GREAT ORMOND STREET HOSPITAL
P22 IMRI SUITE, LONDON

VOLUME 2

FACTUAL AND INTERPRETATIVE REPORT ON GROUND INVESTIGATION

Report No E8013-18-2

March 2018

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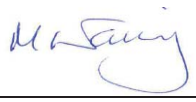
		SIGNATURE 	SIGNATURE 	SIGNATURE 
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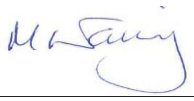
		SIGNATURE 	SIGNATURE 	SIGNATURE 
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REPORT STRUCTURE

VOLUME NO.	TITLE	REPORT NO.
1	DESK STUDY	E8013-18-1
2	**INTERPRETATIVE REPORT**	**E8013-18-2**

SOCOTEC

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1 INTRODUCTION

In January 2018 SOCOTEC UK Limited (SOCOTEC) was commissioned by KIER Construction Ltd. (KIER) with the designer Thomasons Limited to carry out a ground investigation at Great Ormond Street Hospital, London. The investigation was required to obtain geotechnical and geo-environmental information for a proposed new 3 storey building to provide healthcare space for Great Ormond Street Hospital.

The scope of the investigation was specified by KIER and Thomasons Limited and comprised cable percussion and window sampling boreholes, in situ testing, laboratory testing, topographic survey and a CCTV survey of the existing drainage services. Due to the sensitive nature of the equipment located in the surrounding buildings, a vibration monitor was installed near the equipment to confirm no disruption to the hospital during the works. The results from the vibration monitor and the CCTV investigation are reported separately. The investigation was performed in accordance with the agreed specification, and the general requirements of BS 5930:2015, BS EN 1997-2 (2007), BS EN ISO 22475-1 (2006) and other relevant related standards identified below. The fieldwork took place between 29 January and 8 February 2018.

This report (Volume 2) presents the factual records of the fieldwork and laboratory testing, along with a geotechnical and geoenvironmental assessment in relation to the proposed development works detailed in Section 6. The information is also presented separately as digital data as defined in AGS (2017). A desk study report is presented separately as Volume 1.

2 SITE SETTING

2.1 Location and Description

The P22 iMRI project is within an area of land known as the Southwood Courtyard, within the confines of Great Ormond Street Hospital for Children; and has an approximate centre at National Grid reference TQ 305 820, and a postal address as follows:

Southwood Courtyard, off Powis Place,
Great Ormond Street Children's Hospital,
Camden,
London
WC1N 3JH

Great Ormond Street Hospital is located in the Bloomsbury area within the London Borough of Camden and is located just over 1km south east of Euston Train Station at. A Site Location Plan is included within Appendix A.

The site is roughly rectangular in shape, with approximate dimensions of 30m by 25m, and is generally flat lying with an elevation of approximately 23m AOD. The site's surface is composed of hardstanding concrete and macadam, with four drainage gulleys present. Three 2.80m deep light wells are present running alongside the site's perimeter on three sides for the existing Southwood Building, indicating the presence of basement floors.

The courtyard is accessed through Powis Place, off Great Ormond Street and is bounded by the Southwood Building of Great Ormond Street Hospital on three sides, the Variety Club Building to the east and the hospital chapel to the south.

The Southwood Courtyard lies within the great Ormond Street Hospital estate, which itself is within a predominantly commercial and residential area of Camden, including further healthcare facilities, and with some areas of public open space.

2.2 Published Geology and Previous Ground Investigations

2.2.1 Published Geological Information

The published geological map for the area, BGS Sheet 256 (2006), the BGS Geology of Britain Viewer (2018) and Geo Insight report shows the superficial geology to be comprised of fluvial sand and gravel deposits of the Lynch Hill Gravel Member, with superficial deposits being recorded as absent approximately 150m northeast of the site.

The Lynch Hill Gravel Member deposits are sedimentary superficial deposits formed during the Wolstonian Stage of the Quaternary period; they generally consist of sand and gravel, locally with lenses of silt, clay or peat. BGS records indicate that this stratum may directly overlie bedrock; which comprises the London Clay Formation. London Clay mainly comprises bioturbated or poorly laminated, blue-grey or grey-brown, slightly calcareous, silty clay.

2.2.2 Previous Investigations

Local borehole records held by the BGS (approximately 20m north of the site), indicate that the superficial deposits have been removed (or were absent), and show Made Ground directly overlying firm to stiff CLAY. This is further evidenced on site, by the Ground Conditions Report (Thomasons, 2017). The report summarised the findings of a 2013 intrusive trial pit investigation for the installation of a tower crane within the Southwood Courtyard area, and made the following key observations, verbatim:

- *The ground encountered was loose fines made ground, with brick rubble plus suspected asbestos sheeting. This was to a depth of approximately 2- 2.7m below ground level, where the brick masonry floor of a previous basement could be observed.*
- *Additional vertical masonry walls were also observed, which indicated that a previous basement of a building, existed under part of the yard.*
- *The full extent of the basement walls could not be observed as the made ground was so loose, it posed a stability problem to the adjacent temporary building and temporary underground train (now since removed).*

3 FIELDWORK

The fieldwork was carried out in general accordance with BS 5930:2015, BS EN 1997-2 (2007) and BS EN ISO 22475-1 (2006).

The exploratory hole and in-situ testing locations and in-situ testing were selected by Thomasons Limited. The locations were set out from local features and reference to a site plan provided by KIER. The co-ordinates and reduced levels were surveyed by Midland Surveys to National Grid and Ordnance Datum in conjunction with the topographic survey. The exploratory hole and in-situ testing locations are shown on the Site Plan in Appendix A.

3.1 Exploratory Holes

The exploratory holes are listed in the following table.

TABLE 1 : SUMMARY OF EXPLORATORY HOLES

TYPE	QUANTITY	DEPTH RANGE (m)	REMARKS
Cable Percussion Boring	2	15.45 and 30.00	BH01 and BH02
Dynamic Sampling	6	5.45 to 6.45	WS01 to WS06
Dynamic Probing	7	3.10 to 10.00	BHDP01, WSDP01 to WSDP06

The exploratory holes had all locations pre cored to allow boring and sampling below the macadam and concrete at surface. Dynamic probing was conducted within the same inspection pit as the boreholes prior to drilling/sampling.

The exploratory hole logs are presented in Appendix B. These provide information including the equipment and methods used, samples taken, tests carried out, water observations and descriptions of the strata encountered. Explanation of the terms and abbreviations used on the logs is given in the Key to Exploratory Hole Records in Appendix B, together with other explanatory information. The logging of soil and rock materials is in accordance with BS 5930:2015.

Standard penetration tests (SPT) in the boreholes were carried out in accordance with BS EN ISO 22476-3+A1 (2011) and the SPT hammer energy ratio certificates are included in Appendix B. The SPT results are presented on the logs as uncorrected N values.

Photographs of the dynamic sampling liners are presented in Appendix F.

On completion of the fieldwork geotechnical samples were transported to the Southam office of SOCOTEC for temporary retention, with those required for testing being transferred to the laboratory at Doncaster. Geo-environmental samples were transported from site directly to the laboratory at Bretby (Burton-on-Trent).

3.2 Groundwater and Gas Monitoring

Two monitoring wells installed in borehole BH02 for groundwater and gas monitoring are shown on the log and summarised in Appendix C. Records of monitoring carried out by SOCOTEC who monitored the installations after the fieldwork period are presented in Appendix C. Groundwater sampling was carried out on the second monitoring visit and the results are presented in Appendix E.

3.3 Onsite Volatile Head Space Testing

Onsite Volatile Head Space testing was conducted on all environmental samples collected during the fieldwork. This testing was conducted using a Mini Rae Lite photo ionisation detector on separate sealable sample bags and the results of these tests are presented on the exploratory hole records in Appendix B.

4 LABORATORY TESTING

4.1 Geotechnical Testing

Geotechnical laboratory testing was scheduled by SOCOTEC and was carried out in accordance with BS 1377 (1990) unless otherwise stated. The testing is summarised below and the results are presented in Appendix D.

TABLE 3 : SUMMARY OF GEOTECHNICAL LABORATORY TESTING

TYPE	REMARKS
Water Content Determination	15 Samples
Atterberg Limit Determination	10 Samples
pH, Total Sulphur, Acid and Water Soluble Sulphate Content of Soils	11 Samples Test methods are BS 1377 or others recognised in BRE Special Digest 1 (2005); they are indicated on the results report sheets.
Unconsolidated Undrained Triaxial Compression Testing	10 Samples
Oedometer Consolidation	3 Samples

4.2 Geoenvironmental Testing

Geoenvironmental laboratory testing was scheduled by SOCOTEC on the soil samples recovered during the fieldwork and groundwater samples taken from the installations during monitoring. The testing was carried out by the laboratory at Burton on Trent. The results are presented in Appendix E.

TABLE 4 : SUMMARY OF GEOENVIRONMENTAL LABORATORY TESTING

TYPE	QTY. SOIL ANALYSIS	QTY. WATER ANALYSIS
"BLACKTOP SUITE TPH by GCFID, (C8-C40), 16PAHs "	1	
COMPREHENSIVE SUITE: As, B, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, PAH (USEPA 16), pH, Phenol Index, CN (total), sulphate, NH3, organic matter and TPH carbon banding by GCFID	20	1
BTEX	20	1
PCB	20	-
VOC	20	1

TYPE	QTY. SOIL ANALYSIS	QTY. WATER ANALYSIS
SVOC	20	1
Asbestos Stage 1	20	-
"INERT WAC SUITE (Total and leachate)"	6	-

5 GROUND CONDITIONS AND GROUNDWATER

5.1 Strata Encountered

Descriptions of the strata encountered are given on the exploratory hole records in Appendix B. The downward succession encountered is broadly uniform across the site and is summarised below. The downward succession of strata is shown on a cross-section presented as Section 1 in Appendix A with Figures 1 to 5 based on the ground conditions assessment.

TABLE 5 : SUMMARY OF GROUND CONDITIONS

STRATUM ENCOUNTERED	RANGE OF THICKNESSES (m)	REMARKS
MADE GROUND Macadam onto concrete ground surfacing overlying granular then cohesive material	3.30 to 4.90	Encountered in all exploratory holes
LYNCH HILL GRAVEL Yellow brownish slightly gravelly SAND	0.90	Encountered in WS05 only
LONDON CLAY CLAY locally laminated and/or fissured, slightly sandy	0.85 to 15.60	Encountered in all exploratory holes, base proven in BH01 at 2.51mOD
LAMBETH GROUP CLAY, locally fissured, friable, slightly sandy	9.50	Encountered in BH01, base not proven

5.2 Made Ground

The ground surfacing comprised macadam overlying concrete. Below the concrete was a general sequence of granular Made Ground (gravelly sand) overlying cohesive Made Ground layers (sandy gravelly clay/gravelly clay and sandy gravelly silt). Cobbles of concrete and brick were encountered throughout the Made Ground.

The Made Ground is not considered to be of engineering significance and no further assessment has been made.

5.3 Lynch Hill Gravel

The Lynch Hill Gravel comprised a band of slightly gravelly sand less than 1m in thickness. One Standard Penetration Test (SPT) carried out within the sand recorded an SPT 'N' value of 21, see Figure 1. This indicates a relative density of medium dense.

5.4 London Clay

The London Clay comprised a clay locally fissured and occasionally slightly sandy.

Twenty one SPT carried out within the London Clay recorded SPT 'N' values of between 4 and 31 blows, with an indication of an increase in blow count with depth. One further test recorded 50 blows without achieving the full 300mm test drive (ie refusal), see Figure 1, however this was within a granular material encountered at the base of WS06 (5.00m) and may relate to an isolated variation within the ground, such as a Terrace Deposit or disturbed London Clay. Published correlations between SPT 'N' values and strength suggests approximate undrained shear strength of 18 to 139 kPa (very low to high strength) with an increase in strength with depth, see Figure 2.

Quick undrained triaxial tests carried out on seven samples revealed undrained shear strengths of between 50 and 149 kPa indicating a medium to high strength, with an increase in strength with depth, see Figure 2.

Five Atterberg limit determinations measured liquid limits of between 53 and 89 % and plastic limits of between 22 and 35 %, These tests indicate the clay is generally of high to very high plasticity, see Plasticity Chart Figure 3. Moisture contents typically ranged from 18 to 32 %, excluding a single extreme value of 9.5 % at 6.80 m (BH02 gravel band). The moisture contents initially fall close to the plastic limits, see Moisture Content and Atterberg Limit Profile Figure 4. The modified plasticity indices range from 25% to 54%, indicating a medium to high volume change potential throughout the cohesive materials encountered. In order to adopt a precautionary design approach, it is therefore recommended that all clays on site are considered to be of a high volume change potential.

Two one dimensional oedometer consolidation tests were carried out on this material across the site. The tests results in the form of void ratio (e) against log effective pressure curves are presented in Appendix C with in addition, assessed values of coefficient of volume compressibility

(m_v) for the various pressure ranges tested. It should be appreciated that values of m_v presented are laboratory values.

The strength indicators above are in general agreement with the consistency assessed from sample inspection indicating that there is a general increase in strength with depth, with little variation across the site.

5.5 Lambeth Group

The Lambeth Group comprised a clay locally friable and occasionally slightly sandy within BH01 only.

Two SPT carried out within the Lambeth Group recorded SPT 'N' values of 43 blows and 50 blows without achieving the full 300mm test drive (ie refusal), see Figure 1. Published correlations between SPT 'N' values and strength suggests approximate undrained shear strength of 194 to >225 kPa (very high strength), see Figure 2.

Quick undrained triaxial tests carried out on three samples revealed undrained shear strengths of between 147 and 412 kPa indicating a high to very high strength, with the highest value indicating a strength similar to bedrock, see Figure 2.

Three Atterberg limit determinations measured liquid limits of between 76 and 65 % and plastic limits of between 27 and 31 %, These tests indicate the clay is generally of high to very high plasticity, see Plasticity Chart Figure 3. Moisture contents typically ranged from 21 to 27 %. The moisture contents initially fall close to the plastic limits, however, these gradually fall below the corresponding plastic limit, see Moisture Content and Atterberg Limit Profile Figure 4. The modified plasticity indices range from 38% to 48%, indicating a medium to high volume change potential throughout the cohesive materials encountered. In order to adopt a precautionary design approach, it is therefore recommended that all clays on site are considered to be of a high volume change potential.

A single one dimensional oedometer consolidation test was carried out on this material across the site. The tests results in the form of void ratio (e) against log effective pressure curves are presented in Appendix C with in addition, assessed values of coefficient of volume compressibility (m_v) for the various pressure ranges tested. It should be appreciated that values of m_v presented are laboratory values.

