

8th June 2018

Our Ref: AHB/ST/41027-Lt002

Mears Group Plc
Junction 7 Business Park Great
Eastern House Wakefield Road
Leeds
West Yorkshire
LS10 3DQ

For the attention of Mr D. Morley

Dear Sirs,

We recently completed an additional intrusive ground investigation at Baden Street, Worsbrough, Barnsley, S70 5PA. The site location is detailed on the attached Figure 41027/001. The additional ground investigation works were undertaken following the demolition of terrace houses in order to further develop the ground model of the site.

The recorded geology at the site is the Pennine Middle Coal Measures Formation which comprises interbedded mudstone, siltstone, sandstone and commonly coal seams. No superficial deposits are recorded at the site.

Previous Site Investigation Works – Hamson Barron Smith Ltd – March 2016

Hamson Barron Smith have previously undertaken a Preliminary Land Contamination and Geotechnical Risk Assessment, dated March 2016 (Ref: 12-17-16-1-6007/DSR1) and Ground Investigation Report, dated September 2017 (Ref: 23-24-18-1-6004/GIR1). These works were undertaken prior to the demolition of the terrace houses and were therefore unable to investigate under the footprint of these properties.

As part of this work, two rotary boreholes were undertaken to determine the presence or absence of coal workings as part of the coal mining risk assessment.

The investigation identified firm becoming stiff clay with mudstone bedrock at depth. Coal was present at 16.00m to 17.60m (BH 'R1') and 3.60m to 5.50m, 18.95m to 19.10m (BH 'R2'), and 5.00m to 5.42m (BH 'M6'). No voids or other evidence of workings were observed.

Elevated lead, benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene concentrations across the site are elevated with respect to the GAC for a residential end use and may pose a risk to human health. It was recommended that a capping system is implemented across areas of soft landscaping, which should be designed according to BRE guidance.

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Alan Wood & Partners Site Investigation Works – May 2018

Alan Wood & Partners have recently undertaken additional intrusive site investigation works following the demolition of terrace houses at the site. The additional ground investigation comprised six mechanically excavated trial pits to a maximum depth of 3.65m bgl and one rotary borehole to 30m bgl. A summary of the encountered ground conditions is presented in Table 1.0 below. An exploratory hole location plan is presented in Figure 41027/002. A copy of the exploratory logs has been included with this report.

Table 1.0; Summary of ground Conditions

Lithology	Exploration Location	Depth range (m bgl)	Approximate Average Thickness (m)	Allowable Safe Bearing Capacity kN/m²
Made Ground	All locations	0.25 to 0.80	0.50	N/A
Medium Dense Clayey Gravelly Sand	All locations except TP101, TP105 AND BH101	0.25 to 3.2+	1.20	100-120
Firm Sandy Gravelly Clay	All locations except TP102	0.34 to 3.65+	3.00	100-120
Pennine Middle Coal Measures	BH101	3.10 to 30.00+	Unknown	230
Groundwater	Arising's recovered wet or moist below 2.50m bgl within TP101, below 2.60m bgl within TP105 and below 2.30m bgl within TP106. A groundwater strike was encountered between 5.80m bgl and 6.00m bgl within BH101.			

The encountered ground conditions comprised made ground across the site to a general depth of around 0.50m bgl. The made ground is loose brown, clayey gravelly sand containing anthropogenic material including brick, metal, porcelain, wood, slate, glass and plastic. The made ground was relatively shallow in trial pits undertaken in the area of former terrace houses (0.25m thick within TH4 and 0.34m thick within TP6) and generally deeper in other areas of the site.

No cellars/basements were encountered in any of the trial pits excavated but it should be noted that one former property in the far south east of the site did have a cellar which has been excavated to form a depression in the ground.

Groundwater was encountered within BH101 at 5.80m bgl to 6.00m bgl at the boundary between an upper sandstone unit and a lower mudstone unit within the Pennine Middle Coal Measures. No perched groundwater was encountered within the trial pits but the firm sandy, clay was recovered wet or moist below a general depth of 2.5m bgl.

Below the made ground is either medium dense, clayey gravelly sand or firm sandy, gravelly clay to sandstone of the Middle Pennine Coal Measures or to the base of the trial pits. The gravel fraction on both of these is generally fine to coarse, angular to sub-rounded sandstone but mudstone and coal was also encountered. These soil horizons are interpreted as being fully weathered Pennine Middle Coal Measures. Below the sands and clays is sandstone of the Pennine Middle Coal Measures which is 2.7m thick. Groundwater was encountered below this at 5.8m bgl to 6.00m bgl.

The Pennine Middle Coal Measures below this comprise grey mudstone which is moderately strong to 9.50m bgl and strong below this to at least 30.00m bgl where the borehole was terminated. An intact coal seam, 0.50m thick was encountered at 8.10m bgl with no voids.

The previous ground investigation works undertaken by Hamson Barron Smith in 2017 encountered coal at 16.00m to 17.60m (BH 'R1') and 3.60m to 5.50m, 18.95m to 19.10m (BH 'R2'), and 5.00m to 5.42m (BH 'M6'). No voids or other evidence of workings were observed by Hamson Barron Smith as part of these works.

As voids or other evidence of workings have not been observed across the site, risk associated with coal mining is considered to be low.

Environmental Laboratory Analysis

Contamination and Performance of Building Materials (Cementitious Products)

Nine soil samples were analysed for a suite of contaminants consistent with BRE Special Digest 1 'Concrete in Aggressive Ground' (2005). A copy of the individual test results has been included in this report.

The pH values recorded for the soil samples ranged between 6.9 and 8.1 (pH units) with an average of 7.6, indicating near neutral (acid/alkaline) conditions prevail within the on-site soils. Water soluble sulphate analysis of the soils yielded concentrations between <0.01g/l (<100mg/l) and 2.24g/l (2,247mg/l) in the samples (0.628g/l on average).

The elevated concentration of water soluble sulphate encountered at 2,247mg/l at TP4 0.20m bgl is considered to represent an outlier and is not representative of the site conditions. This material is located under the footprint of the existing structure and is anticipated to be removed from the site as part of the demolition works.

An assessment of the data was carried out in accordance with Section C4 'Site Investigation for Aggressive Ground Conditions' and the procedure prescribed in Section C5 'Classification of Site Locations for Chemicals Aggressive to Concrete' of BRE SD1 (2005) to assess whether ground conditions at the site are potentially aggressive to buried concrete products.

The outlier test result has not been incorporated in the assessment as it is not considered to be representative of the site. The results of the assessment indicate that a Design Sulphate classification of DS-1 may be adopted along with an ACEC class of AC-1s. However, it is recommended that a DS-2

classification is adopted due to the presence of made ground material. Static groundwater conditions have been assumed in this assessment.

Laboratory Chemical Testing

Preamble

Representative samples of the on-site soils were recovered from the trial pits that were positioned to provide coverage of the site area under investigation. Sampling was undertaken in accordance with those guidelines prescribed in BS 10175:2011. All environmental samples were collected in 500ml plastic tubs with sealable lids, 250ml glass amber jars or vials (subject to analytical requirements). Care was taken to minimise cross contamination (i.e. wiping of equipment) between sampling. Environmental samples were packed into cool boxes with ice packs and transported by courier to Chemtest, an MCERTS and UKAS accredited laboratory for analysis and subsequent storage.

The analytical strategy adopted for the environmental investigation was designed to provide an overall assessment of potential contaminants thought to likely be present within the on-site soils.

During the ground investigation, made ground across the site, to an approximate average depth of 0.50m bgl, comprised a range of anthropogenic material described above which could present a source of contaminants within near surface soils. The made ground samples collected from the site are therefore a target of environmental laboratory testing.

Anecdotal evidence of sewage sludge leaking to the surface in the south west of the site, from a foul sewer which runs north – south near the sites western boundary may also present a source of contamination. Samples of near surface soils from this area were collected and are a target of pathogen testing. No visual or olfactory evidence of hydrocarbons was noted.

Soil testing undertaken was for a suite of contaminants in general accordance with NHBC Standards Chapter 4.1 'Land Quality – Managing Ground Conditions' and CLR 8 'Potential Contaminants for the Assessment of Land' (withdrawn but used for reference purposes where applicable).

The testing of the following analytes was scheduled on selected samples:

- Heavy metals suite (including As, Cd, Cr, Cu, Hg, Pb, Ni, Zn);
- Speciated Polycyclic Aromatic Hydrocarbons;
- Speciated Total Petroleum Hydrocarbons (TPHCWG);
- BTEX;
- Cyanide (free and total) and Thiocyanate;
- Phenol (total);
- Sulphates (Total and Water Soluble);
- Asbestos fibres;
- β -glucoronidase positive escherichia coli;
- Salmonella;
- Sulphide; and
- pH.

