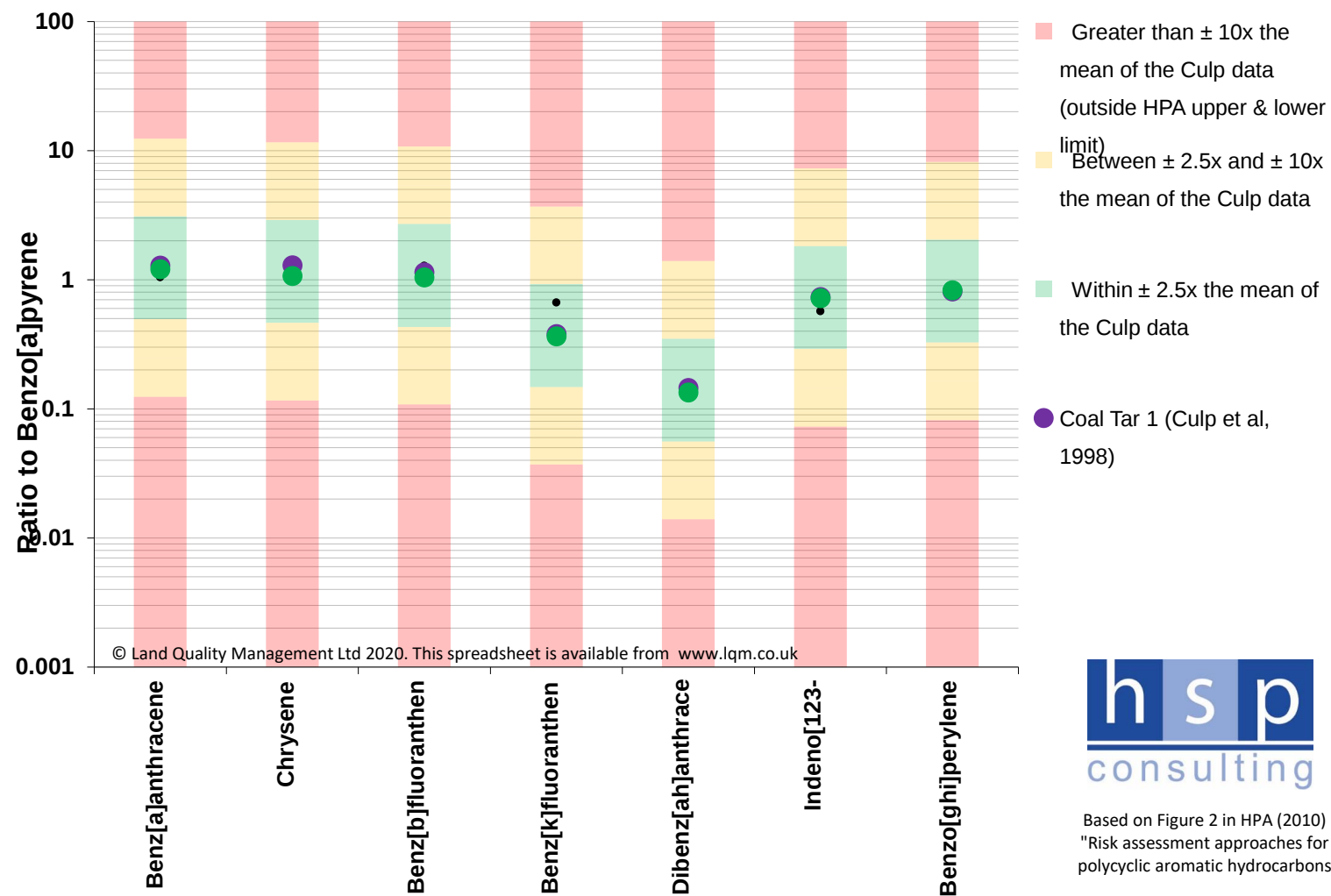
C3257

DRAWING No:

502

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Appendix IV





Final Report

Report No.:	20-23576-1		
Initial Date of Issue:	15-Sep-2020		
Client	HSP Consulting Engineers Limited		
Client Address:	Lawrence House Meadowbank Way Eastwood Nottinghamshire NG16 3SB		
Contact(s):	Karen Murray		
Project	C3257 - The Homestead, Hurst Knowle Road, Huddersfield		
Quotation No.:		Date Received:	04-Sep-2020
Order No.:	SC13457	Date Instructed:	08-Sep-2020
No. of Samples:	11		
Turnaround (Wkdays):	5	Results Due:	14-Sep-2020
Date Approved:	15-Sep-2020		
Approved By:			

Details: Glynn Harvey, Technical Manager

Results - Soil

Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield

Client: HSP Consulting Engineers Limited	Chemtest Job No.:				20-23576	20-23576	20-23576	20-23576	20-23576	20-23576	20-23576	20-23576	20-23576
Quotation No.:	Chemtest Sample ID.:				1059009	1059012	1059013	1059015	1059016	1059017	1059020	1059021	1059022
	Sample Location:				WS01	WS02	WS02	WS03	WS04	WS04	WS05	WS06	WS06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.6	0.35	0.80	0.25	0.10	0.45	0.25	0.20	0.50
	Date Sampled:				02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020
	Asbestos Lab:							DURHAM	DURHAM		DURHAM	DURHAM	
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A				-	-		-	-	
Asbestos Identification	U	2192	%	0.001				No Asbestos Detected	No Asbestos Detected		No Asbestos Detected	No Asbestos Detected	
ACM Detection Stage	U	2192		N/A				-	-		-	-	
Moisture	N	2030	%	0.020	15	13	12	8.2	20	17			18
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown			Grey
Other Material	N	2040		N/A	None	Stones	None	Stones	Stones	None			None
Soil Texture	N	2040		N/A	Clay	Sand	Clay	Sand	Sand	Clay			Clay
pH	M	2010		4.0	7.6	> 12.0	9.0	8.8	7.0	7.5			7.8
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	[B] 0.45	[B] 0.60		[B] < 0.40	[B] 1.1				
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	[B] < 0.010	[B] 0.16	[B] 0.037	[B] < 0.010	[B] < 0.010	[B] 0.018			[B] 0.016
Total Sulphur	M	2175	%	0.010			0.029			0.012			0.044
Sulphur (Elemental)	M	2180	mg/kg	1.0	8.1	1.6		< 1.0	10				
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50				
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50		< 0.50	0.60				
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	22	5.6		3.5	27				
Sulphate (Acid Soluble)	M	2430	%	0.010			0.072			0.015			0.039
Arsenic	M	2450	mg/kg	1.0	18	16		8.1	19				
Cadmium	M	2450	mg/kg	0.10	0.14	< 0.10		0.14	0.28				
Chromium	M	2450	mg/kg	1.0	35	20		31	36				
Copper	M	2450	mg/kg	0.50	34	14		28	28				
Mercury	M	2450	mg/kg	0.10	0.13	< 0.10		< 0.10	0.19				
Nickel	M	2450	mg/kg	0.50	36	20		44	23				
Lead	M	2450	mg/kg	0.50	40	5.9		16	47				
Selenium	M	2450	mg/kg	0.20	0.46	< 0.20		< 0.20	0.50				
Zinc	M	2450	mg/kg	0.50	84	30		77	78				
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50		< 0.50	< 0.50				
Organic Matter	M	2625	%	0.40									
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0				
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0		< 5.0	< 5.0				

Results - Soil

Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield

Client: HSP Consulting Engineers Limited	Chemtest Job No.:				20-23576	20-23576	20-23576	20-23576	20-23576	20-23576	20-23576	20-23576
Quotation No.:	Chemtest Sample ID.:				1059009	1059012	1059013	1059015	1059016	1059017	1059020	1059022
	Sample Location:				WS01	WS02	WS02	WS03	WS04	WS04	WS05	WS06
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.6	0.35	0.80	0.25	0.10	0.45	0.25	0.50
	Date Sampled:				02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020
	Asbestos Lab:							DURHAM	DURHAM		DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD								
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	< 5.0		< 5.0	< 5.0			
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	< 10		< 10	< 10			
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10			
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10			
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10			
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	< 0.10			
Phenanthrene	M	2700	mg/kg	0.10	2.7	< 0.10		< 0.10	5.3			
Anthracene	M	2700	mg/kg	0.10	0.63	< 0.10		< 0.10	1.2			
Fluoranthene	M	2700	mg/kg	0.10	3.2	< 0.10		< 0.10	6.0			
Pyrene	M	2700	mg/kg	0.10	3.3	< 0.10		< 0.10	5.8			
Benzo[a]anthracene	M	2700	mg/kg	0.10	1.0	< 0.10		< 0.10	2.2			
Chrysene	M	2700	mg/kg	0.10	1.6	< 0.10		< 0.10	2.5			
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	2.7			
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	1.4			
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	2.1			
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	1.2			
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	0.30			
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10		< 0.10	1.9			
Total Of 16 PAH's	M	2700	mg/kg	2.0	12	< 2.0		< 2.0	33			
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Ethylbenzene	M	2760	µg/kg	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			
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0		< 1.0	< 1.0			
Total Phenols	M	2920	mg/kg	0.30	< 0.30	< 0.30		< 0.30	< 0.30			