The strength indicators above are in general agreement with the consistency assessed from sample inspection indicating that there is a general increase in strength with depth, with little variation across the site.

5.6 Groundwater

Groundwater seepages were encountered in three of the exploratory holes and are summarised in Table 6. These observations do not necessarily indicate equilibrium conditions due to the short time frame over which the exploratory holes are open. To determine equilibrium conditions standpipe levels are more appropriate. Monitoring wells were installed in two of the boreholes and the details are presented in Table 3 along with the groundwater levels recorded to date in March 2018.

TABLE 6 : SUMMARY OF GROUNDWATER DATA

HOLE ID	GROUNDWATER STRIKES (m bgl)	GROUND CONDITIONS	GROUNDWATER MONITORING RESULTS (m bgl)	GROUND CONDITIONS
BH01	6.50	London Clay	N/A	N/A
BH01	15.00	London Clay	N/A	N/A
BH02	N/A	N/A	3.42 and 3.61 *Response zone = 1.00 to 4.00m*	Made Ground
BH02	6.50	London Clay	3.26 and 4.27 *Response zone = 5.00 to 10.00m*	London Clay
WS05	5.00	Lynch Hill Gravel	N/A	N/A

Groundwater was generally encountered within the London Clay as seepages, though the two monitoring wells indicated over the monitoring period that the groundwater level was at a shallow level. Further monitoring is to be carried out. It is be appreciated that seasonal fluctuations in groundwater level occur. Other effects such as investigation and constructional excavation may also change groundwater levels.

6 PROPOSED WORKS

It is understood that the proposed development will comprise a new three storey building to provide healthcare space for Great Ormond Street Hospital. The facilities will include physiotherapy and rehabilitation facilities, an iMRI suite and operating theatre. Works include a stair link at second floor level to the Southwood Building, a two storey link to the Variety Club Building, entrance ramps and stairs, a green roof, cycle parking, artificial lighting, plant equipment and associated works. The development is proposed to link to existing services in the area, including drainage.

Information provided by KIER indicates the preferred foundation solution to be 300mm diameter CFA piles. Proposed development plans are included in Appendix A.

7 GEOTECHNICAL ENGINEERING ASSESSMENT

7.1 General

As discussed in Section 6 the foundation solution indicated by KIER is to be 300mm diameter CFA piles, as such this report is limited to this foundation option.

7.2 Piled Foundations

The carrying capacity of a pile is dependant not only on the ground conditions but also on the type of pile and its method of installation. It is therefore considered essential that the advice of specialist piling contractors is sought regarding the suitability of their various proprietary systems giving due consideration to the ground conditions present on the site. The piling contractor will be able to provide a pile design and confirm the pile lengths and diameters required to maintain settlements within the specified tolerances under the applied loads for their piling systems.

When evaluating the type of pile to be used on this site the following issues should be considered:

- Any access constraints for piling plant and equipment gaining access onto the site and manoeuvring around the site. The site is relatively small and is situated in an urban inner city environment.

- The effects of noise, vibrations and ground disturbance on any nearby infrastructure including structures, roads and buried services. In particular the site is within an existing hospital environment where more stringent noise and vibration limits may be imposed on construction work.
- Manmade obstructions may be present such as basements, old foundations and sub structures. These may require breaking out or pre-boring prior to the main piling works.
- Potential obstructions in the form of claystone nodules may be present in the London Clay. These can be up to cobble, and occasionally boulder size, and could cause a pile to terminate prematurely or deviate from a vertical alignment. No such features were encountered in the two deep ground investigation boreholes but this does not necessarily preclude the possibility of such features being present elsewhere beneath the site. The chosen piling system should be capable of dealing with any such obstructions if encountered.
- Some ground water was observed locally in the exploratory holes during the investigation. Therefore water within the more permeable materials may enter pile holes e.g. perched water from within the Made Ground and drift deposits or water ingress from sand lenses or layers in the London Clay and Lambeth Group.
- Traditional bored piles would require temporary support through potentially unstable materials such as the Made Ground and superficial deposits.
- Should the Made Ground settle relative to the piles this could generate additional negative skin friction forces on the pile shaft. The pile design and construction should consider these potential effects.

If continuous flight auger (CFA) bored piles are used then temporary casing will probably not be required to support the pile holes and the effects of noise and vibrations will be reduced. However, the piling contractor will need to confirm the suitability of their particular methods to manage the specific geotechnical risks on the development site.

7.3 Temporary Works

7.3.1 Excavations

Shallow excavations will be required for the construction of pile caps and ground beams. Site observations indicated that such excavations should be feasible in the near surface soils with conventional backhoe excavators; however, the possible presence of old buried infrastructure (slabs, foundations, former basement walls etc) should not be discounted. Excavations in the

Made Ground may be unstable and should either be battered back to a safe slope where working space permits or a system of close sheeting and shoring adopted for areas where working space is restricted. Careful consideration to excavation stability needs to be given due to the close proximity of adjacent structures.

7.3.2 Dewatering

Localised seepages into shallow excavations may occur but they should be able to be controlled through pumping from internal sumps.

7.4 Chemical Considerations for Buried Concrete

A total of 11 samples, between 0.50 and 18.00 m, were tested for pH, total sulphur, water and acid soluble sulphate, in accordance with BRE Special Digest 1 (2005). The site has been classified as Brownfield with pyrite and a mobile groundwater situation and the results are summarised in Table 7. The recommendations in the digest should be followed for the design of subsurface concrete.

TABLE 7 : SUMMARY OF CHEMICAL TEST RESULTS

STRATUM	RANGE OF VALUES				CALCULATIONS			DESIGN SULPHATE CLASS	ACEC CLASS
	Acid Soluble Sulphate (mg/kg)	Total Sulphur (%)	pH	Water Soluble Sulphate (mg/l)	Total Potential Sulphate (TPS % S04)	Oxidisable Sulphides (OS % SO4)	Pyrite Probably Present		
Made Ground 5 results	1180 to 4340	0.07 to 0.14	8.0 to 11.6	173 to 451	0.39	0.12	No	DS-2	AC-2
London Clay 6 results	532 to 1150	0.04 to 0.58	7.8 to 8.8	129 to 462	1.61	1.53	Yes	DS-4	AC-4

The presence of pyrite may result in an increased risk of sulphate attack of buried concrete where the ground is disturbed during construction. In accordance with recommendations given in BRE Special Digest 1, the assessed Design Sulphate Class for materials in which pyrite is likely to be present, and where ground may be disturbed, should be based on TPS and pH values, as indicated in the table above. However, for concrete that will be placed against material that will not be disturbed during construction (e.g. cast in-situ piles), then the Design Sulphate Class may be based on water soluble sulphate and pH values.

8 GEOENVIRONMENTAL ASSESSMENT

8.1 Human Health Risk Assessment

Laboratory testing has been undertaken on 20 no. soil samples collected from 2 no. boreholes and 6 no. window samples during the ground investigation during the January 2018 ground investigation undertaken by SOCOTEC.

8.1.1 Technical Approach

In accordance with Environment Agency guidance CLR 11, Model Procedures for the Management of Land Contamination, (EA, 2004), human health risk assessment follows a tiered approach. The first tier comprises a Preliminary Risk Assessment, which was completed in Volume 1 of this report. Further tiers include Generic Quantitative Risk Assessment (GQRA) and Detailed Quantitative Risk Assessment (DQRA), which use data derived from the ground investigation undertaken previously to assess risks to identified receptors. The assessment included in this report comprises a GQRA, which is undertaken by comparing soil contaminant concentrations with conservative Generic Assessment Criteria (GAC).

Generic Assessment Criteria (GAC) for various land use and exposure scenarios have been selected from the following sources:

- CL:AIRE Category 4 Screening Levels (C4SL);
- LQM Suitable for Use Levels (S4UL)[1]; and
- CL:AIRE/EIC/AGS GAC

The GAC have been derived using the Environment Agency Contaminated Land Exposure Assessment (CLEA) model, for a range of land uses and exposure scenarios, including:

- Residential with the consumption of homegrown produce;
- Residential without the consumption of homegrown produce;
- Commercial;
- Allotments;
- Public Open Space near residential housing (POS_{resi}); and
- Public Open Space public park scenario (POS_{park})

Great Ormond Street is a specialist children's hospital and is it therefore acknowledged that children are a sensitive human health receptor for the development; however given that no areas of soft landscaping are proposed, and this assessment and is intended for chronic long term exposure from contaminants present over a prolonged period of years, it is considered appropriate to adopt GACs for a Commercial end use scenario, (which are based upon a 16 to 59 year old)

Provisional C4SL values for a total of six priority substances (arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium and lead) were produced by CL:AIRE, and published in December 2013. A policy companion document was published by DEFRA in March 2014, which confirmed the final C4SL for these determinands.

The final C4SL values are considered to represent 'relevant technical tools', as per paragraph 4.21(c) of the Contaminated Land Part IIA Statutory Guidance. Their purpose is to identify land that falls within Category 4 (Human Health) as defined by the Statutory Guidance, i.e. land that is definitely not Contaminated Land as defined by the Part IIA legislation.

It should be noted that the C4SLs have been derived using toxicological criteria that are presented as posing a 'low level of toxicological concern'. This is in comparison with previous Soil Guidelines Values (SGVs) and LQM GAC, which were derived using toxicological criteria that represent a 'minimal risk' to human health.

The LQM Suitable for Use Levels (S4ULs) have been derived in accordance with the changes in exposure modelling presented within the C4SL framework, whilst still using a set of toxicological criteria that are set within the 'minimal risk' range. The S4ULs were published to offer a set of collated information on the toxicity and transport properties for a number of common contaminants, and should be seen as suitable for use in planning and change of use assessments, as well as Part IIA assessments.

The CL:AIRE/EIC/AGC Generic Assessment Criteria were published in December 2009. Assessment criteria were produced using the CLEA model for a total of 35 No. less common contaminants, in accordance with the CLEA guidance. The GAC were intended to compliment the SGVs produced by the Environment Agency, and the LQM GAC that were current at the time. These have been used in the assessment for contaminants where S4ULs and C4SLs are not available.

The SOCOTEC approach to human health risk assessment in planning and development risk assessments is to use the various assessment criteria in the following order of preference: S4UL > EIC GAC > C4SLs. Note that for some contaminants this will not be possible, for example lead has a C4SL but not an S4UL or a EIC GAC.

Where contaminants fail the initial screen against S4UL or EIC GAC, a further assessment may be possible by screening against C4SLs. Where this is undertaken it should be clearly understood that the C4SLs represent 'low risk' rather than 'minimal risk' GAC.

8.1.2 Human Health Risk Assessment Screening

All of the 20 no. soil samples collected from the site during the most recent site investigation have been screened against the GAC for a commercial development as described above. The maximum contaminant concentrations are summarised along with the relevant GAC in Table 8 below. The relevant laboratory reports (EFS/183175 (Ver. 1) and EFS/183180 (Ver. 1) are presented in Appendix E.

Table 8 : Comparison of Maximum Measured Soil Concentrations with Commercial GACs

Determinand	Maximum Measured Concentration (mg/kg)	GAC Value (mg/kg)	No. of results exceeding GAC (total tests)
Metals and Semi-Metals			
Arsenic	25.1	640	0 (20)
Boron	2.7	240000	0 (20)
Cadmium	0.24	190	0 (20)
Chromium (III)	87.4	8600	0 (20)
Hexavalent Chromium	0.3	33	0 (20)
Copper	103.1	68000	0 (20)
Lead[1]	4218	2330	1 (20)
Mercury[2]	2.56	1100	0 (20)
Nickel	62.5	980	0 (20)
Selenium	1.1	12000	0 (20)
Zinc	171.7	730000	0 (20)
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.26	84000	0 (20)
Acenaphthylene	0.14	83000	0 (20)
Anthracene	0.91	520000	0 (20)
Benzo(a)anthracene	1.65	170	0 (20)
Benzo(a)pyrene	1.16	35	0 (20)

Determinand	Maximum Measured Concentration (mg/kg)	GAC Value (mg/kg)	No. of results exceeding GAC (total tests)
Benzo(b)fluoranthene	1.22	44	0 (20)
Benzo(ghi)perylene	0.55	3900	0 (20)
Benzo(k)fluoranthene	0.45	1200	0 (20)
Chrysene	1.15	350	0 (20)
Dibenzo(ah)anthracene	0.15	3.5	0 (20)
Fluoranthene	3.86	23000	0 (20)
Fluorene	0.4	63000	0 (20)
Indeno(123cd)pyrene	0.76	500	0 (20)
Naphthalene	0.29	190	0 (20)
Phenanthrene	2.78	220000	0 (20)
Pyrene	3.02	54000	0 (20)
Total Petroleum Hydrocarbons and BTEX Compounds			
TPH – >C08-C10[3]	<2	2000	0 (20)
TPH – >C10-C12[3]	<2	9700	0 (20)
TPH – >C12-C16[3]	8.91	36000	0 (20)
TPH – >C16-C21[3]	73.4	28000	0 (20)
TPH –>C21-C35[3]	367	28000	0 (20)
Benzene	<0.010	27	0 (20)
Toluene	<0.010	56000	0 (20)
Ethylbenzene	<0.010	5700	0 (20)
Xylene-m / p	<0.020	5900	0 (20)
Xylene-o	<0.010	5900	0 (20)
Other Compounds (including VOCs and SVOCs greater than LOD)			
Asbestos	None Detected	presence of fibres	0 (20)
Cyanide (free)	<0.5	157	0 (20)
Phenol (total)	<0.5	760	0 (20)
Polychlorinated Biphenyls (PCBs) – EC7	<0.062	9.0	0 (20)
VOCs (exc. PAHs)	All less than detection limits	Various	0 (20)
SVOCs (exc. PAHs)	All less than detection limits. Except dibenzofuran, where max = 1.0 mg/kg	Various	0 (20)

[1]C4SL
[2]GAC for Inorganic Mercury used
[3]Most conservative aliphatic/aromatic carbon band GAC used.
GAC assumed 1 % Soil Organic Matter where relevant

During the quantitative screening of the maximum concentrations against the commercial GACs, there was only one exceedance for lead for BH01 ES4 at 0.5 m bgl. The concentrations of VOCs and SVOCs were generally below their respective limits of detection. The maximum concentration

of VOC detected was naphthalene (0.031 mg/kg) in WS05 ES 1 0.25 m. The maximum concentration of SVOC was fluoranthene detected at 19.2 mg/kg in WS04 ES 4 0.50.

