BROWNFIELD SOLUTIONS LTD

GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

ALDI STORES LTD

WESTGATE, SKELMERSDALE

Geo-Environmental Assessment Report

JM/C3788/7517 Rev A

May 2018

William Smith House
173-183 Witton Street
Northwich, Cheshire CW9 5LP

Tel: +44 (0) 1606 334 844

brownfield-solutions.com

EXECUTIVE SUMMARY	
Location	The site comprises a disused office building and associated car parking off Westgate, Skelmersdale. The site covers an area of approximately 1.2 hectares and is situated approximately 1.9km west of Skelmersdale Town Centre.
Site History	The site comprised open fields from 1849 to 1927, by which time a football pitch and stands had been built. By 1974 the football pitch had been demolished and a new office block had been constructed.
Geology	The site is underlain by Glacial Till deposits over the Pennine Lower Coal Measures Formation. The Blaguegate Fault is located circa 250m east of the site. Three workable coal seams exist beneath the site, the shallowest being 21.5m bgl.
Hydrogeology	The Glacial Till is classified as a Secondary Aquifer – Undifferentiated layers, whilst the bedrock is classified as a Secondary A Aquifer. There are no detailed river network entries within 500m of the site. The site is not located within a flood risk zone.
Mining	No evidence for prior mine workings were identified during the site investigation, and in the event any seams have been worked, a sufficient rock cover exists to prevent upward migration of a void.
Environmental	Main identified potential sources of contamination on site include: • Made ground associated with the current building and car parks • Electrical Substation • Former tank • Ground gas • Mine Gas Offsite sources include backfilled ponds and pits. Associated risks were generally considered to be low to moderate for human health and low for controlled waters in general respect to a commercial end use.
Ground Conditions	Made ground was encountered in all of the borehole locations, generally comprising a thin veneer less than 0.50m thick. The natural strata underlying the made ground was generally firm to stiff sandy clay recorded to a maximum depth of 9.2m bgl. Bedrock was encountered as interbedded mudstone and sandstone from 8.5m bgl to 40.0m bgl. Three coal seams were identified beneath site at depths ranging from 21.6m to 28.2m bgl, with a maximum thickness of 1.0m.
Foundations and Floor Slabs	Pads and strip foundations are considered suitable. They will need to be taken to the underside of any made ground, founding at a depth of approximately 1.50m bgl where an allowable bearing capacity of 150kN/m^2 should be assumed. If required ground bearing floor slabs may generally be adopted at the site provided that once finished levels have been established, less than 600mm of suitable, appropriately compacted granular material exists beneath the slab.
Soil Contamination	On the basis of the testing undertaken to date it appears that there are no metals or PAHs above the relevant commercial screening values (S4ULs) for human health within the made ground. Asbestos fibres were detected in four samples however they were revealed to be at trace levels.
Groundwater Contamination	The aquifers beneath the site are considered to be at low risk. The presence of low permeability cohesive strata will prevent the downward migration of leached contaminants to the underlying aquifers. The risk to surface waters is also assessed to be low, with the overall risk to controlled waters considered to be low.

Ground Gases	The results indicate gas precautionary measures are required as the proposed development fits into Characteristic Situation 2 as assessed by CIRIA C665.
Highways	CBR values of 2% - 5% are likely to be achieved in undisturbed natural soils for pavement design purposes, unless proven otherwise by in-situ testing at sub-base level by a specialist geotechnical engineer. Where the CBR value is found to be less than 2.5%, some re-engineering of the subgrade will be required prior to highway construction to achieve the required design CBR value.
Further Work	• Drilling of additional holes in NW part of site beneath building post demolition. • Tree survey by qualified aboriculturist. • Foundation design – inc test grout holes • Confirmation of Remedial Strategy Local Authority

PROJECT QUALITY CONTROL DATA SHEET

Site Name:	Westgate, Skelmersdale		
Report Name:	Geo-Environmental Assessment Report		
Report Number:	JM/C3788/7517 Rev A		
Date:	11 May 2018		
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Revision:	Rev A	25/06/2018	Completed Gas Monitoring

Client: Aldi Stores Ltd	**Engineer: SWF Consulting Ltd**
Unit D1 Logistics North Bridgewater Avenue Middle Hulton Bolton BL5 1EE	Unit 4 Millbank House Riverside Park Wilmslow Cheshire SK9 1BJ
Contact:	Contact: Mr D Rogers

Written by:	Checked by:	Approved by:
		
J Mather BSc (Hons)	A Stokoe BSc(Hons) CSci MIEnvSc FGS	J M Jacob BSc(Hons) CGeol FGS

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GEO-ENVIRONMENTAL ASSESSMENT REPORT FOR A SITE OFF WESTGATE, SKELMERSDALE

1.0 INTRODUCTION

1.1 Objectives

1.1.1 This report describes a Geo-environmental Assessment carried out by Brownfield Solutions Limited (BSL) for Aldi Stores Limited for a site off Westgate, Skelmersdale.

1.1.2 A previous Desk Study and Coal Mining Risk Assessment was undertaken by Brownfield Solutions Ltd for the site, referenced below.

- Brownfield Solutions Ltd, Phase 1 Desk Study Assessment Report, reference JMC/C3788/7347, dated 26th January 2018.
- Brownfield Solutions Ltd, Coal Mining Risk Assessment, reference JMC/C3788/7390, dated 26th January 2018.

1.1.3 The objectives of the assessment were to determine the sites environmental setting and likely ground conditions, highlighting potential areas of concern that may govern the sites redevelopment.

1.1.4 An initial intrusive investigation was undertaken to confirm the findings of the preliminary CSM and risk assessment and meet any objectives that had not been satisfied. The initial investigation was undertaken using rotary open boreholes, window sampling, cable percussive boreholes and hand dug trial pits.

1.1.5 The report has been completed in general accordance with CLR11 "Model Procedures for the Management of Land Contamination", BS 5930:2015 and BS 10175:2011+A1:2013.

1.2 Proposed Development

1.2.1 The proposed development will consist of a new purpose-built Aldi Superstore, with associated hardstanding car parking, soft landscaping and a smaller secondary retail unit situated on the northern part of the site. A proposed development layout plan is presented in Drawings for reference, by Harris Partnership Architects, drawing number 2269BOL-100 dated November 2017.

1.3 Limitations

1.3.1 This assessment has been carried out based on information obtained from a number of areas, BSL have assumed that this information is correct.

1.3.2 There may be other conditions prevailing on the site which are outside the scope of work and have not been highlighted by this assessment and therefore not been taken into account by this report. Responsibility cannot be accepted for such site conditions not revealed by the assessment.

1.3.3 Access was not available to drill any boreholes inside the existing building, and access was not possible to drill rotary open holes in the north west corner of the site.

1.3.4 This report has been prepared for the sole use of the client. No other third parties may rely upon or reproduce the contents of this report without the written permission of Brownfield Solutions Ltd (BSL). If any unauthorised third party comes into possession of this report they rely on it at their own risk and BSL do not owe them any Duty of Care.

2.0 THE SITE

2.1 Location & Access

2.1.1 The site covers an area of approximately 1.2 hectares and is situated approximately 1.9km west of Skelmersdale Town Centre.

2.1.2 The site is centred on National Grid Reference 346912, 405873 as shown on the Site Location Plan C3788/01.

2.1.3 Access to the site is gained off High Street to the north and Westgate to the west of the site.

2.2 Site Description

2.2.1 The site is currently a vacant office with associated car park. The main building is irregular in shape and occupies the majority of the north of the site.

2.2.2 The area surrounding the building to the north and west are surfaced in soft landscaping with trees and there are shrubs and steps down to the main office from High Street. The car park areas located to the east and south of the building are surfaced with asphalt.

2.2.3 The site is split on two levels by a retaining wall and an embankment covered in soft landscaping with steps. The southern car park is circa 1.00m lower in level than the building and eastern car park area. There are fences along the boundary surrounding the eastern car park and the main building. The southern car park is bound by fencing to the east and south and by removable concrete blocks to the west.

2.2.4 Electronic gates are situated towards the north of the site and between the eastern and southern car park area, with a small sloped and curved link road between the two.

2.2.5 The site slopes from north to south and the difference in height is circa 4.50m.

2.2.6 Anecdotal evidence indicates asbestos is present in the existing building.

3.0 DESK STUDY SUMMARY

3.1 A summary of the relevant points from the desk study undertaken by Brownfield Solutions Ltd is presented in the table below:

- The earliest map dates back to 1849, where the site consisted of undeveloped fields. By 1891 a football pitch had appeared across the centre of the site, and by 1927 two small structures had been developed south of the football pitch. By 1974 all previous structures were no longer present, and the site had been developed with a large irregular building across the majority of the centre of the site, which was extended towards the south of the site in 1978, along with the construction of an electricity substation. The map dated 2010 shows part of the building to have been demolished. No significant change occurred between 2010 and the present day.
- Geology comprises Glacial Till deposits (Secondary Undifferentiated Aquifer) over the Pennine Lower Coal Measures (Secondary A Aquifer).
- The Blaguegate Fault is located circa 250m east of the site, trending north to south with strata being downthrown to the east.
- The site is recorded as being situated within an identified coal mining area.
- There is potentially an unknown seam sub-cropping on site beneath the superficial deposits. The Skelmersdale Earthly Delf Seam potentially lies at a depth ranging between 21-28m beneath the site, whilst the Ravine Seam potentially lies at depths ranging between 42-56m beneath the site. Both named seams are considered to be of workable thickness. Additional workable seams lie at greater depth.
- There are no detailed river network entries within 500m of the site.
- The site is not located within a flood risk zone.
- The site is within an area of very low hazard from shrinking or swelling of clays, landslides, rock solubility and compressible ground.
- The site is not located in an area requiring radon precautions in foundations.
- The risks to human health from metals, inorganic and low volatile contaminants is expected to be low.
- The risk to groundwater from possible leachate contaminants in the made ground is expected to be low.
- The potential for ground gas is considered to be moderate to low, therefore gas monitoring was recommended.
- The desk study recommended a proportionate Phase II Intrusive Investigation should be carried out to confirm the risks to site end users, controlled waters and the risk to the development from instability caused by historical coal extraction.

4.0 METHOD OF INVESTIGATION

4.1 Objectives

4.1.1 The aim of the fieldwork was to:

- Investigate ground conditions on the site.
- Assess the potential contamination on the site and obtain samples for contamination screening.
- Assess the potential impact of any contamination on controlled waters.
- Assess the need for detailed investigation.
- Obtain geotechnical information on the ground conditions at the site for preliminary foundation design and preliminary pavement design purposes.
- Install standpipes to allow future monitoring.
- Give an assessment of the geo - environmental risks associated with redevelopment of the site.

4.2 Site Works

4.2.1 Eight rotary open boreholes (RO01 to RO08) were drilled to depths between 30.00m and 40.00m bgl using a tracked rotary rig and water flush from 20th to 21st March 2018.

4.2.2 Seven window sample boreholes (WS1 to WS7) were drilled to depths between 2.45m and 5.45m bgl using a tracked window sampling rig and liners (windowless) on 22nd March 2018.

4.2.3 Two cable percussive boreholes (BH1 and BH2) were drilled to depths between 8.50m and 9.95m bgl using a cable percussive rig with 6inch casing from 22nd to 23rd March 2018.

4.2.4 Four trial pits (HP1 to HP4) were excavated by hand to depths between 0.61m and 1.15m using insulated digging equipment on 20th March 2018 to determine the nature of existing foundations.

4.2.5 The approximate locations of the exploratory holes are indicated on the Exploratory Hole Location Plan, Drawing No C3788/03. The exploratory hole logs are presented in Appendix A.

4.2.6 The exploratory holes were positioned to establish general ground conditions on the site and investigate the area below the proposed store footprint and the unknown coal seam identified in the coal mining risk assessment. The trial pits were logged by an experienced geo-environmental engineer in general accordance with BS 5930 'Code of Practice for Site Investigations' 1999, BS EN 14688-1:2002 'Geotechnical Investigation and Testing – Identification and classification of soil' and BS EN ISO 14689:2002 "Geotechnical investigation and testing – Identification and classification of rock"

4.3 Sampling

4.3.1 During the drilling of the exploratory holes, representative samples were taken at regular intervals to assist in the identification of the soils and to allow subsequent laboratory testing.

4.3.2 A summary of the samples taken is presented in the table below:

Type	Number
Environmental	16
Disturbed	49
U100	2

4.3.3 The type of sample is dependent upon the stratum and the purpose of analysis in accordance with current environmental and geotechnical guidance.

4.3.4 Disturbed samples of soil for chemical testing were placed in plastic tubs and amber jars as required by the UKAS accredited laboratory and transported under secure refrigerated conditions.

4.3.5 The distribution of samples taken across the site is recorded on the exploratory logs.

4.4 Laboratory Testing

4.4.1 As part of the initial assessment for potential contamination of the site, selected samples were taken for the purpose of chemical contamination testing.

4.4.2 Based on the potential contaminants identified by the preliminary CSM, nine representative soil samples were screened for the following general suite of determinands and an UKAS approved laboratory:

Determinand	Matrix	Number
BSL Default Soil Suite: Arsenic, Cadmium, Chromium (total and hex), Copper, Nickel, Mercury, Lead, Zinc, Selenium, speciated polycyclic hydrocarbons (PAH 16), total phenol, free cyanide, organic matter and pH	Soil	9
Asbestos Screen and ID	Soil	9
Asbestos Quantification	Soil	3

4.4.3 The Chemical Laboratory Testing Results are presented in Appendix B.

4.4.4 Representative disturbed samples were obtained for all soil types encountered. Selected samples were scheduled for testing at an approved laboratory in accordance with BS 1377 'Method of Test for Soils for Civil Engineering Purposes' 1990. The following tests were scheduled:

BS Test Number	Description	No of Samples
Part 2:	Natural Moisture Content	8
Part 2:	Plasticity Index Analysis	8
Part 3:	pH Value	10
Part 3:	Water Soluble Sulphate Content	2

BS Test Number	Description	No of Samples
Part 7:	Determination of Undrained Shear Strength in Triaxial Compression	2
Part 3:	SD1 BRE Full Suite	2

4.4.5 The Geotechnical Laboratory Testing Results are presented in Appendix C.

4.5 Monitoring

4.5.1 Four ground gas and ground water monitoring standpipes were installed in BH2, WS1, WS2 and WS4 the boreholes and subsequently two monitoring visits were undertaken. All gas monitoring was undertaken using GA 2000/5000 infrared gas meter with integral electronic flow analyser.

4.5.2 Measurements of the percentage volume in air (%v/v) of oxygen (O_2), carbon dioxide (CO_2) and methane (CH_4) were recorded in addition to the percentage Lower Explosive Limit (%LEL) of methane and the atmospheric pressure. Flow measurements on each standpipe (l/hr) were also taken. (Note: 100% LEL equates to 5% by volume).

4.5.3 The standpipes consisted of high-density polyethylene (HDPE) pipe. A bentonite seal was made around the plain pipe and a clean gravel pack was placed around the slotted pipe. A summary of the installation construction is presented in the table below:

Location	Depth	Response Zone (m bgl)	Targeted Strata	Reason
BH1	7.5	1.50 – 7.50	Natural Ground	Ground Gas
WS1	4	2.00 – 4.00	Natural Ground	Ground Gas
WS2	4	1.00 – 4.00	Natural Ground	Ground Gas
WS3	3.4	1.40 – 3.40	Natural Ground	Ground Gas
WS5	3	1.00 – 3.00	Natural Ground	Ground Gas

4.5.4 The results monitored peak and steady state conditions. Peak results are those that occur on opening the valve on the borehole tap. Steady state conditions are those that occur a period of time afterwards when the initial (accumulated) gases have been purged from the borehole.

4.5.5 Made Ground was generally shallow (generally <0.70m in thickness) therefore no standpipes were installed within the made ground.

4.5.6 Completed gas monitoring results are presented in Appendix D of this report.

5.0 GROUND CONDITIONS

5.1 Made Ground

5.1.1 Made Ground was encountered in all of the exploratory hole locations and was generally a thin veneer ranging from 0.40m to 0.70m bgl in depth with an average thickness of 0.59m.

5.1.2 The made ground generally comprised asphalt overlying sandy gravels, with gravel comprised of brick, limestone, sandstone and locally containing ash and gravel sized fragments of bituminous/tar material.

5.2 Natural Ground

5.2.1 The natural strata underlying the made ground was generally a firm, sandy clay with varying gravel content, interbedded with loose to medium dense clayey gravelly sands. Gravel typically comprised sandstone and mudstone. These strata are interpreted as Glacial Till and were recorded to depths ranging between 7.70m and 9.50m bgl.

5.2.2 In WS3 there was a loose to medium dense sand band from 2.25m to 3.05m bgl.

5.2.3 In WS6 there was no recovery from 1.20m to 2.45m bgl, which is considered to represent probable loose sand.

5.3 Bedrock

5.3.1 Bedrock was encountered as a weak light grey weathered thinly laminated mudstone interpreted as the Pennine Lower Coal Measures, with some sandstone bands, from between 7.7m and 9.50m bgl to a maximum depth of 40m bgl.

5.3.2 Due to the nature of rotary open hole drilling and the comminuted nature of the arising's, detailed soil and rock descriptions could not be made in these boreholes and only the depth to the solid geology of the Pennine Lower Coal Measures could be determined with accuracy.

5.3.3 Three coal seams of workable thickness were encountered in RO02-RO08, from 21.6m bgl with a maximum thickness of 1.0m. The shallowest coal seam is inferred to be the Unknown Seam identified in the Coal Mining Risk Assessment (Ref: JMC/C3788/7930). The seam below this is inferred to be the Skelmersdale Earthy Delf, with the deepest seam being the Ravine Plodder seam. RO01 had just two coal seams, inferred to be the Skelmersdale Earthy Delf and the Ravine Plodder seams.

5.3.4 The coals seams dip from north to south across site with the following average dips:

- Unknown Seam – 3.74°
- Skelmersdale Earthy Delf – 4.77°
- Ravine Plodder Seam – 3.10°

5.3.5 The following table summarises the findings of the rotary open boreholes:

Seam	Thickness of Coal Seam (m)	Depth Beneath Site (m)	Thickness of Intact Rock Overburden	Inferred Coal Seam
RO01	0.7	24.7	15.5	Unknown Seam
RO01	0.5	28.2	19.0	Skelmersdale Delf
RO02	1.0	22.0	13.7	Unknown Seam
RO02	0.5	24.0	15.7	Skelmersdale Delf
RO02	0.4	26.0	17.7	Ravine Plodder
RO03	1.0	23.0	13.5	Unknown Seam
RO03	0.8	25.0	15.5	Skelmersdale Delf
RO03	0.4	27.0	17.5	Ravine Plodder
RO04	0.9	24.3	15.6	Unknown Seam
RO04	0.5	26.5	17.8	Skelmersdale Delf
RO04	0.5	27.7	19.0	Ravine Plodder
RO05	1.0	23.1	15.4	Unknown Seam
RO05	0.5	24.8	17.1	Skelmersdale Delf
RO05	0.3	26.5	18.8	Ravine Plodder
RO06	1.0	22.5	14.0	Unknown Seam
RO06	0.7	24.7	16.2	Skelmersdale Delf
RO06	0.3	27.0	18.5	Ravine Plodder
RO07	1.0	21.6	12.9	Unknown Seam
RO07	0.6	23.5	14.8	Skelmersdale Delf
RO07	0.4	26.2	17.5	Ravine Plodder
RO08	1.0	21.5	13.0	Unknown Seam
RO08	0.6	23.4	14.9	Skelmersdale Delf
RO08	0.4	25.5	17.0	Ravine Plodder

5.4 Existing Foundations

5.4.1 The current foundations beneath the existing building onsite appear to be concrete strip foundations, based on the foundation inspection pits excavated. All four hand excavated trial pits proved thickness of the foundations to be 0.25-0.35m thick, and depth from ground level to foundations to be between 0.21m and 0.70m bgl. A diagram of the foundations is presented in drawings, reference C3788/05.

5.5 Groundwater

5.5.1 The hand dug trial pits did not generally encounter any groundwater, and the rotary open holes used water flush resulting in the groundwater level being unreadable. Seepages were encountered in some of the window sample and cable percussive boreholes as detailed below:

Location	Depth of Seepage (m)	Comments
WS1	2.40	Slow Seepage
WS3	2.00	Slow Seepage
BH2	8.50	Rising to 6.20m after 20 mins

5.5.2 Post site works groundwater levels have ranged between 0.15m and 2.35m bgl.

5.6 Observations

5.6.1 During the works undertaken by BSL observations for both visual and olfactory evidence of contamination were made. Aside from the presence of ash and gravel sized bituminous fragments within the made ground, no evidence was identified.

5.6.2 In all of the rotary open boreholes the strata encountered were firm and intact, with water flush remaining present throughout the entire drilling process.