Guidance for Analytical Results - Assessment Criteria

Soil

With reference to the proposed end use of the site, the results of the chemical testing were assessed as part of an environmental risk assessment against a number of potential receptors, considering risks to human health, environmental quality and the built environment. Such risk assessment comprises the initial comparison of the measured soil concentrations with Generic Assessment Criteria (GAC), which in this instance are considered protective of a *commercial* end use.

Changes to UK human health risk assessment has seen the introduction of DEFRA's Category 4 Screening Levels (2014) and the LQM/CIEH Suitable 4 Use Levels (2015). Both set out to provide generic assessment criteria on the basis of updated assumptions relating to the modelling of human exposure to soil contaminants for the standard land uses: residential (with and without home-grown produce), allotments, commercial and public open space.

The general consensus between contaminated land practitioners is that the C4SL values, which are based on the low level of toxicological concern (LLTC), are less cautious than the newly revised GAC values published by LQM/CIEH and may not, therefore, be wholly applicable for use outside the context of Part 2A Statutory Guidance. Although both publications in no way undermine the validity of existing Environment Agency guidance presented in, for example, SR2, SR3 and the existing CLEA software, we are of the mind that the LQM/CIEH S4UL values, which are based on Health Criteria that represents minimal or tolerable levels of risks to health (as described in the Environment Agency's SR2 guidance) but incorporates the updated exposure assumptions presented in DEFRA's C4SL guidance, provide a better starting point from which to generate generic assessment criteria that can be applied to brownfield development sites and are 'suitable for use' under the planning system.

It should be noted that both approaches are based on sandy loam soil with 6% soil organic matter (SOM). Whilst this does not present a problem for metals, as they are not dependent on soil type or SOM, the algorithms used to model plant uptake and volatilisation for organic contaminants do take account of SOM content in the soil. The GAC values for metals in the standard land uses may therefore be directly applied, whether these are C4SL or S4UL derived, whilst independent GAC values for organics (e.g. PAH, TPH) have been generated using CLEA Version 1.071 and the toxicological updates presented in the aforementioned documents. These have also been adjusted for soil type and are calculated for SOM contents at 1%, 2.5% and 6% for a sandy soil.

A summary of the generic assessment criteria values is presented as part of this report.

Test Results

The chemical analysis results and screening criteria are summarised in Tables 2.0 to 6.0 below and overleaf.

Table 2.0; Summary of Total Soil Concentrations

Contaminant of Concern	GAC* (mg/kg)	Contaminant Concentrations (mg/kg)		No. of Samples Tested	No. of Samples >GAC	Pass/Fail Tier 1 GAC Screen
		Min	Max			
Metals						
Arsenic (inorganic)	37	6.9	29	13	0	PASS
Cadmium	22	<0.10	1.4	13	0	PASS
Chromium (III)	910	11	180	13	0	PASS
Copper	2,400	9.9	1,289	13	0	PASS
Mercury (inorganic)	40	<0.1	0.23	13	0	PASS
Nickel	130	13	61	13	0	PASS
Lead	200	15	290	13	2	FAIL
Selenium	250	<0.2	1.0	13	0	PASS
Zinc	3,700	56	929	13	0	PASS

* DEFRA (2014). Development of Category 4 Screening Levels (SP1010);

** LQM/CIEH (2015). S4UL for Human Health Risk Assessment.

Table 3.0; Summary of Chemical Test Results (PAH)

Contaminant of Concern	GAC* (mg/kg)	Contaminant Concentrations (mg/kg)		No. of Samples Tested	No. of Samples >GAC	Pass/Fail Tier 1 GAC Screen
		Min	Max			
Naphthalene	1	<0.01	2.1	16	5	FAIL
Acenaphthylene	170	<0.01	20	16	0	PASS
Acenaphthene	200	<0.01	2.2	16	0	PASS
Fluorene	165	<0.01	6.0	16	0	PASS
Phenanthrene	95	<0.02	55	16	0	PASS
Anthracene	2,300	<0.02	30	16	0	PASS
Fluoranthene	280	<0.02	170	16	0	PASS
Pyrene	620	<0.02	170	16	0	PASS
Benzo(a)anthracene	7.5	<0.02	120	16	6	FAIL
Chrysene	15	<0.01	130	16	3	FAIL
Benzo(b)fluoranthene	2.6	<0.02	140	16	9	FAIL
Benzo(k)fluoranthene	77	<0.02	56	16	0	PASS
Benzo(a)pyrene	2.2	<0.02	110	16	9	FAIL
Dibenzo(a,h)anthracene	0.24	<0.02	20	16	10	FAIL
Indeno(1,2,3-cd)pyrene	27	<0.02	71	16	3	FAIL
Benzo(g,h,i)perylene	315	<0.02	59	16	0	PASS

* [CLEA/LQM/CIEH, 2015] Calculated for residential end-use scenario, with plant uptake in CLEA v1.071. GAC range for 1.0% SOM used unless stated otherwise. Values will be more conservative for cohesive soils.

Table 4.0; Summary of Chemical Test Results (TPH)

Contaminant of Concern	GAC* (mg/kg)	Contaminant Concentrations (mg/kg)		No. of Sample s Tested	No. of Samples >GAC	Pass/Fail Tier 1 GAC Screen
		Min	Max			
Aromatic						
TPH (>EC5-EC7)	50	<0.01	<1.0	13	0	PASS
TPH (>EC7-EC8)	100	<0.01	0.02	13	0	PASS
TPH (>EC8-EC10)	20	<0.01	15	13	0	PASS
TPH (>EC10-EC12)	63	<1.0	35	13	0	PASS
TPH (>EC12-EC16)	140	<1.0	460	13	1	FAIL
TPH (>EC16-EC21)	260	<1.0	2,400	13	3	FAIL
TPH (>EC21-EC35)	1,100	<1.0	9,200	13	3	FAIL
TPH (>EC35-EC44)	1,100	<1.0	970	13	0	PASS
Aliphatic						
TPH (>EC5-EC6)	24	<0.1	<1.0	13	0	PASS
TPH (>EC6-EC8)	52	<0.1	0.3	13	0	PASS
TPH (>EC8-EC10)	13	<0.1	2.5	13	0	PASS
TPH (>EC10-EC12)	60	<1.0	<4	13	0	PASS
TPH (>EC12-EC16)	500	<1.0	130	13	0	PASS
TPH (>EC16-EC35)	41,000	<1.0	710	13	0	PASS
TPH (>EC35-EC44)	41,000	<1.0	130	13	0	PASS

* [CLEA/LQM/CIEH, 2015] Calculated for residential end-use scenario, with plant uptake in CLEA v1.071. GAC range for 1% SOM used unless stated otherwise. Values will be more conservative for cohesive soils.

Table 5.0; Summary of Chemical Test Results (TPH)

Contaminant of Concern	GAC* (mg/kg)	Contaminant Concentrations (mg/kg)		No of Samples Tested	No of Samples >GAC	Pass/Fail Tier 1 GAC Screen
		Min	Max			
Benzene	0.06	<0.001	<0.01	13	0	PASS
Toluene	104	<0.001	0.03	13	0	PASS
Ethylbenzene	30	<0.001	<0.01	13	0	PASS
m & p-xylene	30	<0.001	<0.02	13	0	PASS

* [CLEA/LQM/CIEH, 2015] Calculated for residential end-use scenario, with plant uptake in CLEA v1.071. GAC range for 1% SOM used unless stated otherwise. Values will be more conservative for cohesive soils.

Table 6.0; Summary of Chemical Test Results (Pathogen Suite)

Contaminant of Concern	Contaminant Concentrations (cfu/g)		No of Samples Tested	No of elevated samples
	Min	Max		
β-Glucoronidase Positive Escherichia coli	<10		2	0
Salmonella	Not detected		2	0

cfu = number of viable bacteria or fungal cells in a sample

Metals, Metalloids and Other Inorganic Analytes

A total of thirteen soil samples were analysed for a range of inorganic contaminants.

Assessment of the soils data indicates that lead (TP3 ES2 at 0.35m bgl, and BH M5 at 0.10m bgl) were elevated above the relevant GAC criteria.

It is recommended that a site strip is carried out across all areas of soft landscaping to 600mm bgl. This material should be replaced with clean, imported topsoil and subsoil material. The capping material should be designed in accordance with BRE guidance.

Organics (PAH)

A total of sixteen soil samples were analysed for PAH contaminants.