The potential risk posed by elevated lead concentration encountered within BH04 at 0.50m bgl will be mitigated due to the proposed hardstanding covering on site, effectively removing any effective pathways to end users of the site.

It is therefore concluded that it is unlikely that the soils will present a significant contamination risk to the site's end users, and the proposed site is considered suitable for development without any special remedial or mitigation measures taking place.

8.2 Ground Gas Risk Assessment

A ground gas risk assessment has been carried out using the guidance presented in BS8485:2015 *Code of practice for the characterization and remediation from ground gas in affected developments*. Gas monitoring data was obtained from BH02, which had both a 50 mm (1 – 4 m response zone targeting the Made Ground) and 19 mm installation (5 – 10 m response zone targeting the underlying natural soils and aquifer). Monitoring took place on two visits, conducted on 05 March 2018 and 19 March 2018, and it should be noted that during the first monitoring visit the atmospheric pressure was <1000 mbars.

The concentrations of carbon dioxide ranged from <0.1% to 0.2 % volume and methane was not detected (less than 0.1%). During the monitoring visits a Photoionization Detector (PID) was used to monitor the volatiles in the ground gases, the results show that no volatiles were present. Groundwater analysis undertaken on a sample obtained from the shallow 50mm pipe within BH02 (installed within the Made Ground) provided further supporting evidence, showing levels of volatile contaminants to be below laboratory detection limits in all cases.

In accordance with BS8454:2015, a worst case condition has been calculated for each hazardous permanent gas. This is calculated by multiplying the maximum recorded flow in any standpipe by the with the maximum gas concentration. The worst case carbon dioxide Qhg is 0.002 litres / hour, and the worst case methane Qhg is <0.0001 litres / hour, which correspond to a characteristic situation of CS1 (very low risk), and indicates that no gas protection measures are required.

It should be acknowledged that the proposed build is considered to be a sensitive end use, and adverse ground gas conditions may exist on site, which have not been encountered during the site investigation. Consideration should therefore be given to installing basic gas protection measures in line with CS-2 conditions for a Type C build as a precaution, with a gas protection score of 2.5.

8.2 Waste Classification of Blacktop

Road surfacings/blacktop can contain coal tars in concentrations which render the material hazardous and this largely depends on the age of the surface. Coal tar was used until the mid-1980s and therefore surfacings laid after this date are likely to be non-hazardous. Once a surface is excavated it becomes a waste and in order for this waste to be handled in accordance with the Duty of Care, it should be determined whether it is hazardous or non-hazardous.

Coal tar is made up of a number of organic chemicals, but in the particular case of road surfacings, the Environment Agency has determined that it is the concentration of benzo(a)pyrene that should be used to determine whether those materials should be classified as hazardous or non-hazardous.

The results of the laboratory testing are summarised in Table 9 below.

TABLE 9 : BLACKTOP TESTING SUMMARY

Sample ID	Total PAH (mg/kg)	Benzo(a)pyrene (mg/kg)	Classification
WS04	3500	190	Hazardous

As shown in Table 9, the sample would be classified as hazardous waste. The List of Waste (LoW) coding for the material is therefore considered to be ’17 03 01* bituminous mixtures containing coal tar’ i.e. hazardous waste.

It should be noted that all blacktop, whether classified as hazardous or non-hazardous waste, can potentially be reused, although blacktop classified as hazardous waste may only be reused in cold lay surfacing.

If disposal is selected rather than reuse, then it is recommended that the proposed receiver site be contacted to confirm whether the testing to date is sufficient for their purposes.

All wastes removed from site should be consigned, transported and disposed of in full accordance with all relevant UK legislation.

8.2 Waste Classification of Made Ground Materials

The HazWasteOnline toolkit was used to undertake a Hazard Assessment Screen, to establish whether the sampled soils should be considered as representative of either hazardous or non-hazardous waste. This classification process is in accordance with technical guidance document WM3, Guidance on the classification and assessment of waste (WM3, 2015).

The HazWasteOnline assessment has been ran on two sample populations, based upon the material types encountered during the ground investigation: Granular Made Ground and Cohesive Made Ground. The maximum recorded concentrations have been used for each group and the output sheets are presented in Appendix G.

The assessment of the two populations are summarised below; however it should be noted that it is the ultimate responsibility of landfill operators to satisfy themselves that accepted wastes meet their permit conditions. It is therefore recommended that the results are presented to the relevant landfill operator to confirm this acceptance.

5.6.1 Granular Made Ground

Analysis of eight granular Made Ground samples has indicated no elevated concentrations of metals, PAH or TPH were encountered in terms of hazardous waste classification; with the exception of lead. Two high levels of lead were observed which led the material to be classified as hazardous waste, based upon the following properties:

Hazard properties

HP7: Carcinogenic;

HP10: Toxic for reproduction; and,

HP14: Ecotoxic

Category:

17: Construction and Demolition Wastes (including excavated soil from contaminated sites)

LoW/EWC Code:

17 05 03* - Soil and stones containing hazardous substances', i.e. ***hazardous waste.***

Materials classified as hazardous may be disposed of at a hazardous landfill without treatment subject to meeting hazardous waste acceptance criteria (WAC) thresholds. The WAC results are presented in Appendix E and confirm that the materials fall within hazardous WAC limits, and therefore can be accepted at a Hazardous Waste Landfill site.

Due to the inherent limitations of a site investigation, at this stage it has to be assumed that all Granular Made Ground soils encountered during the excavation works on site should be disposed of as hazardous waste. However, further subpopulations may become evident upon commencing excavation and enabling works and additional sampling within these materials could be undertaken to obtain a more representative data set and potentially determine materials of non-hazardous and hazardous wastes types.

It is also considered possible that further testing may allow the use of statistics to demonstrate that the elevated lead concentrations was an outlier or localised hotspot, and that only a small volume of material will be classified as hazardous waste, or allow a down-grading of the material to non-hazardous.

5.6.2 Cohesive Made Ground

Analysis of eleven samples of Cohesive Made Ground at the site has indicated that there are no elevated concentrations of contaminants in terms of hazardous waste classification. The waste classification summary sheet therefore gives a chemical waste classification for the samples as **non-hazardous**. The List of Waste (LoW) code for the Made Ground materials is therefore considered to be:

'17 05 04 (Soil and stones other than those mentioned in 17 05 03)' i.e. non-hazardous waste.

Materials classified as non-hazardous may be disposed of at an inert landfill subject to meeting inert waste acceptance criteria (WAC) values. Alternatively the materials may be disposed of at a non-hazardous landfill, which do not have set numerical WAC values.

WAC analysis undertaken on two Cohesive Made Ground samples indicate that the materials exceed the Inert WAC limits due to elevated arsenic and lead concentrations, and therefore any cohesive waste deposits should be disposed of at a non-hazardous waste landfill site.

REFERENCES

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BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing - Part 3 Standard penetration test. British Standards Institution.

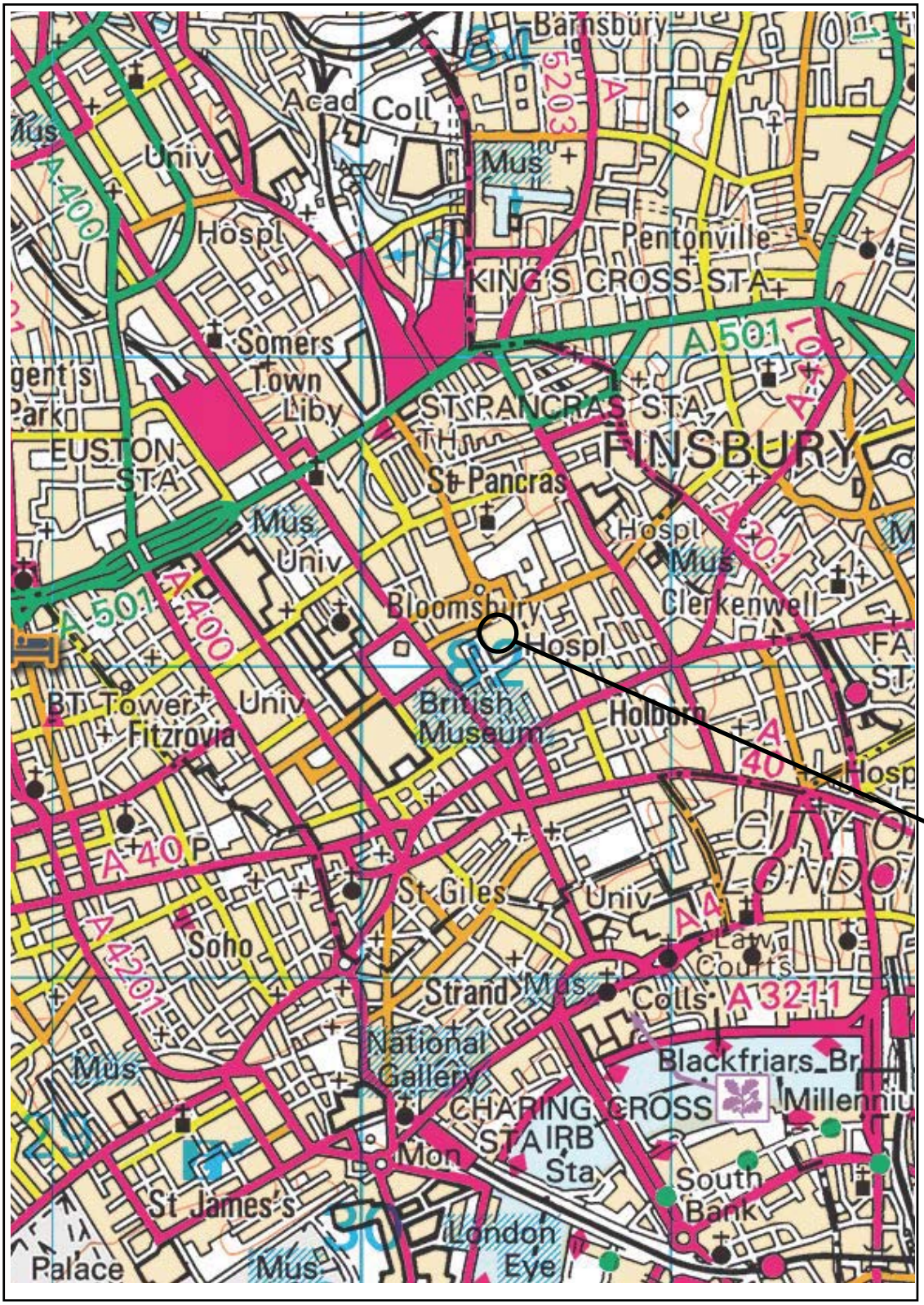
Technical Guidance WM3 : Waste Classification - Guidance on the classification and assessment of waste (1st edition 2015). Environment Agency

APPENDIX A
FIGURES AND DRAWINGS

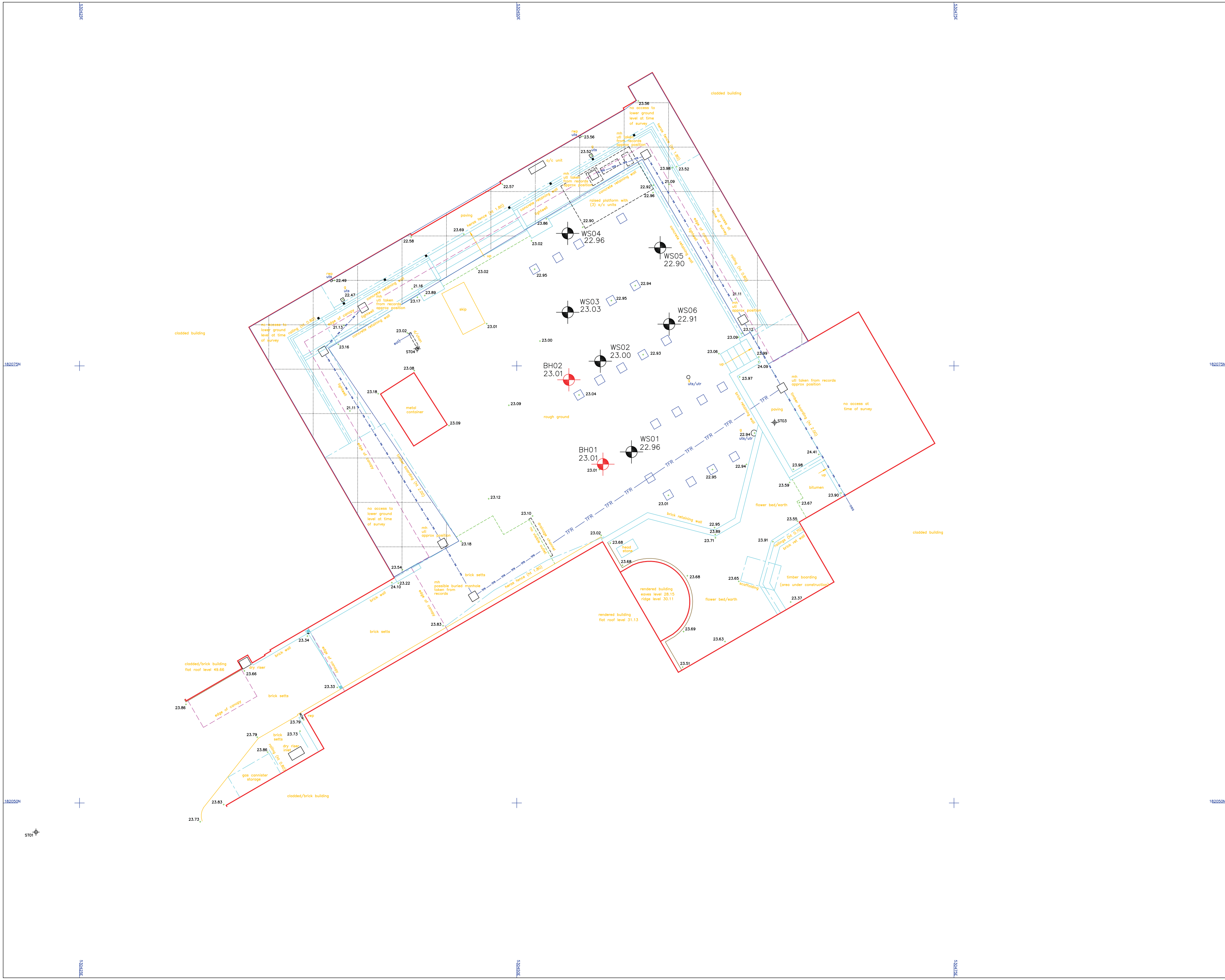
Site Location Plan	A1
Site Plan	U00944
SPT N Depth Profile	Figure 1
Undrained Strength Depth Profile	Figure 2
Plasticity Chart	Figure 3
Moisture Content and Atterberg Limits Profile	Figure 4
Summary of Dynamic Probe Blow Counts	Figure 5
Cross Section	Section 1
DEVELOPMENT PLANS – The Proposals	Pages 45 to 49 of Design and Access Statement
DEVELOPMENT PLANS – Isometric Views	G22191-AA-XX-S-0301

Site Location Plan

SOCOTEC



Notes: Not to scale	**Project** Great Ormond Street Hospital P22 iMRI Project **Project No.** E8013-18 **Carried out for** Kier	**Figure** **A1**



NOTES

GENERAL NOTES :–

THIS DRAWING HAS BEEN PRODUCED WITH A PLOT SCALE ACCURACY OF 1:100

ALL LEVELS ARE IN METRES DERIVED FROM GPS TRANSFORMATION.