5.6.3 The first location for RO08 was unable to be taken beyond 2.00m bgl due to an unknown obstruction. The new location 2m to the south east encountered no obstruction.

6.0 TEST RESULTS

6.1 Chemical Test Results - Soils

6.1.1 The samples were tested for an assessment of the chemical contamination and results were examined with reference to a selection of guidance documents as detailed in Appendix E. In this case, the construction of a new Aldi Store and retail unit requires the use of commercial S4UL screening criteria.

6.1.2 The full results can be found in Appendix B – Chemical Testing Results. A summary of the chemical testing is presented below:

- **Metals**

No elevated levels of metals were detected in any of the samples above the relevant commercial S4UL screening criteria.

- **PAHs**

Concentrations were below the relevant commercial S4UL screening criteria and were also generally below laboratory detection limits

- **Asbestos**

Loose Chrysotile and Amosite fibres have been detected in four samples to date between 0.20m and 0.50m bgl. On quantification, the asbestos level was at trace levels (i.e. <0.001% mass).

6.1.3 In the absence of any particular sources of petroleum hydrocarbon contamination onsite and offsite, alongside the lack of any visual or olfactory evidence of this contaminant, no testing has been undertaken for petroleum hydrocarbons.

6.2 Geotechnical Testing

6.2.1 Plasticity index results ranged between 12% and 25% indicating the soils to have low to medium plasticity. Associated moisture contents ranged between 12% and 21%.

6.2.2 After modification of particle size in accordance with BRE 240 the modified plasticity indexes are in the range of 11% to 25% indicating the soils to be of low to medium volume change potential.

6.2.3 The shear vane values from hand vane tests taken in natural clays recorded from the hand dug trial pits are presented below:

Location	Depth (m)	Result (kPa)	Strength
HP02	0.5	66	Firm
HP03	0.5	56	Firm
	1.0	62	Firm
HP04	0.5	95	Stiff
	1.0	113	Stiff

6.2.4 Two undrained shear strength tests were undertaken on undisturbed cohesive samples. An undrained shear strength of 90kPa was reported for the sample at 3.00-

3.45m bgl in BH1, whilst an undrained shear strength of 72kPa was reported for the sample obtained from BH2 at 8.00-8.45m bgl.

6.3 Aggressive Ground Conditions/SD1 Testing

6.3.1 Water soluble sulphate testing was undertaken on four samples of the natural strata. The results revealed soluble sulphate (SO_4) contents of 0.0084g/l to 0.19g/l. Associated pH values were obtained which ranged between 7.8 and 8.5 indicating slightly alkaline conditions.

6.3.2 The latest investigation revealed soluble sulphate extract analysis concentrations between 8.4mg/l and 187mg/l in the sandy Clay with total soil sulphate concentration recorded up to 370mg/kg recorded in this Clay.

6.3.3 Analysis of the natural strata in WS1 and WS3 beneath the proposed store footprint revealed the following tabulated results:

Determinand	Range (mg/l)
Soluble Chloride	3.2 – 26
Soluble Nitrate	<2
Soluble Magnesium	<2.5 – 7.7
Soluble Sulphate	8.4 – 187
pH	7.8 – 8.5

6.4 Waste Disposal Testing Results

6.4.1 We have reviewed the testing results and inputted them into the HazWasteOnline model which allows users to code and classify waste as defined in the EWC (European Waste Catalogue 2002) based on EC Regulation 1272/2008 on the Classification, labelling and packaging of substances and mixtures (CLP) and latest Environment Agency guidance (WM3 "Guidance on the classification and assessment of waste (1st edition 2015)-Technical Guidance").

6.4.2 This is a useful tool as waste producers have the legal responsibility to classify any waste they produce, despite most classifications in the UK being done by the waste receivers.

6.4.3 Eight environmental samples collected during the site investigation were run through the HazWasteOnline tool to determine their waste classification. Six samples returned a Hazardous Waste result as outlined in the table below.

Location	Classification	Hazard Properties	Contaminants
BH1	Non-hazardous	N/A	N/A
HP1	Non-hazardous	N/A	N/A
HP2	Non-hazardous	N/A	N/A
HP4	Non-hazardous	N/A	N/A
WS2	Non-hazardous	N/A	N/A
WS3	Non-hazardous	N/A	N/A
WS4	Non-hazardous	N/A	N/A
WS6	Non-hazardous	N/A	N/A

6.4.4 The full results are in the Waste Classification Report presented in Appendix G

6.5 Gas Monitoring Results

6.5.1 Five gas monitoring visits have been carried out to date between the dates of 6th April 2018 and 8th June 2018.

6.5.2 Peak carbon dioxide concentrations between 0.1% and 6.9% v/v have been recorded during the monitoring period, while steady state concentrations varied between 0.1% and 3.6%v/v.

6.5.3 Only one methane concentration was recorded over the ambient level of 0.1%v/v, in BH2 at a level of 0.2%v/v over the course of the gas monitoring programme. In addition, no hydrogen sulphide gas has been detected.

6.5.4 Oxygen concentrations between 3.1%v/v and 24.5% v/v have been recorded during the monitoring period. They were depleted generally in WS03 and BH02.

6.5.5 A maximum flow reading of 5.1l/hr was recorded in WS01 during the first visit. However, typical values are below 1l/hr.

6.5.6 The atmospheric pressure was between 1005mb and 1019mb during the monitoring visits.

6.5.7 Groundwater levels on the site ranged between 0.15m and 4.84m bgl during the visits.

6.5.8 Full gas monitoring results are presented in Appendix D.

7.0 GEOTECHNICAL ASSESSMENT

7.1 General

7.1.1 The site is irregular in shape and consists of a large redundant office building in the north west, with the rest of the site being mostly covered with hardstanding asphalt, except for a small amount of soft landscaping in the west.

7.1.2 The proposed development will consist of a new purpose-built0.0 Aldi Superstore, with associated hardstanding car parking, soft landscaping and a smaller secondary retail unit situated on the northern part of the site. A proposed development layout plan is presented in Drawings for reference, by Harris Partnership Architects, drawing number 2269BOL-100 dated November 2017. The foundation requirements made are based this drawing and the current site level.

7.1.3 There is currently one large building on site of brick and steel construction that will require demolition prior to the commencement of the retail development.

7.1.4 In general, the ground conditions on site consist of made ground recorded to a maximum depth of 0.70m bgl, in the form of asphalt over sandy gravels. The natural strata were recorded to be sandy clays with varying gravel content, interbedded with loose to medium dense sand bands recorded to maximum depth ranging between 7.70m and 9.50m bgl. Weak thinly laminated weathered grey mudstone belonging to the Pennine Lower Coal Measures Formation was encountered directly beneath the Glacial Till.

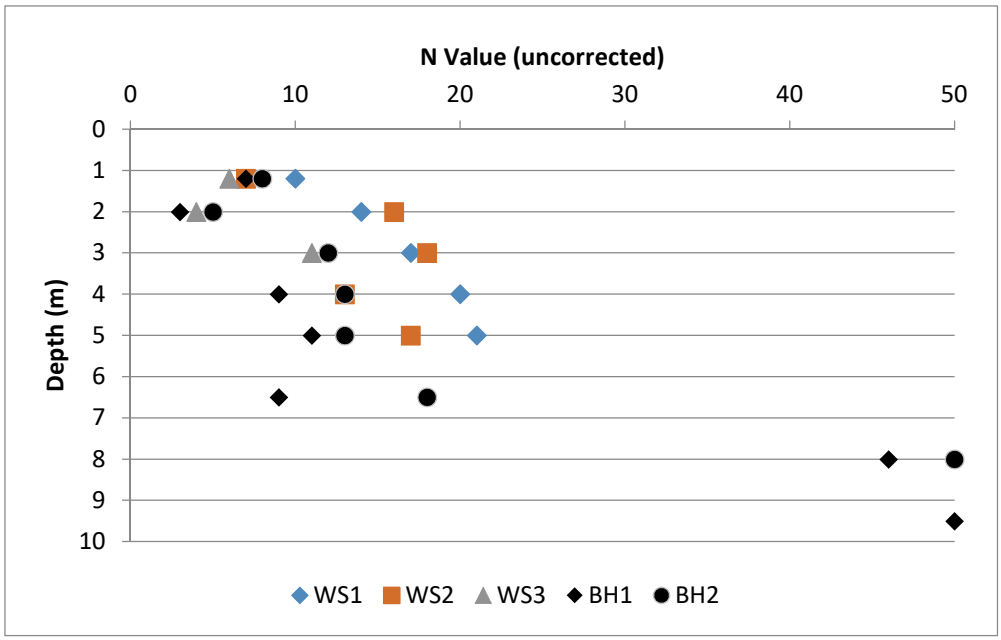
7.1.5 Rotary Open Drilling revealed the site to be underlain by mudstone down to at least 40m, with occasional sandstone bands. Three coal seams were identified interbedded within the mudstone, which are considered to be of workable thickness. The average thickness of the three coal seams were 0.95m, 0.59m and 0.39m respectively.

7.1.6 Post site work monitoring revealed groundwater levels between 0.15m and 4.84m bgl, which is considered to represent perched groundwater.

7.2 Soil Parameters

7.2.1 The test results have been evaluated to derive geotechnical soil parameters for the site. A depth vs SPT N value graph is provided below to provide a profile of the ground conditions underlying the proposed store footprint. Data from exploratory holes outside of the proposed building footprint have been excluded for clarity.

There is a positive correlation between depth and N value. In general, the deeper the strata



the higher the N value, therefore the soils generally increase in strength with depth.

7.2.2 Characterisation of the geotechnical parameters above has been undertaken to obtain a characteristic value, which is a cautious estimate of the value affecting the occurrence of the limit state.

7.2.3 Based on the anticipated and likely structural loads of the proposed store, the soils at 1.0m bgl are not considered to be suitable as a bearing stratum. Therefore, a characteristic value for SPT N value in clays at a depth of 1.50m has been used and interpreted to be 10, generally increasing with depth.

7.2.4 Based on the correlation with Stroud (1975), using the 'average' plasticity index and an f1 value of 6, this gives a characteristic undrained shear strength (Cu) value of 60kPa at 1.50m bgl.

7.3 Foundations

7.3.1 The most suitable foundations for the proposed store are considered to be pad foundations to support the steel frame of the building with strip foundations used to support the masonry walls.

7.3.2 Based on the soils strengths observed, foundations will need to be taken to the underside of any made ground and found on undisturbed natural ground: this will be at approximately 1.5m to 1.7m bgl. Based on the above parameters, for a square pad measuring 1m x 1m at 1.5m depth, an allowable bearing capacity not exceeding 150kN/m^2 should be assumed, which includes a global factor of safety of 3 and should limit settlement below 25mm. A higher bearing capacity is likely to be available in deeper soils, or wider pad foundations could be utilised, if required.

7.3.3 It is possible that a change in bearing stratum may occur across the proposed store footprints. If any sudden changes from clay to sand or gravel are encountered

reference should be made to a suitably qualified engineer, recommendations may include that the foundations should either be deepened to found on the same stratum or reinforced to reduce the potential for differential settlement.

7.3.4 The bearing stratum should be inspected for 'soft spots' within the natural clay strata, resulting for instance from localised groundwater perched within the overlying fill materials. Any such soft spots should be dealt with in accordance with good site practice.

7.3.5 If the ground conditions encountered during the construction phase differ significantly to the conditions encountered during construction, work should cease and BSL contacted for further advice.

7.3.6 During the construction phase supervision should be on a continuous basis to check the design assumptions are correct and construction conforms to design. Supervision should include inspections, Control Ground Investigations and monitoring.

7.4 Building Near Trees

7.4.1 The clay on site is of a medium volume change potential. Where foundation excavations encounter cohesive strata in the vicinity of existing, proposed or recently removed trees, foundations should be adjusted in full accordance with current guidance. All foundations should be deepened below roots of greater than 5mm diameter during excavations for footings.

7.4.2 A survey of all trees and hedges on the site and within influencing distance of the site boundary should be undertaken to identify tree species and heights. This information will be required in order to assess the effects of trees on the cohesive strata.

7.4.3 Where foundation depths due to trees already present or recently removed exceeds 1.50m there is a possibility for heave to occur on removal of the tree and a compressible material or void former is required against the inside face of all external wall foundations, unless it can be proven that cohesive soils are not desiccated in the vicinity of proposed footings.

7.5 Floor Slabs

7.5.1 If required, ground bearing floor slabs may generally be adopted at the site provided that once finished levels have been established, less than 600mm of suitable, appropriately compacted granular material exists beneath the slab.

7.5.2 Ground floor slabs should take into consideration the requirement for ground gas protection measures, which at the time of writing results suggests that protection measures will not be required, subject to ongoing monitoring.

7.6 Construction

7.6.1 Instability of excavations through natural soils is not anticipated provided they are not exposed to adverse weather conditions for any substantial period of time.

Instability of the made ground should be allowed for. All excavations should be carried out in accordance with CIRIA Report 97 'Trenching Practice'.

7.6.2 Excavation depths should generally be readily achieved using conventional plant (JCB or similar) although high specification plant (tracked 360° or similar) is recommended to maintain the build programme. Breaking equipment may also be required locally to penetrate old foundations associated with former construction.

7.6.3 The characteristic value for sulphate content in the natural clays is 0.0646g/l, with the average pH value being 8.1.

7.6.4 The site is underlain by low permeability deposits therefore the groundwater has been classified as static.

7.6.5 The results of laboratory pH and sulphate content indicate that ACEC Class AC-1 and sulphate class DS-1 conditions prevail in accordance with BRE Special Digest 1 "Concrete in aggressive ground" 2005. The specific concrete mixes (the Design Concrete Class) to be used on site will be determined by the site specific concrete requirements in terms of the durability and structural performance. These are assessed in terms of the Structural Performance Level (SPL) and any need for Additional Protective Measures (APM) detailed in Part D of BRE Special Digest 1 with further guidance in Pt E and F.

7.7 Mine Workings

7.7.1 The Coal Mining Risk Assessment identified a risk to the proposed development from unrecorded mine entries and unrecorded mine workings.

7.7.2 No evidence of unrecorded or recorded mine workings was identified during the investigation. The seams that were encountered during the drilling were intact, with full water flush returns maintained.

7.7.3 In addition, there was no evidence for unrecorded mine entries during the investigation.

7.7.4 Evidence of coal mine workings can be represented by voids, broken ground and/or loss of flush with evidence of potential workings indicated by intact coal of a suitable workable thickness and quality. An assessment should be made based on all the available evidence.

7.7.5 Three coal seams of workable thickness were encountered in RO02-RO08, from 21.6m bgl with a maximum thickness of 1.0m. The shallowest coal seam is inferred to be the Unknown Seam identified in the Coal Mining Risk Assessment (Ref: JMC/C3788/7930). The seam below this is inferred to be the Skelmersdale Earthy Delf, with the deepest seam being the Ravine Plodder seam. RO01 had just two coal seams, inferred to be the Skelmersdale Earthy Delf and the Ravine Plodder seams.

7.7.6 No evidence of coal workings in the form of broken ground and or loss of flush were recorded during the site investigation in any of the boreholes.

7.8 Treatment of Mine workings

7.8.1 CIRIA SP32 "Construction over abandoned mine workings" indicates that a void will not migrate to the surface where there is more than ten times the seam thickness of rock cover. Up to this depth, the void will begin to choke with rock from the roof (represented by broken ground).

7.8.2 Beyond 10 times the seam thickness the rock will arch and prevent upwards migration of the void.

7.8.3 The shallowest of the three unworked coal seams was at 21.5m bgl, with a maximum thickness of 1.0m. Based on CIRIA SP32 at least 10 times the seam thickness of rock exists in between the top of the coal seam and the top of the bedrock. In addition, if the seams had been worked the depth of competent rock cover is sufficient that crown holing will not affect the foundations of the proposed store.

7.8.4 It would be highly recommended to drill additional boreholes in the north western part of the site beneath the current building post demolition, and beneath the proposed smaller northern retail unit where access was prohibited during the site investigation, in order to test whether the ground at these locations matches the rest of the ground investigation report findings.

7.8.5 A further investigation should also be conducted during the construction phase to identify the unknown obstruction encountered in the first borehole attempt at RO08 at 2.00m bgl. It is worth noting that common materials unable to be drilled through are timber and steel, possibly related to a relict mining feature.

7.8.6 Subject to additional post demolition probe holes as described above, there appears to be no significant risk from shallow mine workings based on the information obtained to date.

7.9 Highways

7.9.1 CBR values of 3% - 5% are likely to be achieved in undisturbed natural soils for pavement design purposes, unless proven otherwise by in-situ testing at sub-base level by a specialist geotechnical engineer.

7.9.2 Where the CBR value is found to be less than 3%, some re-engineering of the subgrade will be required prior to highway construction to achieve the required design CBR value.

7.10 Soakaways

7.10.1 The use of soakaways within the natural ground is not feasible at the site due to the presence of relatively impermeable strata underlying the site.

8.0 ENVIRONMENTAL ASSESSMENT

8.1 General

8.1.1 The level of protection for the clean potable water supply pipes should be determined using the local water company risk assessment criteria in accordance with UKWIR.

8.2 Contamination

Soils

8.2.1 On the basis of the testing undertaken to date it appears that there are no heavy metals or PAHs above the relevant commercial screening values (S4ULs) for human health within the made ground.

8.2.2 Chrysotile and Amosite asbestos fibres have been detected in four samples to date, all of which were quantified to <0.001% total mass (at trace level).

Permanent Ground Gases

8.2.3 In order to assess the ground gas situation and the requirement for ground gas precautionary measures at the site, guidance was taken from CIRIA C665 'Assessing risks posed by hazardous ground gases to buildings' and BS8485:2015 'Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings'.

8.2.4 The proposed commercial end use dictates that the gas monitoring results are assessed in accordance with CIRIA C665 and the Wilson and Card methodology. The Wilson and Card method uses the concept of a Gas Screening Value (GSV) which is calculated using the maximum concentration of ground gas and flow rate.

8.2.5 A maximum flow rate of 5.1l/hr has been used to calculate the GSVs. This is the worst case scenario for the site. The results obtained generated a Gas Screening Value of 0.35l/hr for carbon dioxide and 0.00l/hr for methane.

8.2.6 The GSV for carbon dioxide places the site into Characteristic Situation 2 (CS2).

8.2.7 The maximum carbon dioxide concentration has been recorded marginally above the 5.0%v/v figure in two boreholes (BH2 and WS3) on two separate visits on 11/05/18 and 08/06/18 respectively. Whilst the flow rate on both boreholes has only been between 0 and 0.1, the install is located within the lower Pennine Coal Measures and both boreholes are within the footprint of the proposed store. Therefore we place the site into Characteristic Situation 2 (CS2).

8.2.8 The site has been assessed in accordance with BS8485:2015. The proposed structure is a Type C building and categorized as CS-2, therefore it requires 2.5 points of ground gas protection measures.

8.2.9 The designer should decide with the engineer which precautions it will utilise to achieve those points in accordance with tables 5, 6 and 7 of the guidance document.

8.3 Qualitative Risk Assessment

8.3.1 The risk assessment methodology used in this instance is based on **Source – Pathway – Receptor** (SPR) philosophy. The **source** is the presence of contamination, or substance/event likely to cause harm. The **receptor** is the target that may be detrimentally affected by the source. The **pathway** is the means of the contamination to move from the source to the receptor. Where any of these three factors are removed there is deemed to be no risk.

8.3.2 The CSMs have been revised based on the findings of the site investigation and laboratory testing results. Only potential sources with a moderate/low risk level and above have been carried forward from the preliminary CSM.

Human Health

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Made Ground	Ingestion, direct contact, inhalation of dusts	End-users	Unlikely	Medium	Low
Made Ground (Ground Gas)	Migration into confined spaces	End-users	Unlikely	Severe	Moderate/Low
Mine Gas	Migration into confined spaces	End-users	Unlikely	Medium	Low
Electricity substation	Ingestion, direct contact	End-users	Unlikely	Low	Low
OFF-SITE					
Infilled Ponds and Pits	Migration into confined spaces	End Users	Unlikely	Medium to severe	Moderate/Low

Human Health Justification

8.3.3 The proposed development at the site is to demolish the existing building and construct a new Aldi store in this location, along with a second smaller retail unit in the north. The rest of the site will be converted into car parking and soft landscaping.

8.3.4 The deepest made ground on site is 0.70m bgl. Ground gas monitoring carried out as part of this commission has revealed slightly elevated levels of carbon dioxide, placing the site into CS2 requiring some ground gas precautions.

8.3.5 Trace asbestos fibres have been detected in four samples to date and widespread contamination is not anticipated, therefore the risk is considered to be moderate to low. The asbestos is likely to have come from the demolition of part of the existing building, as mentioned in the historical section of the desk study.