Assessment of the soils data indicates that five contaminants were elevated above the relevant GAC criteria;

- Naphthalene (TP2 at 0.30m, TP3 at 0.15m, TP3 at 0.55m, TP4 at 0.20m, and BH M5 at 0.10m);
- Benzo(a)anthracene (TP4 ES1 at 0.20m, TP5 ES2 0.45m, TP2 at 0.30m, TP3 at 0.15m, TP3 at 0.55m, and TP4 at 0.20m);
- Benzo(b)fluoranthene (TP1 ES2 at 0.50, TP4 ES1 at 0.20m, TP5 ES2 0.45m, TP2 at 0.30m, TP3 at 0.15m, TP3 at 0.55m, TP4 at 0.20m, BH M5 at 0.10m, and BH M5 at 0.30m);
- Benzo(a)pyrene (TP1 ES2 at 0.50, TP4 ES1 at 0.20m, TP5 ES2 0.45m, TP2 at 0.30m, TP3 at 0.15m, TP3 at 0.55m, TP4 at 0.20m, BH M5 at 0.10m, and BH M5 at 0.30m); and
- Dibenz(a,h)anthracene (TP1 ES2 at 0.50, TP2 ES1 at 0.25m, TP4 ES1 at 0.20m, TP5 ES2 0.45m, TP2 at 0.30m, TP3 at 0.15m, TP3 at 0.55m, TP4 at 0.20m, BH M5 at 0.10m, and BH M5 at 0.30m).

Four identified contaminant hot spots with organic (PAH) contaminants are located under areas of proposed hardstanding; TP1 ES2 at 0.50, TP4 ES1 at 0.20m, TP2 at 0.30m, TP3 at 0.15m, and TP3 at 0.55m. These deposits and are likely to be removed as part of the proposed development works.

Four contaminant hotspots with organic (PAH) contaminants have been identified within areas of soft landscaping; TP1 at 0.50m, TP5 at 0.45m, TP4 at 0.20m, BH M5 at 0.10m, and BH M5 at 0.30m.

It is recommended that a site strip is carried out across all areas of soft landscaping to 600mm bgl. This material should be replaced with clean, imported topsoil and subsoil material. The capping material should be designed in accordance with BRE guidance.

Organics (TPH, BTEX)

A total of six soil samples were analysed for TPH and BTEX contaminants.

Assessment of the soils data indicates that no contaminants were elevated above the relevant GAC criteria.

Assessment of the soils data indicates that five contaminants were elevated above the relevant GAC criteria;

- Aromatic TPH >C12-C16 (*TP3 at 0.15m*);
- Aromatic TPH >16-C21 (*TP2 at 0.30m, TP3 at 0.15m, and TP4 at 0.20m*); and
- Aromatic TPH >C21-C35 (*TP2 at 0.30m, TP3 at 0.15m, and TP4 at 0.20m*).

Two identified contaminant hot spots with organic (TPH) contaminants are located under areas of proposed hardstanding; *TP2 at 0.30m, and TP3 at 0.15m*. These deposits and are likely to be removed as part of the proposed development works.

One contaminant hotspot with organic (TPH) contaminants has been identified within areas of soft landscaping; *TP4 at 0.20m*.

It is recommended that a site strip is carried out across all areas of soft landscaping to 600mm bgl. This material should be replaced with clean, imported topsoil and subsoil material. The capping material should be designed in accordance with BRE guidance.

Organics (Pathogen Suite)

Two samples were analysed for β -glucoronidase positive escherichia coli and salmonella. These suites have been tested in order to establish risk associated with contamination of a faecal origin. The results show recorded concentrations of the β -glucoronidase positive escherichia coli pathogen suite was below the laboratory limit of detection and salmonella was not detected. As a result, risk to human health associated with β -glucoronidase positive escherichia coli and salmonella is considered to be very low.

Asbestos

A total of six soil samples were analysed. No asbestos fibres were detected in the samples tested.

Risk associated with asbestos containing materials is therefore not anticipated.

Conclusions and Recommendations

Controlled Waters Receptors

Hamson Barron Smith Ltd have established risk associated with controlled waters to be 'Low'.

Ecological Receptors

There are no ecological receptors at the site.

Utilities

It is recommended that the results of the chemical testing and details of the proposed redevelopment of the site are provided to the appropriate utility companies to determine the necessity for service protection.

Hamson Barron Smith Ltd have established risk associated with controlled waters to be 'Low'.

Potable Water Supplies

On the basis of available test results it is likely that protective measures will be required. Consultation should however be undertaken with the local water authority with respect to any precautions they may require, prior to construction.

Ground Gas Risk

Ground gas risk has been completed as part of the previous ground investigation report by Hamson Barron Smith Ltd. This report concluded that negligible risk is present beneath the site. Ground gas protection is therefore not required.

Asbestos Containing Materials

No asbestos fibres were identified in the samples near surface soils analysed by the laboratory. Risks to construction workers and site end users are considered to be moderate/low. Although no risk is anticipated, risk cannot be revised given the severity associated with exposure to asbestos.

Radon Precautions

No radon protection measures are required in construction.

Construction - Risk Evaluation

Site Preparation

Significant enabling works are not anticipated, with only limited re-grading of the ground being anticipated in order to achieve finished ground levels.

Sulphate Attack

Contamination and Performance of Building Materials (Cementitious Products)

Nine soil samples were analysed for a suite of contaminants consistent with BRE Special Digest 1 'Concrete in Aggressive Ground' (2005). A copy of the individual test results has been included in this report.

The pH values recorded for the soil samples ranged between 6.9 and 8.1 (pH units) with an average of 7.6, indicating near neutral (acid/alkaline) conditions prevail within the on-site soils. Water soluble sulphate analysis of the soils yielded concentrations between <0.01g/l (<100mg/l) and 2.24g/l (2,247mg/l) in the samples (0.628g/l on average).

The elevated concentration of water soluble sulphate encountered at 2,247mg/l at TP4 0.20m bgl is considered to represent an outlier and is not representative of the site conditions. This material is located under the footprint of the existing structure and is anticipated to be removed from the site as part of the demolition works.

An assessment of the data was carried out in accordance with Section C4 'Site Investigation for Aggressive Ground Conditions' and the procedure prescribed in Section C5 'Classification of Site Locations for Chemicals Aggressive to Concrete' of BRE SD1 (2005) to assess whether ground conditions at the site are potentially aggressive to buried concrete products.

The outlier test result has not been incorporated in the assessment as it is not considered to be representative of the site. The results of the assessment indicate that a Design Sulphate classification of DS-1 may be adopted along with an ACEC class of AC-1s. However, it is recommended that a DS-2 classification is adopted due to the presence of made ground material. Static groundwater conditions have been assumed in this assessment.

Coal Mining Risk Assessment

Given that intact rock was encountered within all of the boreholes to their target depth and intact coal seams were encountered it is considered highly unlikely that unrecorded shallow coal workings exist beneath the site. The risk associated with coal mining at the site is considered to be low.

Foundations

The findings of the recent ground investigation support the recommendations of the previous ground investigation report by Hamson Barron Smith Ltd that traditional strip foundations are likely to be suitable for the proposed development.

Floor Slabs

Suspended floor slabs have been recommended in the previous ground investigation report by Hamson Barron Smith Ltd.

Precautions Near Trees

Hamson Barron Smith Ltd carried out five plasticity index tests on samples of cohesive deposits.

The plasticity indices of five soil samples of the weathered clay strata ranged from 15% to 21%, with the percentage of the soil <425µm ranging from 85% to 100%. The calculated modified plasticity indices ranged from 14% to 21%. These deposits are considered to have a low to medium volume change potential.

In addition, precautions would be required where trees are to be removed or where new planting is proposed. All foundations should be constructed in accordance with NHBC Standards (i.e. Chapter 4.2).

Drainage and Soakaways

As the near surface superficial deposits are cohesive in nature, the underlying geology is not suitable for soakaways.

Ground Stability

The near surface made ground and superficial deposits should be considered to be unstable. This situation is likely to be exacerbated where excavations are left open during prolonged periods of wet weather (e.g. in service trenches).

An adequate drainage system for surface water may need to be installed by a competent contractor in order to prevent surface water ponding or collection, both during and post construction, as this may lead to deterioration and weakening of the founding stratum.

Where excavations are proposed close to site boundaries and there is the possibility of weak/unstable ground passing across that boundary and beneath adjacent structures, a risk assessment of the integrity/stability should be undertaken prior to such works being carried out.

Designed and engineered temporary/permanent measures should be adopted to ensure their continued stability where necessary.

Coal Mining Risk Assessment

The intrusive ground investigation works undertaken by Hamson Barron Smith in 2017 incorporated the completion of two rotary boreholes to 30.00m, and six windowless sample boreholes to 5.45m. This investigation encountered coal at 16.00m to 17.60m (BH 'R1') and 3.60m to 5.50m, 18.95m to 19.10m (BH 'R2'), and 5.00m to 5.42m (BH 'M6'). No voids or other evidence of workings were observed by Hamson Barron Smith as part of these works.

Alan Wood & Partners have completed additional intrusive investigation works, which incorporated one rotary borehole to 30.00m bgl. An intact coal seam, 0.50m thick was encountered at 8.10m bgl. No voids or other evidence of workings were observed.