Results - Soil

Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield

Client: HSP Consulting Engineers Limited	Chemtest Job No.:				20-23576	20-23576
Quotation No.:	Chemtest Sample ID.:				1059024	1059025
	Sample Location:				WS07	WS07
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.40	0.45
	Date Sampled:				02-Sep-2020	02-Sep-2020
	Asbestos Lab:					
Determinand	Accred.	SOP	Units	LOD		
ACM Type	U	2192		N/A		
Asbestos Identification	U	2192	%	0.001		
ACM Detection Stage	U	2192		N/A		
Moisture	N	2030	%	0.020	17	8.3
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	None	None
Soil Texture	N	2040		N/A	Clay	Clay
pH	M	2010		4.0	6.5	7.0
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	[B] 0.42	
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	[B] < 0.010	[B] < 0.010
Total Sulphur	M	2175	%	0.010		< 0.010
Sulphur (Elemental)	M	2180	mg/kg	1.0	1.5	
Cyanide (Free)	M	2300	mg/kg	0.50	< 0.50	
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.8	
Sulphate (Acid Soluble)	M	2430	%	0.010		< 0.010
Arsenic	M	2450	mg/kg	1.0	14	
Cadmium	M	2450	mg/kg	0.10	0.17	
Chromium	M	2450	mg/kg	1.0	26	
Copper	M	2450	mg/kg	0.50	22	
Mercury	M	2450	mg/kg	0.10	< 0.10	
Nickel	M	2450	mg/kg	0.50	23	
Lead	M	2450	mg/kg	0.50	25	
Selenium	M	2450	mg/kg	0.20	0.29	
Zinc	M	2450	mg/kg	0.50	60	
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	
Organic Matter	M	2625	%	0.40	2.4	
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C16-C21	M	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	

Results - Soil

Project: C3257 - The Homestead, Hurst Knowle Road, Huddersfield

Client: HSP Consulting Engineers Limited	Chemtest Job No.:				20-23576	20-23576
Quotation No.:	Chemtest Sample ID.:				1059024	1059025
	Sample Location:				WS07	WS07
	Sample Type:				SOIL	SOIL
	Top Depth (m):				0.40	0.45
	Date Sampled:				02-Sep-2020	02-Sep-2020
	Asbestos Lab:					
Determinand	Accred.	SOP	Units	LOD		
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C8-C10	M	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C10-C12	M	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C12-C16	M	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C21-C35	M	2680	mg/kg	1.0	< 1.0	
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	< 1.0	
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	< 5.0	
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	< 10	
Naphthalene	M	2700	mg/kg	0.10	< 0.10	
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	
Fluorene	M	2700	mg/kg	0.10	< 0.10	
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	
Anthracene	M	2700	mg/kg	0.10	< 0.10	
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	
Pyrene	M	2700	mg/kg	0.10	< 0.10	
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	
Chrysene	M	2700	mg/kg	0.10	< 0.10	
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	
Benzene	M	2760	µg/kg	1.0	< 1.0	
Toluene	M	2760	µg/kg	1.0	< 1.0	
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	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	
Total Phenols	M	2920	mg/kg	0.30	< 0.30	

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request. The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1059009			WS01	02-Sep-2020	B	Amber Glass 250ml
1059009			WS01	02-Sep-2020	B	Plastic Tub 500g
1059012			WS02	02-Sep-2020	B	Amber Glass 250ml
1059012			WS02	02-Sep-2020	B	Plastic Tub 500g
1059013			WS02	02-Sep-2020	B	Amber Glass 250ml
1059013			WS02	02-Sep-2020	B	Plastic Tub 500g
1059015			WS03	02-Sep-2020	B	Amber Glass 250ml
1059015			WS03	02-Sep-2020	B	Plastic Tub 500g
1059016			WS04	02-Sep-2020	B	Amber Glass 250ml
1059016			WS04	02-Sep-2020	B	Plastic Tub 500g
1059017			WS04	02-Sep-2020	B	Amber Glass 250ml
1059017			WS04	02-Sep-2020	B	Plastic Tub 500g
1059022			WS06	02-Sep-2020	B	Amber Glass 250ml
1059022			WS06	02-Sep-2020	B	Plastic Tub 500g
1059024			WS07	02-Sep-2020	B	Amber Glass 250ml
1059024			WS07	02-Sep-2020	B	Plastic Tub 500g
1059025			WS07	02-Sep-2020	B	Amber Glass 250ml
1059025			WS07	02-Sep-2020	B	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	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 <37°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.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
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.
2450	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.
2680	TPH A/A Split	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	Dichloromethane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenzo[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
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.
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"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

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 TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°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

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 45 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

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix V



LABORATORY REPORT



4043

Contract Number: PSL20/4804

Report Date: 02 October 2020
Client's Reference: C3257
Client Name: HSP Consulting
Lawrence House
4 Meadowbank Way
Eastwood
Nottingham
NG16 3SB

For the attention of: Karen Murray

Contract Title: The Homestead, Hurst Knowle, Huddersfield
Date Received: 10/9/2020
Date Commenced: 10/9/2020
Date Completed: 2/10/2020

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

R Berriman
(Quality Manager)

L Knight
(Senior Technician)

S Eyre
(Senior Technician)

S Royle
(Laboratory Manager)

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Page 1 of

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

4043

PSL
Professional Soils Laboratory

The Homestead, Hurst Knowle, Huddersfield

Contract No:**PSL20/4804****Client Ref:**

C3257

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

[illegible]

SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**



4043

PSL

Professional Soils Laboratory

The Homestead, Hurst Knowle, Huddersfield

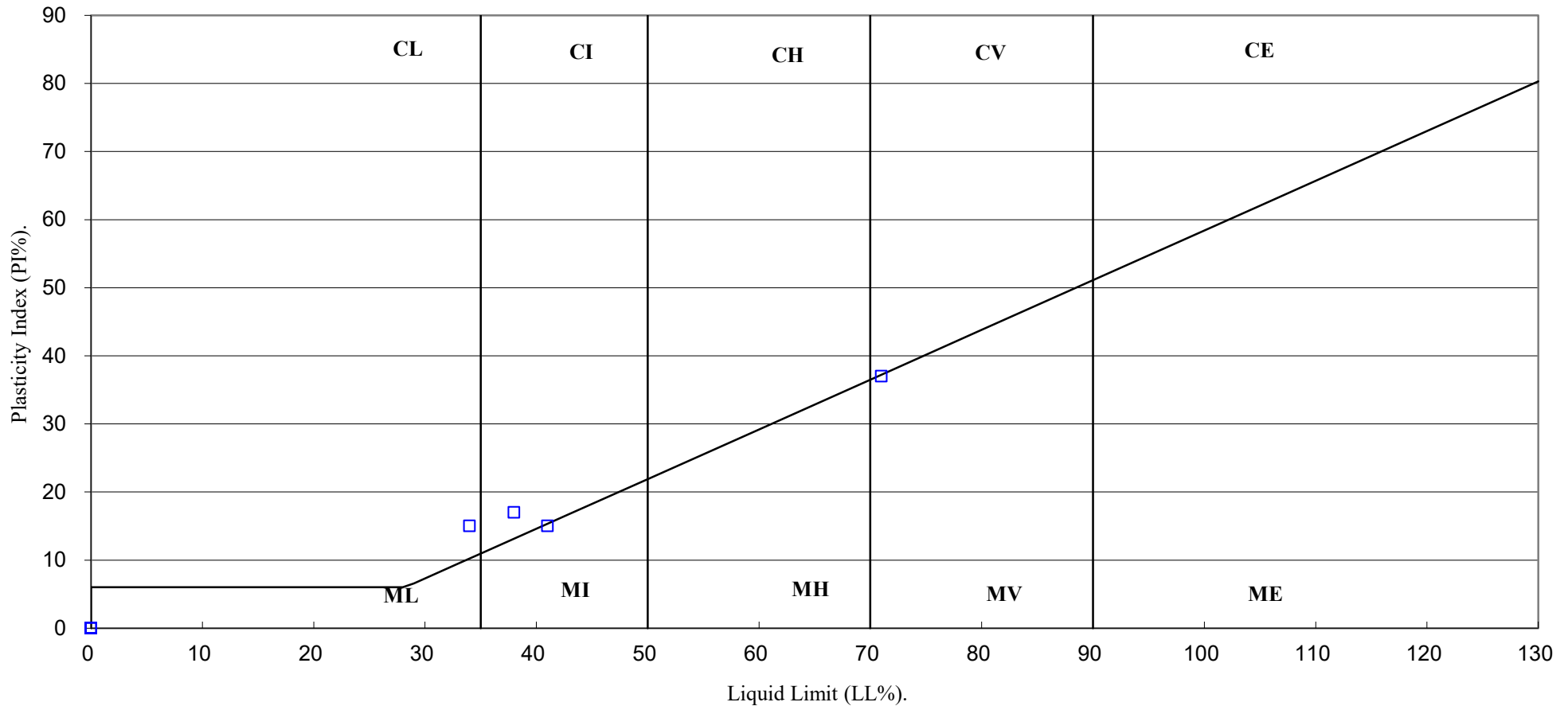
Contract No:

PSL20/4804

Client Ref:

C3257

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



4043

PSL

Professional Soils Laboratory

The Homestead, Hurst Knowle, Huddersfield

Contract No:

PSL20/4804

Client Ref:

C3257

Appendix VI

CBR Test Results (MEXE Probe)

Job No.	C3257
Job Name	The Homestead, Hurst Knowle
Date	November 2020

MP1				
Position	Depth (mm)			
	150	300	450	600
P1	5	14		
P2	14			
P3	14			
P4	14			
P5	14			
Minimum CBR Value	5.0	14.0		

MP2				
Position	Depth (mm)			
	150	300	450	600
P1	14			
P2	3	7	5	
P3	2	14		
P4	6	14		
P5	4	9	14	
Minimum CBR Value	2.0	7.0	4.5	

MP3				
Position	Depth (mm)			
	150	300	450	600
P1				
P2				
P3				
P4				
P5				
Minimum CBR Value				

MP4				
Position	Depth (mm)			
	150	300	450	600
P1				
P2				
P3				
P4				
P5				
Minimum CBR Value				

If Empty - Means unable to penetrate further due to strata strength

Appendix VII

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.4	<0.1	<1	<1		3.00	2.77
00:15	0.0	<0.1	<0.1	18.1	3.5	<1	<1			
00:30	0.0	<0.1	<0.1	17.7	3.5	<1	1			
00:45	0.0	<0.1	<0.1	17.6	3.6	<1	<1			
01:00	0.0	<0.1	<0.1	17.4	3.6	1	1			
01:15	0.0	<0.1	<0.1	17.4	3.7	<1	1			
01:30	0.0	<0.1	<0.1	17.3	3.8	<1	<1			
01:45	0.0	<0.1	<0.1	17.2	3.9	1	<1			
02:00	0.0	<0.1	<0.1	17.1	4.0	<1	<1			
02:15	0.0	<0.1	<0.1	17.0	4.0	<1	<1			
02:30	0.0	<0.1	<0.1	17.0	4.1	1	<1			
02:45	0.0	<0.1	<0.1	16.9	4.2	<1	<1			
03:00	0.0	<0.1	<0.1	16.8	4.3	<1	<1			
03:15		<0.1	<0.1	16.7	4.4	1	<1			
03:30		<0.1	<0.1	16.6	4.4	<1	1			
03:45		<0.1	<0.1	16.5	4.5	<1	<1			
04:00		<0.1	<0.1	16.4	4.6	<1	<1			
04:15		<0.1	<0.1	16.4	4.7	<1	<1			
04:30		<0.1	<0.1	16.2	4.8	<1	<1			
04:45		<0.1	<0.1	16.2	4.8	<1	<1			
05:00		<0.1	<0.1	16.1	4.9	1	<1			
Steady	0.0	<0.1	<0.1	16.1	4.9	1.0	<1	#####	3.00	2.77
Peak	0.0	0.0	0.0	20.4	4.9	1.0	1.0	0.0	3.00	2.77

Date	Notes:		Barometric Pressure, mbar	1015
19.09.2020	Engineer	DRS		steady
	Equipment	GFM430	Air Temp (°C)	14

Gas Monitoring Certificate



Project Number C3257
Project Name The Homestead, Hurst Knowle Rd, Huddersfield
Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbg)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.6	0.1	<1	<1		2.78	2.51
00:15	0.0	<0.1	<0.1	16.0	0.2	<1	1			
00:30	0.0	<0.1	<0.1	14.9	0.3	<1	1			
00:45	0.0	<0.1	<0.1	14.8	0.3	<1	<1			
01:00	0.0	<0.1	<0.1	14.7	0.3	<1	<1			
01:15	0.0	<0.1	<0.1	14.7	0.3	<1	<1			
01:30	0.0	<0.1	<0.1	14.6	0.3	<1	<1			
01:45	0.0	<0.1	<0.1	14.5	0.3	<1	<1			
02:00	0.0	<0.1	<0.1	14.4	0.3	<1	<1			
02:15	0.0	<0.1	<0.1	14.3	0.3	<1	<1			
02:30	0.0	<0.1	<0.1	14.2	0.3	<1	<1			
02:45	0.0	<0.1	<0.1	14.1	0.3	<1	1			
03:00	0.0	<0.1	<0.1	13.9	0.3	<1	<1			
03:15		<0.1	<0.1	13.8	0.3	<1	<1			
03:30		<0.1	<0.1	13.7	0.3	<1	<1			
03:45		<0.1	<0.1	13.6	0.4	<1	<1			
04:00		<0.1	<0.1	13.5	0.4	<1	<1			
04:15		<0.1	<0.1	13.3	0.4	<1	<1			
04:30		<0.1	<0.1	13.2	0.4	<1	<1			
04:45		<0.1	<0.1	13.1	0.4	<1	<1			
05:00		<0.1	<0.1	12.9	0.4	<1	<1			
Steady	0.0	<0.1	<0.1	12.9	0.4	<1	<1	#####	2.78	2.51
Peak	0.0	0.0	0.0	20.6	0.4	0.0	1.0	0.0	2.78	2.51

Date	Notes:			
19.09.2020	Engineer	DRS	Barometric Pressure, mbar	1015
			Pressure Trend	steady
	Equipment	GFM430	Air Temp (°C)	14

Gas Monitoring Certificate



Project Number C3257
Project Name The Homestead, Hurst Knowle Rd, Huddersfield
Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.4	<0.1	<1	<1		1.91	1.56
00:15	0.0	<0.1	<0.1	20.0	1.2	<1	<1			
00:30	0.0	<0.1	<0.1	19.9	1.2	<1	1			
00:45	0.0	<0.1	<0.1	19.8	1.3	<1	<1			
01:00	0.0	<0.1	<0.1	19.8	1.3	<1	1			
01:15	0.0	<0.1	<0.1	19.7	1.3	<1	<1			
01:30	0.0	<0.1	<0.1	19.8	1.3	<1	<1			
01:45	0.0	<0.1	<0.1	19.7	1.3	<1	1			
02:00	0.0	<0.1	<0.1	19.7	1.4	<1	<1			
02:15	0.0	<0.1	<0.1	19.7	1.4	<1	<1			
02:30	0.0	<0.1	<0.1	19.7	1.4	<1	<1			
02:45	0.0	<0.1	<0.1	19.7	1.4	<1	<1			
03:00	0.0	<0.1	<0.1	19.7	1.4	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	0.0	<0.1	<0.1	19.7	1.4	<1	<1	#####	1.91	1.56
Peak	0.0	0.0	0.0	20.4	1.4	0.0	1.0	0.0	1.91	1.56

Date	Notes:		Barometric Pressure, mbar	1015
19.09.2020	Engineer	DRS		steady
	Equipment	GFM430	Pressure Trend	
			Air Temp (°C)	14

Gas Monitoring Certificate



Project Number C3257
Project Name The Homestead, Hurst Knowle Rd, Huddersfield
Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.8	2.4	<1	<1		3.00	2.68
00:15	0.0	<0.1	<0.1	12.9	7.7	<1	<1			
00:30	0.0	<0.1	<0.1	12.6	8.0	<1	1			
00:45	0.0	<0.1	<0.1	12.4	8.2	<1	<1			
01:00	0.0	<0.1	<0.1	12.4	8.3	<1	<1			
01:15	0.0	<0.1	<0.1	12.3	8.3	<1	1			
01:30	0.0	<0.1	<0.1	12.3	8.4	<1	1			
01:45	0.0	<0.1	<0.1	12.3	8.4	<1	<1			
02:00	0.0	<0.1	<0.1	12.3	8.4	<1	<1			
02:15	0.0	<0.1	<0.1	12.3	8.4	<1	<1			
02:30	0.0	<0.1	<0.1	12.0	8.4	<1	<1			
02:45	0.0	<0.1	<0.1	12.3	8.4	<1	<1			
03:00	0.0	<0.1	<0.1	12.3	8.4	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	0.0	<0.1	<0.1	12.3	8.4	<1	<1	#####	3.00	2.68
Peak	0.0	0.0	0.0	20.8	8.4	0.0	1.0	0.0	3.00	2.68

Date	Notes:		Barometric Pressure, mbar	977
01.10.2020	Engineer	LEJ		Falling
			Pressure Trend	
	Equipment	GFM430	Air Temp (°C)	13