8.3.6 There is an electricity substation on site that was first shown on the map dated 1977 by which time PCBs were banned therefore it is unlikely to have contained PCBs. Transformers are closed systems and the likelihood of significant leaks during maintenance or due to system failures is low.

8.3.7 In the absence of any particular sources of petroleum hydrocarbon contamination onsite and offsite, alongside the lack of any visual or olfactory evidence of this contaminant, no testing has been undertaken for petroleum hydrocarbons.

8.3.8 The risk to ground gas from off-site sources is classified as moderate to low, whilst no elevated gas levels have been recorded to date, the severity of ground gas is always severe. The offsite sources are not considered to be within an influencing distance of the site and the majority have been redeveloped and gross contamination is unlikely to still be present. Due to the presence of hardstanding and impermeable strata no pathway exists for any contamination that has migrated onto the site. The risks to site end users are considered to be low.

8.3.9 On the basis of the testing undertaken, no significant contamination has been identified at the site in respect to Commercial S4UL levels, and no specific mitigation measures are required.

Controlled Waters

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
Made Ground	Migration through groundwater or granular soils	Superficial Deposits Secondary Aquifer	Low Likelihood	Mild	Low
Made Ground	Migration through groundwater or granular soils	Bedrock Secondary Aquifer	Low likelihood	Mild	Low

Controlled Waters Justification

8.3.10 The made ground has been proven to lie directly above the superficial deposits. However, no significant concentrations of contaminants have been identified in the soils at the site. In addition, the proposed development will be covered in hardstanding which will limit infiltration and thus limit the potential for contaminants to leach downwards. Therefore, the risk to the superficial deposits (Secondary A Aquifer) is considered to be low.

8.3.11 The bedrock is classified as a Secondary A Aquifer and the site lies within a source protection zone, although the superficial deposits have been confirmed as low permeability clays, which will inhibit downward contaminant transport into the underlying bedrock. Therefore, the level of risk to the bedrock aquifer is considered to be low.

8.4 Outline Remedial Measures

8.4.1 No specific remedial measures are required in respect to soils or groundwater contamination.

8.4.2 Ground gas monitoring has revealed no significant concentrations of methane; however, carbon dioxide has been recorded at levels above 5%v/v during peak conditions. In addition, a significant flow of 5.1l/hr was detected in one of the holes. This places the site into Characteristic Situation 2, whereby atleast 2.5 points are required in accordance with BS8485:2015.

8.4.3 The designer should decide with the engineer which precautions it will utilise to achieve those points in accordance with tables 5, 6 and 7 of the guidance document.

8.4.4 The designer should produce a gas verification plan which conforms to CIRIA C735. This should define the installer and the verifier and their qualifications. It should also define what happens in the event of any non-conformances, such that irrevocable actions are avoided.

8.4.5 A watching brief should be maintained during groundworks for any unidentified sources of contamination within soils or groundwater.

8.5 Asbestos

8.5.1 The investigation of asbestos issues within structures was beyond the scope of this report. However, guidance from UK Government indicates that asbestos should be assumed to be present in buildings unless proven otherwise.

8.5.2 Any asbestos within structures will require removal prior to re-development. This will need to be done by a suitably qualified experienced and licensed contractor, who ensures that adequate PPE is provided to operatives, and that all the relevant legislation is adhered to.

8.5.3 Precautions are unlikely to be required, however a detailed method statement may be required to ensure compliance with CAR2012. Basic asbestos management good practice will be required. Typically, precautions would include:

- Ensuring soils do not dry out to become dusty
- Site personnel have the risk communicated at induction stage.

8.5.4 Additional guidance is provided within the Guidance Note in Appendix F

8.6 Health and Safety Issues

8.6.1 During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. The risk to construction and ground workers is assessed in the table below:

Potential Source	Potential Pathway	Potential Receptor	Likelihood	Severity	Level of Risk
ON-SITE					
Made Ground	Ingestion, direct contact, inhalation of dusts.	End-users	Likely	Low	Low
Made Ground (Ground Gas)	inhalation of gases.	End-users	Likely	Low	Low

Discussion

8.6.2 There is made ground present from ground level to a maximum depth of 0.70m bgl. It is likely that ground workers will come into contact with these soils, however as no significant contaminants were detected, the risk to groundworks is considered to be low.

8.6.3 General guidance on these matters is given in the Health and Safety Executive (HSE) document “Protection of Workers and the General Public during the Redevelopment

of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.
- Care should be taken to minimise the potential for off-site migration of contamination by the provision of dust suppression control and wheel cleaning equipment during the construction works.
- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

8.7 Waste

8.7.1 Based on the HazWasteOnline assessment tool the made ground soils have been classified as non-hazardous.

8.7.2 If the end disposal route of any site won soil waste is landfill, then that material needs to be specifically classified prior to leaving site. Details of how material should be classified for waste disposal are presented in Appendix F, although general guidance is given below.

8.7.3 The possibility of automatic inert classification of the natural soils should be explored in accordance with Section 4.3 of the EA guidance document. The Council Decision includes a list of wastes in Section 2.1.1 of the document that are assumed to be inert and therefore acceptable at a landfill for inert waste without testing, this is the case if:

- *They are single stream waste of a single waste type (although different waste types from the list may be accepted together if they are from a single source) and*
- *There is no suspicion of material or substances such as metals, asbestos, plastics, chemicals, etc to an extent which increases the risk associated with the waste sufficiently to justify contamination and they do not contain other their disposal in other classes of landfill.*

<u>General</u>

8.7.4 The made ground soils have the potential to be classified as Inert or Non-hazardous for disposal purposes, however this would be subject to testing on the actual arising's that will constitute the waste. Hazardous soils require pre-treatment prior to disposal. Effective pre-treatment, involving separation, sorting and screening can offer cost reductions through reducing the hazardous nature and volume of soil waste. Costs for disposal of non-hazardous nature and volume of soil waste. Costs for disposal of non-hazardous/hazardous soils are significant compared to disposal of inert material.

8.7.5 If any gross hydrocarbon contaminated material is encountered during the construction phase, it is possible that this may be classified as hazardous and testing should be undertaken at that time.

8.7.6 Waste produces have the legal responsibility to classify any waste they produce, despite most classifications in the UK being done by the waste receivers.

8.7.7 Where it is necessary to dispose material off site it is recommended that materials are segregated and where necessary sufficient time is allowed to further classify the material properly, including discussion with landfill sites and waste transfer stations to find the best disposal route.

8.7.8 As a significant proportion of the soils likely to be generated on site are clean it is recommended that where possible that the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

8.8 Compliance

8.8.1 It is recommended that the approval of the Local Authority is obtained in regard to the findings of this report prior to any irrevocable action at the site.

9.0 CONCLUSIONS

9.1 Summary

Environmental

9.1.1 Made ground generally comprises asphalt over sands and gravels, over firm to stiff natural clay deposits.

9.1.2 Chemical test results of onsite soils have revealed no elevated levels of metals or PAHs in respect to commercial S4UL screening levels. Asbestos fibres were detected; however, they were only at trace level. The risk to human health from asbestos fibres is considered to be low. Therefore, the risk presented to site end-users from the made ground is considered to be low.

9.1.3 The aquifers beneath the site are considered to be at low risk. The presence of low permeability cohesive strata will prevent the downward migration of leached contaminants to the underlying aquifers. The risk to surface waters is also assessed to be low, with the overall risk to controlled waters considered to be low.

9.1.4 Five ground gas monitoring visits have been undertaken, the results indicated some gas precautionary measures are required as the proposed development has been classified as Characteristic Situation 2 as assessed by CIRIA C665, gas precautions are therefore required in accordance with BS8485, and need to be verified in accordance with CIRIA C735.

Geotechnical

9.1.5 The proposed store footprint has three coal seams underlying it of workable thickness. No evidence for prior mine workings were identified during the drilling as the coal seams encountered were intact, and no flush was lost during drilling.

9.1.6 In the event that the seams had been worked, a sufficient rock cover exists to prevent upward migration of a void. Therefore, it is considered that mine workings will not affect the proposed store extension and precautions are not required.

9.1.7 The most suitable foundations for the proposed store in this area are considered to be pad and strip foundations. The clay on the site is of low to medium volume change potential, however, based on the soils strengths observed, foundations will need to be taken to the underside of any made ground and found on undisturbed natural ground at 1.5m bgl. An allowable bearing capacity not exceeding 150kN/m^2 should be assumed, which includes a global factor of safety of 3 and should limit settlement below 25mm.

9.1.8 If required, ground bearing floor slabs may generally be adopted at the site provided that once finished levels have been established, less than 600mm of suitable, appropriately compacted granular material exists beneath the slab.

9.1.9 Ground floor slabs should take into consideration the requirement for ground gas protection measures.

9.1.10 CBR values of 2-5% are likely to be achieved in undisturbed natural strata across the site unless proven otherwise by in-situ testing at sub-base level by a specialist

engineer. Some reengineering will be required including compaction of the subgrade prior to construction to achieve minimum design CBR values of 5%.

9.1.11 The use of soakaways within the natural ground are not considered feasible within this area due to the poor drainage conditions caused by the presence of relatively impermeable strata underlying the site and the area restrictions on site.

9.2 Further Work

9.2.1 The following further work is considered necessary to progress the site to construction phase:

- Drilling of additional holes in NW part of site beneath building post demolition.
- Tree survey by qualified aboriculturist.
- Foundation design
- Design of Remedial Strategy and Gas Verification Plan
- Confirmation of Remedial Strategy by Local Authority

10.0 REFERENCES

10.1 British Standards Institution. *Investigation of Potentially Contaminated sites - code of practice*. BS 10175:2011 (2nd Ed).

10.2 British Standards Institution 'Code of Practice for Site Investigations' BS 5930:2015

10.3 British Standards Institution "Geotechnical investigation and testing – Identification and classification of soil" BS EN ISO 14688:2002.

10.4 British Standards Institution "Geotechnical investigation and testing – Identification and classification of rock" BS EN ISO 14689:2002.

10.5 BRE Report BR211 'Radon – Guidance on protective measures for new buildings' 2015 Edition.

10.6 BRE Special Digest 1: "Concrete in Aggressive Ground" 3rd Ed 2005.

10.7 CIRIA 149 "Protecting development from methane" 1995.

10.8 CIRIA 150 "Methane Investigation Strategies" 1995.

10.9 CIRIA 151 "Interpreting measurements of gas in the ground" 1995.

10.10 CIRIA 152 "Risk assessment for methane and other gases from the ground" 1995.

10.11 CIRIA 552 "Contaminated Land Risk Assessment – A guide to good practice" 2001.

10.12 CIRIA C665 "Assessing Risks Posed by Hazardous Ground Gases to Buildings" 2007.

10.13 Wilson & Card "Proposed method classifying gassing sites" Ground Engineering 1999.

10.14 Card & Steve Wilson in "A pragmatic approach to ground gas risk assessment for the 21st Century" - CIRIA/Environmental Protection UK Ground gas seminar 2011

10.15 BS 8576:2013 'Guidance on investigations for ground gas – Permanent gases and Volatile Organic Compounds (VOCs)'

10.16 BS 8485:2015 'Code of practise for the design of protective measures for methane and carbon dioxide ground gases for new buildings'

10.17 The Hazardous Waste (England) Regulations 2005.

10.18 Environment Agency Hazardous Waste: "Guidance on the classification and assessment of waste" WM3 ver 1 May 2015.

10.19 The National Planning Policy Framework (NPPF) March 2012

10.20 DETR. Circular 02/2000 Contaminated Land.

10.21 Environment Agency, 2009 'Using Soil Guideline Values'.

10.22 Environment Agency, 2009 'Updated Technical Background to the CLEA model'.

10.23 Environment Agency, 2009 'Human health toxicological assessment of contaminants in soil'.

10.24 Department of the Environment, 1994, CLR Report No 1 'A framework for assessing the impact of contaminated land on groundwater and surface water'.

10.25 Department of the Environment, 1994, CLR Report No 2 'Guidance on Preliminary Site Inspection of Contaminated Land'.

10.26 Department of the Environment, 1994, CLR Report No 3 'Documentary research on Industrial Sites'.

10.27 Department of the Environment, 1994, CLR Report No 4 'Sampling Strategies for Contaminated Land'.

10.28 DEFRA and the Environment Agency, 2002-2004, CLR10 'Soil Guideline Value Reports for Individual Soil Contaminants'.

10.29 DEFRA and the Environment Agency, 2004, CLR Report No 11 'Model Procedures for the Management of Contaminated Land'.

10.30 Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R. C. and Nathanail, J.F. 2015. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham.

10.31 CL:AIRE, 2014 'Development of Category 4 Screening Levels for Assessment of Land Affected by Contamination'.

10.32 Water Framework Directive.

10.33 Environmental Quality Standards.

10.34 UK Drinking Water Standards: Water Supply (Water Quality) Regulations 1989 (SI 1989/1147) and Water Supply (Water Quality) Regulations 2000 (SI 2000/3184).

10.35 UKWIR Report 10/WM/03/21 2010 "Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites"

10.36 Health & Safety Executive, 1991. 'Protection of Workers & the General Public during the Development of Contaminated Land'.

10.37 Environment Agency & NHBC, 2000. R&D Publication 66. Guidance for the Safe Development of Housing on Land Affected by Contamination.

10.38 Environment Agency "Guidance on the classification and assessment of waste (1st edition 2015) Technical Guidance WM3"

10.39 Department of the Environment, 1992. Waste Management Paper No. 27. Landfill Gas: A Technical Memorandum Providing Guidance on the Monitoring and Control of Landfill Gas.

10.40 NHBC Standards 2017

10.41 CL:AIRE "The Definition of Waste: Development Industry Code of Practice" Version 2 March 2011.

10.42 CIRIA "Asbestos in soil and made ground: a guide to understanding and managing risks" C733 2014

10.43 Control of Asbestos Regulations (CAR) 2012

10.44 Harris, M R, Herbert, S. M, Smith, M A 'Remedial Treatment for Contaminated Land' (twelve volumes), special publications 101-112, CIRIA 1996.

10.45 Department of the Environment. 1995. Industry Profiles - 48 separate publications available from The Stationery Office, London

10.46 BRE Report 465 "Cover Systems for Land Regeneration" 2004.

10.47 Privett, K D, Matthews, S C, & Hodges, R, A, 'Barriers, liners and cover systems for containment and control of land contamination' 1996. CIRIA Special Publication 124.

10.48 BRE Digest 365 “Soakaway Design” 2007.

10.49 Environment Agency. R&D Publication 20. Methodology for the Derivation of Remedial Targets for Soil and Groundwater to Protect Water Resources. 1999.

10.50 Environment Agency Technical Guidance Note 01. Hydrogeological Risk Assessment for Landfills.

10.51 Specification for Highways Works – Series 600 Earthworks November 2006.

10.52 SEPA “Land remediation and waste management guidelines” publication date unknown.

10.53 Environment Agency Petroleum Hydrocarbons in Groundwater, Supplementary Guidance for Hydrogeological Risk Assessment 2009.

10.54 Total Petroleum Hydrocarbon Criteria Working Group Volume 1 Analysis of Petroleum Hydrocarbons in Environmental Media March 1998.

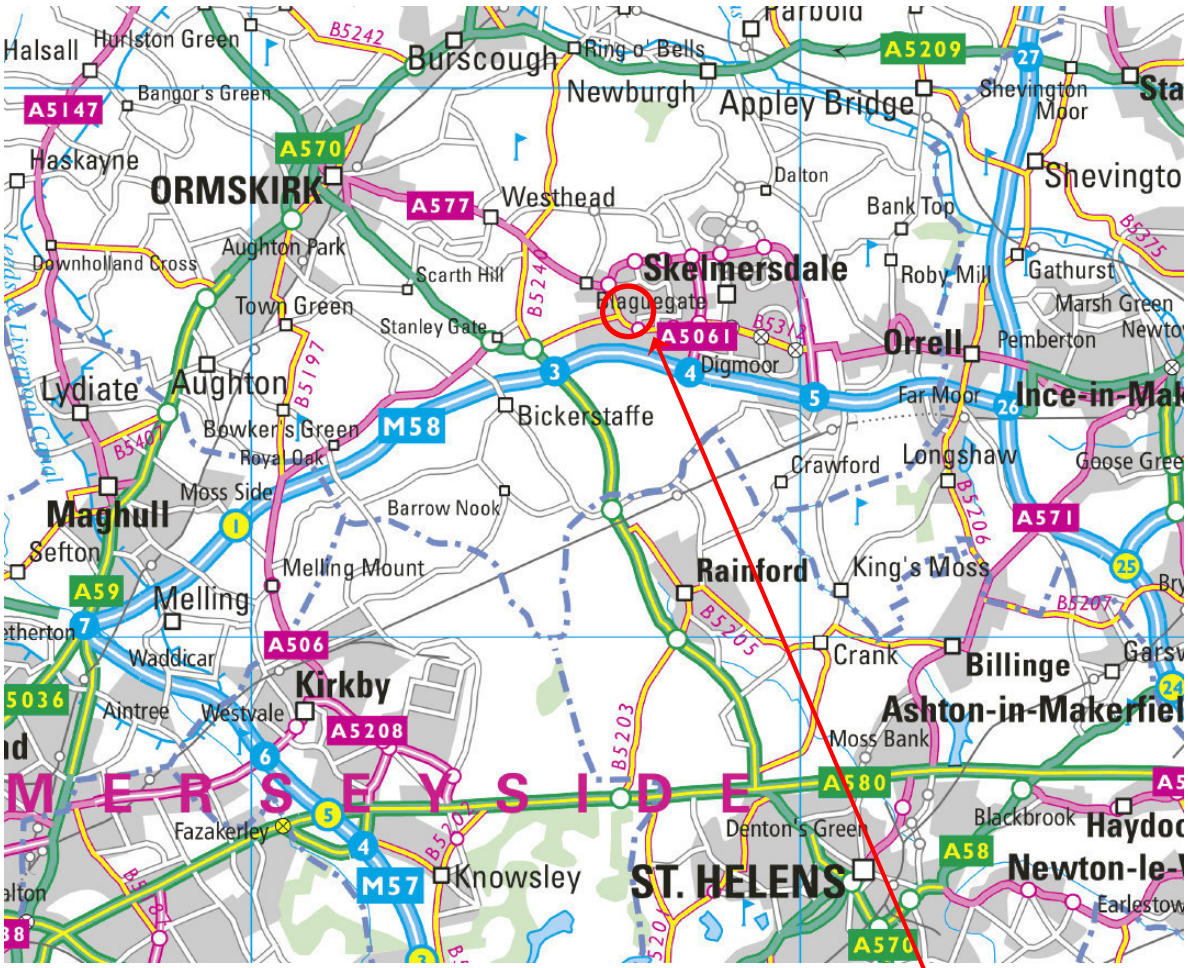
10.55 Total Petroleum Hydrocarbon Criteria Working Group Volume 2 Composition of Petroleum Mixtures May 1998.

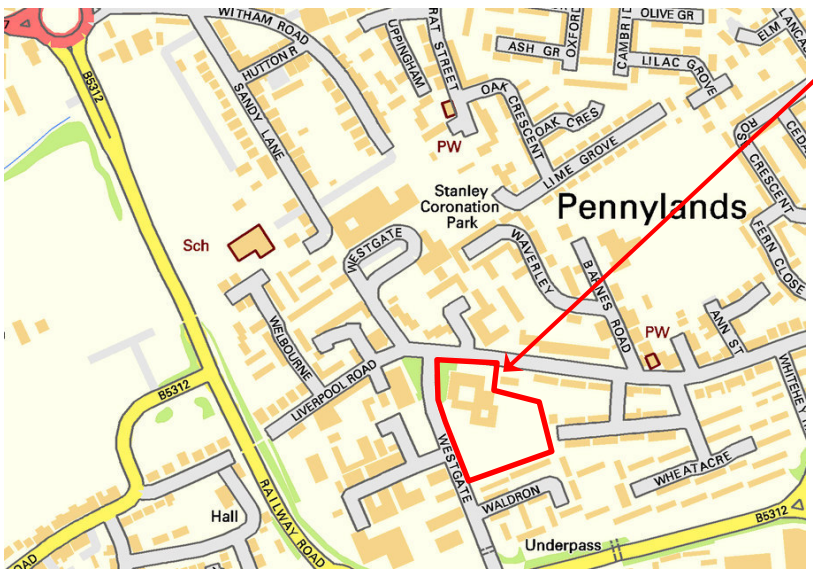
10.56 Total Petroleum Hydrocarbon Criteria Working Group Volume 3 Selection of Representative TPH Fractions Based on Fate and Transport Considerations July 1997.

10.57 Total Petroleum Hydrocarbon Criteria Working Group Volume 4 Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH).

10.58 Total Petroleum Hydrocarbon Criteria Working Group Volume 5 Human Health Risk-Based Evaluation of Petroleum Release Sites: Implementing the Working Group Approach June 1999.