As voids or other evidence of workings have not been observed across the site, risk associated with coal mining is considered to be low.

Excavations

It is understood that the previous site development has been demolished. Remnant foundations are assumed to have been excavated out as part of these works.

Excavation of the materials encountered should be easily achieved using conventional hydraulic excavation techniques.

No man entry into unsupported excavations should be allowed without an appropriate risk assessment. Reference to CIRIA report 97 (1983) should be made to establish suitable means of support, or battering of excavation sides.

Outline Remediation Requirements

As elevated inorganic and organic contaminants have been identified, it is recommended that a site strip is carried out across all areas of soft landscaping to 600mm bgl. This material should be replaced with clean, imported topsoil and subsoil material. The capping material should be designed in accordance with BRE guidance.

Confirmation of the chemical condition of any materials brought to site should be confirmed prior to importation.

Disposal of Soils

Should brightly coloured or odorous soil be encountered during the proposed construction works, Alan Wood and Partners should be notified immediately. An experienced geo-environmental engineer will visit site for further sampling, analysis and risk assessment, where required.

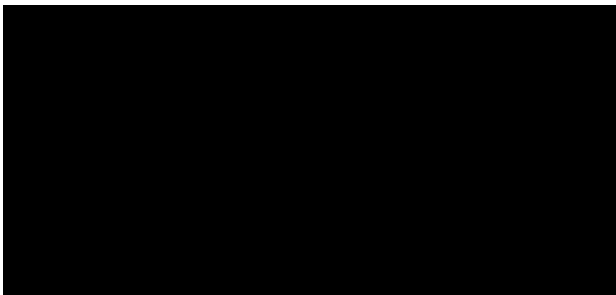
Any materials removed from site should be undertaken in accordance with the Duty of Care Regulations 1991 and the Hazardous Waste Regulations 2005. There will also be a requirement to classify the waste in accordance with the European Waste Catalogue. The waste should also be subject to Waste Acceptance Criteria (WAC) testing

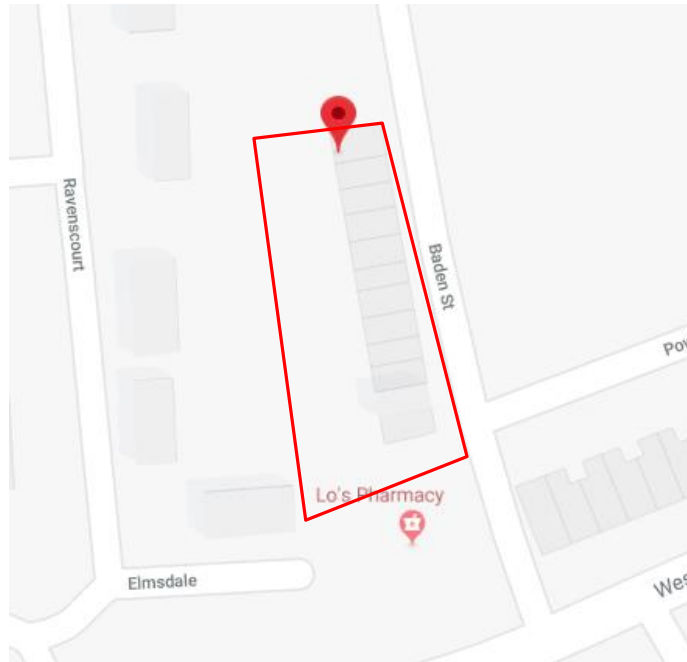
I trust that the above is satisfactory but should you have any questions or wish clarification of the above, please do get in touch with us.

Yours faithfully,



S. Thomas, *BSc (Hons) MSc*
Geo-Environmental Engineer
For and on behalf of Alan Wood and Partners.





DO NOT SCALE



Approximate Site Location



Approximate site boundary



Client.

Mears Group Plc

Project.

Land off Baden Street

Drawing.

Site Location Plan

Date. **01.05.18**

Scale. **NTS**

Drawn by.

AHB

Check by.

JMS

Approved by.

JMS

Status:

Final

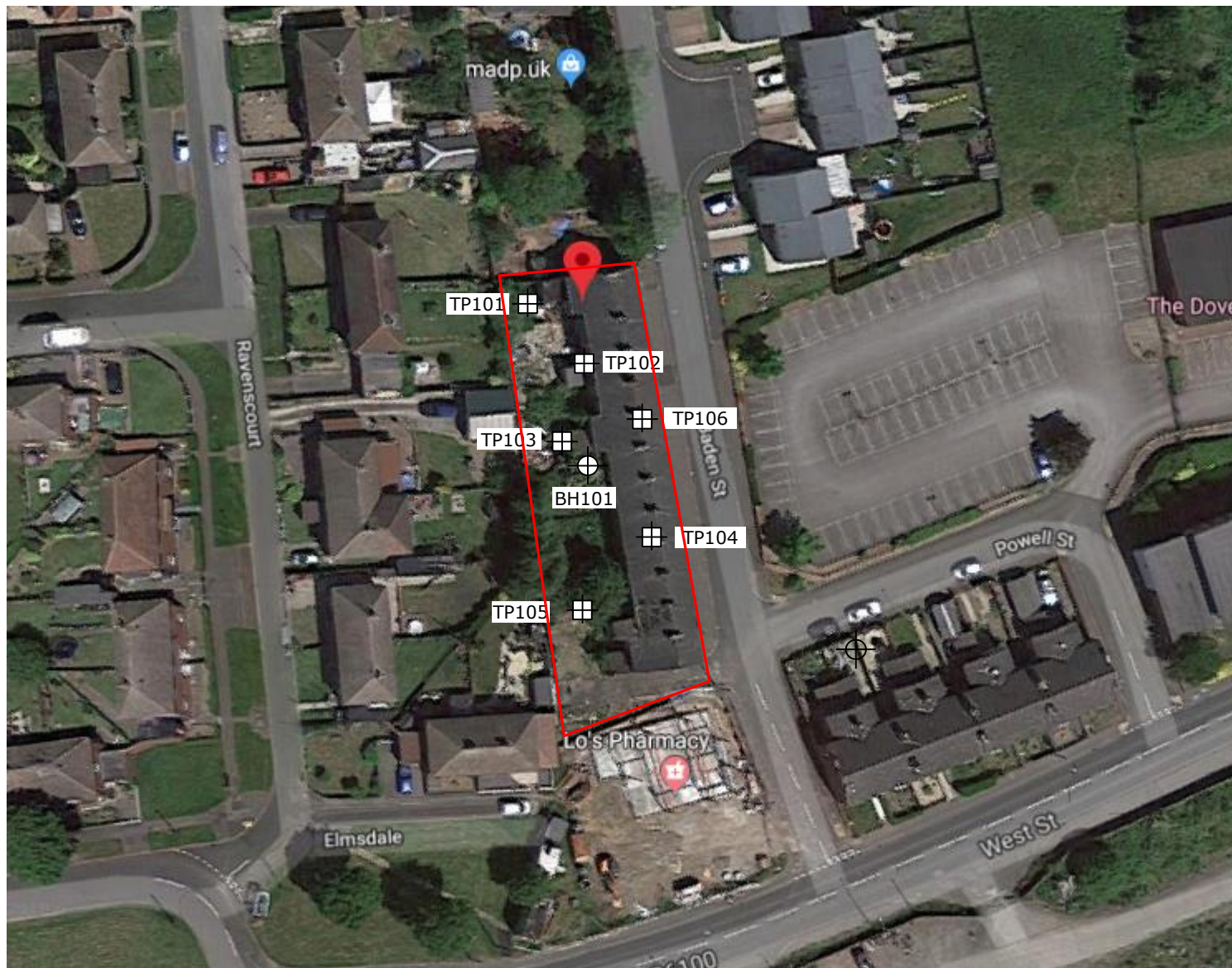
Job no.

41027

Fig. no.

001

Rev.



DO NOT SCALE

 Approximate Red Line Site Boundary

 Trial Pit Location

 Cable percussion Borehole Location



Client.

Mears Group Plc

Project. **Land off Baden Street**

Drawing. **Exploratory Hole Location Plan**

Date. **15.05.2018**

Scale. **NTS**

Drawn by.
CL

Check by.
JS

Approved by.
JS

Status: **FINAL**

Job no.
41027

Fig. no.
002

Rev.



Rotary Core Log

Borehole No.