GRID COORDINATES ARE ORDNANCE SURVEY NATIONAL GRID DERIVED FROM GPS TRANSFORMATION. GPS COORDINATES AND LEVELS SET AT ST01 (NO SCALE FACTOR APPLIED)

SERVICE COVERS INDICATED WHERE VISIBLE. PIPE INVERTS / DETAILS SURVEYED FROM SURFACE INSPECTION ONLY. GENERALLY DAMAGED COVERS AND COVERS WITHIN HIGHWAYS WILL NOT BE LIFTED

TREE SPECIES SHOULD BE CONFIRMED BY TREE SPECIALIST IF CRITICAL.

OVERHEAD CABLES ARE INDICATED USING REMOTE SURVEY METHODS AND ARE SUBJECT TO SEASONAL VARIATION, AND SHOULD BE TREATED AS APPROXIMATE.

SERVICE COVERS LOCATED UNDER PARKED VEHICLES/MOBILE STRUCTURES MAYBE OMITTED.

BURIED SERVICE COVERS WILL NOT BE INDICATED.

TOPOGRAPHICAL SURVEY/UTILITY KEY :–

(ht) – height
ø – diameter
● – pea trap
a/g – above ground
a/r – assumed route
av – air valve
bb – belisha beacon
bd – back drop
bl – bed level
boll – bollard
bos – bottom of shaft
bt – telecom
c/b fence – closeboard fence
c/box – control box
catv – cable television
cl – cover level
con – conifer
cr – cable riser
cws – combined water sewer
d/chan – drainage channel
ejb – electric junction box
elec – electric
eot – end of trace
ep – electric pole
er – earth rod
f/bed – flower bed
fh – fire hydrant
fl – floor level
fs – fire switch
fws – foul water sewer
g – gully
g/run – gully run
gr – gas riser
h/chestnut – horse chestnut
h/thorn – hawthorn
ic – inspection cover
il – invert level
ill – illuminated
int – interceptor
lp – lamp post
mh – manhole cover
mkr – marker
o/h – over head
ol – off let
osa – off survey area
OSBM – ordnance survey bench mark
p & r fence – post & rail fence
pd – pit depth
pr – pipe riser
ptg – pipe to ground
pts – pipe to surface
re – rodding eye
ret wall – retaining wall
rs – road sign
rwp – rain water pipe
s/birch – silver birch
s/p – safety paving
sap – sapling
sec fence – security fence
sfc – soil filled chamber
sl – spot light
sp – soil pipe
st – stop tap
sv – stop valve
svp – soil vent pipe
sws – storm water sewer
TBM – temporary bench mark
tfr – taken from records
tl – threshold level
toc – top of cap
top – top of pipe
tot – top of tank
tp – telecom pole
ts – traffic signal
t/s – trench scar
u/s – underside
utl – unable to lift
utr – unable to rod
uts – unable to survey
utt – unable to trace
vp – vent pipe
wfc – water filled chamber
wl – water level
wm – water meter
wp – waste pipe
wr – water riser

SURVEY CONTROL :–

STATION	EASTINGS	NORTHINGS	LEVEL
ST01	530422.510	182048.333	23.829
ST02	530466.431	181972.625	23.542
ST03	530464.739	182071.766	23.966
ST04	530444.298	182075.980	23.021

NORTH

UTILITY SURVEY KEY :–

N – ELECTRIC CABLE
W – WATER PIPE
FOUL SEWER
STORM SEWER
COMBINED SEWER
D – DUCTS
TV – CABLE TELEVISION
COM – DATA CABLE
: – TELECOM CABLE
G – GAS PIPE
U – UNIDENTIFIED SERVICE
– – OTHER
CCTV – CCTV
TL – TRAFFIC LIGHT
O – OFFSET FILL
V – VENT
F – FUEL PIPE
GL – GAUGE LINES
P – PIPE
AR – ASSUMED ROUTE
TFR – TAKEN FROM RECORDS

DISCLAIMER :–

Electromagnetic techniques have been used in the location of underground services. The results are not infallible and trial excavations should be carried out to confirm service identification, positions and particularly depths, where these are critical. The completeness of the underground services information cannot be guaranteed.

This method of survey does not differentiate between live and dead services, and as such all services should be treated as live. This drawing may not include the location of all public services that may cross the site, therefore the relevant service drawings should be obtained from the appropriate utility company and used in conjunction with this drawing.

Private service pipes and cables in highways are not shown, but there presence should be anticipated.

Additional below ground structures or obstructions not shown on this drawing may be present. Reference should be made to historical plans and as–built drawings. Excavations in the vicinity of services should be carried out with due diligence ref: HSG47 document avoiding dangers from underground services

Please note that factors such as ground conditions, proximity of other utilities, material and method of construction have an influence on the quality of the data collected on site.

TSA Standards – "Even an appropriate and professionally executed survey may not be able to achieve a 100% detection rate."

UTILITY NOTES

UNABLE TO GAIN ACCESS TO LOWER GROUND LEVEL AT TIME OF SURVEY.

UNABLE TO LIFT MANHOLES WITHIN SERVICE WALKWAY, APPROX POSITIONS HAVE BEEN ADDED FROM RECORDS TO THE DRAWING AND ASSUMED ROUTES HAVE BEEN PLOTTED AND THEREFORE SHOULD NOT TREATED AS ACCURATE.

0 1 2 4 6 8 10

MIDLAND SURVEY LTD

HEAD OFFICE

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www.midlandsurvey.co.uk

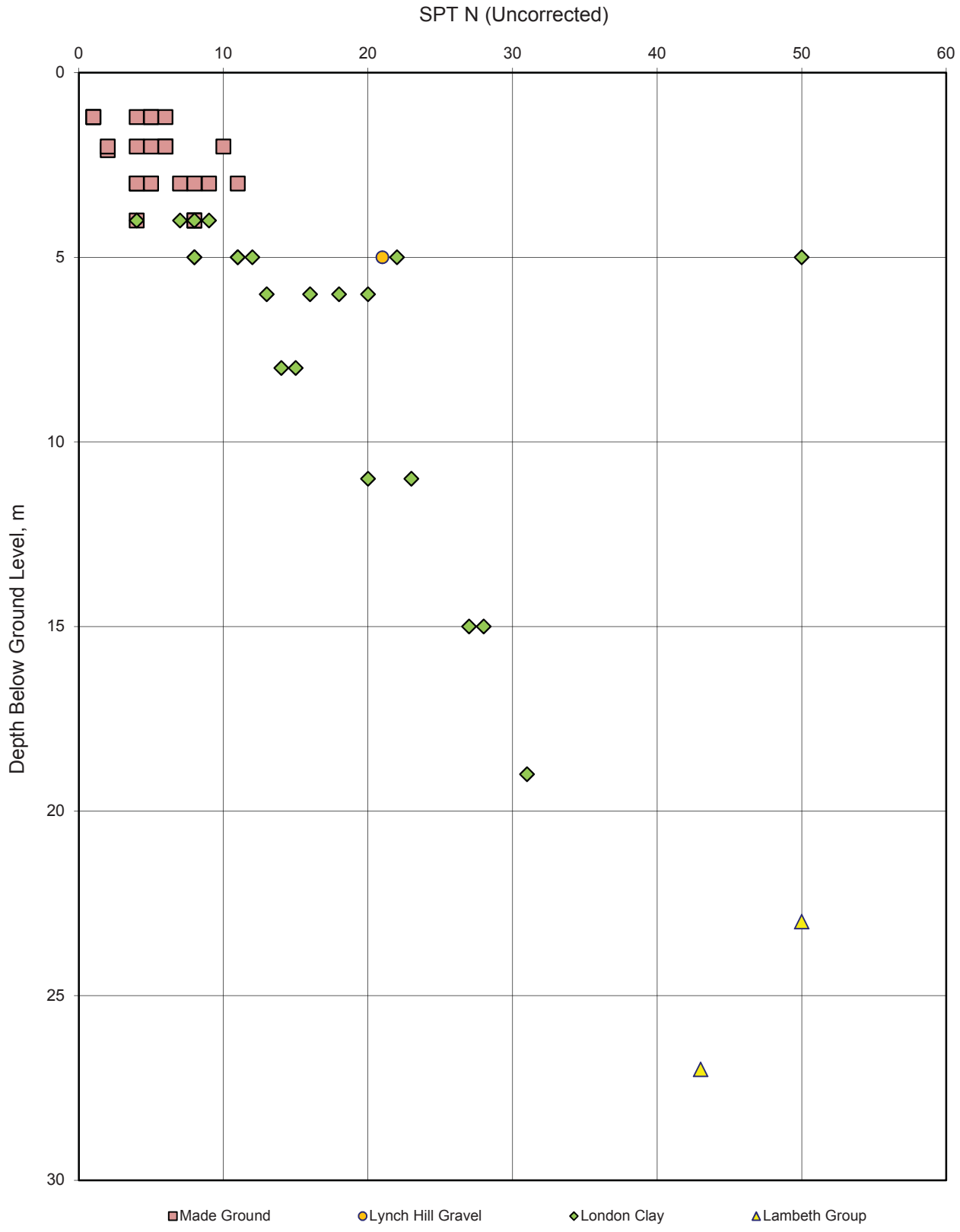
Client	SOCOTEC
Project	GREAT ORMOND STREET HOSPITAL, LONDON
Title	TOPOGRAPHICAL SURVEY/UTILITY SURVEY
Date	JANUARY 2018
Scale	1:100@A1
Dwg No	U00944
Surveyor	EP C.N
Checked	JMP

Revisions

TOPOGRAPHICAL (LAND) SURVEYORS / UTILITY SURVEYORS
BUILDING MEASUREMENT SURVEYORS / 3D LASER SCANNING

SPT N Depth Profile

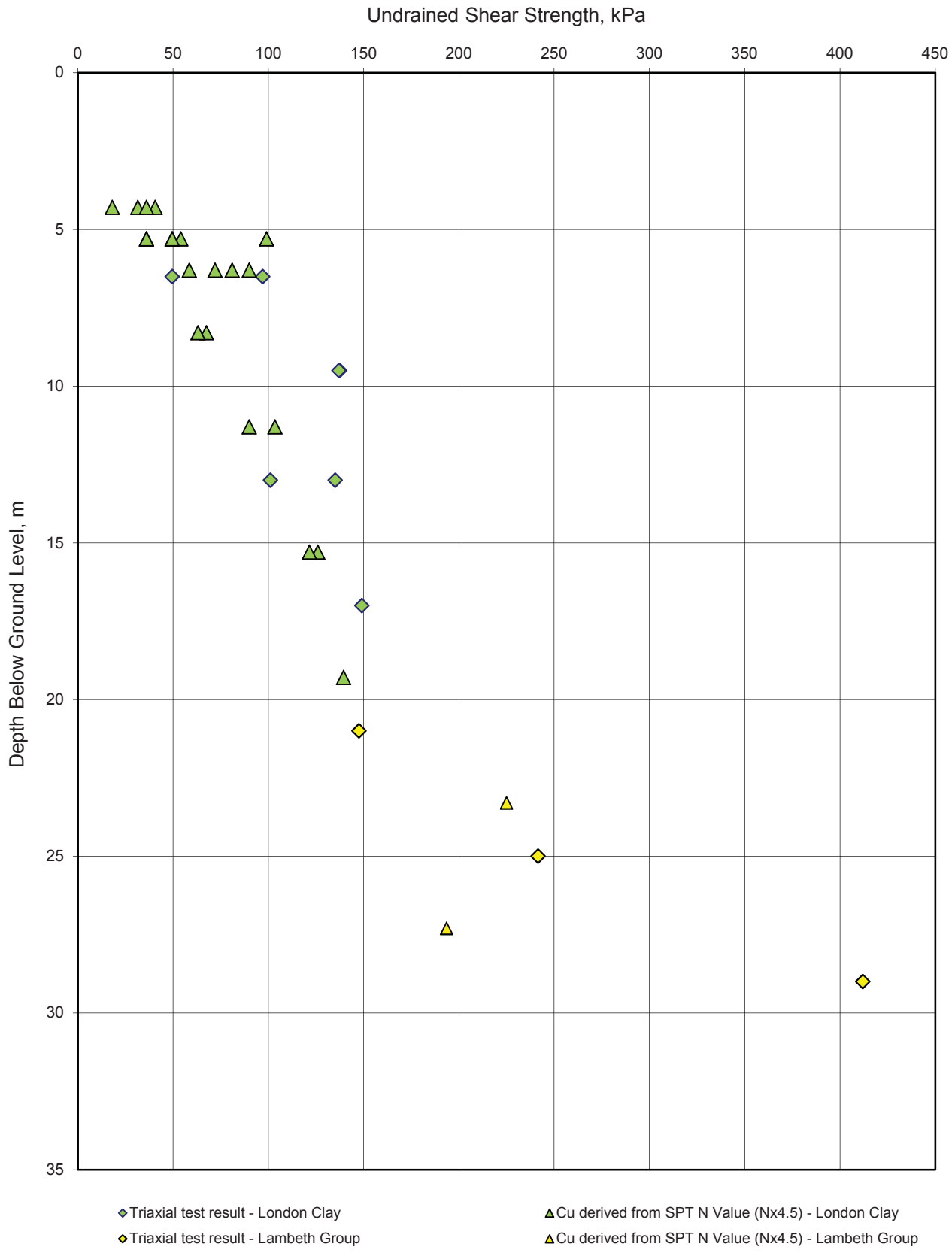
SOCOTEC



Notes:	Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT	Figure
	Project No.	E8013-18	1
	Carried out for	KIER CONTRUCTION	