DRAWINGS





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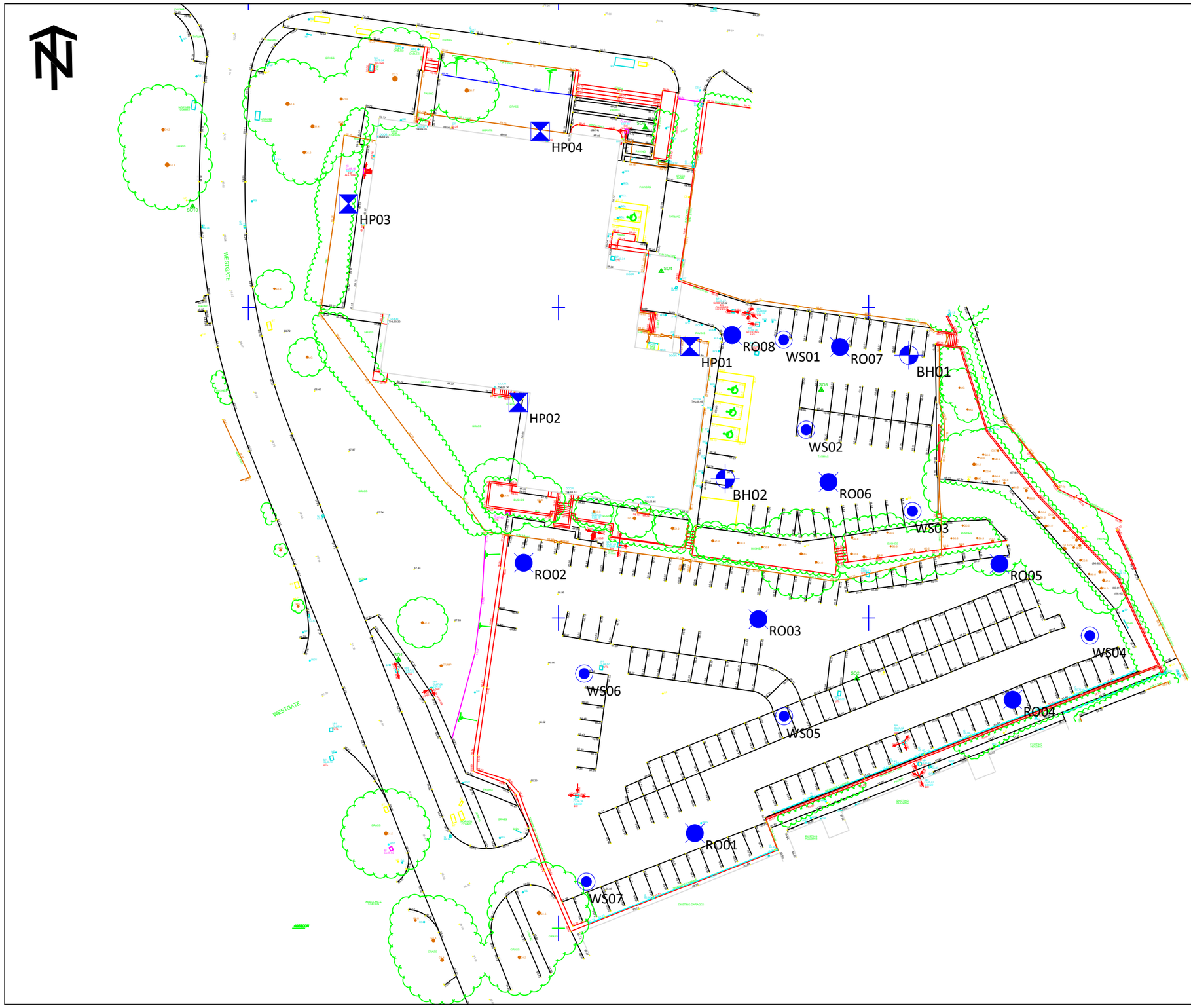
Westgate, Skelmersdale

Site Location Plan

Drawing Number C3788/01

Scale: NTS

Drawn By: JMC	Checked By: AJS



KEY

- HPXX — HAND EXCAVATED TRIAL PIT
- WSXX — WINDOW SAMPLE BOREHOLE
- BHXX — CABLE PERCUSSIVE BOREHOLE
- ROXX — ROTARY OPEN BOREHOLE

DO NOT PASTE SYMBOLS HERE! – THIS IS A VIEW PORT – SET UP KEY WITHIN MODEL VIEW AND ZOOM ALL EXTENTS TO LOCATE HERE **THEN DELETE THIS TEXT

NOTES

1. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT & ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS REPORTS. THIS DRAWING IS COPYRIGHT OF BSL.
3. DRAWING NOT FOR CONSTRUCTION PURPOSES.

DESCRIPTION	REV	DATE

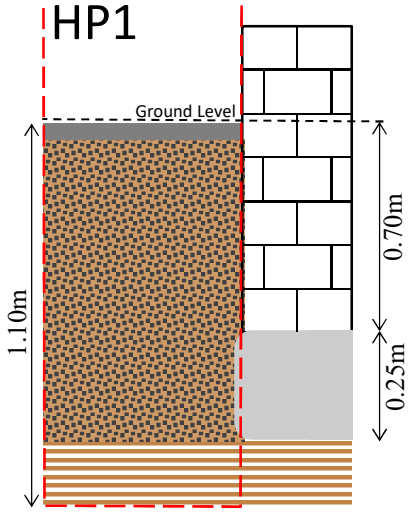
BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

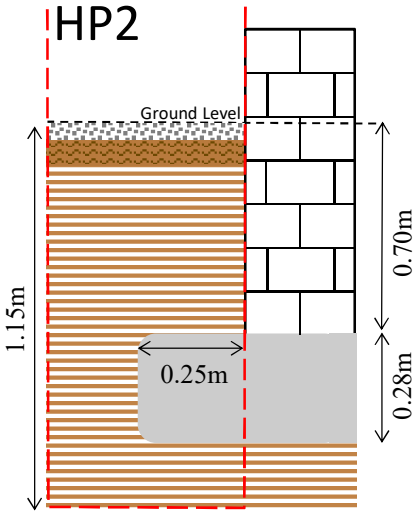
CLIENT: ALDI

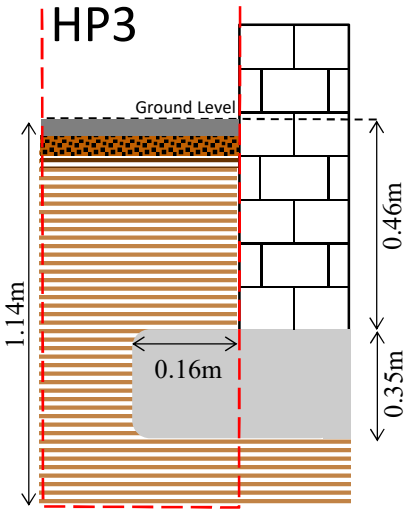
PROJECT TITLE: WESTGATE, SKELMERSDALE

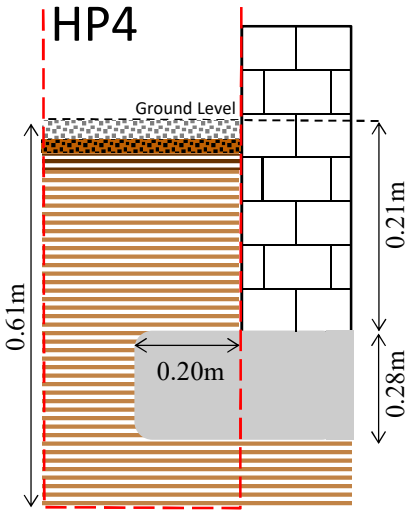
DRAWING DETAIL: EXPLORATORY HOLE LOCATION PLAN

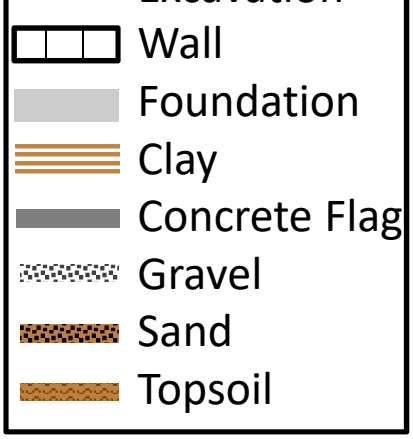
DRAWN	CHECKED
JM	AJS
DATE	**SCALE**
MARCH 2018	NTS
DRAWING NUMBER	**REVISION**
C3788/03	–











NB See trial pit logs for detailed encountered soils description

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

ALDI
Westgate, Skelmersdale
Existing Foundations
Drawing Number C3788/05
Scale: NTS
Drawn By: JM / Checked By: AJS

APPENDIX A
Exploratory Hole Logs

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **BH1**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type CP
Location: SKELMERSDALE		Level:	Scale 1:50
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	D		0.10			MADE GROUND: Asphalt.
		0.50	ES					MADE GROUND: Brown/black gravelly fine to coarse sand with medium brick cobble content and rare ash. Gravel is subangular fine to coarse of brick and limestone.
		0.70	D		0.70			Firm brown sandy CLAY. Sand is fine to coarse.
		1.20	D					
		1.20		N=7 (1,1/2,1,2,2)				
		1.80	D		1.80			Loose brown clayey fine to coarse SAND.
		2.00	D					
		2.00		N=3 (1,0/1,0,1,1)				
		2.50	D		2.50			Firm brown sandy CLAY. Sand is fine to coarse.
		3.00 - 3.45	U					
		3.50	D					
		4.00	D					
		4.00		N=9 (1,2/2,2,3,2)				
		5.00	D					
		5.00		N=11 (1,2/2,3,3,3)				
		6.50	D					
		6.50		N=9 (1,2/2,2,2,3)				
		8.00	D					*Very Stiff from 8.00m bgl.*
		8.00		46 (3,4/46 for 295mm)				
					8.40			Weak light grey weathered thinly laminated MUDSTONE.
		9.50	D					
		9.50		50 (25 for 145mm/50 for 140mm)				
					9.95			End of borehole at 9.95 m

1 2 3 4 5 6 7 8 9 10

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Hole backfilled with arisings upon completion.

AGS

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **BH2**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type CP
Location: SKELMERSDALE		Level:	Scale 1:50
Client: ALDI		Dates: 22/03/2018 - 23/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10	D		0.10			MADE GROUND: Asphalt.
		0.50	ES					MADE GROUND: Brown/black gravelly fine to coarse sand with medium brick cobble content and rare ash. Gravel is subangular fine to coarse of brick and limestone.
		0.70	D		0.70			Soft to Firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
		1.20	D					
		1.20		N=8 (1,1/2,2,2,2)				
		2.00	D					
		2.00		N=5 (1,1/1,1,2,1)				
		3.00	D		3.00			Firm brown sandy CLAY. Sand is fine to coarse.
		3.00		N=12 (1,2/3,3,3,3)				
		4.00	D					
		4.00		N=13 (1,2/3,3,4,3)				
		5.00	D					
		5.00		N=13 (2,2/3,3,4,3)				
		6.50	D					*Becoming Stiff from 6.50m bgl.*
		6.50		N=18 (2,3/3,4,5,6)				
		7.00	D					
					7.60			Stiff brown very sandy CLAY. Sand is fine to coarse.
		8.00 - 8.45	U					
					8.40			Weak light grey weathered thinly laminated MUDSTONE.
		8.50	D					
		8.50		N=50 (6,7/12,12,13,13)				
					8.95			End of borehole at 8.95 m

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater encountered at 8.40m bgl, rising to 6.20m bgl after 20 minutes.
3. Install: 1.50m plain pipe, slotted to 7.50m bgl.

AGS

Trial Pit Log

Trialpit No **HP1**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: - Level:	Date 20/03/2018
Location: SKELMERSDALE		Dimensions (m): Depth 1.10	Scale 1:25
Client: ALDI			Logged JM

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.10			MADE GROUND: Concrete flag.
▼	0.20	ES					MADE GROUND: Brown/black clayey gravelly fine to coarse sand with medium brick cobble content and low sandstone cobble content. Gravel is subangular fine to coarse of brick and limestone.
				1.10			End of pit at 1.10 m

1
2
3
4
5

Remarks:
1. Groundwater encountered at 0.90m bgl.
2. Hole backfilled with arisings upon completion.
3. See drawing C3788/05 for foundation details.

Stability: Stable.

Trial Pit Log

Trialpit No **HP2**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: - Level:	Date 20/03/2018
Location: SKELMERSDALE		Dimensions (m): Depth 1.15	Scale 1:25
Client: ALDI			Logged JM

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	ES	HVP=66	0.05			MADE GROUND: Grey limestone gravel.
				0.12			MADE GROUND: Grass over soft brown slightly sandy clay (topsoil) with low brick cobble content.
							MADE GROUND: Soft brown sandy clay with low brick cobble content. Sand is fine to coarse.
				0.45			Soft to Firm brown very sandy CLAY with low brick cobble content.
				1.15			End of pit at 1.15 m

1
2
3
4
5

Remarks: 1. Hole backfilled with arisings upon completion.
2. See drawing C3788/05 for foundation details.

Stability: Stable.

Trial Pit Log

Trialpit No **HP3**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: - Level:	Date 20/03/2018
Location: SKELMERSDALE		Dimensions (m): Depth 1.14	Scale 1:25
Client: ALDI			Logged JM

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				0.10			MADE GROUND: Concrete flag.
				0.14			MADE GROUND: Light brown medium to coarse sand.
	0.30	ES		0.35			MADE GROUND: Soft dark brown very sandy clay with low brick cobble content.
			HVP=56				Soft to Firm brown sandy gravelly CLAY. Sand is fine to medium. Gravel is subangular fine to coarse of sandstone and mudstone.
			HVP=62				
				1.14			End of pit at 1.14 m

1
2
3
4
5

Remarks: 1. Hole backfilled with arisings upon completion.
2. See drawing C3788/05 for foundation details.

Stability: Stable.

AGS

Trial Pit Log

Trialpit No **HP4**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: - Level:	Date 20/03/2018
Location: SKELMERSDALE		Dimensions (m): Depth 0.61	Scale 1:25
Client: ALDI			Logged JM

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES	HVP=95	0.05			MADE GROUND: Grey limestone gravel.
				0.26			MADE GROUND: Soft to Firm dark brown slightly sandy gravelly clay. Gravel is subangular fine to coarse of sandstone, mudstone and brick.
	0.60	D	HVP=113	0.61			Stiff reddish brown mottled grey sandy CLAY.
							End of pit at 0.61 m

1
2
3
4
5

Remarks: 1. Hole backfilled with arisings upon completion.
2. See drawing C3788/05 for foundation details.

Stability: Stable.

Borehole Log

Borehole No. **WS1**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.40			MADE GROUND: Brown/black sandy gavel with high brick cobble content. Sand is fine to coarse. Gravel is subangular fine to coarse of brick and sandstone. Rare glass and tar material.
		0.50	ES		0.55			MADE GROUND: Dark brown sandy clay with medium brick cobble content.
								Sand lens from 0.50m to 0.53m bgl.
								Stiff brown mottled grey sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
		1.20 1.20	D	N=10 (1,1/2,2,3,3)	1.10			Firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
					1.35			Firm brown sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of mudstone.
								Sand lens from 1.85m to 1.90m bgl.
		2.00 2.00	D	N=14 (2,2/3,3,4,4)				
		3.00 3.00	D	N=17 (1,3/3,4,5,5)	3.10			Stiff brown slightly sandy very gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded medium to coarse of sandstone and mudstone.
								Sand lens from 3.70m to 3.74m bgl.
		4.00 4.00	D	N=20 (4,3/4,5,5,6)				
		5.00	D					Continued on next sheet

1 2 3 4 5

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater encountered at 2.50m bgl.
3. Install: 2.00m plain pipe, slotted to 4.00m bgl.

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **WS1**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00		N=21 (4,4/5,5,5,5,6)				
					5.45			End of borehole at 5.45 m

6
7
8
9
10

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater encountered at 2.50m bgl.
3. Install: 2.00m plain pipe, slotted to 4.00m bgl.

AGS

Borehole Log

Borehole No. **WS2**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.25			MADE GROUND: Dark brown mottled black gravel. Gravel is subangular to angular fine to coarse of brick and tar.
					0.30			MADE GROUND: Brick cobbles.
					0.65			MADE GROUND: Dark brown stiff clay with bituminous staining and medium brick cobble content.
		0.70	ES					Soft brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.
		1.20 1.20	D	N=7 (1,1/2,1,2,2)				
		2.00 2.00	D	N=16 (2,2/3,4,4,5)	2.10			Stiff brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of sandstone and mudstone.
		2.50	D					
		3.00 3.00	D	N=18 (3,3/4,4,5,5)				
		4.00 4.00	D	N=13 (2,3/3,3,3,4)				
		5.00	D					

1 2 3 4 5

Continued on next sheet

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Install: 1.00m plain, slotted to 4.00m bgl.

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **WS2**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		5.00		N=17 (2,3/3,4,5,5)				
					5.45			End of borehole at 5.45 m

6
7
8
9
10

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Install: 1.00m plain, slotted to 4.00m bgl.

AGS

Borehole Log

Borehole No. **WS3**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.20	ES		0.22			MADE GROUND: Black sandy gravel. Sand is fine to coarse of ash. Gravel is subangular medium to coarse of brick and bituminous material.
		0.70	ES		0.70			MADE GROUND: Soft brown sandy clay with high brick cobble content.
		1.20 1.20	D	N=6 (1,0/1,1,2,2)	1.15			Dark brown clayey slightly gravelly fine to coarse SAND with rootlets. Gravel is subangular to angular fine to medium brick and sandstone.
	▼	2.00 2.00	D	N=4 (1,1/1,1,1,1)	2.25			Loose light brown mottled grey clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.
		3.00 3.00	D	N=11 (1,2/2,3,3,3)	3.05			Loose brown clayey fine to coarse SAND.
		3.50	D					Firm brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of sandstone and mudstone.
		4.00 4.00	D	N=12 (1,2/2,3,3,4)				
					5.00			End of borehole at 5.00 m

1 2 3 4 5

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater encountered at 2.00m bgl.
3. Install: 1.40m plain, slotted to 3.4m bgl.

Borehole Log

Borehole No. **WS4**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.18			MADE GROUND: Grey gravel with low limestone cobble content. Gravel is subangular to angular fine to coarse of sandstone and limestone.
					0.40			MADE GROUND: Sandstone and mudstone cobbles.
		0.50	ES					Black clayey slightly gravelly fine to coarse SAND. Gravel is subrounded fine to coarse of mudstone.
		1.00	ES		1.05			
		1.20 1.20	D	N=7 (1,1/1,2,2,2)				Firm brown mottled grey slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subrounded fine to coarse of mudstone and sandstone.
		2.00 2.00	D	N=15 (2,2/3,3,4,5)				*Becoming Stiff from 2.00m bgl.*
		3.00 3.00	D	N=11 (2,2/2,3,3,3)				*Becoming Firm from 3.00m bgl.*
					3.45			End of borehole at 3.45 m

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Hole backfilled with arisings upon completion.

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **WS5**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.23			MADE GROUND: Brown gravel with low brick cobble content. Gravel is subangular fine to coarse of limestone.
					0.45			MADE GROUND: Mudstone cobbles.
		0.50	ES					Brown mottled grey clayey slightly gravelly SAND. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of sandstone and mudstone.
					0.95			Medium dense brown clayey gravelly SAND. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
		1.20 1.20	D	N=21 (3,4/5,5,5,6)				
		2.00 2.00	D	N=8 (2,2/2,2,2,2)				*Becoming loose from 2.00m bgl.*
					2.60			Firm grey/brown very sandy CLAY.
		3.00 3.00	D	N=10 (1,2/2,2,3,3)				
					3.45			End of borehole at 3.45 m

1
2
3
4
5

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Install: 1.00m plain, slotted to 3.00m bgl.

AGS

Borehole Log

Borehole No. **WS6**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
					0.35			MADE GROUND: Brick cobbles.
		0.50	ES		0.45			MADE GROUND: Sandy gravel of subangular to angular fine to coarse of limestone. Sand is fine to coarse.
								Firm brown very sandy gravelly CLAY. Sand is fine to coarse.
		1.20	D		1.20			No recovery. Probably loose SAND.
		1.20		N=4 (2,1/1,1,1,1)				
		2.00		N=9 (3,3/3,2,2,2)				
					2.45			End of borehole at 2.45 m

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Hole backfilled with arisings upon completion.