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbg)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	29.3	1.2	11.0	6.7	<1	3		2.73	1.92
00:15	0.0	29.3	1.2	8.0	5.7	<1	1			
00:30	0.0	29.5	1.2	7.7	5.7	<1	1			
00:45	0.0	29.7	1.3	7.4	5.7	<1	<1			
01:00	0.0	30.4	1.3	7.2	5.7	<1	<1			
01:15	0.0	30.6	1.3	7.2	5.8	<1	<1			
01:30	0.0	31.2	1.3	7.1	6.1	<1	1			
01:45	0.0	31.7	1.4	7.1	6.1	<1	<1			
02:00	0.0	31.8	1.4	7.1	5.9	<1	<1			
02:15	0.0	32.1	1.4	7.1	5.9	<1	<1			
02:30	0.0	32.4	1.4	7.1	5.8	<1	<1			
02:45	0.0	32.4	1.4	7.1	5.8	<1	<1			
03:00	0.0	32.2	1.4	7.1	5.8	<1	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	0.0	32.2	1.4	7.1	5.8	<1	<1	#####	2.73	1.92
Peak	0.0	32.4	1.4	11.0	6.7	0.0	3.0	0.0	2.73	1.92

Date	Notes:			
01.10.2020	Engineer	LEJ	Barometric Pressure, mbar	977
			Pressure Trend	Falling
	Equipment	GFM430	Air Temp (°C)	13

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	17.9	1.1	<1	<1		1.88	0.43
00:15	0.0	<0.1	<0.1	18.2	1.1	<1	1			
00:30	0.0	<0.1	<0.1	18.2	1.1	<1	1			
00:45	0.0	<0.1	<0.1	18.3	1.0	<1	<1			
01:00	0.0	<0.1	<0.1	18.3	1.1	<1	1			
01:15	0.0	<0.1	<0.1	18.3	1.1	<1	<1			
01:30	0.0	<0.1	<0.1	18.3	1.1	<1	<1			
01:45	0.0	<0.1	<0.1	18.3	1.1	<1	1			
02:00	0.0	<0.1	<0.1	18.3	1.2	<1	1			
02:15	0.0	<0.1	<0.1	18.2	1.4	<1	<1			
02:30	0.0	<0.1	<0.1	18.0	1.5	<1	1			
02:45	0.0	<0.1	<0.1	17.8	1.5	<1	<1			
03:00	0.0	<0.1	<0.1	17.5	1.5	0	<1			
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	0.0	<0.1	<0.1	17.5	1.5	0.0	<1	#####	1.88	0.43
Peak	0.0	0.0	0.0	18.3	1.5	0.0	1.0	0.0	1.88	0.43

Date	Notes:		Barometric Pressure, mbar	977
01.10.2020	Engineer	LEJ		Falling
			Pressure Trend	
	Equipment	GFM430	Air Temp (°C)	13

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.5	5.8	<1	<1		3.40	2.50
00:15	0.0	<0.1	<0.1	12.5	8.3	<1	<1			
00:30	0.0	<0.1	<0.1	12.5	8.5	<1	<1			
00:45	0.0	<0.1	<0.1	12.1	8.6	<1	<1			
01:00	0.0	<0.1	<0.1	11.9	8.8	<1	<1			
01:15	0.0	<0.1	<0.1	11.9	8.8	<1	<1			
01:30	0.0	<0.1	<0.1	11.8	9.0	<1	<1			
01:45	0.0	<0.1	<0.1	11.7	9.0	<1	<1			
02:00	0.0	<0.1	<0.1	11.7	9.0	<1	<1			
02:15	0.0	<0.1	<0.1	11.7	9.0	<1	<1			
02:30	0.0	<0.1	<0.1	11.7	9.1	<1	<1			
02:45	0.0	<0.1	<0.1	11.6	9.1	<1	<1			
03:00	0.0	<0.1	<0.1	11.6	9.1	<1	<1			
03:15	0.0	<0.1	<0.1	11.6	9.2	<1	<1			
03:30	0.0	<0.1	<0.1	11.6	9.2	<1	1			
03:45	0.0	<0.1	<0.1	11.6	9.2	<1	<1			
04:00	0.0	<0.1	<0.1	11.5	9.2	<1	<1			
04:15	0.0	<0.1	<0.1	11.5	9.3	<1	1			
04:30	0.0	<0.1	<0.1	11.5	9.3	<1	<1			
04:45	0.0	<0.1	<0.1	11.4	9.3	<1	<1			
05:00	0.0	<0.1	<0.1	11.4	9.3	<1	0			
Steady	0.0	<0.1	<0.1	11.4	9.3	<1	0.0	#####	3.40	2.50
Peak	0.0	0.0	0.0	20.5	9.3	0.0	1.0	0.0	3.40	2.50

Date	Notes:		Barometric Pressure, mbar	983
20.10.20	Engineer	IA		steady
	Equipment	GFM430	Air Temp (°C)	15

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbg)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	19.4	0.2	<1	<1		2.80	2.15
00:15	0.0	<0.1	<0.1	11.2	3.0	<1	<1			
00:30	0.0	<0.1	<0.1	10.4	3.9	<1	1			
00:45	0.0	<0.1	<0.1	10.3	3.9	<1	<1			
01:00	0.0	<0.1	<0.1	10.1	4.0	<1	<1			
01:15	0.0	<0.1	<0.1	9.8	4.0	<1	<1			
01:30	0.0	<0.1	<0.1	9.8	4.1	<1	<1			
01:45	0.0	<0.1	<0.1	9.5	4.2	<1	1			
02:00	0.0	<0.1	<0.1	9.4	4.2	<1	<1			
02:15	0.0	<0.1	<0.1	9.2	4.3	<1	1			
02:30	0.0	<0.1	<0.1	9.1	4.3	<1	<1			
02:45	0.0	<0.1	<0.1	9.0	4.4	<1	<1			
03:00	0.0	<0.1	<0.1	8.9	4.4	<1	<1			
03:15	0.0	<0.1	<0.1	8.8	4.4	<1	<1			
03:30	0.0	<0.1	<0.1	8.6	4.5	<1	<1			
03:45	0.0	<0.1	<0.1	8.6	4.5	<1	<1			
04:00	0.0	<0.1	<0.1	8.4	4.6	<1	<1			
04:15	0.0	<0.1	<0.1	8.3	4.6	<1	<1			
04:30	0.0	<0.1	<0.1	8.2	4.6	<1	<1			
04:45	0.0	<0.1	<0.1	8.2	4.6	<1	<1			
05:00	0.0	<0.1	<0.1	8.1	4.7	<1	<1			
Steady	0.0	<0.1	<0.1	8.1	4.7	<1	<1	#####	2.80	2.15
Peak	0.0	0.0	0.0	19.4	4.7	0.0	1.0	0.0	2.80	2.15

Date	Notes:			
20.10.20	Engineer	IA	Barometric Pressure, mbar	983
			Pressure Trend	steady
	Equipment	GFM430	Air Temp (°C)	15

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00										
00:15										
00:30										
00:45										
01:00										
01:15										
01:30										
01:45										
02:00										
02:15										
02:30										
02:45										
03:00										
03:15										
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
Peak	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00



Date	Notes:		Barometric Pressure, mbar	983
20.10.20	Engineer	IA		steady
			Pressure Trend	
	Equipment	GFM430	Air Temp (°C)	15

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	18.9	0.0	<1	<1		3.10	2.05
00:15	0.0	<0.1	<0.1	13.9	5.6	<1	<1			
00:30	0.0	<0.1	<0.1	16.7	3.2	<1	<1			
00:45	0.0	<0.1	<0.1	18.0	2.2	<1	<1			
01:00	0.0	<0.1	<0.1	18.2	2.0	<1	<1			
01:15	0.0	<0.1	<0.1	18.7	1.8	<1	<1			
01:30	0.0	<0.1	<0.1	19.1	1.5	<1	<1			
01:45	0.0	<0.1	<0.1	19.3	1.3	<1	<1			
02:00	0.0	<0.1	<0.1	19.4	1.1	<1	<1			
02:15	0.0	<0.1	<0.1	19.5	1.1	<1	<1			
02:30	0.0	<0.1	<0.1	19.7	1.0	<1	<1			
02:45	0.0	<0.1	<0.1	19.8	0.9	<1	<1			
03:00	0.0	<0.1	<0.1	19.8	0.9	<1	<1			
03:15	0.0	<0.1	<0.1	19.9	0.9	<1	<1			
03:30	0.0	<0.1	<0.1	19.9	0.8	<1	<1			
03:45	0.0	<0.1	<0.1	20.0	0.8	<1	<1			
04:00	0.0	<0.1	<0.1	20.0	0.8	<1	<1			
04:15	0.0	<0.1	<0.1	20.1	0.8	<1	<1			
04:30	0.0	<0.1	<0.1	20.1	0.8	<1	<1			
04:45	0.0	<0.1	<0.1	20.1	0.8	<1	<1			
05:00	0.0	<0.1	<0.1	20.2	0.7	<1	<1			
Steady	0.0	<0.1	<0.1	20.2	0.7	<1	<1	#####	3.10	2.05
Peak	0.0	0.0	0.0	20.2	5.6	0.0	0.0	0.0	3.10	2.05