Undrained Shear Strength Profile

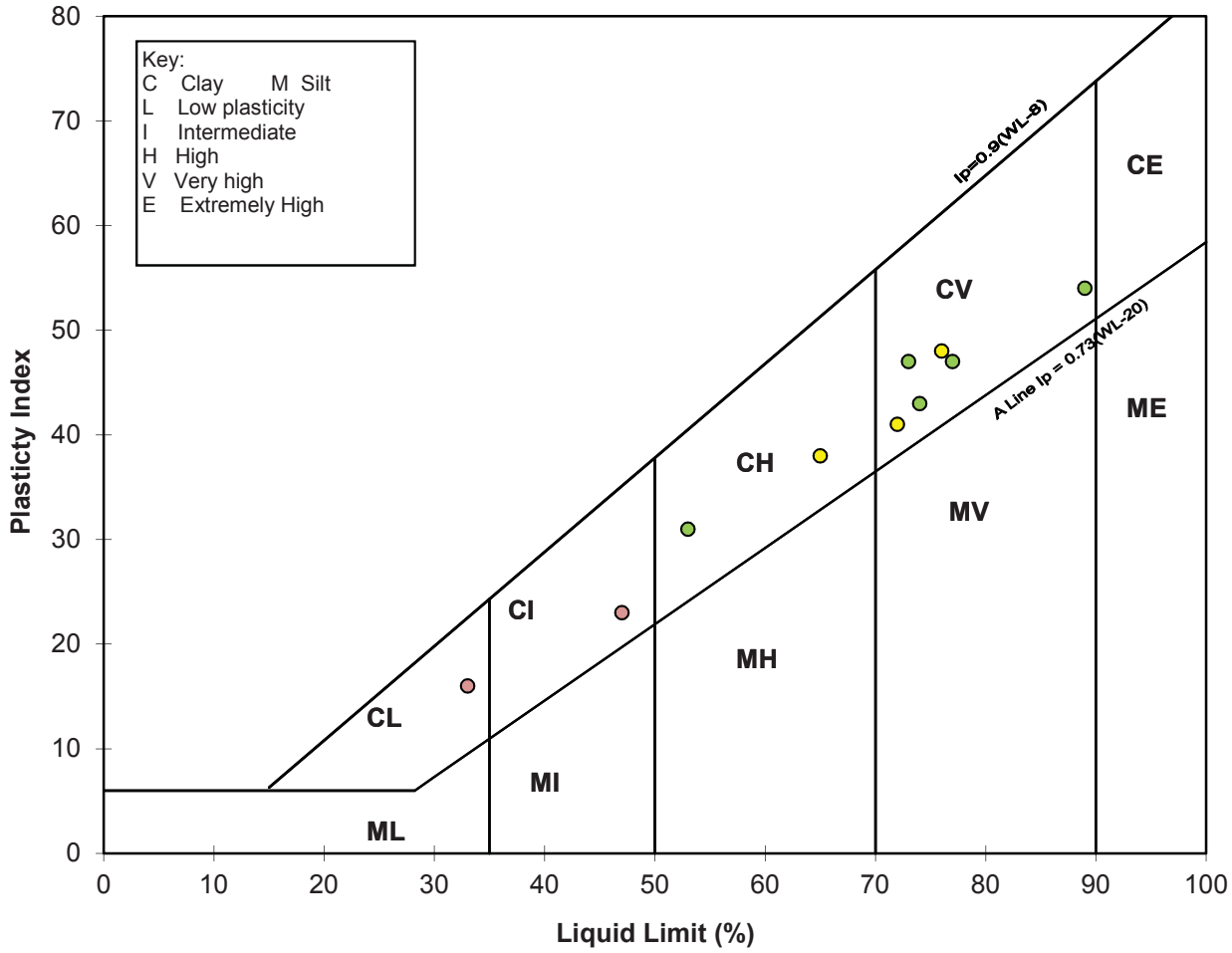
SOCOTEC



Notes:	Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT	Figure
	Project No.	E8013-18	2
	Carried out for	KIER CONTRUCTION	

Plasticity Chart

SOCOTEC

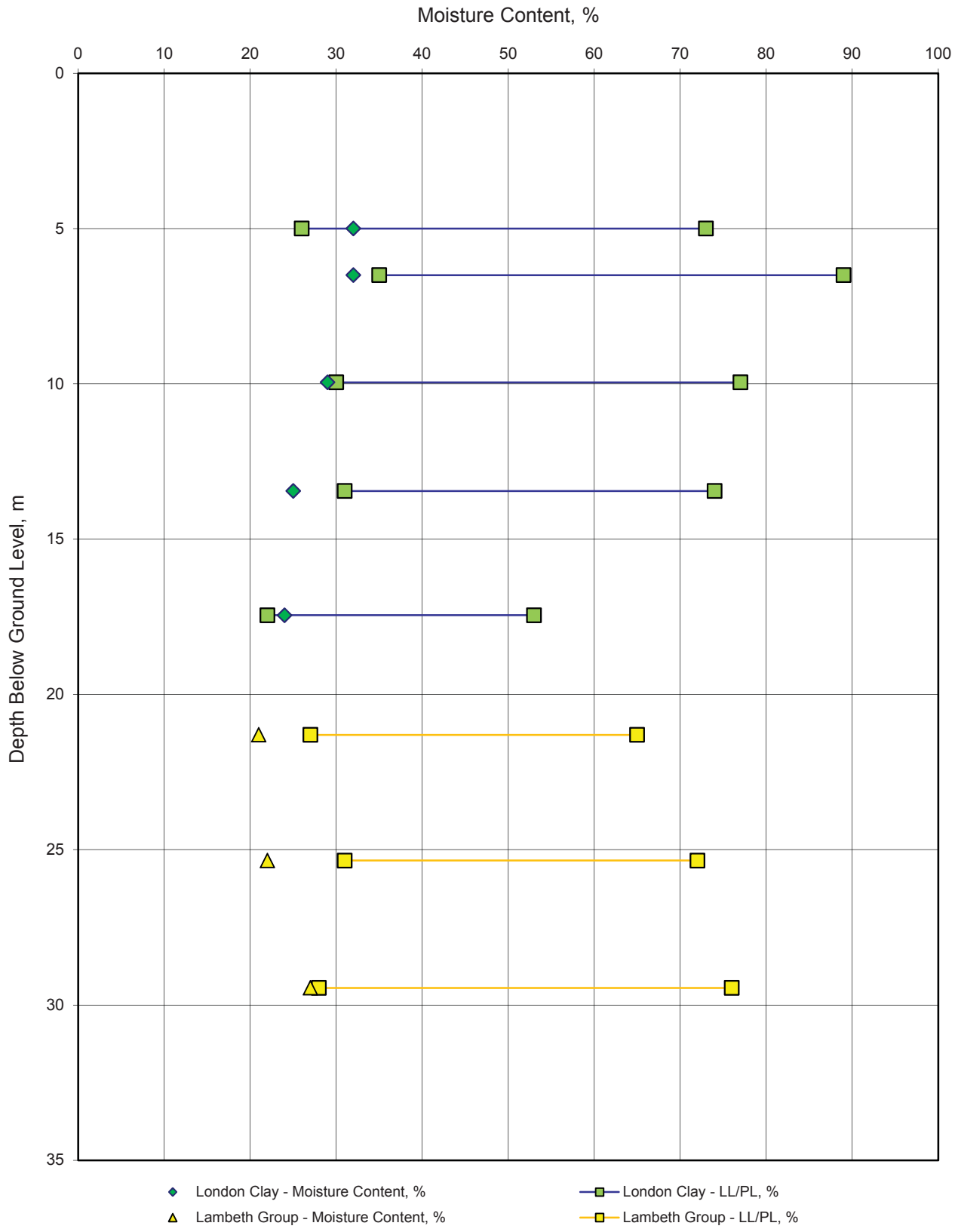


Made Ground
London Clay
Lambeth Group

Notes:	Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT	Figure
	Project No.	E8013-18	3
	Carried out for	KIER CONSTRUCTION	

Moisture Content and Atterberg Limits Profile

SOCOTEC



Notes:	Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT	Figure
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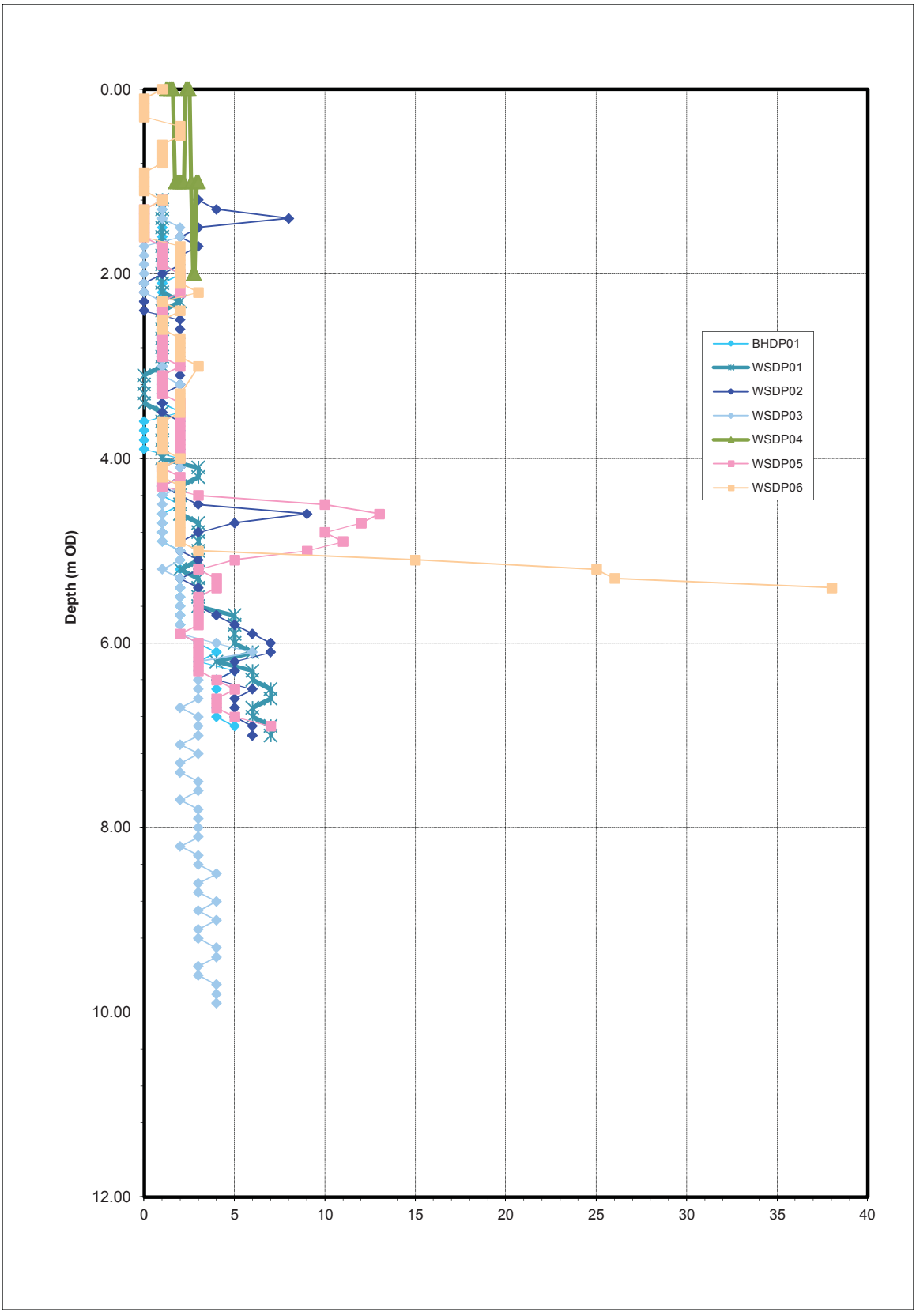
	Carried out for	KIER CONSTRUCTION	

Summary of Dynamic Probe Blow Counts

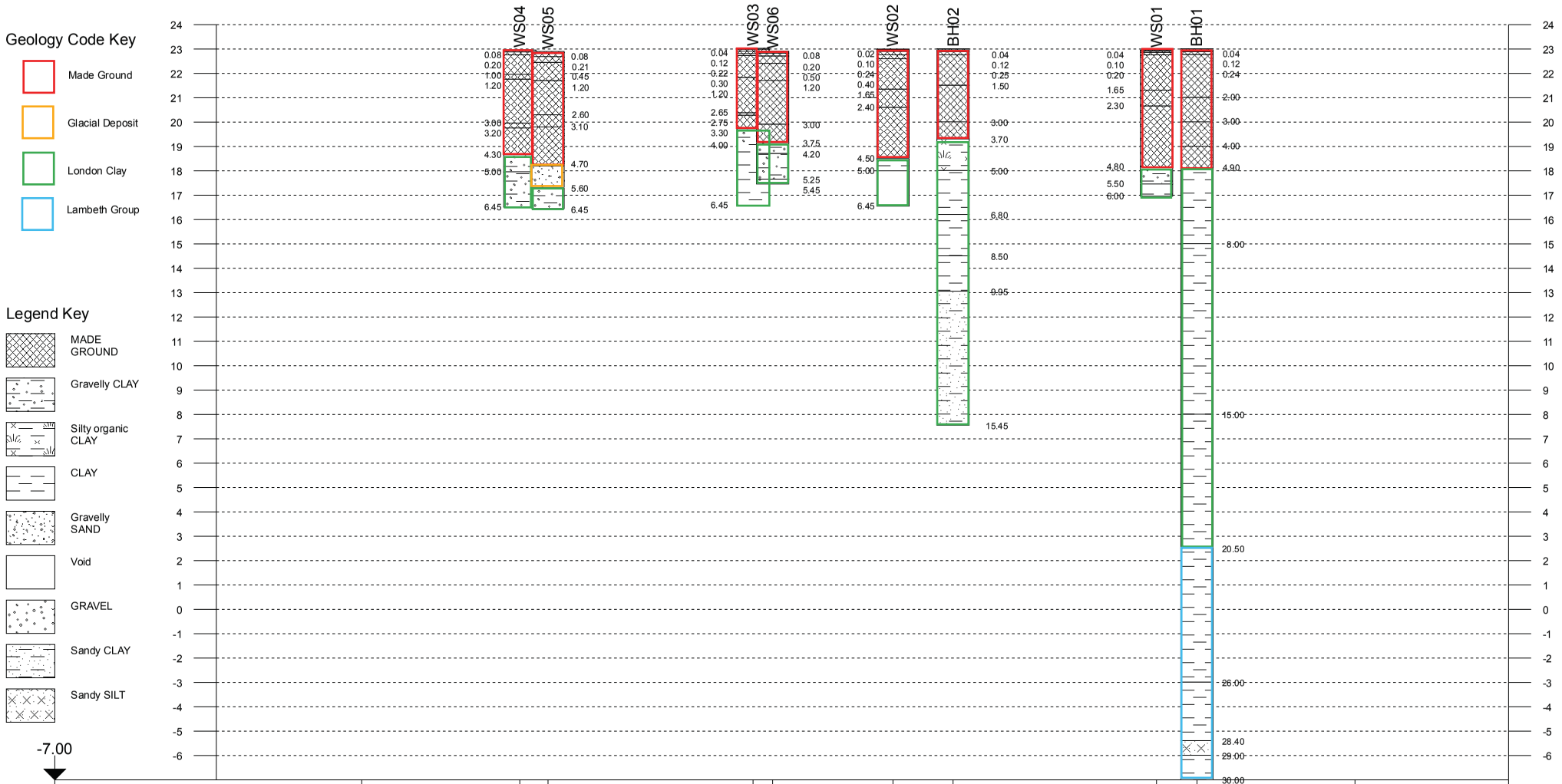


Notes	Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT	Figure
	Project No	E8013-18	5
	Carried out for	KIER CONSTRUCTION	

Project Id: E8013-18
Project Title: GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT
Location:
Client: Kier Construction

Title: Section line 2
Vertical Scale: 1:238
Horizontal Scale: 1:112
Engineer: Craig Curtis

SOCOTEC



The Proposals

8

This section of the Statement sets out the proposal, particularly in relation to how it addresses the existing site, whilst meeting the Trust's brief and clinical needs.