Borehole Log

Borehole No. **WS7**

Sheet 1 of 1

Project Name: WESTGATE	Project No. C3788	Co-ords: -	Hole Type WS
Location: SKELMERSDALE		Level:	Scale 1:25
Client: ALDI		Dates: 22/03/2018 - 22/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			MADE GROUND: Asphalt.
		0.20	ES		0.32			MADE GROUND: Grey/brown sandy gravel with low limestone cobble content. Rare ash and tar. Sand is fine to coarse. Gravel is subangular to angular fine to coarse of limestone.
					0.50			MADE GROUND: Red gravel with high brick cobble content. Gravel is subangular to angular medium to coarse of brick.
		0.70	ES		0.70			MADE GROUND: Black clayey gravelly fine to coarse sand with medium mudstone cobble content. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		1.20 1.20	D	N=18 (2,3/4,4,5,5)	1.30			Medium dense grey/brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone.
		2.00 2.00	D	N=8 (2,3/3,2,2,1)				Medium dense slightly clayey fine to coarse SAND. *Loose from 2.00m bgl.*
		3.00 3.00	D	N=9 (1,1/2,2,2,3)	2.60			Firm brown sandy CLAY. Sand is fine to coarse.
					3.45			End of borehole at 3.45 m

1 2 3 4 5

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Groundwater not encountered.
3. Hole backfilled with arisings upon completion.

AGS

Borehole Log

Borehole No. **RO01**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346922.00 - 405815.00	Hole Type RO
Location: SKELMERSDALE		Level: 65.90	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	65.80		MADE GROUND: Asphalt. Light brown CLAY.
					9.20	56.70		Grey MUDSTONE.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

BROWNFIELD SOLUTIONS LTD

Borehole No. **RO01**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346922.00 - 405815.00	Hole Type RO
Location: SKELMERSDALE		Level: 65.90	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					17.60	48.30		Grey MUDSTONE with sandstone bands.
					24.70	41.20		COAL.
					25.40	40.50		Grey MUDSTONE.
					26.20	39.70		COAL.
					28.70	37.20		Grey MUDSTONE.
					30.00	35.90		End of borehole at 30.00 m

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

AGS

Borehole Log

Borehole No. **RO02**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346894.00 - 405859.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.90	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	66.80		MADE GROUND: Asphalt. Light brown CLAY.
					8.30	58.60		Grey MUDSTONE.
					14.30	52.60		Grey MUDSTONE with sandstone bands.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO02**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346894.00 - 405859.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.90	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					22.00	44.90		COAL.
					23.00	43.90		Grey MUDSTONE.
					24.00	42.90		COAL.
					24.50	42.40		Grey MUDSTONE.
					26.00	40.90		COAL.
					26.40	40.50		Grey MUDSTONE.
					30.00	36.90		End of borehole at 30.00 m

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO03**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346932.00 - 405850.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.60	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	66.50		MADE GROUND: Asphalt. Light brown CLAY.
					9.50	57.10		Grey MUDSTONE.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO03**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346932.00 - 405850.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.60	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					15.50	51.10		Grey MUDSTONE with sandstone bands.
					23.00	43.60		COAL.
					24.00	42.60		Grey MUDSTONE.
					25.00	41.60		COAL.
					25.80	40.80		Grey MUDSTONE.
					27.00	39.60		COAL.
					27.40	39.20		Grey MUDSTONE.
					30.00	36.60		End of borehole at 30.00 m

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO04**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346973.00 - 405837.00	Hole Type RO
Location: SKELMERSDALE		Level: 65.60	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	65.50		MADE GROUND: Asphalt. Light brown CLAY.
					8.70	56.90		Grey MUDSTONE.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO04**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346973.00 - 405837.00	Hole Type RO
Location: SKELMERSDALE		Level: 65.60	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 20/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					15.70	49.90		Grey MUDSTONE with sandstone bands.
					24.30	41.30		COAL.
					25.20	40.40		Grey MUDSTONE.
					26.50	39.10		COAL.
					27.00	38.60		Grey MUDSTONE.
					27.70	37.90		COAL.
					28.20	37.40		Grey MUDSTONE.
					30.00	35.60		End of borehole at 30.00 m

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO05**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346971.00 - 405859.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.50	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	66.40		MADE GROUND: Asphalt. Light brown CLAY.
					7.70	58.80		Grey MUDSTONE.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO05**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346971.00 - 405859.00	Hole Type RO
Location: SKELMERSDALE		Level: 66.50	Scale 1:75
Client: ALDI		Dates: 20/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					15.30	51.20		Grey MUDSTONE with sandstone bands.
					23.10	43.40		COAL.
					24.10	42.40		Grey MUDSTONE.
					24.80	41.70		COAL.
					25.30	41.20		Grey MUDSTONE.
					26.50	40.00		COAL.
					26.80	39.70		Grey MUDSTONE.
					30.00	36.50		End of borehole at 30.00 m

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

AGS

Borehole Log

Borehole No. **RO06**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346944.00 - 405872.00	Hole Type RO
Location: SKELMERSDALE		Level: 68.20	Scale 1:75
Client: ALDI		Dates: 21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	68.10		MADE GROUND: Asphalt. Light brown CLAY.
					8.50	59.70		Grey MUDSTONE.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

BROWNFIELD SOLUTIONS LTD

Borehole Log

Borehole No. **RO06**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346944.00 - 405872.00	Hole Type RO
Location: SKELMERSDALE		Level: 68.20	Scale 1:75
Client: ALDI		Dates: 21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					16.20	52.00		Grey MUDSTONE with sandstone bands.
					22.50	45.70		COAL.
					23.50	44.70		Grey MUDSTONE.
					24.70	43.50		COAL.
					25.40	42.80		Grey MUDSTONE.
					27.00	41.20		COAL.
					27.30	40.90		Grey MUDSTONE.
					30.00	38.20		End of borehole at 30.00 m

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

AGS

Borehole Log

Borehole No. **RO07**

Sheet 1 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346945.00 - 405894.00	Hole Type RO
Location: SKELMERSDALE		Level: 68.60	Scale 1:75
Client: ALDI		Dates: 21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	68.50		MADE GROUND: Asphalt. Light brown CLAY.
					8.70	59.90		Grey MUDSTONE.
					14.50	54.10		Grey MUDSTONE with sandstone bands.
								Continued on next sheet

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO07**

Sheet 2 of 2

Project Name: WESTGATE	Project No. C3788	Co-ords: 346945.00 - 405894.00	Hole Type RO
Location: SKELMERSDALE		Level: 68.60	Scale 1:75
Client: ALDI		Dates: 21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.60	47.00		COAL.
					22.60	46.00		Grey MUDSTONE.
					23.50	45.10		COAL.
					24.10	44.50		Grey MUDSTONE.
					26.20	42.40		COAL.
					26.60	42.00		Grey MUDSTONE.
					30.00	38.60		End of borehole at 30.00 m

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO08**

Sheet 1 of 3

Project Name:	WESTGATE	Project No. C3788	Co-ords:	346928.00 - 405896.00	Hole Type RO
Location:	SKELMERSDALE		Level:	68.80	Scale 1:75
Client:	ALDI		Dates:	21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	68.70		MADE GROUND: Asphalt. Light brown CLAY.
					8.50	60.30		Grey MUDSTONE.
					13.80	55.00		Grey MUDSTONE with sandstone bands.
								Continued on next sheet

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Remarks

1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No. **RO08**

Sheet 2 of 3

Project Name: WESTGATE	Project No. C3788	Co-ords: 346928.00 - 405896.00	Hole Type RO
Location: SKELMERSDALE		Level: 68.80	Scale 1:75
Client: ALDI		Dates: 21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.50	47.30		COAL.
					22.50	46.30		Grey MUDSTONE.
					23.40	45.40		COAL.
					24.00	44.80		Grey MUDSTONE.
					25.50	43.30		COAL.
					25.90	42.90		Grey MUDSTONE with sandstone bands.
								Continued on next sheet

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

Borehole Log

Borehole No.
RO08
Sheet 3 of 3

Project Name:	WESTGATE	Project No. C3788	Co-ords:	346928.00 - 405896.00	Hole Type RO
Location:	SKELMERSDALE		Level:	68.80	Scale 1:75
Client:	ALDI		Dates:	21/03/2018 - 21/03/2018	Logged By JM

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					40.00	28.80		End of borehole at 40.00 m

Remarks
1. Hand dug pit to 1.2m bgl to check for services.
2. Hole backfilled with arisings upon completion.
3. Water flush remained throughout drilling.

APPENDIX B
Chemical Testing Results

Jack Mather
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

e: j.mather@brownfield-solutions.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-81275

Project / Site name:	Westgate, Skelmersdale	**Samples received on:**	05/04/2018
Your job number:	C3788	**Samples instructed on:**	05/04/2018
Your order number:	C3788-5559-JM	**Analysis completed by:**	12/04/2018
Report Issue Number:	1	**Report issued on:**	12/04/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-81275

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Lab Sample Number				937850				
Sample Reference				WS1				
Sample Number				None Supplied				
Depth (m)				0.50				
Date Sampled				22/03/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	18				
Total mass of sample received	kg	0.001	NONE	1.0				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.4				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Organic Matter	%	0.1	MCERTS	4.4				
Phenols by HPLC								
Catechol	mg/kg	0.1	ISO 17025	< 0.10				
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10				
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30				
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20				
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10				
Phenol	mg/kg	0.1	ISO 17025	< 0.10				
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10				
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30				
Total Phenols								
Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.29				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	1.0				
Anthracene	mg/kg	0.05	MCERTS	0.25				
Fluoranthene	mg/kg	0.05	MCERTS	1.6				
Pyrene	mg/kg	0.05	MCERTS	1.3				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.80				
Chrysene	mg/kg	0.05	MCERTS	0.64				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.80				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.40				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.66				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.37				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.42				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	8.61				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	20				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	15				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	64				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	95				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	55				

Analytical Report Number : 18-81275

Project / Site name: Westgate, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
937850	WS1	None Supplied	0.50	Brown clay and sand with rubble.

Analytical Report Number : 18-81275

Project / Site name: Westgate, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Phenols, speciated, in soil, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
WS1		S	18-81275	937850	c	Free cyanide in soil	L080-PL	c

Key: a - No sampling date b - Incorrect container
c - Holding time d - Headspace e - Temperature

Jack Mather
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

e: j.mather@brownfield-solutions.co.uk

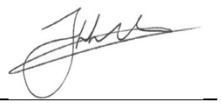
i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-80423

Replaces Analytical Report Number : 18-80423, issue no. 1

Project / Site name:	Westgate, Skelmersdale	**Samples received on:**	26/03/2018
Your job number:	C3788	**Samples instructed on:**	26/03/2018
Your order number:	C3788-5559-JM	**Analysis completed by:**	18/04/2018
Report Issue Number:	2	**Report issued on:**	23/04/2018
Samples Analysed:	8 soil samples		

Signed: 

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 18-80423

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Lab Sample Number				933496	933497	933498	933499	933500
Sample Reference				BH1	HP1	HP2	HP4	WS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				00.50	0.20	0.30	0.20	0.70
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	22	17	21	13
Total mass of sample received	kg	0.001	NONE	1.2	1.1	1.1	1.0	1.6
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	-	< 0.001	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	8.1	8.2	7.8	7.9
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Organic Matter	%	0.1	MCERTS	2.8	2.9	1.1	4.1	1.4
Phenols by HPLC								
Catechol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Total Phenols								
Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3	< 1.3	< 1.3	< 1.3	< 1.3
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.19	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.14	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.4	0.59	< 0.05	0.26	0.44
Anthracene	mg/kg	0.05	MCERTS	0.51	< 0.05	< 0.05	< 0.05	0.16
Fluoranthene	mg/kg	0.05	MCERTS	2.9	1.4	< 0.05	0.72	1.5
Pyrene	mg/kg	0.05	MCERTS	2.4	1.3	< 0.05	0.67	1.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.64	< 0.05	0.35	0.53
Chrysene	mg/kg	0.05	MCERTS	1.1	0.66	< 0.05	0.42	0.54
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.4	1.2	< 0.05	0.57	0.89
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.70	0.50	< 0.05	0.34	0.45
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	1.0	< 0.05	0.53	0.83
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.54	0.53	< 0.05	0.27	0.36
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.60	0.72	< 0.05	0.36	0.44
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	14.2	8.51	< 0.80	4.49	7.32
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.4	12	6.3	13	8.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	3.0	< 0.2	0.4	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	18	19	19	21	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	20	20	21	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	51	16	42	21
Lead (aqua regia extractable)	mg/kg	1	MCERTS	35	250	20	170	32
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	0.4	0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	17	17	18	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 18-80423

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Lab Sample Number				933496	933497	933498	933499	933500
Sample Reference				BH1	HP1	HP2	HP4	WS2
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				00.50	0.20	0.30	0.20	0.70
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	37	290	33	160	39

Analytical Report Number: 18-80423

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Lab Sample Number				933501	933502	933503		
Sample Reference				WS3	WS4	WS6		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20	1.00	0.50		
Date Sampled				22/03/2018	22/03/2018	22/03/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	16	12	15		
Total mass of sample received	kg	0.001	NONE	1.0	1.1	1.3		
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Amosite	-	-		
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	-	-		
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	-	-		
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.2	7.5	7.9		
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Organic Matter	%	0.1	MCERTS	2.7	0.8	2.2		
Phenols by HPLC								
Catechol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10		
Resorcinol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10		
Cresols (o-, m-, p-)	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30		
Total Naphthols (sum of 1- and 2- Naphthol)	mg/kg	0.2	ISO 17025	< 0.20	< 0.20	< 0.20		
2-Isopropylphenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10		
Phenol	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10		
Trimethylphenol (2,3,5-)	mg/kg	0.1	ISO 17025	< 0.10	< 0.10	< 0.10		
Total Xylenols and Ethylphenols	mg/kg	0.3	ISO 17025	< 0.30	< 0.30	< 0.30		
Total Phenols								
Total Phenols (HPLC)	mg/kg	1.3	ISO 17025	< 1.3	< 1.3	< 1.3		
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	0.54	< 0.05	1.1		
Anthracene	mg/kg	0.05	MCERTS	0.15	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	0.72	< 0.05	1.4		
Pyrene	mg/kg	0.05	MCERTS	0.63	< 0.05	1.0		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.52		
Chrysene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.45		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.58		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.25	< 0.05	0.26		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37	< 0.05	0.45		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.20	< 0.05	0.19		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.27	< 0.05	0.21		
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.14	< 0.80	6.18		
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	49	6.0	13		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (III)	mg/kg	1	NONE	22	20	11		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	20	11		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	72	15	33		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	100	7.3	54		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.4	< 0.3	0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	49	20	17		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.3	< 1.0	< 1.0		

Analytical Report Number: 18-80423

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Lab Sample Number				933501	933502	933503		
Sample Reference				WS3	WS4	WS6		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.20	1.00	0.50		
Date Sampled				22/03/2018	22/03/2018	22/03/2018		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	72	30	100		

Analytical Report Number: 18-80423
Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5559-JM

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
933496	BH1	00.50	175	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
933497	HP1	0.20	166	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
933499	HP4	0.20	150	Loose Fibres	**Chrysotile**	< 0.001	**< 0.001**
933501	WS3	0.20	160	Loose Fibres	**Amosite**	< 0.001	**< 0.001**

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 18-80423

Project / Site name: Westgate, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
933496	BH1	None Supplied	00.50	Brown clay and loam with gravel.
933497	HP1	None Supplied	0.20	Brown clay and loam with brick.
933498	HP2	None Supplied	0.30	Brown clay and sand.
933499	HP4	None Supplied	0.20	Brown clay.
933500	WS2	None Supplied	0.70	Brown clay and sand.
933501	WS3	None Supplied	0.20	Brown clay and sand.
933502	WS4	None Supplied	1.00	Brown clay and sand with gravel.
933503	WS6	None Supplied	0.50	Brown clay and loam.

Analytical Report Number : 18-80423

Project / Site name: Westgate, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Phenols, speciated, in soil, by HPLC	Determination of speciated phenols by HPLC.	In house method based on Blue Book Method.	L030-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX C
Geotechnical Testing Results

Jack Mather
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

e: j.mather@brownfield-solutions.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 18-80422

Project / Site name:	Westgate, Skelmersdale	**Samples received on:**	26/03/2018
Your job number:	C3788	**Samples instructed on:**	26/03/2018
Your order number:	C3788-5558-JM	**Analysis completed by:**	04/04/2018
Report Issue Number:	1	**Report issued on:**	04/04/2018
Samples Analysed:	4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 18-80422

Project / Site name: Westgate, Skelmersdale
Your Order No: C3788-5558-JM

Lab Sample Number				933492	933493	933494	933495	
Sample Reference				BH1	BH2	WS1	WS3	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.70	0.70	2.00	2.00	
Date Sampled				22/03/2018	22/03/2018	22/03/2018	22/03/2018	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	11	12	11	12	
Total mass of sample received	kg	0.001	NONE	0.90	0.78	0.78	0.75	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.0	7.8	8.2	8.5	
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.029	0.012	
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	80	370	40	17	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.040	0.19	0.020	0.0084	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	40.2	187	19.8	8.4	
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	26	3.2	
Total Sulphur	%	0.005	MCERTS	-	-	0.010	0.006	
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	-	-	16	< 5.0	
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	7.7	< 2.5	

Analytical Report Number : 18-80422

Project / Site name: Westgate, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
933492	BH1	None Supplied	0.70	Brown clay.
933493	BH2	None Supplied	0.70	Brown clay.
933494	WS1	None Supplied	2.00	Brown clay.
933495	WS3	None Supplied	2.00	Brown sand.

Analytical Report Number : 18-80422

Project / Site name: Westgate, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests. 2:1 extraction.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038	W	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

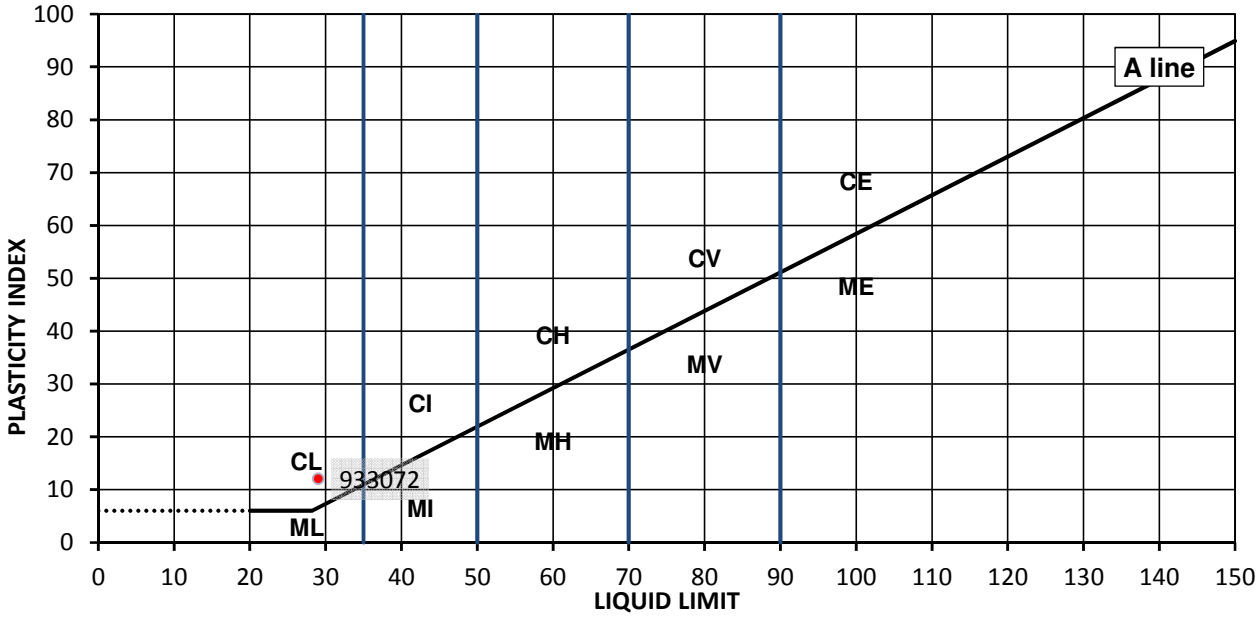
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933072
Sample Reference: Not Given

Description:	Brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	BH1	Depth Top [m]:	2.50
Sample Preparation:	Tested after washing to remove >425um	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	29	17	12	92