BH101

Sheet 1 of 3

Project Name: Baden Street

Project No.
41027

Co-ords: -

Hole Type
RO

Location: Worsbrough, Barnsley S70 5PA

Level:

Scale
1:50

Client: Mears Group Plc

Dates: 14/05/2018 -

Logged By
Drillers Log

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.60			Brick earth. (MADE GROUND)	
										Light orange/brown sandy clay. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES)	1
							2.40			Dark orange/brown sandy clay. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES)	2
							3.10			Moderately strong light brown sandstone. (PENNINE MIDDLE COAL MEASURES)	3
											4
							6.00			Moderately strong light grey mudstone, slightly shaley. (PENNINE MIDDLE COAL MEASURES)	6
											7
							8.10			Coal. (PENNINE MIDDLE COAL MEASURES)	8
							8.60			Dark Grey shaley mudstone. (PENNINE MIDDLE COAL MEASURES)	9
							9.50			Strong light grey mudstone. (PENNINE MIDDLE COAL MEASURES)	10

Continued on next sheet

Remarks

Groundwater encountered between 5.80m bgl and 6.00m bgl.





Rotary Core Log

Borehole No.

BH101

Sheet 2 of 3

Project Name: Baden Street

Project No.
41027

Co-ords: -

Hole Type
RO

Location: Worsbrough, Barnsley S70 5PA

Level:

Scale
1:50

Client: Mears Group Plc

Dates: 14/05/2018 -

Logged By
Drillers Log

Well	Water Strikes	Depth (m)	Type / Fl	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
											11
											12
											13
											14
											15
											16
											17
											18
											19
											20

Continued on next sheet

Remarks

Groundwater encountered between 5.80m bgl and 6.00m bgl.







Trial Pit Log

Trialpit No

TP101

Sheet 1 of 1

Project Name: Baden Street

Project No.
41027Co-ords: -
Level:Date
14/05/2018

Location: Worsbrough, Barnsley S70 5PA

Dimensions
(m):

2.5

Client: Mears Group Plc

Depth
2.70

0.6

Scale
1:25Logged
CL

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.30	ES		0.80			Loose, dark brown, clayey, gravelly, SAND. Gravel is fine to coarse, angular to sub-rounded sandstone, brick fragments, wire, wood, plastic, mudstone, glass and kinker. (MADE GROUND)	
	0.50	ES						
	0.75	ES					<u>Foul sewer encountered at 0.75m bgl.</u>	
	0.80	ES					Firm, light brown, mottled grey, slightly sandy, silty, rarely gravelly, friable CLAY. Gravel is fine to coarse, angular and sub-angular sandstone including cobbles. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	1
	0.85	D						
	1.70	D		2.70			<u>Becoming moist below 2.50 m bgl.</u>	
							End of pit at 2.70 m	3
								4
								5

Remarks: No Groundwater Encountered.

Stability: Stable





Trial Pit Log

Trialpit No

TP102

Sheet 1 of 1

Project Name: Baden Street

Project No.
41027Co-ords: -
Level:Date
14/05/2018

Location: Worsbrough, Barnsley S70 5PA

Dimensions
(m):

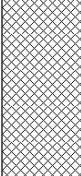
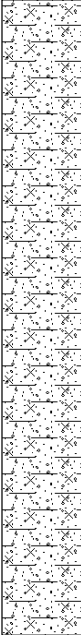
2.5

Client: Mears Group Plc

Depth
2.70

0.6

Scale
1:25Logged
CL

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.25	ES		0.60			Loose, brown, clayey, gravelly, SAND. Gravel is fine to coarse, angular and sub-angular sandstone, glass and plastic. (MADE GROUND)	
	0.65	ES					Medium dense, orange mottled grey, very clayey, silty, slightly gravelly SAND. Gravel is fine to coarse, angular and sub-angular sandstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	
	0.90	D					Becoming very gravelly between 1.00 and 1.60m blg.	1
	2.40	D		2.70				2
							End of pit at 2.70 m	3
								4
								5

Remarks: No Groundwater Encountered.

Stability: Stable





Trial Pit Log

Trialpit No

TP104

Sheet 1 of 1

Project Name: Baden Street

Project No.
41027Co-ords: -
Level:Date
14/05/2018

Location: Worsbrough, Barnsley S70 5PA

Dimensions
(m):

2.5

Client: Mears Group Plc

Depth
3.20

0.6

Scale
1:25Logged
CL

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.25			Loose, brown, silty, clayey, gravelly SAND. Gravel is fine to coarse, angular and sub-angular, bricks, slate, wood, glass, plastic and sandstone. (MADE GROUND)	
	0.30	D					Medium dense, light brown/orange, very clayey, slightly gravelly SAND. Gravel is medium and coarse, angular and sub-angular sandstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	
	0.30	ES						
	1.00	D		0.80			Firm, grey mottled light brown/orange, very sandy, gravelly, CLAY. Gravel is medium and coarse, sub-angular and sub-rounded, mudstone, sandstone and coal. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	1
	1.00	ES						
				2.10			Medium dense, brown, very clayey, gravelly SAND. Gravel is medium and coarse, sub-angular and sub-rounded mudstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	2
				3.20				3
							End of pit at 3.20 m	4
								5

Remarks: No Groundwater Encountered

Stability: Stable





Trial Pit Log

Trialpit No

TP105

Sheet 1 of 1

Project Name: Baden Street

Project No.
41027Co-ords: -
Level:Date
14/05/2018

Location: Worsbrough, Barnsley S70 5PA

Dimensions
(m):

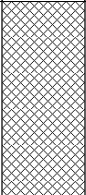
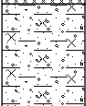
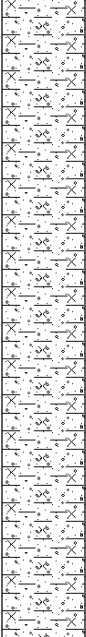
2.5

Client: Mears Group Plc

Depth
3.10

0.6

Scale
1:25Logged
CL

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.65			Loose, dark brown, very clayey, gravelly SAND. Gravel is fine to coarse, angular to sub-rounded, sandstone, brick, plastic, wood, metal and porcelain. (MADE GROUND)	
	0.45	ES					Firm, grey mottled light brown, very sandy, silty friable, slightly gravelly CLAY. Gravel is medium and coarse, angular and sub-angular, sandstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	1
	0.85 0.85	D ES						2
				3.10			<u>Recovered moist below 2.60m bgl.</u>	3
							End of pit at 3.10 m	4
								5

Remarks: No Groundwater Encountered.

Stability: Stable





Trial Pit Log

Trialpit No

TP106

Sheet 1 of 1

Project Name: **Baden Street**

Project No.
41027

Co-ords: -
Level:

Date
14/05/2018

Location: **Worsbrough, Barnsley S70 5PA**

Dimensions
(m):

2.5

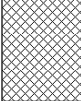
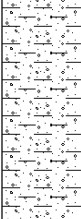
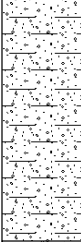
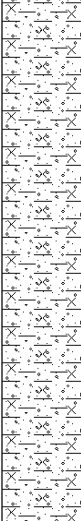
Depth
3.65

0.6

Scale
1:25

Logged
CL

Client: **Mears Group Plc**

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.34			Loose, dark brown, clayey, slightly gravelly, SAND. Gravel is fine to coarse, angular to sub-rounded, brick, porcelain, wood, plastic and sandstone. (MADE GROUND)	
				1.10			Firm, light brown mottled grey, very sandy with sand lenses, slightly gravelly CLAY. Gravel is medium and coarse, angular and sub-angular, sandstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	1
				1.90			Medium dense, brown, very clayey, slightly gravelly, SAND. Gravel is fine to coarse, angular and sub-angular, sandstone. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION)	
				3.65			Firm, light brown mottled grey, sandy, friable silty, rarely gravelly, CLAY. Gravel is medium and coarse, angular and sub-angular, mudstone, sandstone and coal. (FULLY WEATHERED PENNINE MIDDLE COAL MEASURES FORMATION) <u>Recovered wet at 2.30m bgl.</u>	2
							End of pit at 3.65 m	3
								4
								5

Remarks: **Wet at 2.30m bgl**

Stability: **Stable**





2531



ANALYTICAL TEST REPORT

Contract no: 71810
Contract name: Badon Street
Client reference: -
Clients name: Alan Wood & Partners
Clients address: Hallamshire House
Hayland Street
Sheffield
S9 1BY

Samples received: 16 May 2018
Analysis started: 16 May 2018
Analysis completed 23 May 2018
Report issued: 23 May 2018

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.
BTX compounds are identified by retention time only and may include interference from co-eluting compounds.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing
NAD No Asbestos Detected

Approved by:



James Spittle
Customer Services Team Leader

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

All results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
71810-1	TP1 E1	0.30	Sand with Gravel & Wood	-	-	9.9
71810-2	TP1 E2	0.50	Sand with Gravel	-	-	24.3
71810-3	TP2 E1	0.25	Sand with Slate, Wood & String	-	-	10.6
71810-4	TP2 E2	0.65	Sandy Clay with Gravel	-	-	16.5
71810-6	TP3 E2	0.35	Clayey Sand with Gravel	-	-	16.3
71810-7	TP3 E4	1.20	Sandy Clay with Gravel	-	-	14.4
71810-8	TP4 EP1	0.20	Clayey Sand with Brick & Paint	-	-	16.7
71810-9	TP4 E2	0.30	Clay & Sand	-	-	15.5
71810-11	TP5 E2	0.45	Clayey Sand with Gravel	-	-	16.0