The Design Proposal

The final proposal seeks to provide a design solution which responds to the context of the site and the clinical needs of Hospital.

The Use and Amount

As mentioned previously, the Masterplan 2015 envisages provision of an iMRI facility in the Phase 4 building, expected to open in 2023. However, in order for the service to keep pace with other centres and to provide the best outcomes for children, GOSH needs to establish an iMRI facility in advance of Phase 4 opening.

The proposed use of the Southwood Courtyard Building is consistent with the rest of the Hospital that is Use Class C2. The building will provide a total GEA of 998 square metres of floorspace. The use of the proposal is in line with the prevailing land use, and sits within the context of the Hospital's buildings.

The building will accommodate: the Physiotherapy and Rehabilitation Facilities and Services at Level 2; an iMRI Suite, which includes a room for the machine itself, a theatre room and associated preparation rooms at Level 3 connecting to existing theatres in the Variety Club Building; Plant and equipment required to serve the new building, at Level 4. The plant floor would be enclosed and insulated. A green roof is proposed at roof level. This arrangement is shown in the Drawing Package, and reproduced as Figures 42 to 46.

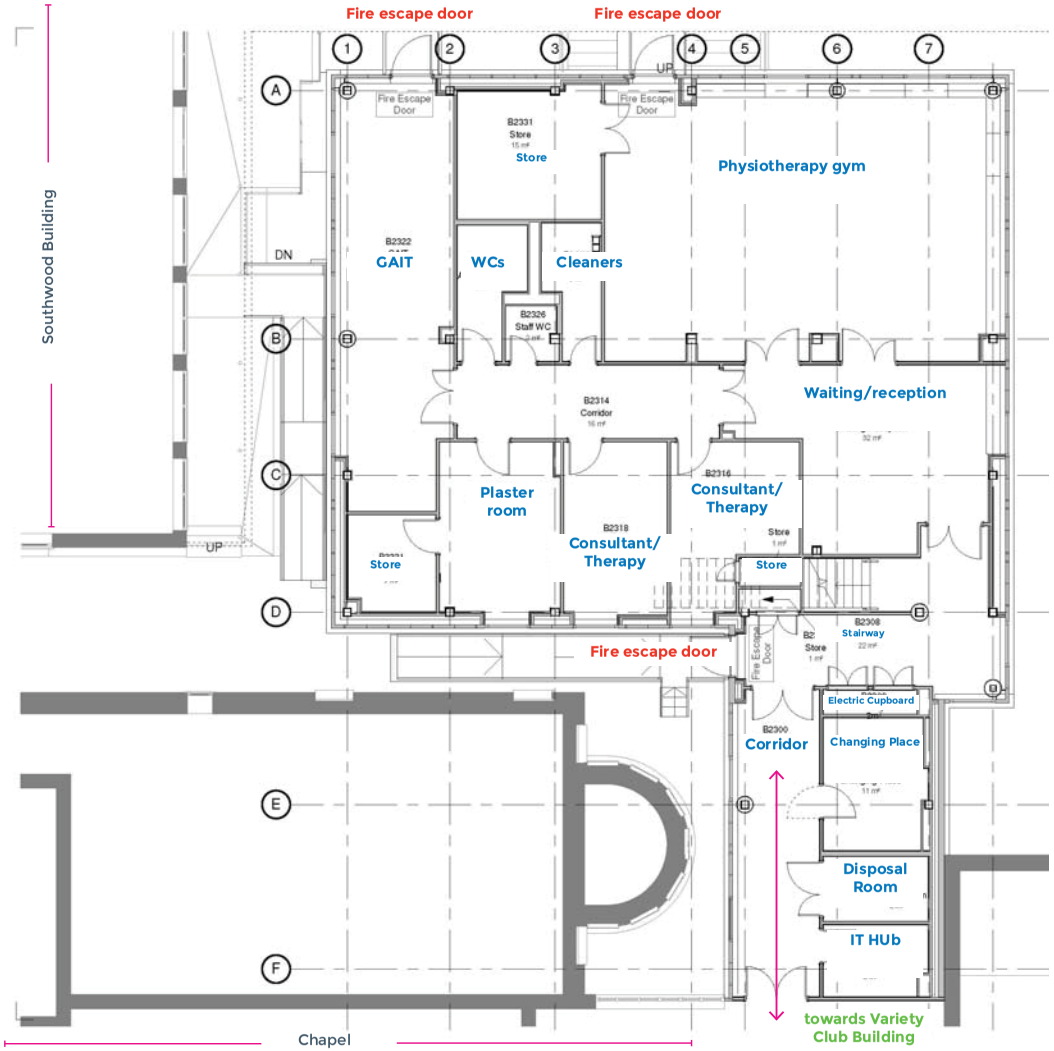


Figure 42: Proposed floor plan at Level 2 (Ground Floor)

Level 3

Figure 43 to the right shows the proposed layout of the iMRI Suite and associated facilities at Level 3.

Connection to the Variety Club Building will be made via a connecting corridor to the existing operating theatres and recovery area, shown in pink.

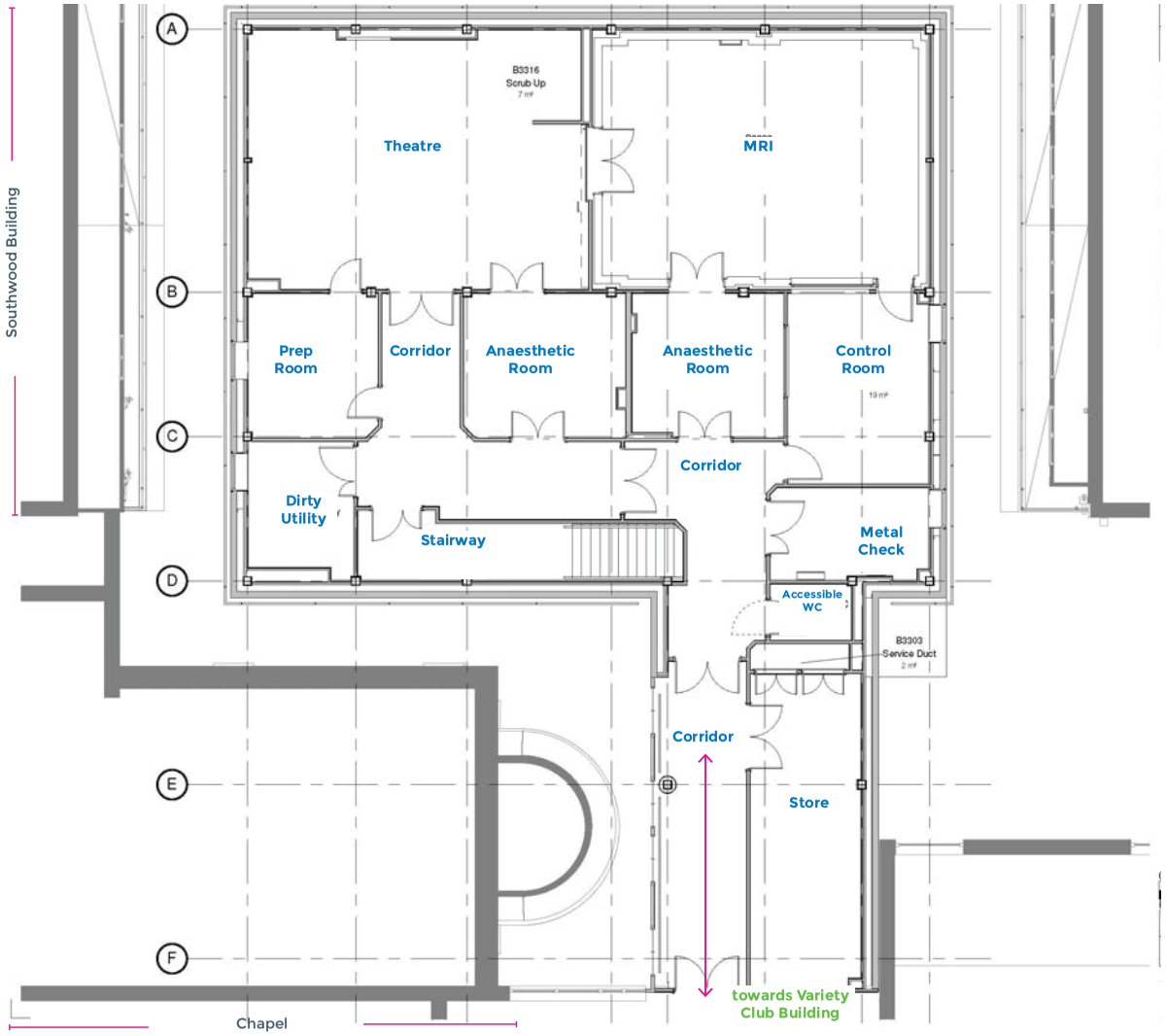


Figure 43: Proposed floor plan at Level 3 (First Floor)

The Proposals

8

Level 4

Figure 44 to the right shows the proposed layout of the plant and equipment required to serve the new building.

A total of two chiller units is provided in a recessed area to the south.

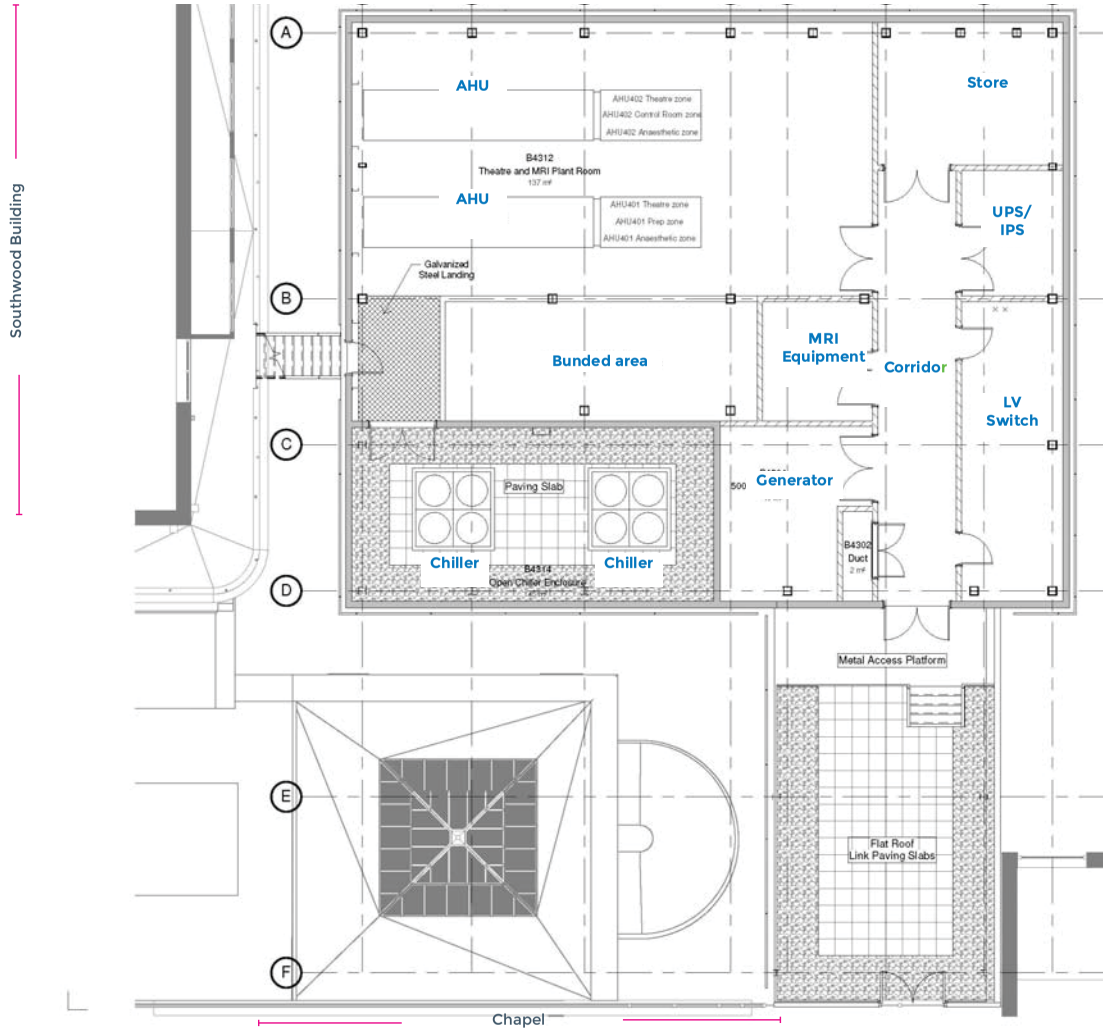


Figure 44: Proposed floor plan at Level 4 (Second Floor)

Roof Level

At roof level a total area of 258 square metres will be provided for a green roof enclosed by a perimeter fence, see Figures 45 and 46.