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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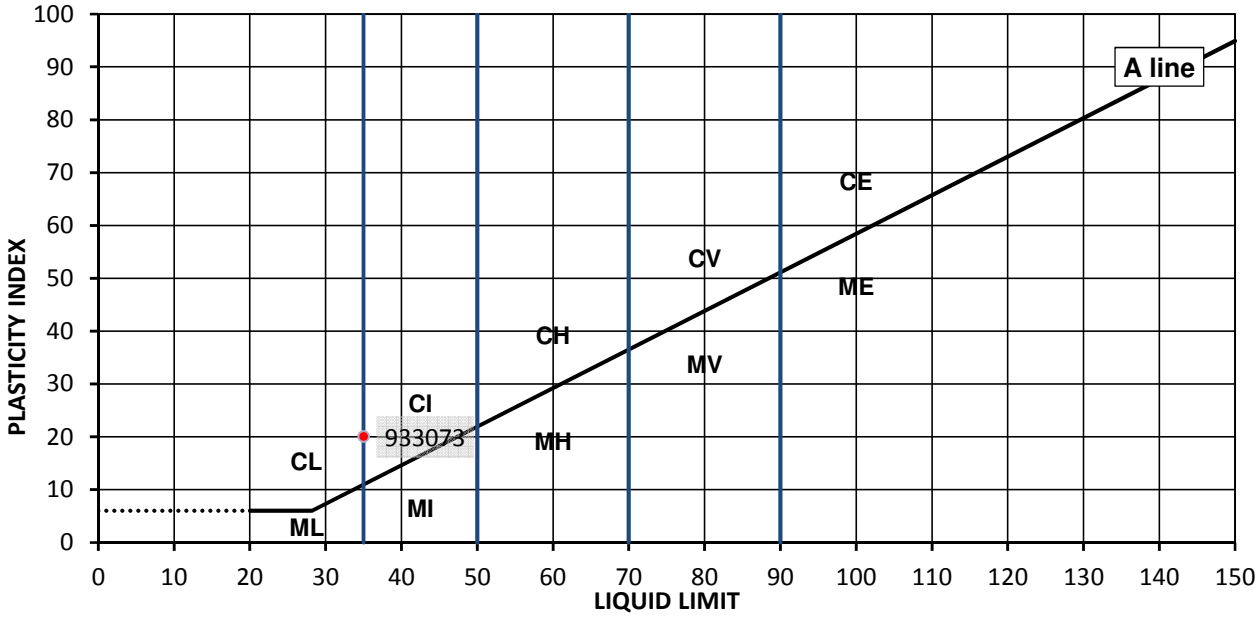
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933073
Sample Reference: Not Given

Description:	Brown slightly gravelly sandy CLAY	Sample Type:	D
Location:	BH2	Depth Top [m]:	2.00
Sample Preparation:	Tested after >425um removed by hand	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	35	15	20	92



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

GF 105.11

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

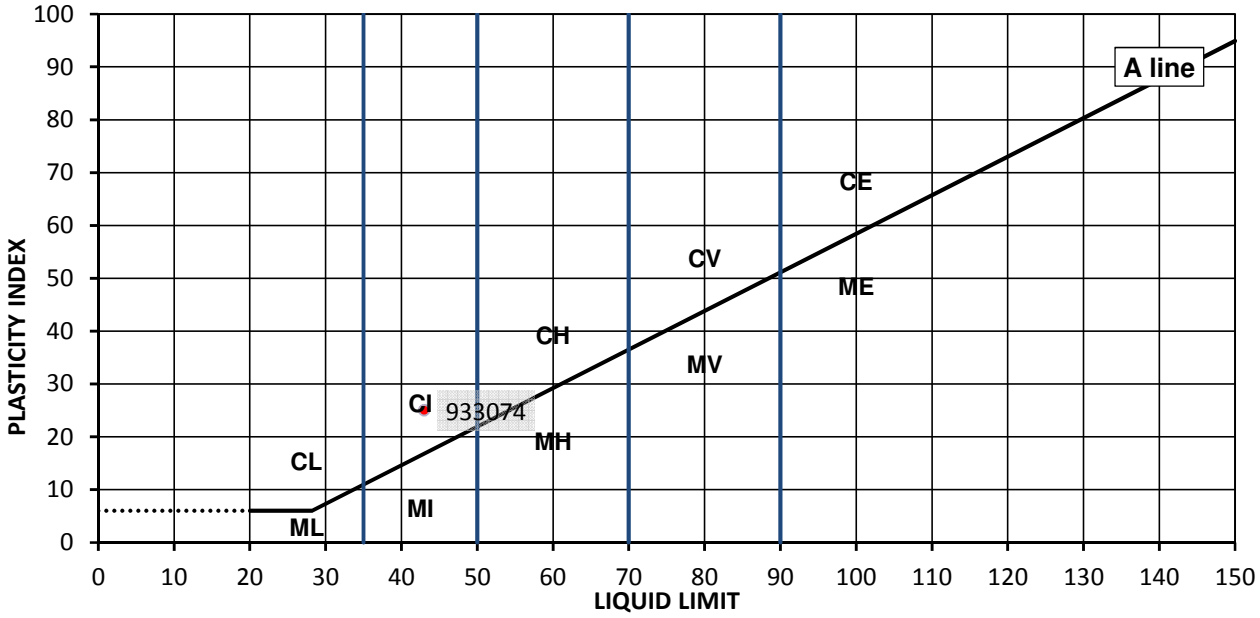
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	20/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933074
Sample Reference: Not Given

Description:	Yellowish brown sandy CLAY	Sample Type:	D
Location:	HP4	Depth Top [m]:	0.60
Sample Preparation:	Tested in natural condition	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
21	43	18	25	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

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PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

GF 105.11

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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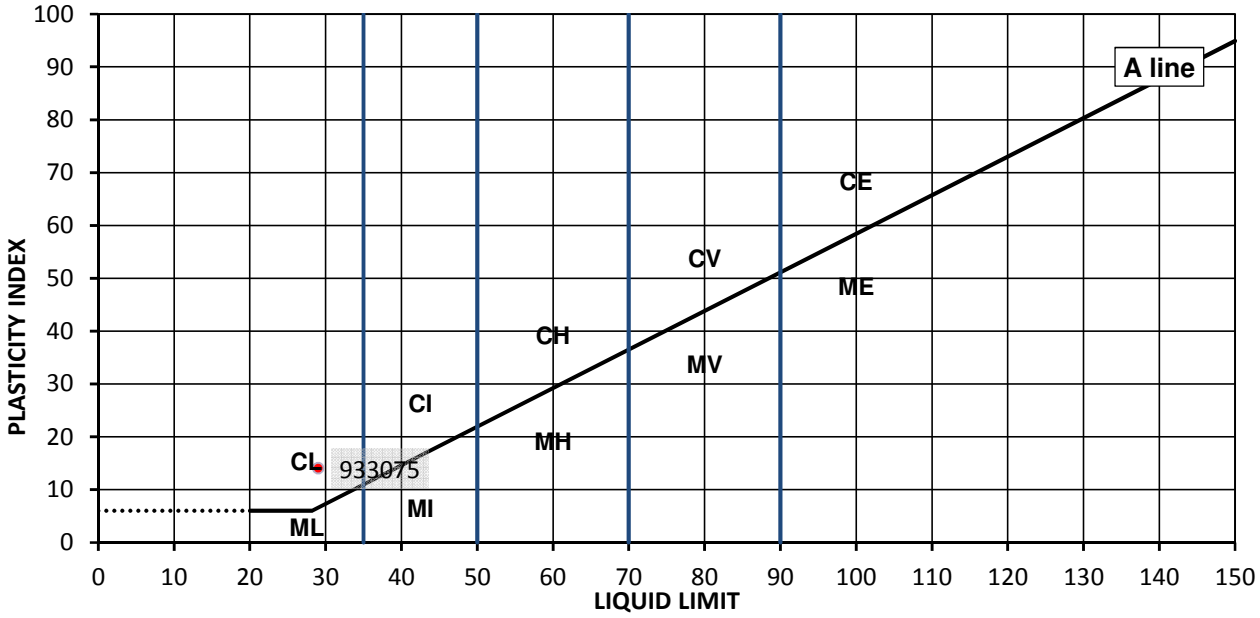
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933075
Sample Reference: Not Given

Description:	Yellowish brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	WS1	Depth Top [m]:	1.20
Sample Preparation:	Tested after >425um removed by hand	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	29	15	14	90



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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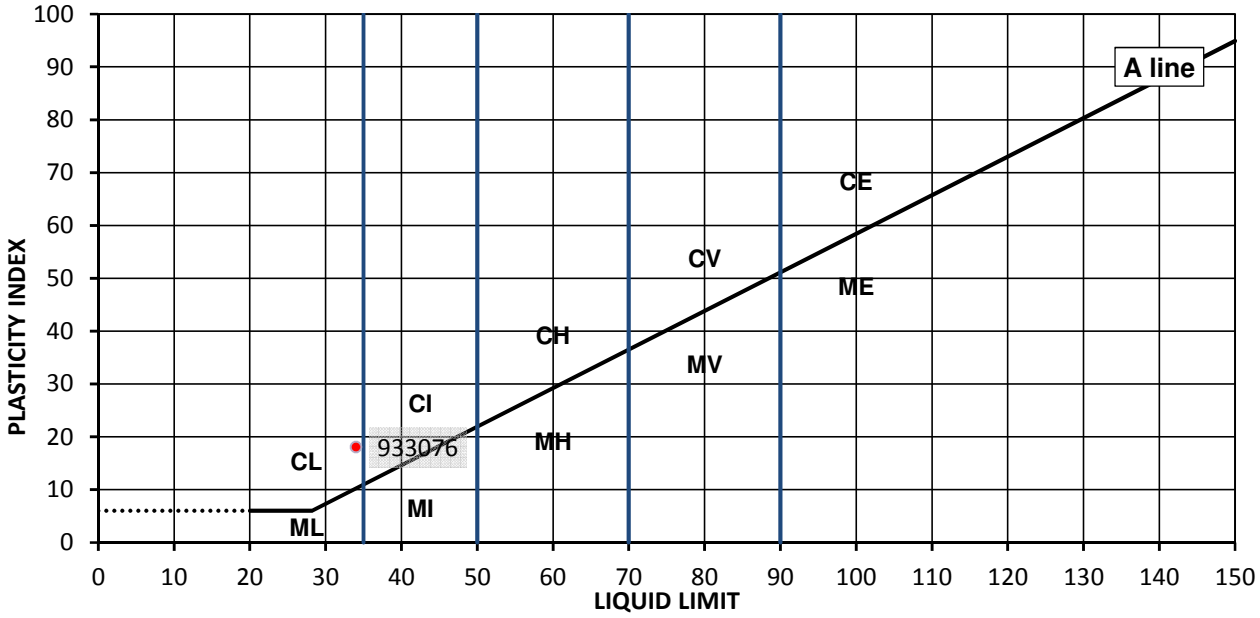
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933076
Sample Reference: Not Given

Description:	Brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	WS2	Depth Top [m]:	2.00
Sample Preparation:	Tested after washing to remove >425um	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	34	16	18	93



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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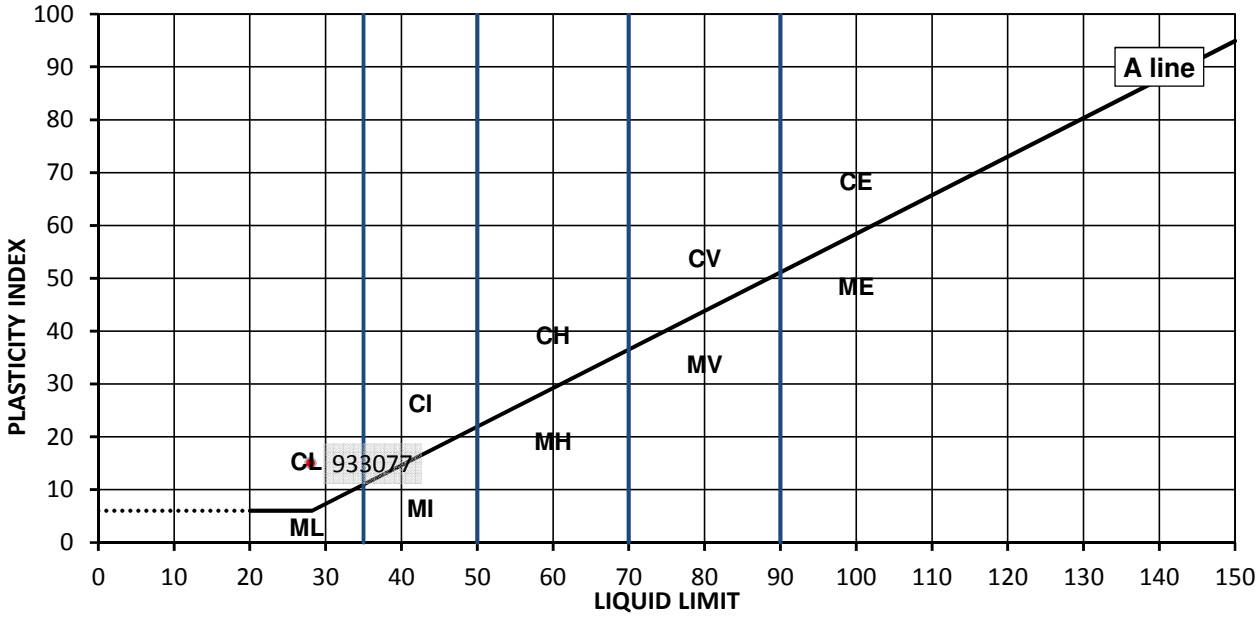
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933077
Sample Reference: Not Given

Description:	Brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	WS3	Depth Top [m]:	2.00
Sample Preparation:	Tested after >425um removed by hand	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	28	13	15	93



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
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Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
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Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

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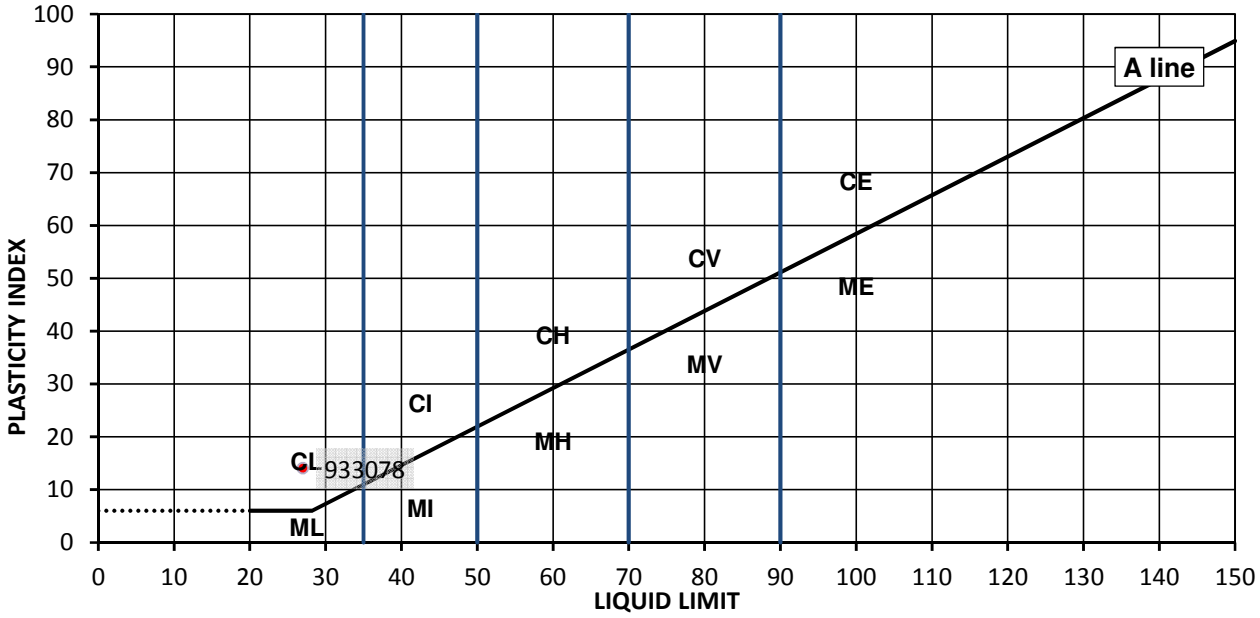
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933078
Sample Reference: Not Given

Description:	Brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	WS4	Depth Top [m]:	1.20
Sample Preparation:	Tested after washing to remove >425um	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
12	27	13	14	86



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

GF 105.11

TEST CERTIFICATE

Determination of Liquid and Plastic Limits

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

Tested in Accordance with BS1377-2: 1990: Clause 4.4 & 5: One Point Method

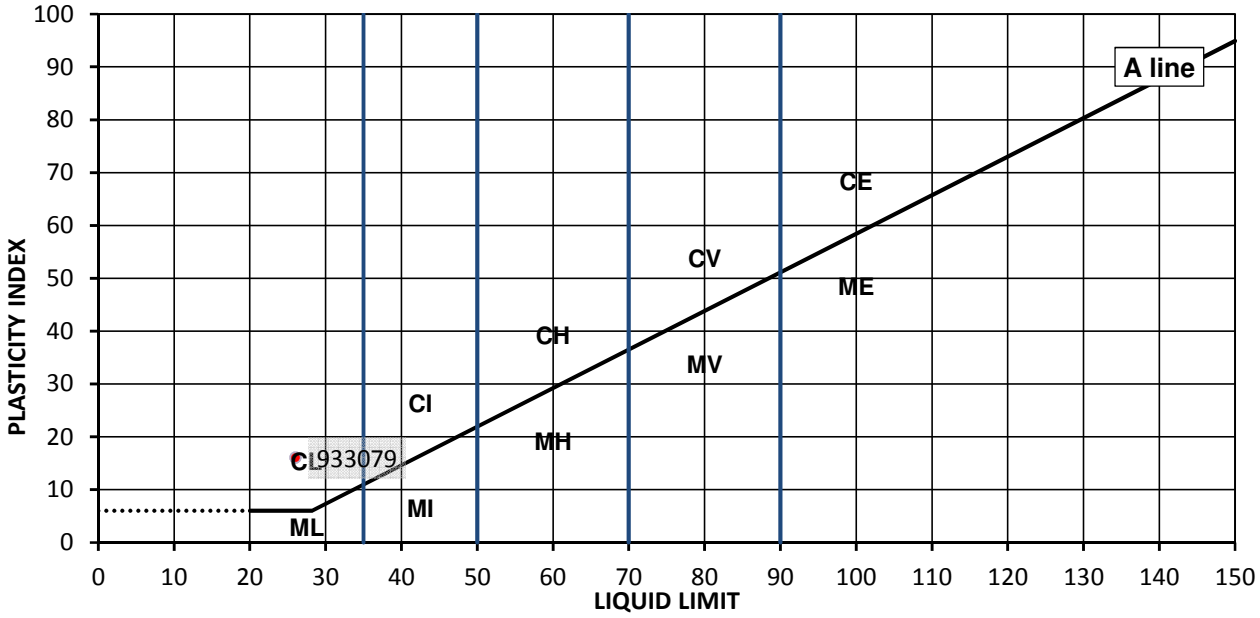
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	03/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

TEST RESULTS

Laboratory Reference: 933079
Sample Reference: Not Given

Description:	Brown slightly gravelly very sandy CLAY	Sample Type:	D
Location:	WS5	Depth Top [m]:	1.20
Sample Preparation:	Tested after >425um removed by hand	Depth Base [m]:	Not Given

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	26	10	16	93



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Remarks

Approved:

Dariusz Piotrowski
PL Laboratory Manager Geotechnical Section
Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Summary of Classification Test Results

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

Client: Brownfield Solutions Ltd
Client Address: William Smith House
173 - 183 Witton Street
Northwich
Cheshire, CW9 5LP
Contact: Jack Mather
Site Name: Westgate, Skelmersdale
Site Address: Not Given

Client Reference: C3788
Job Number: 18-80349
Date Sampled: 20/03 - 22/03/2018
Date Received: 26/03/2018
Date Tested: 03/04/2018
Sampled By: JM

Test results

Laboratory Reference	Hole No.	Sample				Soil Description	Density		M/C	Atterberg				PD
		Reference	Top depth [m]	Base depth [m]	Type		bulk Mg/m3	dry Mg/m3	%	% Passing 425um %	LL %	PL %	PI %	Mg/m3
933072	BH1	Not Given	2.50	Not Given	D	Brown slightly gravelly very sandy CLAY			15	92	29	17	12	
933073	BH2	Not Given	2.00	Not Given	D	Brown slightly gravelly sandy CLAY			18	92	35	15	20	
933074	HP4	Not Given	0.60	Not Given	D	Yellowish brown sandy CLAY			21	100	43	18	25	
933075	WS1	Not Given	1.20	Not Given	D	Yellowish brown slightly gravelly very sandy CLAY			19	90	29	15	14	
933076	WS2	Not Given	2.00	Not Given	D	Brown slightly gravelly very sandy CLAY			15	93	34	16	18	
933077	WS3	Not Given	2.00	Not Given	D	Brown slightly gravelly very sandy CLAY			17	93	28	13	15	
933078	WS4	Not Given	1.20	Not Given	D	Brown slightly gravelly very sandy CLAY			12	86	27	13	14	
933079	WS5	Not Given	1.20	Not Given	D	Brown slightly gravelly very sandy CLAY			19	93	26	10	16	

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

4041

Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	22/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	04/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