Chemtech Environmental Limited

SOILS

Lab number			71810-1	71810-2	71810-3	71810-4	71810-6	71810-8
Sample id			TP1 E1	TP1 E2	TP2 E1	TP2 E2	TP3 E2	TP4 EP1
Depth (m)			0.30	0.50	0.25	0.65	0.35	0.20
Date sampled			14/05/2018	14/05/2018	14/05/2018	14/05/2018	14/05/2018	14/05/2018
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	-	17	18	9.3	13	17
Boron (water soluble)	CE063 ^M	mg/kg B	-	1.2	2.1	1.7	1.0	2.2
Cadmium (total)	CE127 ^M	mg/kg Cd	-	0.5	0.4	<0.2	0.4	0.3
Chromium (total)	CE127 ^M	mg/kg Cr	-	58	48	56	40	44
Chromium (VI)	CE146	mg/kg CrVI	-	<1	<1	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	-	39	31	18	1289	44
Lead (total)	CE127 ^M	mg/kg Pb	-	195	69	19	235	56
Mercury (total)	CE127 ^M	mg/kg Hg	-	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	-	25	23	20	16	18
Selenium (total)	CE127 ^M	mg/kg Se	-	1.0	1.0	0.9	0.7	1.0
Zinc (total)	CE127 ^M	mg/kg Zn	-	210	130	61	196	929
pH	CE004 ^M	units	-	8.1	7.7	6.9	7.5	7.8
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	-	121	831	40	262	2247
Sulphate (total)	CE062 ^M	mg/kg SO ₄	-	907	2154	200	1176	16031
Sulphide	CE079	mg/kg S ²⁻	-	<10	<10	<10	<10	<10
Cyanide (free)	CE077	mg/kg CN	-	<1	<1	<1	<1	<1
Cyanide (total)	CE077	mg/kg CN	-	<1	<1	<1	<1	<1
Thiocyanate	CE145 ^M	mg/kg SCN	-	<1	<1	<1	<1	<1
Phenols (total)	CE078	mg/kg PhOH	-	<0.5	<0.5	<0.5	<0.5	<0.5
Total Organic Carbon (TOC)	CE072 ^M	% w/w C	-	3.62	3.39	0.34	3.56	3.26
Estimate of OMC (calculated from TOC)	CE072 ^M	% w/w	-	6.24	5.85	0.59	6.13	5.62
PAH								
Naphthalene	CE087 ^M	mg/kg	0.27	0.44	0.38	<0.01	0.26	0.34
Acenaphthylene	CE087 ^M	mg/kg	0.04	0.06	0.04	<0.01	0.03	0.19
Acenaphthene	CE087 ^M	mg/kg	0.02	0.28	0.03	<0.01	<0.01	0.04
Fluorene	CE087 ^U	mg/kg	0.03	0.25	0.03	<0.01	<0.01	0.06
Phenanthrene	CE087 ^M	mg/kg	0.70	6.10	1.05	<0.02	0.78	3.71
Anthracene	CE087 ^U	mg/kg	0.44	2.87	0.65	<0.02	0.45	2.41
Fluoranthene	CE087 ^M	mg/kg	1.70	10.70	2.45	<0.02	1.46	9.44
Pyrene	CE087 ^M	mg/kg	1.52	8.59	2.19	<0.02	1.29	6.90
Benzo(a)anthracene	CE087 ^U	mg/kg	1.22	6.37	1.73	<0.02	0.96	7.59
Chrysene	CE087 ^M	mg/kg	0.99	4.59	1.46	<0.01	0.84	5.12
Benzo(b)fluoranthene	CE087 ^M	mg/kg	1.58	7.71	2.22	<0.02	1.12	7.05
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.60	2.78	1.37	<0.02	0.79	3.27
Benzo(a)pyrene	CE087 ^U	mg/kg	1.14	5.55	1.84	<0.02	0.80	5.22
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.65	3.12	1.23	<0.02	0.50	2.73
Dibenz(ah)anthracene	CE087 ^M	mg/kg	0.18	0.88	0.32	<0.02	0.13	0.87
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.71	2.90	1.32	<0.02	0.53	2.59
PAH (total of USEPA 16)	CE087	mg/kg	11.8	63.2	18.3	<0.27	9.96	57.5

Chemtech Environmental Limited

SOILS

Lab number			71810-1	71810-2	71810-3	71810-4	71810-6	71810-8
Sample id			TP1 E1	TP1 E2	TP2 E1	TP2 E2	TP3 E2	TP4 EP1
Depth (m)			0.30	0.50	0.25	0.65	0.35	0.20
Date sampled			14/05/2018	14/05/2018	14/05/2018	14/05/2018	14/05/2018	14/05/2018
Test	Method	Units						
BTEX & TPH								
Benzene	CE057 ^U	mg/kg	<0.01	-	<0.01	-	<0.01	<0.01
Toluene	CE057 ^U	mg/kg	0.03	-	0.01	-	0.01	<0.01
Ethylbenzene	CE057 ^U	mg/kg	<0.01	-	<0.01	-	<0.01	<0.01
m & p-Xylene	CE057 ^U	mg/kg	<0.02	-	<0.02	-	<0.02	<0.02
o-Xylene	CE057 ^U	mg/kg	<0.01	-	<0.01	-	<0.01	<0.01
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	<0.01	-	<0.01	-	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	0.02	-	0.01	-	0.01	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	<0.01	-	<0.01	-	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	<1	-	<1	-	<1	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	<1	-	<1	-	<1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	4	-	6	-	4	23
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	6	-	10	-	5	32
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	<1	-	1	-	<1	3
VPH Aliphatic (>C5-C6)	CE067	mg/kg	<0.1	-	<0.1	-	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	0.2	-	<0.1	-	<0.1	0.3
VPH Aliphatic (>C8-C10)	CE067	mg/kg	0.2	-	<0.1	-	<0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	<4	-	<4	-	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	8	-	6	-	5	4
EPH Aliphatic (>C16-C35)	CE068	mg/kg	121	-	105	-	115	204
EPH Aliphatic (>C35-C44)	CE068	mg/kg	33	-	25	-	58	29
Subcontracted analysis								
Asbestos (qualitative)	\$	-	-	NAD	NAD	NAD	NAD	NAD

Chemtech Environmental Limited

SOILS

Lab number			71810-9	71810-11	71810-7
Sample id			TP4 E2	TP5 E2	TP3 E4
Depth (m)			0.30	0.45	1.20
Date sampled			14/05/2018	14/05/2018	14/05/2018
Test	Method	Units			
Arsenic (total)	CE127 ^M	mg/kg As	6.9	-	-
Boron (water soluble)	CE063 ^M	mg/kg B	1.1	-	-
Cadmium (total)	CE127 ^M	mg/kg Cd	<0.2	-	-
Chromium (total)	CE127 ^M	mg/kg Cr	46	-	-
Chromium (VI)	CE146	mg/kg CrVI	<1	-	-
Copper (total)	CE127 ^M	mg/kg Cu	9.9	-	-
Lead (total)	CE127 ^M	mg/kg Pb	18	-	-
Mercury (total)	CE127 ^M	mg/kg Hg	<0.5	-	-
Nickel (total)	CE127 ^M	mg/kg Ni	13	-	-
Selenium (total)	CE127 ^M	mg/kg Se	0.7	-	-
Zinc (total)	CE127 ^M	mg/kg Zn	56	-	-
pH	CE004 ^M	units	8.0	-	-
Sulphate (2:1 water soluble)	CE061 ^M	mg/l SO ₄	271	-	-
Sulphate (total)	CE062 ^M	mg/kg SO ₄	788	-	-
Sulphide	CE079	mg/kg S ²⁻	<10	-	-
Cyanide (free)	CE077	mg/kg CN	<1	-	-
Cyanide (total)	CE077	mg/kg CN	<1	-	-
Thiocyanate	CE145 ^M	mg/kg SCN	<1	-	-
Phenols (total)	CE078	mg/kg PhOH	<0.5	-	-
Total Organic Carbon (TOC)	CE072 ^M	% w/w C	0.41	-	-
Estimate of OMC (calculated from TOC)	CE072 ^M	% w/w	0.71	-	-
PAH					
Naphthalene	CE087 ^M	mg/kg	<0.01	0.28	<0.01
Acenaphthylene	CE087 ^M	mg/kg	<0.01	0.83	<0.01
Acenaphthene	CE087 ^M	mg/kg	<0.01	0.05	<0.01
Fluorene	CE087 ^U	mg/kg	<0.01	0.07	<0.01
Phenanthrene	CE087 ^M	mg/kg	0.09	1.15	<0.02
Anthracene	CE087 ^U	mg/kg	0.06	0.80	<0.02
Fluoranthene	CE087 ^M	mg/kg	0.08	7.58	<0.02
Pyrene	CE087 ^M	mg/kg	0.08	8.10	<0.02
Benzo(a)anthracene	CE087 ^U	mg/kg	0.04	9.62	<0.02
Chrysene	CE087 ^M	mg/kg	0.04	5.74	<0.01
Benzo(b)fluoranthene	CE087 ^M	mg/kg	<0.02	12.93	<0.02
Benzo(k)fluoranthene	CE087 ^M	mg/kg	<0.02	5.75	<0.02
Benzo(a)pyrene	CE087 ^U	mg/kg	<0.02	11.00	<0.02
Indeno(123cd)pyrene	CE087 ^M	mg/kg	<0.02	7.46	<0.02
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	2.00	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	<0.02	7.05	<0.02
PAH (total of USEPA 16)	CE087	mg/kg	0.40	80.4	<0.27