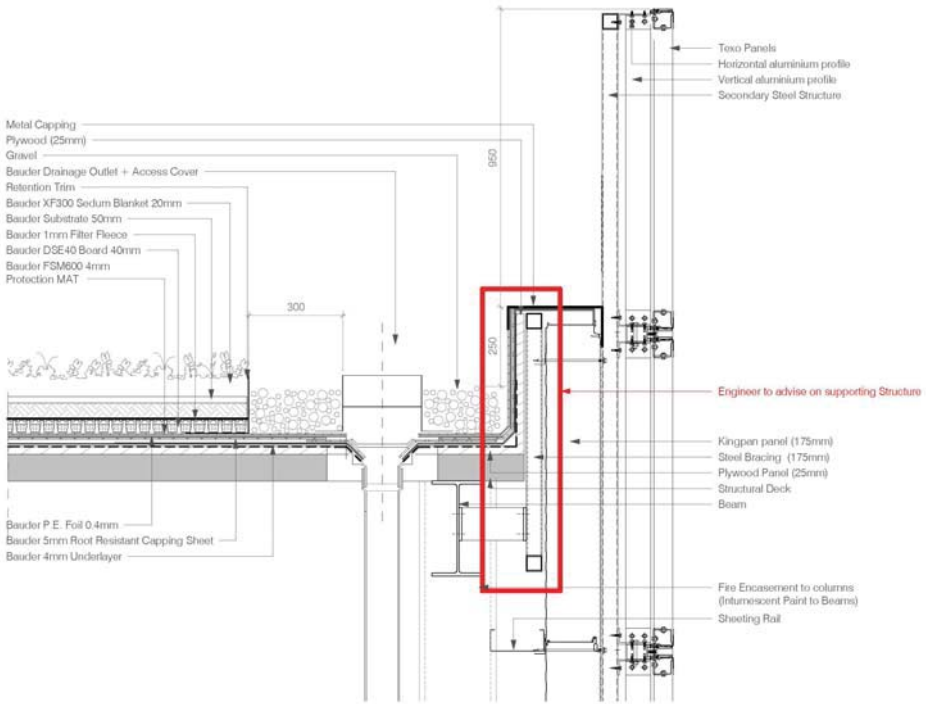


Figure 45: Section showing details at roof level

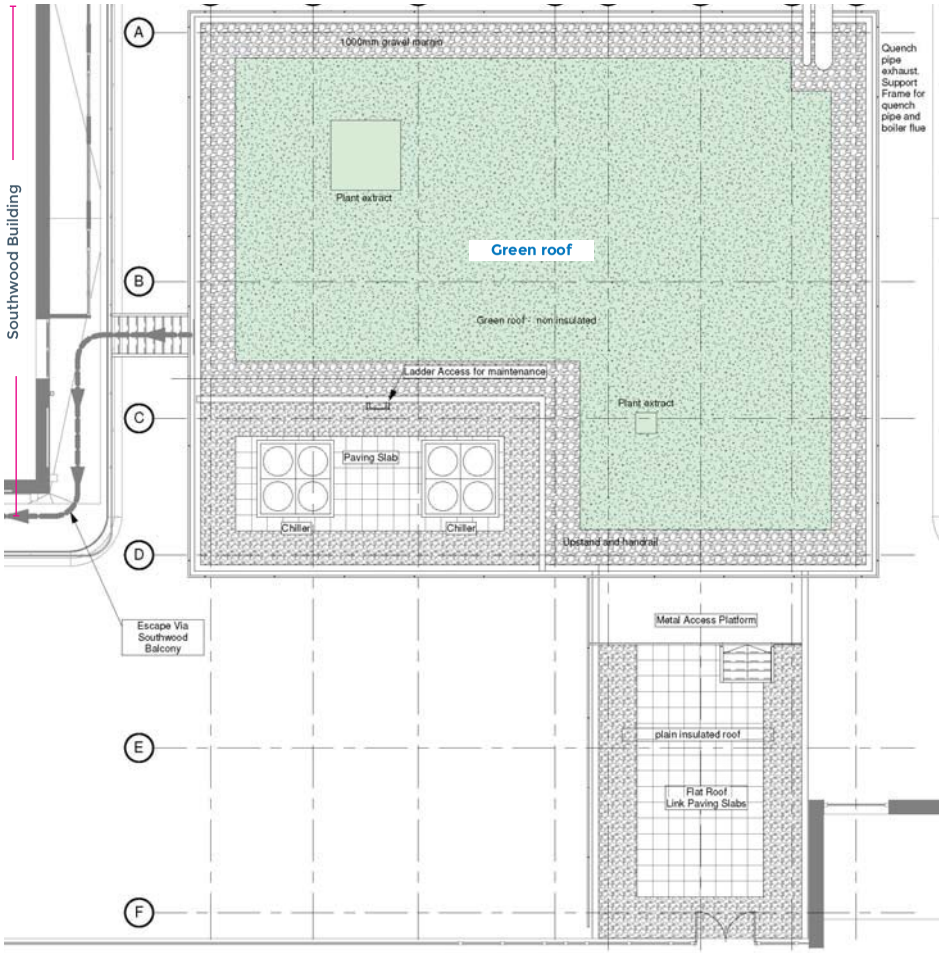


Figure 46: Proposed floor plan at Level 5 (Third)

The Proposals

8

All departmental designs are based on detailed clinical briefs, which have been produced with room-by-room schedules for each department. These have been informed by NHS guidance in Health Building Notes (HBNs) and Health Technical Memorandum (HTMs) providing recommendations for room sizes, room adjacencies and environmental requirements as well as details of specialised requirements such as air change rates, shielding and acoustic performance. The Trust and the design team have developed a detailed brief.

Although the theatre and the MRI room sizes exceed the minimum recommendations other room sizes are designed to meet the minimum recommended size due to the shortage of overall space. The lifetime of the new building will be reviewed when Phase 4 is designed in detail.

A draft programme for the construction of the Southwood Courtyard Building is provided in the draft Construction Management Plan (CMP) showing an indicative timescale for development and the key stages and interrelationships of the development.

In order to take account of the construction impact of the proposal and protect the amenity of surrounding occupiers, the draft CMP details the methods that will be employed by the Main Contractor to minimise the potential negative impacts associated with construction.

Once the Phase 4 Building opens, it is envisaged that the Physiotherapy and Rehabilitation Facilities and Services and the iMRI Suite and its associated rooms, plant and equipment will transfer into the Phase 4 Building.

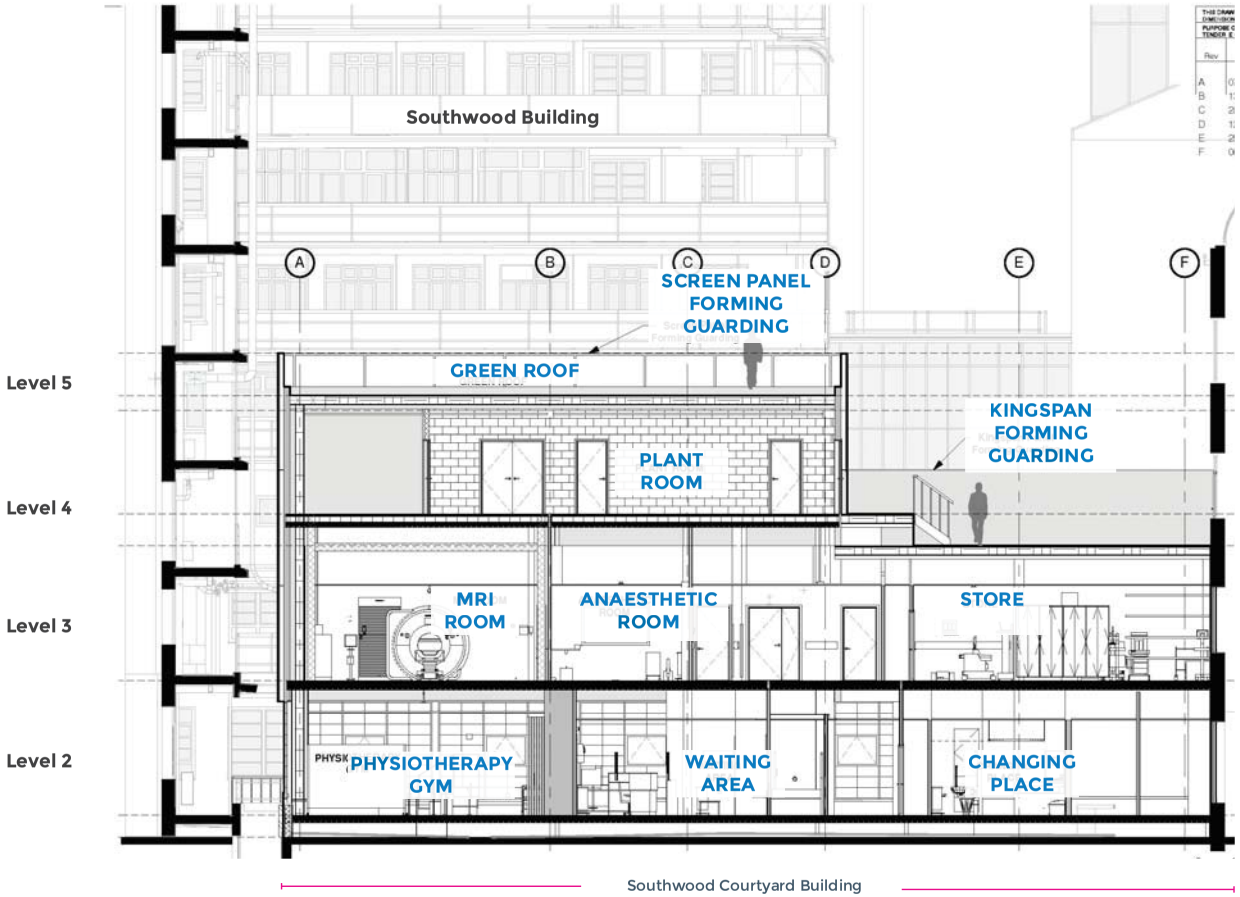
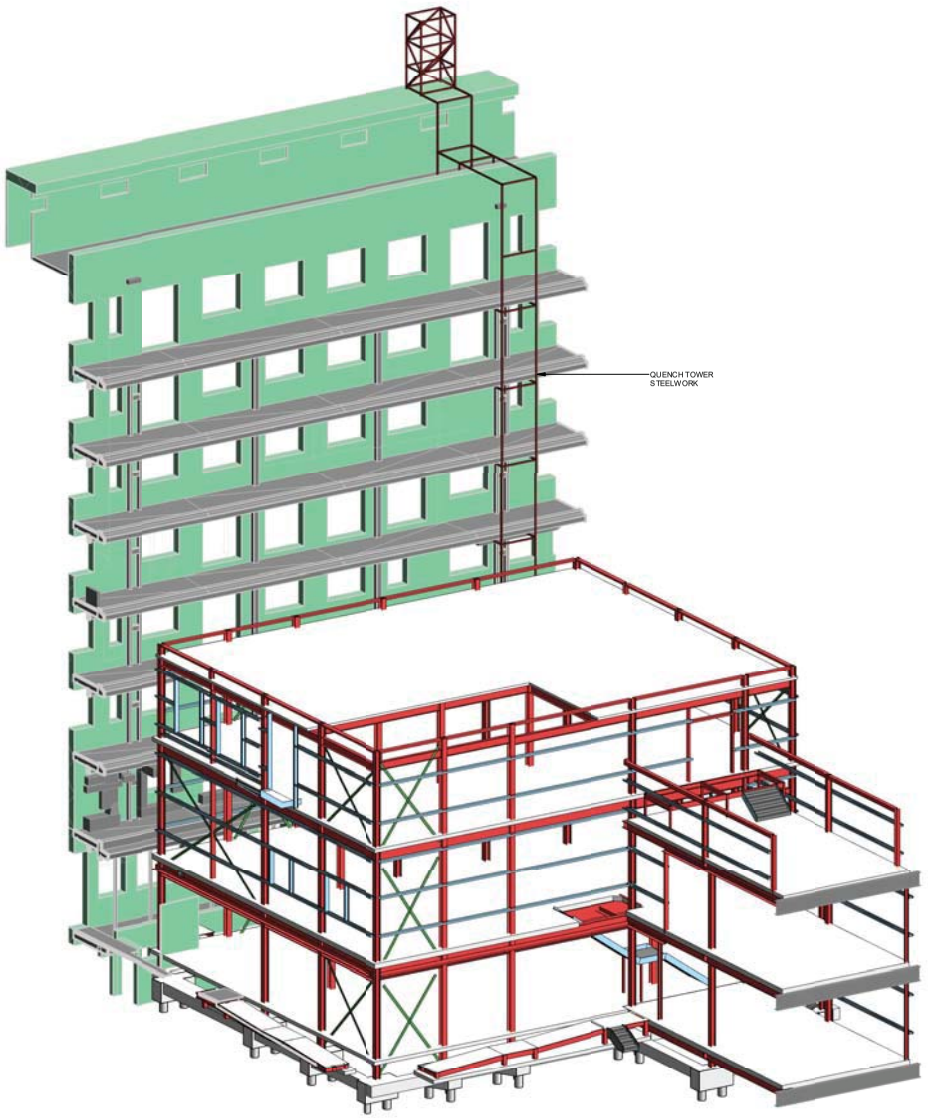


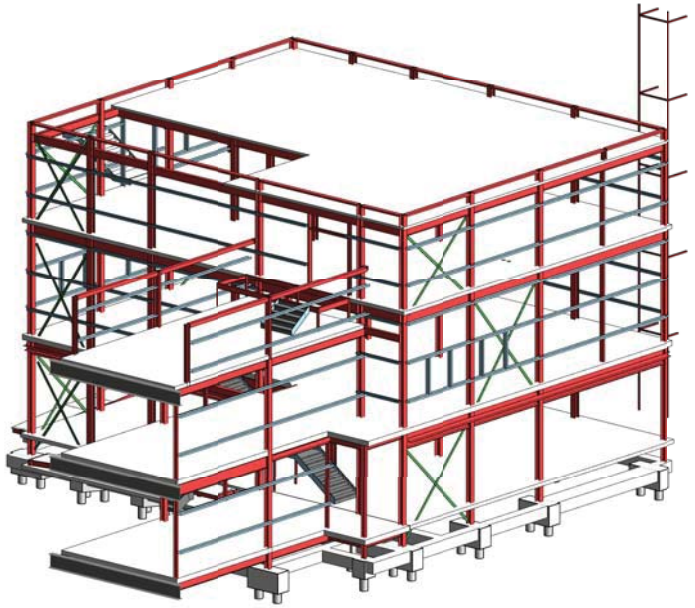
Figure 47: Proposed Southwood Courtyard Building showing north-south section through the building

NOTES

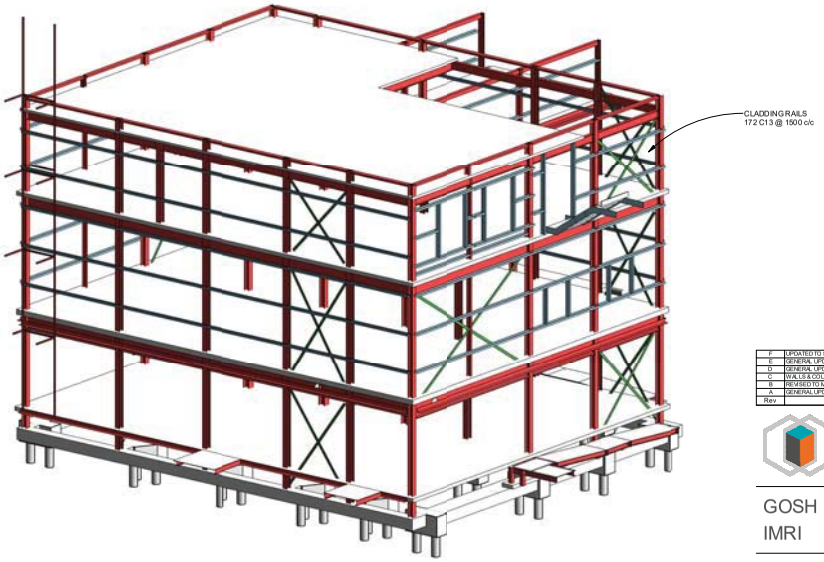
1. THIS DRG TO BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL RELEVANT ARCHITECT, ENGINEERS, SERVICES AND SPECIALIST DRAWINGS.
2. REFER TO DRAWING No. G22191 / 0001 FOR GENERAL NOTES.