Date	Notes:		Barometric Pressure, mbar	1000
03.11.20	Engineer	IA		Steady
	Equipment	GFM430	Air Temp (°C)	6

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbg)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.6	0.0	<1	<1		2.80	1.40
00:15	0.0	<0.1	<0.1	1.6	6.8	1	<1			
00:30	0.0	<0.1	<0.1	0.0	6.9	1	<1			
00:45	0.0	<0.1	<0.1	0.0	7.0	<1	<1			
01:00	0.0	<0.1	<0.1	0.0	7.0	1	1			
01:15	0.0	<0.1	<0.1	0.0	7.0	2	1			
01:30	0.0	<0.1	<0.1	0.0	7.3	1	1			
01:45	0.0	<0.1	<0.1	0.0	7.1	1	<1			
02:00	0.0	<0.1	<0.1	0.0	7.1	2	<1			
02:15	0.0	<0.1	<0.1	0.0	7.1	<1	<1			
02:30	0.0	<0.1	<0.1	0.0	7.1	2	<1			
02:45	0.0	<0.1	<0.1	0.0	7.1	2	1			
03:00	0.0	<0.1	<0.1	0.0	7.1	1	3			
03:15	0.0	<0.1	<0.1	0.0	7.1	0	<1			
03:30	0.0	<0.1	<0.1	0.0	7.1	0	1			
03:45	0.0	<0.1	<0.1	0.0	7.1	1	1			
04:00	0.0	<0.1	<0.1	0.0	7.1	<1	<1			
04:15	0.0	<0.1	<0.1	0.0	7.1	<1	<1			
04:30	0.0	<0.1	<0.1	0.0	7.1	<1	<1			
04:45	0.0	<0.1	<0.1	0.0	7.1	1	<1			
05:00	0.0	<0.1	<0.1	0.0	7.1	<1	1			
Steady	0.0	<0.1	<0.1	0.0	7.1	<1	1.0	#####	2.80	1.40
Peak	0.0	0.0	0.0	20.6	7.3	2.0	3.0	0.0	2.80	1.40

Date	Notes:			
03.11.20	Engineer	IA	Barometric Pressure, mbar	1000
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (°C)	6

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	20.2	1.2	1	1		1.94	0.90
00:15	0.0	<0.1	<0.1	18.1	1.8	<1	4			
00:30	0.0	<0.1	<0.1	19.2	0.8	1	4			
00:45	0.0	<0.1	<0.1	20.2	0.8	1	1			
01:00	0.0	<0.1	<0.1	19.8	0.8	<1	4			
01:15	0.0	<0.1	<0.1	19.9	0.8	1	4			
01:30	0.0	<0.1	<0.1	20.0	0.6	<1	4			
01:45	0.0	<0.1	<0.1	20.1	0.6	1	1			
02:00	0.0	<0.1	<0.1	20.2	0.5	1	4			
02:15	0.0	<0.1	<0.1	20.4	0.4	<1	1			
02:30	0.0	<0.1	<0.1	20.4	0.3	1	4			
02:45	0.0	<0.1	<0.1	20.5	0.3	1	1			
03:00	0.0	<0.1	<0.1	20.6	0.2	<1	<1			
03:15	0.0	<0.1	<0.1	20.6	0.2	<1	<1			
03:30	0.0	<0.1	<0.1	20.6	0.2	<1	1			
03:45	0.0	<0.1	<0.1	20.6	0.2	<1	<1			
04:00	0.0	<0.1	<0.1	20.6	0.2	<1	<1			
04:15	0.0	<0.1	<0.1	20.6	0.2	<1	1			
04:30	0.0	<0.1	<0.1	20.6	0.2	1	1			
04:45	0.0	<0.1	<0.1	20.6	0.2	<1	<1			
05:00	0.0	<0.1	<0.1	20.6	0.2	<1	1			
Steady	0.0	<0.1	<0.1	20.6	0.2	<1	1.0	#####	1.94	0.90
Peak	0.0	0.0	0.0	20.6	1.8	1.0	4.0	0.0	1.94	0.90

Date	Notes:		Barometric Pressure, mbar	1000
03.11.20	Engineer	IA		Steady
			Pressure Trend	
	Equipment	GFM430	Air Temp (°C)	6

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	-27.1	<0.1	<0.1	20.2	<0.1	<1	<1		3.02	2.18
00:15	0.0	<0.1	<0.1	2.5	13.7	<1	<1			
00:30	0.0	<0.1	<0.1	<0.1	14.0	<1	<1			
00:45	0.0	<0.1	<0.1	<0.1	14.2	<1	<1			
01:00	0.0	<0.1	<0.1	<0.1	15.1	<1	<1			
01:15	0.0	<0.1	<0.1	<0.1	15.9	<1	<1			
01:30	0.0	<0.1	<0.1	<0.1	16.6	<1	<1			
01:45	0.0	<0.1	<0.1	<0.1	16.8	<1	<1			
02:00	0.0	<0.1	<0.1	<0.1	17.0	<1	<1			
02:15	0.0	<0.1	<0.1	<0.1	17.2	<1	<1			
02:30	0.0	<0.1	<0.1	<0.1	17.4	<1	<1			
02:45	0.0	<0.1	<0.1	<0.1	17.4	<1	<1			
03:00	0.0	<0.1	<0.1	<0.1	17.4	<1	<1			
03:15		<0.1	<0.1	<0.1	17.4	<1	<1			
03:30		<0.1	<0.1	<0.1	17.4	<1	<1			
03:45		<0.1	<0.1	<0.1	17.3	<1	<1			
04:00		<0.1	<0.1	<0.1	17.1	<1	<1			
04:15		<0.1	<0.1	<0.1	17.0	<1	<1			
04:30		<0.1	<0.1	<0.1	16.9	<1	<1			
04:45		<0.1	<0.1	<0.1	16.9	<1	<1			
05:00		<0.1	<0.1	<0.1	16.8	<1	<1			
Steady	0.0	<0.1	<0.1	<0.1	16.8	<1	<1	#####	3.02	2.18
Peak	0.0	0.0	0.0	20.2	17.4	0.0	0.0	0.0	3.02	2.18

Date	Notes:		Barometric Pressure, mbar	1000
16/11/2020	Engineer	IA		Steady
			Pressure Trend	
	Equipment	GFM430	Air Temp (°C)	9

Gas Monitoring Certificate



Project Number C3257
Project Name The Homestead, Hurst Knowle Rd, Huddersfield
Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	0.0	<0.1	<0.1	19.3	0.3	<1	<1		2.77	2.24
00:15	0.0	<0.1	<0.1	0.3	7.1	<1	<1			
00:30	0.0	<0.1	<0.1	<0.1	7.2	<1	<1			
00:45	0.0	<0.1	<0.1	<0.1	7.3	<1	1			
01:00	0.0	<0.1	<0.1	<0.1	7.3	<1	<1			
01:15	0.0	<0.1	<0.1	<0.1	7.3	<1	<1			
01:30	0.0	<0.1	<0.1	<0.1	7.3	<1	<1			
01:45	0.0	<0.1	<0.1	<0.1	7.3	<1	<1			
02:00	0.0	<0.1	<0.1	<0.1	7.4	<1	<1			
02:15	0.0	<0.1	<0.1	<0.1	7.4	<1	<1			
02:30	0.0	<0.1	<0.1	<0.1	7.4	<1	<1			
02:45	0.0	<0.1	<0.1	<0.1	7.4	<1	<1			
03:00	0.0	<0.1	<0.1	<0.1	7.4	<1	<1			
03:15		<0.1	<0.1	<0.1	7.4	<1	<1			
03:30										
03:45										
04:00										
04:15										
04:30										
04:45										
05:00										
Steady	0.0	<0.1	<0.1	<0.1	7.4	<1	<1	#####	2.77	2.24
Peak	0.0	0.0	0.0	19.3	7.4	0.0	1.0	0.0	2.77	2.24

Date	Notes:		Barometric Pressure, mbar	1000
16/11/2020	Engineer	IA		Steady
	Equipment	GFM430	Air Temp (°C)	9