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SOILS

Lab number			71810-9	71810-11	71810-7
Sample id			TP4 E2	TP5 E2	TP3 E4
Depth (m)			0.30	0.45	1.20
Date sampled			14/05/2018	14/05/2018	14/05/2018
Test	Method	Units			
BTEX & TPH					
Benzene	CE057 ^U	mg/kg	-	<0.01	<0.01
Toluene	CE057 ^U	mg/kg	-	0.02	<0.01
Ethylbenzene	CE057 ^U	mg/kg	-	<0.01	<0.01
m & p-Xylene	CE057 ^U	mg/kg	-	<0.02	<0.02
o-Xylene	CE057 ^U	mg/kg	-	<0.01	<0.01
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	-	<0.01	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	-	0.02	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	-	<0.01	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	-	<1	<1
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	-	1	<1
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	-	18	<1
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	-	55	<1
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	-	7	<1
VPH Aliphatic (>C5-C6)	CE067	mg/kg	-	<0.1	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	-	<0.1	0.2
VPH Aliphatic (>C8-C10)	CE067	mg/kg	-	0.1	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	-	<4	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	-	13	<4
EPH Aliphatic (>C16-C35)	CE068	mg/kg	-	442	<10
EPH Aliphatic (>C35-C44)	CE068	mg/kg	-	121	<10
Subcontracted analysis					
Asbestos (qualitative)	\$	-	NAD	-	-

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	M	0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	Wet	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	M	100	mg/kg SO ₄
CE079	Sulphide	Extraction, Continuous Flow Colorimetry	Wet		10	mg/kg S ²⁻
CE077	Cyanide (free)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	Wet		1	mg/kg CN
CE145	Thiocyanate	Weak acid extraction, Colorimetry	Dry	M	1	mg/kg SCN
CE078	Phenols (total)	Extraction, Continuous Flow Colorimetry	Wet		0.5	mg/kg PhOH
CE072	Total Organic Carbon (TOC)	Removal of IC by acidification, Carbon Analyser	Dry	M	0.1	% w/w C
CE072	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry	M	0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	Wet	U	0.01	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	Wet	M	0.01	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	Wet	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	Wet	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	Wet		0.27	mg/kg
CE057	Benzene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	Toluene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	Ethylbenzene	Headspace GC-FID	Wet	U	0.01	mg/kg
CE057	m & p-Xylene	Headspace GC-FID	Wet	U	0.02	mg/kg
CE057	o-Xylene	Headspace GC-FID	Wet	U	0.01	mg/kg

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE057	BTEX (total)	Headspace GC-FID	Wet		0.06	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	Wet		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	Wet		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	Wet		0.01	mg/kg
CE068	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE068	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID	Wet		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	Wet		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	Wet		0.1	mg/kg
CE068	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID	Wet		4	mg/kg
CE068	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID	Wet		10	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
71810-1	TP1 E1	0.30	N	
71810-2	TP1 E2	0.50	N	
71810-3	TP2 E1	0.25	N	
71810-4	TP2 E2	0.65	N	
71810-6	TP3 E2	0.35	N	
71810-7	TP3 E4	1.20	N	
71810-8	TP4 EP1	0.20	N	
71810-9	TP4 E2	0.30	N	
71810-11	TP5 E2	0.45	N	

ANALYTICAL TEST REPORT

Contract no: 72094
Contract name: Baden Street, Barnsley
Client reference: -
Clients name: Alan Wood & Partners
Clients address: Hallamshire House
Hayland Street
Sheffield
S9 1BY

Samples received: 22 May 2018

Analysis started: 31 May 2018

Analysis completed 31 May 2018

Report issued: 31 May 2018

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.
Methods, procedures and performance data are available on request.
Results reported herein relate only to the material supplied to the laboratory.
This report shall not be reproduced except in full, without prior written approval.
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

Key: U UKAS accredited test
M MCERTS & UKAS accredited test
\$ Test carried out by an approved subcontractor
I/S Insufficient sample to carry out test
N/S Sample not suitable for testing

Approved by:



James Spittle
Customer Services Team Leader

Chemtech Environmental Limited

SOILS

Lab number			72094-1	72094-2
Sample id			TP5 E4	TP5 E5
Depth (m)			0.10	0.10
Date sampled			21/05/2018	21/01/2018
Test	Method	Units		
Subcontracted analysis				
β-Glucoronidase Positive Escherichia coli	\$	cfu/g	<10	<10
Salmonella	\$	-	Not Detected	Not Detected

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
\$	β-Glucuronidase Positive Escherichia coli	Microbiology (details on request)	Wet		10	cfu/g
\$	Salmonella	Microbiology (details on request)	Wet		-	-

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
IT	Sample not cooled
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
72094-1	TP5 E4	0.10	N	
72094-2	TP5 E5	0.10	N	



Amended Report

Report No.:	17-19498-2		
Initial Date of Issue:	02-Aug-2017	Date of Re-Issue:	24-Aug-2017
Client	Sub Surface		
Client Address:	3 Peel Street Preston Lancashire PR2 2QS		
Contact(s):	Simon Gabbatt		
Project	NE3625 Baden Street, Worsborough, Barnsley		
Quotation No.:		Date Received:	27-Jul-2017
Order No.:		Date Instructed:	27-Jul-2017
No. of Samples:	10		
Turnaround (Wkdays):	21	Results Due:	24-Aug-2017
Date Approved:	24-Aug-2017		
Approved By:			
Details:	Glynn Harvey, Laboratory Manager Martin Dyer, Laboratory Manager		

Results - Soil

Client: Sub Surface		Chemtest Job No.:		17-19498		17-19498		17-19498		17-19498		17-19498		17-19498		17-19498		17-19498	
Quotation No.:		Chemtest Sample ID.:		489162		489163		489164		489165		489166		489167		489168		489169	
Order No.:		Client Sample Ref.:		TP1		M3		M6		M1		TP2		TP3		TP3		M5	
		Client Sample ID.:		282		294		321		266		263		260		261		329	
		Sample Type:		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
		Top Depth (m):		0.70		0.90		1.40		0.45		0.30		0.15		0.55		0.10	
		Date Sampled:		10-Jul-2017		10-Jul-2017		10-Jul-2017		10-Jul-2017		10-Jul-2017		10-Jul-2017		10-Jul-2017		10-Jul-2017	
		Asbestos Lab:																	
Determinand	Accred.	SOP	Units	LOD															
Moisture	N	2030	%	0.020	16	18	14	14		14		15		12		21		13	14
pH	U	2010		N/A						7.9		8.3		8.5		8.1		7.9	8.3
pH (2.5:1)	N	2010		N/A	8.1	8.3	8.0												
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40						< 0.40		0.48		< 0.40		0.57		< 0.40	0.55
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	< 0.010	< 0.010	< 0.010												
Total Sulphur	U	2175	%	0.010	0.026	0.024	0.012												
Sulphate (Acid Soluble)	U	2430	%	0.010	< 0.010	0.012	< 0.010												
Arsenic	U	2450	mg/kg	1.0						8.5		29		15		22		24	20
Cadmium	U	2450	mg/kg	0.10						< 0.10		0.41		0.70		0.41		1.4	0.60
Chromium	U	2450	mg/kg	1.0						15		100		180		13		15	11
Copper	U	2450	mg/kg	0.50						19		82		48		31		44	31
Mercury	U	2450	mg/kg	0.10						< 0.10		0.20		0.23		0.14		0.12	< 0.10
Nickel	U	2450	mg/kg	0.50						28		61		38		21		28	22
Lead	U	2450	mg/kg	0.50						15		79		100		63		290	71
Selenium	U	2450	mg/kg	0.20						< 0.20		< 0.20		< 0.20		< 0.20		< 0.20	< 0.20
Zinc	U	2450	mg/kg	0.50						68		230		190		150		350	240
Chromium (Hexavalent)	N	2490	mg/kg	0.50						< 0.50		< 0.50		< 0.50		< 0.50		< 0.50	< 0.50
LOI	U	2610	%	0.10						2.6						6.4			
Total Organic Carbon	U	2625	%	0.20						0.32		14		7.7		4.8		9.0	5.8
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] 2.5		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0						[B] < 1.0		[B] 1.1		[B] 10		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0						[B] < 1.0		[B] 7.0		[B] 130		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0						[B] < 1.0		[B] 28		[B] 360		[B] 1.4		[B] 4.0	[B] < 1.0
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0						[B] < 1.0		[B] 85		[B] 350		[B] 40		[B] 34	[B] 22
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0						[B] < 1.0		[B] 41		[B] 130		[B] 8.2		[B] < 1.0	[B] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0						[B] < 5.0		[B] 160		[B] 980		[B] 50		[B] 38	[B] 22
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0						[B] < 1.0		[B] < 1.0		[B] 15		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0						[B] < 1.0		[B] 6.6		[B] 35		[B] < 1.0		[B] < 1.0	[B] < 1.0
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0						[B] < 1.0		[B] 61		[B] 460		[B] 1.8		[B] < 1.0	[B] < 1.0
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0						[B] < 1.0		[B] 730		[B] 2400		[B] 43		[B] 14	[B] 4.2
Aromatic TPH >C21-C35	U	2680	mg/kg	1.0						[B] < 1.0		[B] 3200		[B] 9200		[B] 310		[B] 110	[B] 52
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0						[B] < 1.0		[B] 330		[B] 970		[B] < 1.0		[B] < 1.0	[B] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0						[B] < 5.0		[B] 4300		[B] 13000		[B] 350		[B] 120	[B] 56
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0						[B] < 10		[B] 4400		[B] 14000		[B] 400		[B] 160	[B] 78