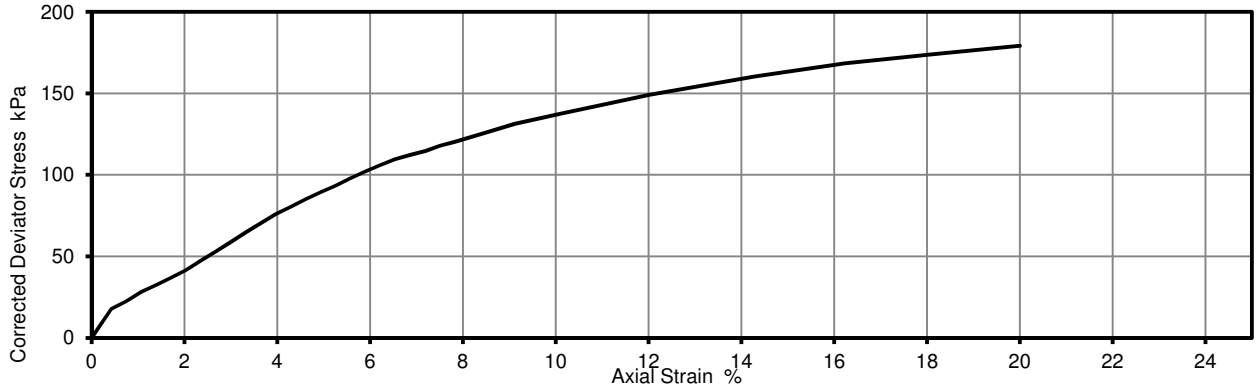
Test Result

Laboratory Reference:	933080
Hole No.:	BH1
Sample Reference:	Not Given
Sample Description:	Brown CLAY

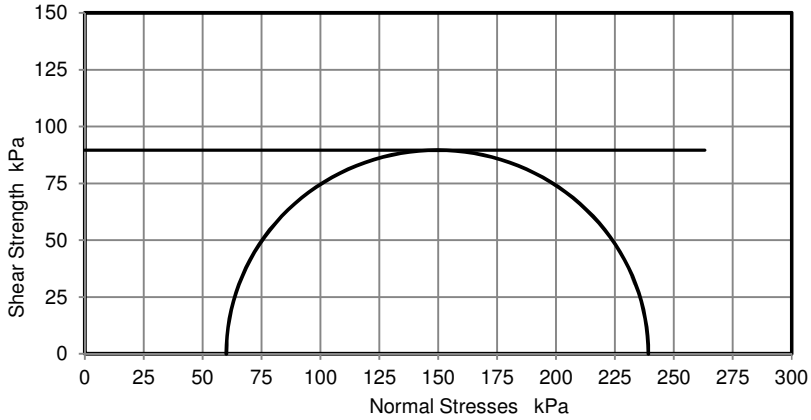
Depth Top [m]:	3.00
Depth Base [m]:	3.45
Sample Type:	U

Test Number	1		Rate of Strain	1.95	%/min
Length	205.30	mm	Cell Pressure	60	kPa
Diameter	104.50	mm	Axial Strain at failure	20.0	%
Bulk Density	2.14	Mg/m3	Deviator Stress, (σ1 - σ3)f	179	kPa
Moisture Content	16	%	Undrained Shear Strength, cu	90	kPa ½(σ1 - σ3)f
Dry Density	1.85	Mg/m3	Mode of Failure	Compound	
Membrane Correction	0.96	kPa	Membrane thickness	0.26	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

TEST CERTIFICATE

Determination of Unconsolidated Undrained Triaxial Compression

Tested in Accordance with BS1377: Part 7: 1990, clause 8, single specimen

i2 Analytical Ltd
7 Woodshots Meadow
Croxley Green Business Park
Watford Herts WD18 8YS

UKAS TESTING 4041

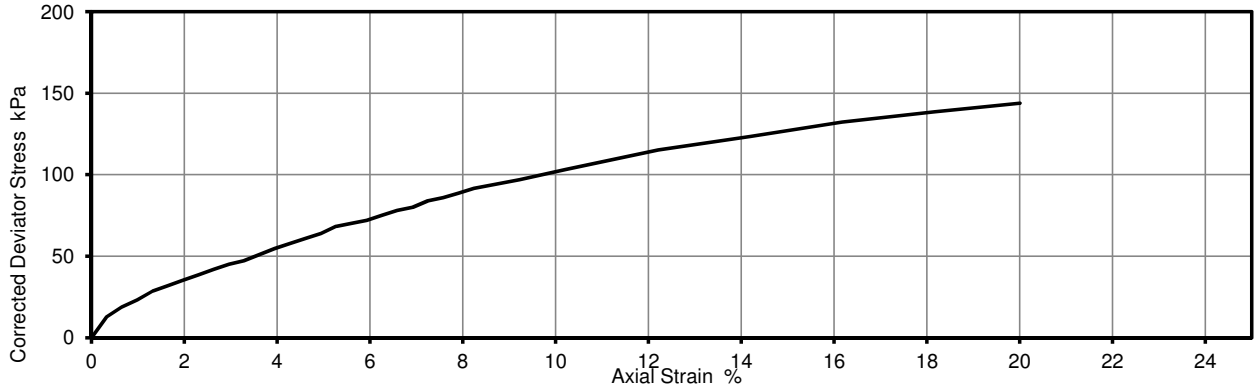
Client:	Brownfield Solutions Ltd	Client Reference:	C3788
Client Address:	William Smith House 173 - 183 Witton Street Northwich Cheshire, CW9 5LP	Job Number:	18-80349
		Date Sampled:	23/03/2018
		Date Received:	26/03/2018
Contact:	Jack Mather	Date Tested:	04/04/2018
Site Name:	Westgate, Skelmersdale	Sampled By:	JM
Site Address:	Not Given		

Test Result

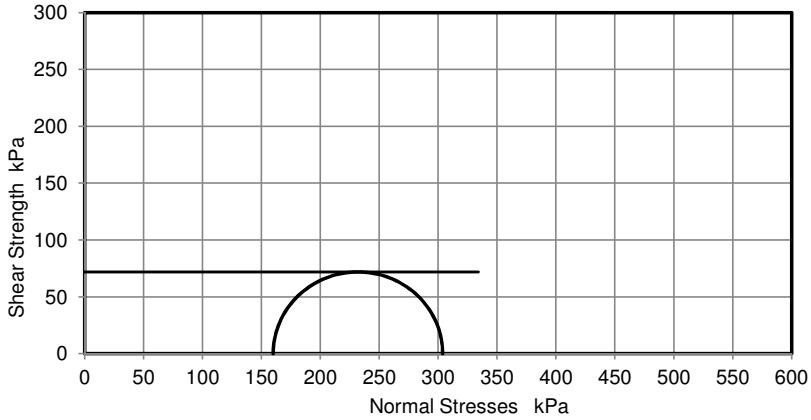
Laboratory Reference:	933081	Depth Top [m]:	8.00
Hole No.:	BH2	Depth Base [m]:	8.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY		

Test Number	1		Rate of Strain	2.00	%/min	
Length	199.55	mm	Cell Pressure	160	kPa	
Diameter	104.49	mm	Axial Strain at failure	20.0	%	
Bulk Density	2.16	Mg/m3	Deviator Stress, (σ1 - σ3)f	144	kPa	
Moisture Content	13	%	Undrained Shear Strength, cu	72	kPa	½(σ1 - σ3)f
Dry Density	1.92	Mg/m3	Mode of Failure	Compound		
Membrane Correction	0.77	kPa	Membrane thickness	0.21	mm	

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Notes:

Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

Comments:

Approved:

Dariusz Piotrowski
PL Laboratory Manager
Geotechnical Section

Date Reported: 10/04/2018

Signed:

Darren Berrill
Geotechnical General Manager

for and on behalf of i2 Analytical Ltd

APPENDIX D
Ground Gas Monitoring Results

LIDL GMBH

Aldi, Skelmersdale

C3788

06/04/2018

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

Key	
ND	Not Detected
NA	Not Available
NGW	No Groundwater

	Percentage Concentrations				Parts per Million		mb				
Ambient	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH4)	LEL	Hydrogen Sulphide (H2S)	Carbon Monoxide (CO)	Atm Pressure	Monitored by	Equipment	Weather	Pressure Trend
Start	24.5	0.0	0.1	2.0	NA	NA	1005	MS	GA2000	Overcast	Steady
Finish	24.4	0.0	0.1	2.0	NA	NA	1005				

		Percentage Concentrations				Parts Per Million		m bgl	litres/hour	mb		litres/hour	litres/hour	
Location	State (Peak/Steady)	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Water Level	Flow	Relative Pressure	Sheen (Y/N)	Q_{hg} CO_2	Q_{hg} CH_4	Notes
WS01	Peak	23.1	0.7	ND	ND	NA	NA	0.81	0.9	0.0	No	0.01	0.00	
	Steady	23.8	0.4	ND	ND	NA	NA							
WS02	Peak	NA	NA	NA	NA	NA	NA	0.00	0.0	0.0	No	0.00	0.00	Headworks flooded
	Steady	NA	NA	NA	NA	NA	NA							
WS03	Peak	24.5	ND	ND	ND	NA	NA	1.24	-0.7	0.1	No	0.00	0.00	
	Steady	24.5	ND	ND	ND	NA	NA							
WS05	Peak	24.3	ND	ND	ND	NA	NA	1.09	0.1	0.0	No	0.00	0.00	
	Steady	24.3	ND	ND	ND	NA	NA							
BH02	Peak	NA	NA	NA	NA	NA	NA	NA	0.0	0.0	No	0.00	0.00	
	Steady	NA	NA	NA	NA	NA	NA							

LIDL GMBH

Aldi, Skelmersdale

C3788

03/05/2018

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

Key	
ND	Not Detected
NA	Not Available
NGW	No Groundwater

	Percentage Concentrations				Parts per Million		mb					
Ambient	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Atm Pressure	Monitored by	Equipment	Weather	Pressure Trend	
Start	24.1	0.0	0.1	2.0	0.0	0.0	1016	GP	GA5000	Fair	Steady	
Finish	24.3	0.0	0.1	2.0	0.0	0.0	1016					

		Percentage Concentrations				Parts Per Million		m bgl	litres/hour	mb		litres/hour	litres/hour	
Location	State (Peak/Steady)	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Water Level	Flow	Relative Pressure	Sheen (Y/N)	Q_{hg} CO_2	Q_{hg} CH_4	Notes
WS01	Peak	23.6	0.2	ND	ND	ND	ND	0.61	5.1	0.1	No	0.01	0.00	
	Steady	24.0	ND	ND	ND	ND	ND							
WS02	Peak	24.1	ND	ND	ND	ND	ND	0.15	0.4	0.1	No	0.00	0.00	
	Steady	24.1	ND	ND	ND	ND	ND							
WS03	Peak	18.8	2.0	ND	ND	ND	ND	1.51	0.0	0.1	No	0.00	0.00	
	Steady	19.8	1.8	ND	ND	ND	ND							
WS05	Peak	24.0	ND	ND	ND	ND	ND	1.10	3.0	0.1	No	0.00	0.00	
	Steady	24.3	ND	ND	ND	ND	ND							
BH02	Peak	14.8	4.8	ND	ND	ND	ND	2.35	0.0	0.1	No	0.00	0.00	
	Steady	17.8	3.6	ND	ND	ND	ND							

LIDL GMBH

Aldi, Skelmersdale

C3788

11/05/2018

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

Key	
ND	Not Detected
NA	Not Available
NGW	No Groundwater

	Percentage Concentrations				Parts per Million		mb				
Ambient	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH4)	LEL	Hydrogen Sulphide (H2S)	Carbon Monoxide (CO)	Atm Pressure	Monitored by	Equipment	Weather	Pressure Trend
Start	23.8	0.1	0.0	0.0	ND	NA	1015	GP	GA5000	Overcast	Steady
Finish	24.2	0.0	0.1	2.0	ND	NA	1015				

		Percentage Concentrations				Parts Per Million		m bgl	litres/hour	mb		litres/hour	litres/hour	
Location	State (Peak/Steady)	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Water Level	Flow	Relative Pressure	Sheen (Y/N)	Q_{hg} CO_2	Q_{hg} CH_4	Notes
WS01	Peak	23.7	ND	ND	ND	ND	NA	0.71	1.6	0.2	No	0.00	0.00	
	Steady	23.9	ND	ND	ND	ND	NA							
WS02	Peak	24.0	ND	ND	ND	ND	NA	0.20	0.2	0.2	No	0.00	0.00	
	Steady	24.0	ND	ND	ND	ND	NA							
WS03	Peak	13.8	2.7	ND	ND	ND	NA	1.71	0.0	0.2	No	0.00	0.00	
	Steady	7.6	3.5	ND	ND	ND	NA							
WS05	Peak	23.7	ND	ND	ND	ND	NA	0.78	1.0	0.2	No	0.00	0.00	
	Steady	24.0	ND	ND	ND	ND	NA							
BH02	Peak	11.8	6.9	ND	ND	ND	NA	4.22	0.0	0.2	No	0.01	0.00	
	Steady	20.1	2.3	ND	ND	ND	NA							

LIDL GMBH

Aldi, Skelmersdale

C3788

23/05/2018

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD
GEO-ENVIRONMENTAL ENGINEERING EXCELLENCE

Key	
ND	Not Detected
NA	Not Available
NGW	No Groundwater

	Percentage Concentrations				Parts per Million		mb					
Ambient	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Atm Pressure	Monitored by	Equipment	Weather	Pressure Trend	
Start	21.8	0.1	0.1	2.0	0.0	NA	1010	JM	GA5000	Clear	Steady	
Finish	22.0	0.1	0.1	2.0	0.0	NA	1012					

		Percentage Concentrations				Parts Per Million		m bgl	litres/hour	mb		litres/hour	litres/hour	
Location	State (Peak/Steady)	Oxygen (O_2)	Carbon Dioxide (CO_2)	Methane (CH_4)	LEL	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Water Level	Flow	Relative Pressure	Sheen (Y/N)	Q_{hg} CO_2	Q_{hg} CH_4	Notes
WS01	Peak	20.8	ND	ND	ND	ND	NA	0.80	1.4	0.0	No	0.00	0.00	
	Steady	20.8	ND	ND	ND	ND	NA							
WS02	Peak	21.0	ND	ND	ND	ND	NA	0.23	0.0	0.0	No	0.00	0.00	
	Steady	21.2	ND	ND	ND	ND	NA							
WS03	Peak	8.8	3.4	ND	ND	ND	NA	1.79	0.1	0.0	No	0.00	0.00	
	Steady	9.4	3.3	ND	ND	ND	NA							
WS05	Peak	19.8	0.7	ND	ND	ND	NA	1.20	0.1	0.0	No	0.00	0.00	
	Steady	20.5	0.7	ND	ND	ND	NA							
BH02	Peak	14.2	4.8	ND	ND	ND	NA	4.61	0.1	0.1	No	0.00	0.00	
	Steady	17.0	3.5	ND	ND	ND	NA							

APPENDIX E
Contaminated Land Screening Values

Contaminated Land Screening Values

In assessing the potential for contamination Brownfield Solutions Limited (BSL) follows UK guidance and current best practice.

General

The current recommended method for assessing contamination is on the basis of:

Source-Pathway-Receptor

Where any one of these "pollution linkages" is absent there is deemed to be no risk.

Fundamentally receptors can be considered as humans and controlled waters (surface and ground waters).

The purpose of using Tier 1 screening levels is to have a simple means of assessing the potential contamination of a site and to inform decisions on whether further investigation is warranted or whether an option to undertake clean up based on the data to hand is cost effective.

Human Health

Current UK guidance is provided by DEFRA and the Environment Agency (EA). Publications forming part of the guidance include; CLEA Model, toxicological reports and soil guideline values (SGV), collectively referred to as the CLEA Guidance. The CLEA Guidance has included a number of publications which have provided initial screening values for soil contamination based on standard land uses and soil assumptions.

CLEA guidance has gone through a number of revisions, all of the original SGV's that were published have been withdrawn and publication of new SGV's commenced in 2009.

For determinands where no SGVs are available, S4UL values have been published using the CLEA 1.06 Model. These are the third set of generic assessment criteria generated by CIEH, and replace the previous two sets of GACs. The revised S4UL values are based on greater knowledge of relevant toxicology and further consideration of exposure frequencies.

No SGV or S4UL is available for lead as this is derived based on blood lead levels. C4SL values for six determinands including lead was published by DEFRA/CL:AIRE in December 2014 and they represent a low risk as opposed to minimal risk. The C4SL values are based on a sandy loam with 6% Soil Organic Matter. These screening values were published by DEFRA for Part 2A use, although with the dual purpose for use under planning. However these have not been officially accepted by Local Government for use under planning. S4ULs remain the first reference due to the broader range of end uses and soil organic content.

The preference from the EA is that site specific screening levels are used wherever possible. Due to numerous factors it is not always possible to utilise site specific values. In these instances the following data sources are used in the order of preference given below:

- Current UK SGV's
- CIEH S4UL values (derived by CIEH/LQM)
- DEFRA/CL:AIRE C4SL's
- CL:AIRE GAC values
- Guidance from other European countries
- Guidance from the outside Europe.

Controlled Waters

The European Water Framework Directive (WFD) became UK law in December 2003. It was created to ensure that European countries manage their rivers, groundwater and lakes so that they stay healthy for people and for wildlife.

This is achieved by the use of chemical standards for surface waters and groundwater. These values describe concentrations of chemicals that are not expected to cause harm to environmental organisms or human health, provided they are not exceeded. The same chemical may have several standards for different environmental regimes, and for different protection objectives.

Statutory Standards are set in legislation and if exceeded, this constitutes non-compliance with statutory obligations. European Directives are implemented in England and Wales by corresponding statutory instruments (i.e. regulations). The statutory instruments can be the exact same standards as they appear in the Directive or be more stringent.

A number of non-statutory standards also exist, these are set by various organisations (including the EA) for chemicals that are considered to be of concern, but are not covered by any specific legislation.

The chemical standards used in the UK to control impaction of contamination on controlled waters are Environmental Quality Standards (EQS). The EQS's cover a large number of compounds.

Where certain compounds are not covered by the EQS these are commonly compared to the UK Drinking Water Standards (DWS).

Further Assessment

When screening values are exceeded then further consideration is required. This could include the use of simple measures to break the pollution pathway and mitigate the risk, further more detailed investigation, including the deriving of site specific values to better define the risk and to design appropriate remedial measures.

APPENDIX F
Waste Disposal Guidance

WASTE CLASSIFICATION FOR SOILS

Introduction

Waste producers have a duty of care classify the waste they are producing:

- before it is collected, disposed of or recovered.
- to identify the controls that apply to the movement of the waste.
- to complete waste documents and records.
- to identify suitably authorised waste management options.
- to prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each of individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site with also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).
If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept **hazardous**, **non-hazardous** or **inert** wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not ie the hazard assessment. The most common EWC waste codes related to soil are:

17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, diesel) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on "risk phrases" which can include risks such as carcinogenicity, flammability or toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

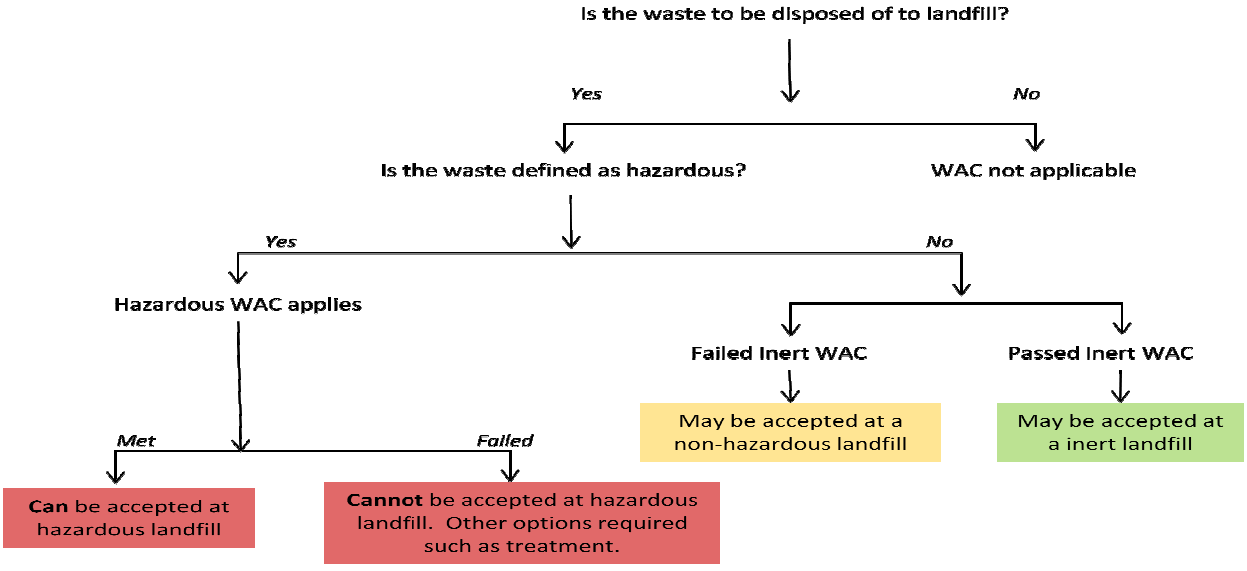
Waste Definitions

Inert	• Will not undergo any significant physical, chemical or biological transformations. • Will not dissolve. • Will not burn. • Will not physically or chemically react. • Will not biodegrade. • Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. • Has insignificant total leachability and pollutant content. • Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (.Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste[#]	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents: in the waste alone (for example, by biodegradation); under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints); by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that has been stabilised and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. The WAC limits **cannot be used to make an assessment of whether a waste is hazardous**. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.



Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However hydrocarbons in soils are a mixture rather than a pure product and absolute entries are not relevant.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known, or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs to provide an interpretation that the chromatograph is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

> For contaminated land specific consideration must be given to the following before proceeding;
>
> - The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as, waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
> - The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of **marker compounds** is optional; however it is recommended that where possible the marker compounds should be used.

WM3 states:

> If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:
>
> - The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
> - This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D, and
> - The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the Council Decision (2003/33/EC).
2. Environment Agency Environmental Permitting Regulations: "*Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land*" 2009.
3. Environment Agency "*Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria*" Nov 2010.
4. Environment Agency "*Guidance on the classification and assessment of waste (Technical Guidance WM3)*" 1st edition May 2015.
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

APPENDIX G
Waste Classification Report

Waste Classification Report

JZYL9-GP3UT-PZ8CA

Job name

Aldi Skelmersdale

Description/Comments

The site is located at NGR 346912, 405873.

Project

C3788

Site

Aldi Skelmersdale

Waste Stream Template

BSL Suite

Classified by

Name:
Nicola Swallow
Date:
15 May 2018 13:31 GMT
Telephone:
01606 334 844

Company:
Brownfield Solutions Ltd
William Smith House
173 – 183 Witton Street
Northwich
CW9 5LP

Report

Created by: Nicola Swallow
Created date: 15 May 2018 13:31 GMT

Job summary

Classification of sample: BH1

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

Sample details

Sample Name:
BH1
Sample Depth:
00.50 m
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.4 mg/kg	1.32	9.427 mg/kg	0.000943 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		18 mg/kg	1.462	22.362 mg/kg	0.00224 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22 mg/kg	1.126	21.054 mg/kg	0.00211 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	35 mg/kg	1.56	46.405 mg/kg	0.00298 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17 mg/kg	1.579	22.824 mg/kg	0.00228 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				37 mg/kg	2.774	87.247 mg/kg	0.00872 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		0.19 mg/kg		0.161 mg/kg	0.0000161 %	✓	
13	fluorene		201-695-5	86-73-7		0.14 mg/kg		0.119 mg/kg	0.0000119 %	✓	
14	phenanthrene		201-581-5	85-01-8		1.4 mg/kg		1.19 mg/kg	0.000119 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				0.51	mg/kg		0.434	mg/kg	0.0000433 %	✓	
			204-371-1	120-12-7									
16		fluoranthene				2.9	mg/kg		2.465	mg/kg	0.000246 %	✓	
			205-912-4	206-44-0									
17		pyrene				2.4	mg/kg		2.04	mg/kg	0.000204 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				1.1	mg/kg		0.935	mg/kg	0.0000935 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				1.1	mg/kg		0.935	mg/kg	0.0000935 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				1.3	mg/kg		1.105	mg/kg	0.000111 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.54	mg/kg		0.459	mg/kg	0.0000459 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.6	mg/kg		0.51	mg/kg	0.000051 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				1.4	mg/kg		1.19	mg/kg	0.000119 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.7	mg/kg		0.595	mg/kg	0.0000595 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				7.7	pH		7.7	pH	7.7 pH		
				PH									
30		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.0214 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: HP1

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

Sample details

Sample Name:
HP1
Sample Depth:
0.20 m
Moisture content:
22%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 22% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		12	mg/kg	1.32	12.358	mg/kg	0.00124 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	3	mg/kg	1.285	3.007	mg/kg	0.000234 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19	mg/kg	1.462	21.66	mg/kg	0.00217 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		51	mg/kg	1.126	44.788	mg/kg	0.00448 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	250	mg/kg	1.56	304.164	mg/kg	0.0195 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.4	mg/kg	1.353	0.422	mg/kg	0.0000422 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17	mg/kg	1.579	20.944	mg/kg	0.00209 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				290	mg/kg	2.774	627.512	mg/kg	0.0628 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		0.59	mg/kg		0.46	mg/kg	0.000046 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				1.4	mg/kg		1.092	mg/kg	0.000109 %	✓	
			205-912-4	206-44-0									
17		pyrene				1.3	mg/kg		1.014	mg/kg	0.000101 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.64	mg/kg		0.499	mg/kg	0.0000499 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.66	mg/kg		0.515	mg/kg	0.0000515 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				1	mg/kg		0.78	mg/kg	0.000078 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.53	mg/kg		0.413	mg/kg	0.0000413 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.72	mg/kg		0.562	mg/kg	0.0000562 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				1.2	mg/kg		0.936	mg/kg	0.0000936 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.5	mg/kg		0.39	mg/kg	0.000039 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				8.1	pH		8.1	pH	8.1 pH		
				PH									
30		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.094 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: HP2

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

Sample details

Sample Name:
HP2
Sample Depth:
0.30 m
Moisture content:
17%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6.3	mg/kg	1.32	6.904	mg/kg	0.00069 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		19	mg/kg	1.462	23.049	mg/kg	0.0023 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	14.952	mg/kg	0.0015 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20	mg/kg	1.56	25.893	mg/kg	0.00166 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17	mg/kg	1.579	22.287	mg/kg	0.00223 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				33	mg/kg	2.774	75.984	mg/kg	0.0076 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
17		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
										Total:	0.0169 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: HP4

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

Sample details

Sample Name:
HP4
Sample Depth:
0.20 m
Moisture content:
21%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 21% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	13.56 mg/kg	0.00136 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.4 mg/kg	1.285	0.406 mg/kg	0.0000316 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		21 mg/kg	1.462	24.247 mg/kg	0.00242 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		42 mg/kg	1.126	37.357 mg/kg	0.00374 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	170 mg/kg	1.56	209.483 mg/kg	0.0134 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.4 mg/kg	1.353	0.428 mg/kg	0.0000428 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		18 mg/kg	1.579	22.46 mg/kg	0.00225 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				160 mg/kg	2.774	350.652 mg/kg	0.0351 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		0.26 mg/kg		0.205 mg/kg	0.0000205 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				0.72	mg/kg		0.569	mg/kg	0.0000569 %	✓	
			205-912-4	206-44-0									
17		pyrene				0.67	mg/kg		0.529	mg/kg	0.0000529 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.35	mg/kg		0.276	mg/kg	0.0000276 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.42	mg/kg		0.332	mg/kg	0.0000332 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				0.53	mg/kg		0.419	mg/kg	0.0000419 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.27	mg/kg		0.213	mg/kg	0.0000213 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.36	mg/kg		0.284	mg/kg	0.0000284 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.57	mg/kg		0.45	mg/kg	0.000045 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.34	mg/kg		0.269	mg/kg	0.0000269 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
30		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.0595 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS2

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

Sample details

Sample Name:
WS2
Sample Depth:
0.70 m
Moisture content:
13%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.5	mg/kg	1.32	9.764	mg/kg	0.000976 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		27	mg/kg	1.462	34.332	mg/kg	0.00343 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	20.57	mg/kg	0.00206 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	32	mg/kg	1.56	43.425	mg/kg	0.00278 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.3	mg/kg	1.353	0.353	mg/kg	0.0000353 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		24	mg/kg	1.579	32.98	mg/kg	0.0033 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				39	mg/kg	2.774	94.127	mg/kg	0.00941 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		0.44	mg/kg		0.383	mg/kg	0.0000383 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				0.16	mg/kg		0.139	mg/kg	0.0000139 %	✓	
			204-371-1	120-12-7									
16		fluoranthene				1.5	mg/kg		1.305	mg/kg	0.000131 %	✓	
			205-912-4	206-44-0									
17		pyrene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.53	mg/kg		0.461	mg/kg	0.0000461 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.54	mg/kg		0.47	mg/kg	0.000047 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				0.83	mg/kg		0.722	mg/kg	0.0000722 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.36	mg/kg		0.313	mg/kg	0.0000313 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.44	mg/kg		0.383	mg/kg	0.0000383 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.89	mg/kg		0.774	mg/kg	0.0000774 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.45	mg/kg		0.391	mg/kg	0.0000391 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				7.9	pH		7.9	pH	7.9 pH		
				PH									
										Total:	0.0235 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS3

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

Sample details

Sample Name:
WS3
Sample Depth:
0.20 m
Moisture content:
16%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		49 mg/kg	1.32	54.345 mg/kg	0.00543 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		22 mg/kg	1.462	27.01 mg/kg	0.0027 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		72 mg/kg	1.126	68.094 mg/kg	0.00681 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	100 mg/kg	1.56	131.024 mg/kg	0.0084 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		1.4 mg/kg	1.353	1.592 mg/kg	0.000159 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		49 mg/kg	1.579	65.012 mg/kg	0.0065 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.3 mg/kg	2.554	2.789 mg/kg	0.000279 %	✓	
9	zinc { zinc chromate }	024-007-00-3				72 mg/kg	2.774	167.78 mg/kg	0.0168 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		0.54 mg/kg		0.454 mg/kg	0.0000454 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				0.15	mg/kg		0.126	mg/kg	0.0000126 %	✓	
			204-371-1	120-12-7									
16		fluoranthene				0.72	mg/kg		0.605	mg/kg	0.0000605 %	✓	
			205-912-4	206-44-0									
17		pyrene				0.63	mg/kg		0.529	mg/kg	0.0000529 %	✓	
			204-927-3	129-00-0									
18		benzo[a]anthracene				0.37	mg/kg		0.311	mg/kg	0.0000311 %	✓	
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				0.32	mg/kg		0.269	mg/kg	0.0000269 %	✓	
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				0.37	mg/kg		0.311	mg/kg	0.0000311 %	✓	
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				0.2	mg/kg		0.168	mg/kg	0.0000168 %	✓	
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				0.27	mg/kg		0.227	mg/kg	0.0000227 %	✓	
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				0.32	mg/kg		0.269	mg/kg	0.0000269 %	✓	
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				0.25	mg/kg		0.21	mg/kg	0.000021 %	✓	
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				8.2	pH		8.2	pH	8.2 pH		
				PH									
30		asbestos				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.048 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS4

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

Sample details

Sample Name:
WS4
Sample Depth:
1.00 m
Moisture content:
12%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		6	mg/kg	1.32	6.971	mg/kg	0.000697 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2	mg/kg	1.285	<0.257	mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		20	mg/kg	1.462	25.723	mg/kg	0.00257 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15	mg/kg	1.126	14.862	mg/kg	0.00149 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	7.3	mg/kg	1.56	10.02	mg/kg	0.000642 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<LOD
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		20	mg/kg	1.579	27.799	mg/kg	0.00278 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				30	mg/kg	2.774	73.237	mg/kg	0.00732 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-371-1	120-12-7									
16		fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-912-4	206-44-0									
17		pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			204-927-3	129-00-0									
18		benzo[a]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-033-00-9	200-280-6	56-55-3									
19		chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-048-00-0	205-923-4	218-01-9									
20		benzo[a]pyrene; benzo[def]chrysene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3	200-028-5	50-32-8									
21		indeno[123-cd]pyrene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-893-2	193-39-5									
22		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
23		benzo[ghi]perylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-883-8	191-24-2									
24		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4	205-911-9	205-99-2									
25		benzo[k]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5	205-916-6	207-08-9									
26		phenol				<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
		604-001-00-2	203-632-7	108-95-2									
27		chromium in chromium(VI) compounds { chromium(VI) oxide }				<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
		024-001-00-0	215-607-8	1333-82-0									
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH				7.5	pH		7.5	pH	7.5 pH		
				PH									
										Total:	0.0164 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS6

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

Sample details

Sample Name:
WS6
Sample Depth:
0.50 m
Moisture content:
15%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

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

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13 mg/kg	1.32	14.59 mg/kg	0.00146 %	✓	
2	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	<0.2 mg/kg	1.285	<0.257 mg/kg	<0.00002 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		11 mg/kg	1.462	13.666 mg/kg	0.00137 %	✓	
4	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		33 mg/kg	1.126	31.581 mg/kg	0.00316 %	✓	
5	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	54 mg/kg	1.56	71.596 mg/kg	0.00459 %	✓	
6	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.3 mg/kg	1.353	0.345 mg/kg	0.0000345 %	✓	
7	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		17 mg/kg	1.579	22.824 mg/kg	0.00228 %	✓	
8	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
9	zinc { zinc chromate }	024-007-00-3				100 mg/kg	2.774	235.802 mg/kg	0.0236 %	✓	
10	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
11	acenaphthylene		205-917-1	208-96-8		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
12	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
13	fluorene		201-695-5	86-73-7		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
14	phenanthrene		201-581-5	85-01-8		1.1 mg/kg		0.935 mg/kg	0.0000935 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		anthracene	204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
16		fluoranthene	205-912-4	206-44-0		1.4	mg/kg		1.19	mg/kg	0.000119 %	✓	
17		pyrene	204-927-3	129-00-0		1	mg/kg		0.85	mg/kg	0.000085 %	✓	
18		benzo[a]anthracene	200-280-6	56-55-3		0.52	mg/kg		0.442	mg/kg	0.0000442 %	✓	
19		chrysene	205-923-4	218-01-9		0.45	mg/kg		0.383	mg/kg	0.0000383 %	✓	
20		benzo[a]pyrene; benzo[def]chrysene	200-028-5	50-32-8		0.45	mg/kg		0.383	mg/kg	0.0000383 %	✓	
21		indeno[123-cd]pyrene	205-893-2	193-39-5		0.19	mg/kg		0.161	mg/kg	0.0000161 %	✓	
22		dibenz[a,h]anthracene	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
23		benzo[ghi]perylene	205-883-8	191-24-2		0.21	mg/kg		0.179	mg/kg	0.0000179 %	✓	
24		benzo[b]fluoranthene	205-911-9	205-99-2		0.58	mg/kg		0.493	mg/kg	0.0000493 %	✓	
25		benzo[k]fluoranthene	205-916-6	207-08-9		0.26	mg/kg		0.221	mg/kg	0.0000221 %	✓	
26		phenol	203-632-7	108-95-2		<1.3	mg/kg		<1.3	mg/kg	<0.00013 %		<**LOD**
27		chromium in chromium(VI) compounds { chromium(VI) oxide }	215-607-8	1333-82-0		<1.2	mg/kg	1.923	<2.308	mg/kg	<0.000231 %		<**LOD**
28		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 }				<1	mg/kg	1.884	<1.884	mg/kg	<0.000188 %		<**LOD**
		006-007-00-5											
29		pH		PH		7.9	pH		7.9	pH	7.9 pH		
										Total:	0.0378 %		

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 Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

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

Conversion factor: 1.462
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
Risk Phrases: R61 , R60 , R50/53 , R43 , R42 , R38 , R37 , R36 , R22 , R20
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

- **dicopper oxide; copper (I) oxide** (EC Number: 215-270-7, CAS Number: 1317-39-1)

CLP index number: 029-002-00-X
Description/Comments: M-factor for long-term aquatic hazard not included as per paragraph (5), ATP9
Data source: Regulation (EU) 2016/1179 of 19 July 2016 (ATP9)
Additional Risk Phrases: N R50/53 >= 0.25 %, N R50/53
Additional Hazard Statement(s): None.
Reason for additional Hazards Statement(s)/Risk Phrase(s):
10 Oct 2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10 Oct 2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

- **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
Risk Phrases: R38 , R37 , R36 , R27 , R26 , R22
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

- **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
Risk Phrases: N R51/53 , N R50/53 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **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
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

- **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
Risk Phrases: N R50/53 , R43 , R40 , R38 , R37 , R36 , R22
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

- **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
Risk Phrases: N R50/53 , R43 , R38 , R37 , R36
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

- **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
Risk Phrases: N R50/53 , Xn R22
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

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
Risk Phrases: N R50/53 , Xi R36/37/38
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

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
Risk Phrases: R40
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
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

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 Risk Phrases: None.
Additional Hazard Statement(s): EUH032 >= 0.2 %
Reason for additional Hazards Statement(s)/Risk Phrase(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
Risk Phrases: None.
Hazard Statements: None.

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Worst case species based on hazard statements

cadmium {cadmium sulfide}

Worst case species based on hazard statements

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

Worst case species based on hazard statements

copper {dicopper oxide; copper (I) oxide}

Most likely common species

lead {lead chromate}

Worst case species based on hazard statements

mercury {mercury dichloride}

Worst case species based on hazard statements

nickel {nickel dihydroxide}

Worst case species based on hazard statements

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

Worst case species based on hazard statements

zinc {zinc chromate}

Worst case species based on hazard statements

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

Worst case species based on hazard statements

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}

Worst case species

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015
HazWasteOnline Classification Engine Version: 2018.129.3535.7218 (09 May 2018)
HazWasteOnline Database: 2018.129.3535.7218 (09 May 2018)

This classification utilises the following guidance and legislation:
WM3 - Waste Classification - May 2015
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
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

APPENDIX H
CL:AIRE CoP Guidance

RE-USE OF WASTE - GUIDANCE NOTE

Definition of Waste:

The Environment Agency considers waste to be *"...any material that is discarded, or intended to be discarded..."* This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

Re-use of Waste

Previously large scale earthworks and remedial schemes relied on waste management exemptions to allow the re-use of waste. However in 2010 the Environment Agency in England and Wales removed many of the waste management licence exemptions and severely restricted the quantity of materials available for other exemptions.

For purposes of earthworks and remediation, the previous exemptions available have been replaced by CL:AIRE Code of Practice (CoP), also commonly referred to as a "Materials Management Plan".

CL:AIRE: Code of Practice

Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. The developer/contractor is advised to complete all works under the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE CoP).

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment;
- Material capable of being used in another place on the same site following ex-situ treatment on site;
- Material capable of being used in another development site without treatment (Direct Transfer);
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site;

The Code of Practice requires 4 No. Factors to be addressed:

1. Protection of human health and protection of the environment.
2. Suitability of use, without further treatment.
3. Certainty of use.
4. Quantity of material.

In order to satisfy these requirements the following are required:

i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
v) Volume calculations.
vi) Planning permission for the development.
vii) Contractual details to be clear, regarding who steps in is a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.

Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.

Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

APPENDIX I
Contaminated Land Legislative Background

Legislative Background

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act;
- The Contaminated Land (England) Regulations 2000;
- The DETR circular 02/2000 Environmental Protection Act 1990: Part IIA Contaminated Land.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

1) Significant harm is being caused or there is a significant possibility of such harm being caused;
2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

- **Source** - substances that are potential contaminants or pollutants that may cause harm;
- **Pathway** - a potential route by which contaminants can move from the source to the receptor;
- **Receptor** - a receptor that may be harmed, for example the water environment, humans and water.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the SPR approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents

This report has been prepared in accordance with the list of guidance below however the list is not exhaustive:

- CLR11 – Model Procedures;
- Contamination and Environmental Matters - Their implications for Property Professionals (2nd Edition RICS Nov 2003);
- Brownfields – Managing the development of previously developed land – A client's guide, CIRIA 2002;
- DEFRA and Environment Agency publications CLR7 – 10, supported by the TOX guides and SGV guides, dated March 2002;
- DETR Circular 02/2000, Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990;
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002;

Relevant Legislative Documents

The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environment Act (1995);
- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012);
- The Environment Protection Act (1990);
- The Contaminated Land (England) Act (2000);
- Contaminated Land (England) Regulations (2012);
- The Water Resources Act (1991);
- The Pollution Prevention and Control (England and Wales) Regulations (2000);
- The Landfill Regulations (England and Wales) Regulations (2002);
- The Landfill (England and Wales) (Amendment) Regulations (2004);
- Health and Safety at Work Act;

APPENDIX J
Limitations

Standard Limitations

This desk study report was conducted and has been prepared for the sole internal use and reliance of the Client, Aldi Stores Ltd. This report shall not be relied upon or transferred to any other parties without the express written authorisation of BSL. If an unauthorised third party comes into possession of this report they rely on it at their risk and the authors owe them no duty of care or skill.

The findings and opinions conveyed via the desk study are based on information obtained from a variety of sources as detailed within this report, which BSL believes are reliable. Nevertheless, BSL cannot and does not guarantee the authenticity or reliability of the information it has relied upon.

Any recommendations made in this report should be confirmed with the Regulatory bodies and Planning Authority prior to implementation to ensure compliance.

No existing manhole covers were lifted or drainage runs inspected during the course of this ground investigation.

The site plans enclosed in this report should not be scaled off.