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	-5.8	<0.1	<0.1	19.6	0.2	1	<1		1.93	0.93
00:15	0.0	<0.1	<0.1	20.7	0.2	<1	1			
00:30	0.0	<0.1	<0.1	20.6	0.2	<1	1			
00:45	0.0	<0.1	<0.1	20.3	0.2	<1	<1			
01:00	0.0	<0.1	<0.1	19.6	0.3	<1	<1			
01:15	0.0	<0.1	<0.1	19.3	0.3	<1	<1			
01:30	0.0	<0.1	<0.1	19.0	0.3	<1	<1			
01:45	0.0	<0.1	<0.1	18.6	0.3	<1	<1			
02:00	0.0	<0.1	<0.1	18.5	0.3	<1	<1			
02:15	0.0	<0.1	<0.1	18.4	0.3	<1	<1			
02:30	0.0	<0.1	<0.1	18.3	0.3	<1	<1			
02:45	0.0	<0.1	<0.1	18.2	0.3	<1	<1			
03:00	0.0	<0.1	<0.1	18.0	0.3	<1	<1			
03:15		<0.1	<0.1	18.0	0.3	1	<1			
03:30		<0.1	<0.1	18.0	0.3	<1	<1			
03:45		<0.1	<0.1	17.9	0.4	<1	<1			
04:00		<0.1	<0.1	17.9	0.4	<1	<1			
04:15		<0.1	<0.1	17.9	0.4	1	<1			
04:30		<0.1	<0.1	17.9	0.4	1	<1			
04:45		<0.1	<0.1	17.8	0.4	1	<1			
05:00		<0.1	<0.1	17.8	0.4	<1	<1			
Steady	0.0	<0.1	<0.1	17.8	0.4	<1	<1	#####	1.93	0.93
Peak	0.0	0.0	0.0	20.7	0.4	1.0	1.0	0.0	1.93	0.93

Date	Notes:		Barometric Pressure, mbar	1000
16/11/2020	Engineer	IA		Steady
	Equipment	GFM430	Pressure Trend	
			Air Temp (°C)	9

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS1

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	-53.2	<0.1	<0.1	20.2	0.1	<1	<1		3.03	2.16
00:15	0.0	<0.1	<0.1	3.6	12.3	<1	<1			
00:30	0.0	<0.1	<0.1	0.0	12.7	<1	1			
00:45	0.0	<0.1	<0.1	<0.1	13.2	<1	<1			
01:00	0.0	<0.1	<0.1	2.0	9.6	<1	<1			
01:15	0.0	<0.1	<0.1	6.2	7.1	<1	<1			
01:30	0.0	<0.1	<0.1	8.5	5.4	<1	<1			
01:45	0.0	<0.1	<0.1	11.6	4.3	<1	1			
02:00	0.0	<0.1	<0.1	12.1	4.1	<1	<1			
02:15	0.0	<0.1	<0.1	13.1	3.4	<1	<1			
02:30	0.0	<0.1	<0.1	13.8	3.4	<1	<1			
02:45	0.0	<0.1	<0.1	13.7	3.4	<1	1			
03:00	0.0	<0.1	<0.1	14.0	3.1	<1	1			
03:15		<0.1	<0.1	14.1	3.1	<1	<1			
03:30		<0.1	<0.1	14.0	3.2	<1	<1			
03:45		<0.1	<0.1	14.0	3.4	<1	<1			
04:00		<0.1	<0.1	13.5	3.6	<1	<1			
04:15		<0.1	<0.1	13.2	3.9	<1	1			
04:30		<0.1	<0.1	13.3	3.8	<1	1			
04:45		<0.1	<0.1	13.4	3.8	<1	<1			
05:00		<0.1	<0.1	13.5	3.5	<1	<1			
Steady	0.0	<0.1	<0.1	13.5	3.5	<1	<1	#####	3.03	2.16
Peak	0.0	0.0	0.0	20.2	13.2	0.0	1.0	0.0	3.03	2.16

Date	Notes:		Barometric Pressure, mbar	1012
01/12/2020	Engineer	DRS		Steady
	Equipment	GFM430	Air Temp (°C)	3

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS2

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbg)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	-17.3	<0.1	<0.1	20.4	<0.1	<1	<1		2.80	2.39
00:15	0.0	<0.1	<0.1	2.3	7.9	1	2			
00:30	0.0	<0.1	<0.1	<0.1	8.2	<1	<1			
00:45	0.0	<0.1	<0.1	<0.1	8.4	<1	1			
01:00	0.0	<0.1	<0.1	<0.1	8.5	<1	<1			
01:15	0.0	<0.1	<0.1	<0.1	8.5	<1	1			
01:30	0.0	<0.1	<0.1	<0.1	8.6	<1	1			
01:45	0.0	<0.1	<0.1	<0.1	8.6	<1	<1			
02:00	0.0	<0.1	<0.1	<0.1	8.6	<1	1			
02:15	0.0	<0.1	<0.1	<0.1	8.6	<1	1			
02:30	0.0	<0.1	<0.1	<0.1	8.7	1	<1			
02:45	0.0	<0.1	<0.1	<0.1	8.6	<1	<1			
03:00	0.0	<0.1	<0.1	<0.1	8.6	<1	1			
03:15		<0.1	<0.1	<0.1	8.7	<1	3			
03:30		<0.1	<0.1	<0.1	8.7	<1	1			
03:45		<0.1	<0.1	<0.1	8.6	<1	1			
04:00		<0.1	<0.1	<0.1	8.7	<1	<1			
04:15		<0.1	<0.1	<0.1	8.6	<1	<1			
04:30		<0.1	<0.1	<0.1	8.7	<1	<1			
04:45		<0.1	<0.1	<0.1	8.6	<1	<1			
05:00		<0.1	<0.1	<0.1	8.6	<1	<1			
Steady	0.0	<0.1	<0.1	<0.1	8.6	<1	<1	#####	2.80	2.39
Peak	0.0	0.0	0.0	20.4	8.7	1.0	3.0	0.0	2.80	2.39

Date	Notes:			
01/12/2020	Engineer	DRS	Barometric Pressure, mbar	1012
			Pressure Trend	Steady
	Equipment	GFM430	Air Temp (°C)	3

Gas Monitoring Certificate



Project Number C3257
 Project Name The Homestead, Hurst Knowle Rd, Huddersfield
 Client Frank Shaw Associates

WS4

Time	Gas Flow Rate. (l/hr)	Detection Limit							Depth of Installation. (mbgl)	Depth of Groundwater (mbgl)
		<0.1	<0.1	<0.1	<0.1	<1	<1	<0.1		
		Methane. (%LEL)	Methane. (%vol)	Oxygen. (%vol)	Carbon Dioxide. (%vol)	Hydrogen Sulphide. (ppm)	Carbon Monoxide. (ppm)	Volatile Organic Carbon (ppm)		
00:00	-17.3	<0.1	<0.1	21.2	<0.1	<1	<1		1.91	1.00
00:15	0.0	<0.1	<0.1	21.4	<0.1	<1	3			
00:30	0.0	<0.1	<0.1	21.5	<0.1	<1	4			
00:45	0.0	<0.1	<0.1	21.7	<0.1	<1	3			
01:00	0.0	<0.1	<0.1	21.8	<0.1	<1	3			
01:15	0.0	<0.1	<0.1	21.7	0.5	<1	3			
01:30	0.0	<0.1	<0.1	21.2	0.7	<1	<1			
01:45	0.0	<0.1	<0.1	20.7	1.0	<1	<1			
02:00	0.0	<0.1	<0.1	20.4	1.2	2	4			
02:15	0.0	<0.1	<0.1	20.1	1.4	<1	<1			
02:30	0.0	<0.1	<0.1	19.9	1.6	<1	4			
02:45	0.0	<0.1	<0.1	19.7	1.7	<1	<1			
03:00	0.0	<0.1	<0.1	19.6	1.7	2	3			
03:15		<0.1	<0.1	19.4	1.9	<1	3			
03:30		<0.1	<0.1	19.4	1.9	<1	3			
03:45		<0.1	<0.1	19.3	1.9	<1	3			
04:00		<0.1	<0.1	19.2	2.0	<1	<1			
04:15		<0.1	<0.1	19.2	2.0	<1	<1			
04:30		<0.1	<0.1	19.2	2.0	<1	3			
04:45		<0.1	<0.1	19.1	2.1	<1	<1			
05:00		<0.1	<0.1	19.1	2.1	<1	<1			
Steady	0.0	<0.1	<0.1	19.1	2.1	<1	<1	#####	1.91	1.00
Peak	0.0	0.0	0.0	21.8	2.1	2.0	4.0	0.0	1.91	1.00

Date	Notes:		Barometric Pressure, mbar	1012
01/12/2020	Engineer	DRS		Steady
	Equipment	GFM430	Pressure Trend	3
			Air Temp (°C)	

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[illegible]

Gas Testing Summary



Project Number	C3257
Project Name	The Homestead, Hurst Knowle Rd, Huddersfield
Client	Frank Shaw Associates

Gas Flow Rate (l/hr)						
WS1	0	0	0	0	0	0
WS2	0	0	0	0	0	0
WS4	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

Volatile Organic Carbons (ppm)						
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

Atmospheric Pressure Range						
	1015	0	0	0	0	0

Max Methane Concentration (%vol)	1.4
Max Carbon Dioxide Concentration (%vol)	16.8
Max Carbon Monoxide Concentration (ppm)	1
Max Hydrogen Sulphide Concentration (ppm)	1
Max Flow Rate (l/hr)	0
Max Volatile Organic Carbon Concentration (ppm)	0
Methane Gas Screening Value	0
Carbon Dioxide Gas Screening Value	0