Results - Soil

Client: Sub Surface		Chemtest Job No.:		17-19498	17-19498	17-19498	17-19498	17-19498	17-19498	17-19498	17-19498	17-19498	17-19498
Quotation No.:		Chemtest Sample ID.:		489162	489163	489164	489165	489166	489167	489168	489169	489170	489171
Order No.:		Client Sample Ref.:		TP1	M3	M6	M1	TP2	TP3	TP3	M5	M5	M5
		Client Sample ID.:		282	294	321	266	263	260	261	329	329	329
		Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):		0.70	0.90	1.40	0.45	0.30	0.15	0.55	0.10	0.10	0.30
		Date Sampled:		10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017	10-Jul-2017
		Asbestos Lab:											
Determinand	Accred.	SOP	Units	LOD									
Naphthalene	U	2700	mg/kg	0.10			< 0.10	2.1	1.5	1.4	1.3	0.98	0.98
Acenaphthylene	U	2700	mg/kg	0.10			< 0.10	3.9	20	1.8	0.75	0.50	0.50
Acenaphthene	U	2700	mg/kg	0.10			< 0.10	1.2	2.2	0.32	0.41	0.31	0.31
Fluorene	U	2700	mg/kg	0.10			< 0.10	2.9	5.9	1.1	0.68	0.67	0.67
Phenanthrene	U	2700	mg/kg	0.10			< 0.10	48	55	6.0	3.7	2.7	2.7
Anthracene	U	2700	mg/kg	0.10			< 0.10	14	30	2.8	1.0	0.98	0.98
Fluoranthene	U	2700	mg/kg	0.10			0.12	130	170	19	6.6	4.6	4.6
Pyrene	U	2700	mg/kg	0.10			0.34	130	170	17	6.4	4.4	4.4
Benzofluoranthene	U	2700	mg/kg	0.10			< 0.10	76	120	11	4.0	3.0	3.0
Benzo[a]anthracene	U	2700	mg/kg	0.10			< 0.10	71	130	13	4.1	2.8	2.8
Chrysene	U	2700	mg/kg	0.10			< 0.10	81	140	15	5.0	3.2	3.2
Benzo[b]fluoranthene	U	2700	mg/kg	0.10			< 0.10	32	56	5.7	1.9	1.2	1.2
Benzo[k]fluoranthene	U	2700	mg/kg	0.10			< 0.10	65	110	11	3.8	2.5	2.5
Benzo[a]pyrene	U	2700	mg/kg	0.10			< 0.10	43	71	7.1	2.9	1.9	1.9
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10			< 0.10	13	20	3.7	0.78	0.71	0.71
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10			< 0.10	40	59	11	2.9	2.7	2.7
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10			< 2.0	750	1200	130	46	33	33
Total Of 16 PAH's	U	2700	mg/kg	2.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Benzene	U	2760	µg/kg	1.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Toluene	U	2760	µg/kg	1.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
o-Xylene	U	2760	µg/kg	1.0			[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0	[B] < 1.0
Total Phenols	U	2920	mg/kg	0.30			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Client: Sub Surface		Chemtest Job No.: 17-19498			
Quotation No.:		Chemtest Sample ID.: 489171			
Order No.:		Client Sample Ref.: TP4			
		Client Sample ID.: 258			
		Sample Type: SOIL			
		Top Depth (m): 0.20			
		Date Sampled: 10-Jul-2017			
		Asbestos Lab: COVENTRY			
Determinand	Accred.	SOP	Units	LOD	
Moisture	N	2030	%	0.020	14
pH	U	2010		N/A	9.9
pH (2.5:1)	N	2010		N/A	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.84
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	
Total Sulphur	U	2175	%	0.010	
Sulphate (Acid Soluble)	U	2430	%	0.010	
Arsenic	U	2450	mg/kg	1.0	16
Cadmium	U	2450	mg/kg	0.10	0.26
Chromium	U	2450	mg/kg	1.0	11
Copper	U	2450	mg/kg	0.50	120
Mercury	U	2450	mg/kg	0.10	0.11
Nickel	U	2450	mg/kg	0.50	18
Lead	U	2450	mg/kg	0.50	52
Selenium	U	2450	mg/kg	0.20	< 0.20
Zinc	U	2450	mg/kg	0.50	130
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50
LOI	U	2610	%	0.10	6.2
Total Organic Carbon	U	2625	%	0.20	6.0
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[B] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[B] < 1.0
Aliphatic TPH >C8-C10	U	2680	mg/kg	1.0	[B] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[B] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[B] 15
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[B] 76
Aliphatic TPH >C21-C35	U	2680	mg/kg	1.0	[B] 140
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] 32
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[B] 260
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[B] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[B] < 1.0
Aromatic TPH >C8-C10	U	2680	mg/kg	1.0	[B] < 1.0
Aromatic TPH >C10-C12	U	2680	mg/kg	1.0	[B] 2.8
Aromatic TPH >C12-C16	U	2680	mg/kg	1.0	[B] 72
Aromatic TPH >C16-C21	U	2680	mg/kg	1.0	[B] 520
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[B] 2500
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[B] 260
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[B] 3400
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[B] 3600

Client: Sub Surface		Chemtest Job No.: 17-19498			
Quotation No.:		Chemtest Sample ID.:		489171	
Order No.:		Client Sample Ref.:		TP4	
		Client Sample ID.:		258	
		Sample Type:		SOIL	
		Top Depth (m):		0.20	
		Date Sampled:		10-Jul-2017	
		Asbestos Lab:		COVENTRY	
Determinand	Accred.	SOP	Units	LOD	
Naphthalene	U	2700	mg/kg	0.10	1.2
Acenaphthylene	U	2700	mg/kg	0.10	17
Acenaphthene	U	2700	mg/kg	0.10	1.3
Fluorene	U	2700	mg/kg	0.10	6.0
Phenanthrene	U	2700	mg/kg	0.10	38
Anthracene	U	2700	mg/kg	0.10	23
Fluoranthene	U	2700	mg/kg	0.10	94
Pyrene	U	2700	mg/kg	0.10	100
Benzo[a]anthracene	U	2700	mg/kg	0.10	82
Chrysene	U	2700	mg/kg	0.10	89
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	98
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	40
Benzo[a]pyrene	U	2700	mg/kg	0.10	79
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	46
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	13
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	37
Total Of 16 PAH's	U	2700	mg/kg	2.0	770
Benzene	U	2760	ug/kg	1.0	[B] < 1.0
Toluene	U	2760	ug/kg	1.0	[B] < 1.0
Ethylbenzene	U	2760	ug/kg	1.0	[B] < 1.0
m & p-Xylene	U	2760	ug/kg	1.0	[B] < 1.0
o-Xylene	U	2760	ug/kg	1.0	[B] < 1.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30

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

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.co.uk