Carbon Monoxide Gas Screening Value	0
Hydrogen Sulphide Gas Screening Value	0
Maximum Gas Screening Value	0
Characteristic Situation 1	FAIL
Characteristic Situation 2	PASS
Characteristic Situation 3	PASS
Characteristic Situation 4	PASS
Characteristic Situation 5	PASS
Characteristic Situation 6	PASS
Hydrocarbon Vapour Barrier Required?	NO

Appendix VIII

Waste Classification Report



8UDT4-BJTSD-2UHGL

Job name

C3257 - Homestead, Hurst Knowle, Huddersfield

Description/Comments

Project

C3257 - Homestead, Hurst Knowle, Huddersfield

Site

Homestead, Hurst Knowle, Huddersfield

Related Documents

#	Name	Description
1	HWOL_20-23576-20201020 111626.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name: Howard Daley Date: 09 Nov 2020 09:45 GMT Telephone: 01773 535555	Company: HSP Consulting Engineers Limited Lawrence House 4 Meadowbank Way Eastwood 4 Meadowbank Way, Eastwood Nottingham NG16 3SB	HazWasteOnline™ Training Record: Course Hazardous Waste Classification Advanced Hazardous Waste Classification Date 11 Feb 2020 12 Feb 2020
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Report

Created by: Howard Daley
Created date: 09 Nov 2020 09:45 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01 0.60m	0.6	Non Hazardous		3
2	WS02 0.80m	0.80	Non Hazardous		6
3	WS03 0.25m	0.25	Non Hazardous		7
4	WS04 0.10m	0.10	Non Hazardous		10
5	WS04 0.45m	0.45	Non Hazardous		13
6	WS06 0.50m	0.50	Non Hazardous		14
7	WS07 0.40m	0.40	Non Hazardous		15
8	WS07 0.45m	0.45	Non Hazardous		18

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	19

Appendices	Page
Appendix B: Rationale for selection of metal species	20
Appendix C: Version	21

Classification of sample: WS01 0.60m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS01 0.60m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.6 m		
Moisture content:		
15%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				18 mg/kg	1.32	20.201 mg/kg	0.00202 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.45 mg/kg	3.22	1.232 mg/kg	0.000123 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.14 mg/kg	1.142	0.136 mg/kg	0.0000136 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				35 mg/kg	1.462	43.481 mg/kg	0.00435 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }				34 mg/kg	1.126	32.538 mg/kg	0.00325 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	40 mg/kg	1.56	53.034 mg/kg	0.0034 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				0.13 mg/kg	1.353	0.15 mg/kg	0.000015 %	✓	
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				36 mg/kg	2.976	91.074 mg/kg	0.00911 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.46 mg/kg	1.405	0.549 mg/kg	0.0000549 %	✓	
	034-002-00-8									
11	zinc { zinc chromate }				84 mg/kg	2.774	198.074 mg/kg	0.0198 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
14	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
15	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
19	pH				7.6 pH		7.6 pH	7.6 pH			
20	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				2.7 mg/kg		2.295 mg/kg	0.00023 %		✓	
		201-581-5	85-01-8								
25	anthracene				0.63 mg/kg		0.536 mg/kg	0.0000536 %		✓	
		204-371-1	120-12-7								
26	fluoranthene				3.2 mg/kg		2.72 mg/kg	0.000272 %		✓	
		205-912-4	206-44-0								
27	pyrene				3.3 mg/kg		2.805 mg/kg	0.000281 %		✓	
		204-927-3	129-00-0								
28	benzo[a]anthracene				1 mg/kg		0.85 mg/kg	0.000085 %		✓	
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				1.6 mg/kg		1.36 mg/kg	0.000136 %		✓	
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
36	sulfur { sulfur }				8.1 mg/kg		6.885 mg/kg	0.000689 %		✓	
	016-094-00-1	231-722-6	7704-34-9								
Total:									0.0452 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: WS02 0.80m



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS02 0.80m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.80 m		
Moisture content:		
12%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 12% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	• pH				9 pH		9 pH	9pH		
			PH							
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS03 0.25m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS03 0.25m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.25 m		
Moisture content:		
8.2%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 8.2% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				8.1 mg/kg	1.32	9.818 mg/kg	0.000982 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				<0.4 mg/kg	3.22	<1.288 mg/kg	<0.000129 %		<LOD
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.14 mg/kg	1.142	0.147 mg/kg	0.0000147 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				31 mg/kg	1.462	41.593 mg/kg	0.00416 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }				28 mg/kg	1.126	28.94 mg/kg	0.00289 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	16 mg/kg	1.56	22.911 mg/kg	0.00147 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				44 mg/kg	2.976	120.217 mg/kg	0.012 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				<0.2 mg/kg	1.405	<0.281 mg/kg	<0.0000281 %		<LOD
	034-002-00-8									
11	zinc { zinc chromate }				77 mg/kg	2.774	196.093 mg/kg	0.0196 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
14	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
15	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
19	pH				8.8 pH		8.8 pH	8.8 pH			
20	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
36	sulfur { sulfur }				<1 mg/kg		<1 mg/kg	<0.0001 %			<LOD
	016-094-00-1	231-722-6	7704-34-9								
Total:									0.0428 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: WS04 0.10m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	WS04 0.10m	LoW Code:	
Sample Depth:	0.10 m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	20%	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
(wet weight correction)			

Hazard properties

None identified

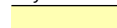
Determinands

Moisture content: 20% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number									
1	arsenic { arsenic trioxide }				19	mg/kg	1.32	20.069	mg/kg	0.00201 %	✓	
	033-003-00-0	215-481-4	1327-53-3									
2	boron { diboron trioxide; boric oxide }				1.1	mg/kg	3.22	2.833	mg/kg	0.000283 %	✓	
	005-008-00-8	215-125-8	1303-86-2									
3	cadmium { cadmium oxide }				0.28	mg/kg	1.142	0.256	mg/kg	0.0000256 %	✓	
	048-002-00-0	215-146-2	1306-19-0									
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				36	mg/kg	1.462	42.093	mg/kg	0.00421 %	✓	
		215-160-9	1308-38-9									
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5	mg/kg	1.923	<0.962	mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0									
6	copper { dicopper oxide; copper (I) oxide }				28	mg/kg	1.126	25.22	mg/kg	0.00252 %	✓	
	029-002-00-X	215-270-7	1317-39-1									
7	lead { lead chromate }			1	47	mg/kg	1.56	58.649	mg/kg	0.00376 %	✓	
	082-004-00-2	231-846-0	7758-97-6									
8	mercury { mercury dichloride }				0.19	mg/kg	1.353	0.206	mg/kg	0.0000206 %	✓	
	080-010-00-X	231-299-8	7487-94-7									
9	nickel { nickel chromate }				23	mg/kg	2.976	54.763	mg/kg	0.00548 %	✓	
	028-035-00-7	238-766-5	14721-18-7									
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.5	mg/kg	1.405	0.562	mg/kg	0.0000562 %	✓	
	034-002-00-8											
11	zinc { zinc chromate }				78	mg/kg	2.774	173.107	mg/kg	0.0173 %	✓	
	024-007-00-3	236-878-9	13530-65-9									
12	TPH (C6 to C40) petroleum group				<10	mg/kg		<10	mg/kg	<0.001 %		<LOD
			TPH									
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4									

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
14	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-020-00-8	200-753-7	71-43-2							
15	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-021-00-3	203-625-9	108-88-3							
16	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	601-023-00-4	202-849-4	100-41-4							
17	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %		<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]							
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.6 mg/kg	1.884	0.904 mg/kg	0.0000904 %	✓	
	006-007-00-5									
19	pH				7 pH		7 pH	7pH		
			PH							
20	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
	601-052-00-2	202-049-5	91-20-3							
21	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		205-917-1	208-96-8							
22	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-469-6	83-32-9							
23	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %		<LOD
		201-695-5	86-73-7							
24	phenanthrene				5.3 mg/kg		4.24 mg/kg	0.000424 %	✓	
		201-581-5	85-01-8							
25	anthracene				1.2 mg/kg		0.96 mg/kg	0.000096 %	✓	
		204-371-1	120-12-7							
26	fluoranthene				6 mg/kg		4.8 mg/kg	0.00048 %	✓	
		205-912-4	206-44-0							
27	pyrene				5.8 mg/kg		4.64 mg/kg	0.000464 %	✓	
		204-927-3	129-00-0							
28	benzo[a]anthracene				2.2 mg/kg		1.76 mg/kg	0.000176 %	✓	
	601-033-00-9	200-280-6	56-55-3							
29	chrysene				2.5 mg/kg		2 mg/kg	0.0002 %	✓	
	601-048-00-0	205-923-4	218-01-9							
30	benzo[b]fluoranthene				2.7 mg/kg		2.16 mg/kg	0.000216 %	✓	
	601-034-00-4	205-911-9	205-99-2							
31	benzo[k]fluoranthene				1.4 mg/kg		1.12 mg/kg	0.000112 %	✓	
	601-036-00-5	205-916-6	207-08-9							
32	benzo[a]pyrene; benzo[def]chrysene				2.1 mg/kg		1.68 mg/kg	0.000168 %	✓	
	601-032-00-3	200-028-5	50-32-8							
33	indeno[123-cd]pyrene				1.2 mg/kg		0.96 mg/kg	0.000096 %	✓	
		205-893-2	193-39-5							
34	dibenz[a,h]anthracene				0.3 mg/kg		0.24 mg/kg	0.000024 %	✓	
	601-041-00-2	200-181-8	53-70-3							
35	benzo[ghi]perylene				1.9 mg/kg		1.52 mg/kg	0.000152 %	✓	
		205-883-8	191-24-2							
36	sulfur { sulfur }				10 mg/kg		8 mg/kg	0.0008 %	✓	
	016-094-00-1	231-722-6	7704-34-9							
Total:								0.0403 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS04 0.45m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS04 0.45m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.45 m		
Moisture content:		
17%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	• pH				7.5 pH		7.5 pH	7.5 pH		
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS06 0.50m



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS06 0.50m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.50 m		
Moisture content:		
18%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
1	• pH				7.8 pH		7.8	pH	7.8 pH		
			PH								
Total:									0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Classification of sample: WS07 0.40m

✔ **Non Hazardous Waste**
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS07 0.40m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.40 m		
Moisture content:		
17%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	arsenic { arsenic trioxide }				14 mg/kg	1.32	15.342 mg/kg	0.00153 %	✓	
	033-003-00-0	215-481-4	1327-53-3							
2	boron { diboron trioxide; boric oxide }				0.42 mg/kg	3.22	1.122 mg/kg	0.000112 %	✓	
	005-008-00-8	215-125-8	1303-86-2							
3	cadmium { cadmium oxide }				0.17 mg/kg	1.142	0.161 mg/kg	0.0000161 %	✓	
	048-002-00-0	215-146-2	1306-19-0							
4	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }				26 mg/kg	1.462	31.54 mg/kg	0.00315 %	✓	
		215-160-9	1308-38-9							
5	chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.5 mg/kg	1.923	<0.962 mg/kg	<0.0000962 %		<LOD
	024-001-00-0	215-607-8	1333-82-0							
6	copper { dicopper oxide; copper (I) oxide }				22 mg/kg	1.126	20.559 mg/kg	0.00206 %	✓	
	029-002-00-X	215-270-7	1317-39-1							
7	lead { lead chromate }			1	25 mg/kg	1.56	32.366 mg/kg	0.00208 %	✓	
	082-004-00-2	231-846-0	7758-97-6							
8	mercury { mercury dichloride }				<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
	080-010-00-X	231-299-8	7487-94-7							
9	nickel { nickel chromate }				23 mg/kg	2.976	56.817 mg/kg	0.00568 %	✓	
	028-035-00-7	238-766-5	14721-18-7							
10	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.29 mg/kg	1.405	0.338 mg/kg	0.0000338 %	✓	
	034-002-00-8									
11	zinc { zinc chromate }				60 mg/kg	2.774	138.152 mg/kg	0.0138 %	✓	
	024-007-00-3	236-878-9	13530-65-9							
12	TPH (C6 to C40) petroleum group				<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
			TPH							
13	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
	603-181-00-X	216-653-1	1634-04-4							

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number								
14	benzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-020-00-8	200-753-7	71-43-2								
15	toluene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-021-00-3	203-625-9	108-88-3								
16	ethylbenzene				<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %			<LOD
	601-023-00-4	202-849-4	100-41-4								
17	xylene				<0.002 mg/kg		<0.002 mg/kg	<0.0000002 %			<LOD
	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]								
18	cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				<0.5 mg/kg	1.884	<0.942 mg/kg	<0.0000942 %			<LOD
	006-007-00-5										
19	pH				6.5 pH		6.5 pH	6.5 pH			
20	naphthalene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-052-00-2	202-049-5	91-20-3								
21	acenaphthylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-917-1	208-96-8								
22	acenaphthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-469-6	83-32-9								
23	fluorene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-695-5	86-73-7								
24	phenanthrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		201-581-5	85-01-8								
25	anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-371-1	120-12-7								
26	fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-912-4	206-44-0								
27	pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		204-927-3	129-00-0								
28	benzo[a]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-033-00-9	200-280-6	56-55-3								
29	chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-048-00-0	205-923-4	218-01-9								
30	benzo[b]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-034-00-4	205-911-9	205-99-2								
31	benzo[k]fluoranthene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-036-00-5	205-916-6	207-08-9								
32	benzo[a]pyrene; benzo[def]chrysene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-032-00-3	200-028-5	50-32-8								
33	indeno[123-cd]pyrene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-893-2	193-39-5								
34	dibenz[a,h]anthracene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
	601-041-00-2	200-181-8	53-70-3								
35	benzo[ghi]perylene				<0.1 mg/kg		<0.1 mg/kg	<0.00001 %			<LOD
		205-883-8	191-24-2								
36	sulfur { sulfur }				1.5 mg/kg		1.245 mg/kg	0.000125 %		✓	
	016-094-00-1	231-722-6	7704-34-9								
Total:									0.03 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1 Only the metal concentration has been used for classification	

Classification of sample: WS07 0.45m



Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
WS07 0.45m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Sample Depth:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
0.45 m		
Moisture content:		
8.3%		
(wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 8.3% Wet Weight Moisture Correction applied (MC)

#	Determinand			CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number	EC Number	CAS Number							
1	• pH				7 pH		7 pH	7pH		
			PH							
Total:								0%		

Key

- User supplied data
- Determinand defined or amended by HazWasteOnline (see Appendix A)

Appendix A: Classifier defined and non CLP determinands

■ **chromium(III) oxide (worst case)** (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462

Description/Comments: Data from C&L Inventory Database

Data source: <https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H332 , Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Resp. Sens. 1 H334 , Skin Sens. 1 H317 , Repr. 1B H360FD , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **TPH (C6 to C40) petroleum group** (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: Flam. Liq. 3 H226 , Asp. Tox. 1 H304 , STOT RE 2 H373 , Muta. 1B H340 , Carc. 1B H350 , Repr. 2 H361d , Aquatic Chronic 2 H411

■ **ethylbenzene** (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4

Description/Comments:

Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)

Additional Hazard Statement(s): Carc. 2 H351

Reason for additional Hazards Statement(s):

03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

■ **salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex**

CLP index number: 006-007-00-5

Description/Comments: Conversion factor based on a worst case compound: sodium cyanide

Data source: Commission Regulation (EC) No 790/2009 - 1st Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP1)

Additional Hazard Statement(s): EUH032 >= 0.2 %

Reason for additional Hazards Statement(s):

14 Dec 2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

■ **pH** (CAS Number: PH)

Description/Comments: Appendix C4

Data source: WM3 1st Edition 2015

Data source date: 25 May 2015

Hazard Statements: None.

■ **acenaphthylene** (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Acute Tox. 4 H302 , Acute Tox. 1 H330 , Acute Tox. 1 H310 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315

■ **acenaphthene** (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Aquatic Chronic 2 H411

■ **fluorene** (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **phenanthrene** (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Carc. 2 H351 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410 , Skin Irrit. 2 H315

■ **anthracene** (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 17 Jul 2015

Hazard Statements: Eye Irrit. 2 H319 , STOT SE 3 H335 , Skin Irrit. 2 H315 , Skin Sens. 1 H317 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **fluoranthene** (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Acute Tox. 4 H302 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **pyrene** (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 21 Aug 2015

Hazard Statements: Skin Irrit. 2 H315 , Eye Irrit. 2 H319 , STOT SE 3 H335 , Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

■ **indeno[123-cd]pyrene** (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 06 Aug 2015

Hazard Statements: Carc. 2 H351

■ **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015

Data source: <http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database>

Data source date: 23 Jul 2015

Hazard Statements: Aquatic Acute 1 H400 , Aquatic Chronic 1 H410

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

boron {diboron trioxide; boric oxide}

Reasonable case CLP species based on hazard statements/ molecular weight, physical form and low solubility. Industrial sources include: fluxing agent for glass/enamels; additive for fibre optics, borosilicate glass (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide (worst case)}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worst case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulposelenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulposelenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

cyanides {salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case as complex cyanides and those specified elsewhere in the annex are not likely to be present in this soil: [Note conversion factor based on a worst case compound: sodium cyanide] (edit as required)

sulfur {sulfur}

Elemental sulfur most likely to be worst case scenario hazardous

Appendix C: Version

HazWasteOnline Classification Engine: **WM3 1st Edition v1.1, May 2018**

HazWasteOnline Classification Engine Version: 2020.310.4521.8789 (05 Nov 2020)

HazWasteOnline Database: 2020.310.4521.8789 (05 Nov 2020)

This classification utilises the following guidance and legislation:

WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010



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