ISOMETRIC VIEW 3



ISOMETRIC VIEW 2



ISOMETRIC VIEW 1

Rev	Description	By	Date	Chkd
F	UPDATED TO SUIT PLANS	MDJ	17/08/17	DW
E	GENERAL UPDATES	MDJ	24/04/17	DW
D	GENERAL UPDATES	MDJ	06/03/17	DW
C	WALLS & COLUMN GENERAL COORDINATION	MDJ	06/01/17	DW
B	REVISED TO MATCH L3	MDJ	15/11/16	NR
A	GENERAL UPDATE / LAYOUT ROTATED	MDJ	08/11/16	NR

THOMASONS

86 Epsom Road, Guildford, Surrey GU1 2BX Tel .01483 565 686

GOSH
IMRI

ISOMETRIC VIEWS

Status
TENDER

Project No.	Zone	Level	Role	Drawing No.	Revision
G22191	ZZ	XX	S	0301	F

Scale	Drawn	Chkd	Passed	Date	Size
NTS	MDJ	BJM		MAR.17	A1

APPENDIX B
EXPLORATORY HOLE RECORDS

Key to Exploratory Hole Records	Key
Hammer Energy Ratio Reports	AR803 and COM116
Borehole Logs	BH01 and 02
Dynamic Sampler Hole Logs	WS01 to 06
Dynamic Probe Logs	BH01, WSDP01 to 06

Key to Exploratory Hole Records

SOCOTEC

SAMPLES

Undisturbed

U	Driven tube sample	nominally 100 mm diameter and full recovery unless otherwise stated
UT	Driven thin wall tube sample	
TW	Pushed thin wall tube sample	
P	Pushed piston sample	
L	Liner sample from dynamic (windowless) sampling. Full recovery unless otherwise stated	
CBR	CBR mould sample	
BLK	Block sample	
C / CS	Core sample (from rotary core) taken for laboratory testing.	
AMAL	Amalgamated sample	

Disturbed

D	Small sample
B	Bulk sample
LB	Large bulk sample

Other

W	Water sample
G	Gas sample
	Environmental chemistry samples (in more than one container where appropriate)
ES	Soil sample
EW	Water sample

Comments

Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that, while an attempt was made to take a tube sample, there was no recovery.

Samples taken from borehole installations (ie water or gas) after hole construction are not shown on the exploratory hole logs.

Specimens for point load testing undertaken on site (or other non-lab location) are not shown on the log.

IN SITU TESTS

SPT S or SPT C — Standard Penetration Test, open shoe (S) or solid cone (C)

The Standard Penetration Test is defined in BS EN ISO 22476-3:2005+A1:2011.
The incremental blow counts are given in the Field Records column; each increment is 75 mm unless stated otherwise and any penetration under self-weight in mm (SW) is noted. Where the full 300 mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 the total blow count beyond the seating drive is given (without the N = prefix).

IV	*in situ* vane shear strength, peak (p) and remoulded (r)
HV	Hand vane shear strength, peak (p) and remoulded (r)
PP	Pocket penetrometer test, converted to shear strength
KFH, KRH, KPI	Permeability tests (KFH = falling head, KRH = rising head; KPI = packer inflow); results provided in Field Records column (one value per stage for packer tests)

DRILLING RECORDS

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930:2015

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacing measurements are presented.
NI	The term non-intact (NI) is used where the core is fragmented.
NA	Used where a measurement is not applicable (eg. If, SCR and RQD in non-rock materials).

Flush returns, estimated percentage with colour where relevant, are given in the Records column

CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss

GROUNDWATER

▼	Groundwater entry
▽	Depth to groundwater after standing period

LOGGING

(p)ACM	(potential) Asbestos containing material

Key to Exploratory Hole Records

INSTALLATION

Details of standpipe/piezometer installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill.

Standpipe/ piezometer

The type of instrument installed is indicated by a code in the Legend column at the depth of the response zone:

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer

Plain Pipe 

Slotted Pipe 

Piezometer Tip 

Inclinometer or Slip Indicator

The installation of vertical profiling instruments is indicated on the Record. The base of tubing is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column at the base of the tubing:

ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator

Settlement Points or Pressure Cells

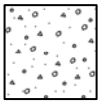
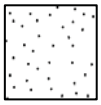
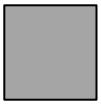
The installation of single point instruments is indicated on the Record. The location of the measuring device is shown in the Legend column.

The type of instrument installed is indicated by a code in the Legend column:

ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
EPCE	Electronic embedment pressure cell
PPCE	Electronic push in pressure cell

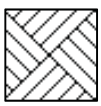
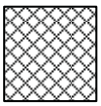
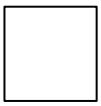
INSTALLATION / BACKFILL LEGENDS

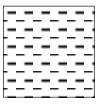
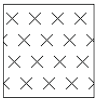
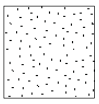
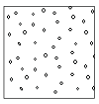
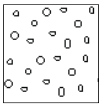
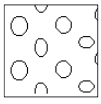
A legend describing the installation is shown in the rightmost column. Legend symbols used to describe the backfill materials are indicated below.

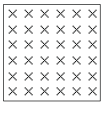
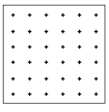
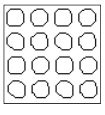
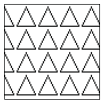
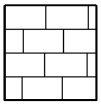
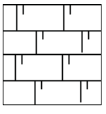
Macadam 
Concrete 
Grout 
Bentonite 
Sand 
Gravel 
Arisings 

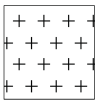
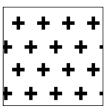
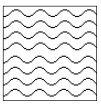
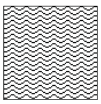
STRATUM LEGENDS

The legend symbols used for graphical representation of soils, rocks and other materials on the borehole logs are shown below. For soils with significant proportions of secondary soil types, a combination of two or more symbols may be used.

Macadam 
Concrete 
Topsoil 
Made Ground / Fill 
Peat 
Void or No Information 

Clay 
Silt 
Sand 
Gravel 
Cobbles 
Boulders 
Coal 

Mudstone 
Siltstone 
Sandstone 
Conglomerate 
Breccia 
Limestone 
Chalk 

Igneous (Fine) 
Igneous (Med) 
Igneous (Coarse) 
Metamorphic (Fine) 
Metamorphic (Med) 
Metamorphic (Coarse) 
Tuff 

Notes:

See report text for full references of standards.

Updated October 2017

Project	**Great Ormond Street Hospital P22 IMRI Project**
Project No.	**E8013-18**
Carried out for	**Kier Construction**

Key

Key to Exploratory Hole Records

SOCOTEC

NOTES

1 Soils and rocks are described in accordance with BS EN ISO 14688-1:2002+A1:2013 and 14689-1:2003 respectively as amplified by BS 5930:2015.

2 For fine soils, consistency determined during description is reported for those strata where undisturbed samples are available. Where the logger considers that the sample may not be representative of the condition in situ, for whatever reason, the reported consistency is given in brackets. The reliability of the sample is indicated by Probably or Possibly as appropriate. Hence (Probably firm) indicates the logger is reasonably confident of the assessment, but (Possibly firm) means less certainty. Where the samples available are too disturbed to allow a reasonable assessment of the in situ condition, no consistency is given.

3 Evidence of the occurrence of very coarse particles (cobbles and boulders) is presented on the logs. However, because of their size in relation to the exploratory hole these records may not be fully representative of their size and frequency in the ground mass.

4 The declination of bedding and joints is given with respect to the normal to the core axis. Thus in a vertical borehole this will be the dip.

5 The assessment of SCR, RQD and Fracture Spacing excludes artificial fractures.

6 Observations of discernible groundwater entries during the advancement of the exploratory hole are given at the foot of the log and in the Legend column. The absence of a recorded groundwater entry should not, however, be interpreted as a groundwater level below the base of the borehole. Under certain conditions groundwater entry may not be observed, for instance, drilling with water flush or overwater, or boring at a rate faster than water can accumulate in the borehole. Similarly, where water entry observations do exist, groundwater may also be present at higher elevations in the ground than where recorded in the borehole. In addition, where appropriate, water levels in the hole at the time of recovering individual samples or carrying out in situ tests and at shift changes are given in the Records column.

7 The borehole logs present the results of Standard Penetration Tests recorded in the field without correction or interpretation. However, in certain ground conditions (eg high hydraulic head or where very coarse particles are present) some judgement may be necessary in considering whether the results are representative of in situ mass conditions.

REFERENCES

1 BS EN ISO 14688-1:2002+A1 : 2013 : Geotechnical investigation and testing - Identification and classification of soil. Part 1 Identification and description. British Standards Institution

2 BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing - Identification and classification of rock. Part 1 Identification and description. British Standards Institution

3 BS EN ISO 22476-3:2005+A1 : 2011 : Geotechnical investigation and testing - Field testing. Part 3 Standard penetration test. British Standards Institution

4 BS 5930 : 2015 : Code of practice for ground investigations. British Standards Institution

DANDO DRILLING INTERNATIONAL

DANDO 4CCO

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref:	AR803
Test Date:	03/03/2017
Report Date:	03/03/2017
File Name:	AR803.spt
Test Operator:	RCP

Instrumented Rod Data

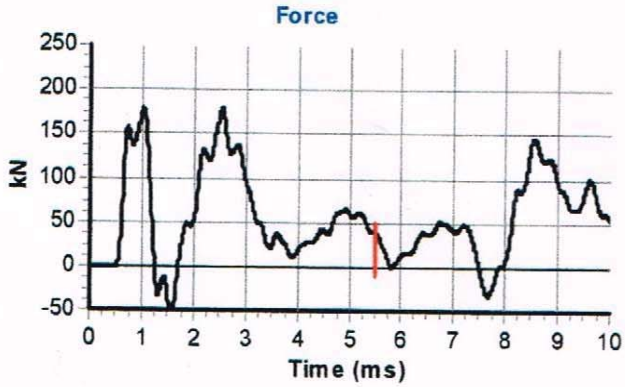
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	7.4
Assumed Modulus E_a (GPa):	208
Accelerometer No.1:	9603
Accelerometer No.2:	9786

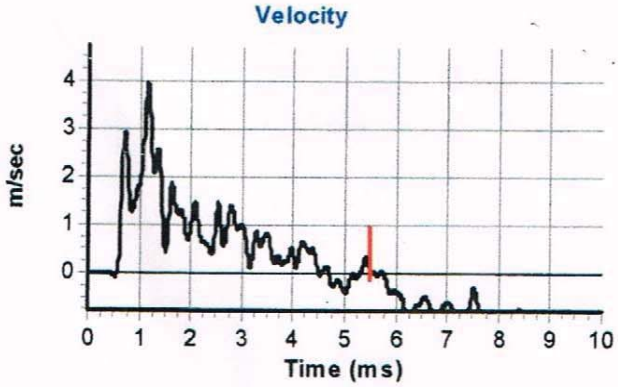
SPT Hammer Information

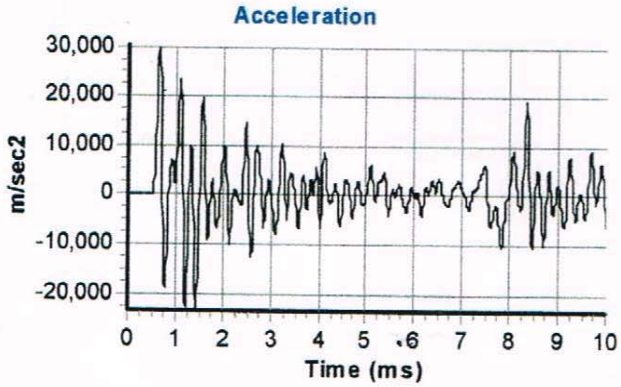
Hammer Mass m (kg):	64.0
Falling Height h (mm):	760
SPT String Length L (m):	16.5

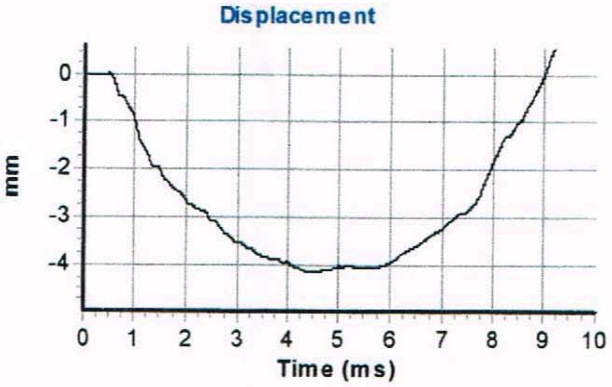
Comments / Location

D4000









Calculations

Area of Rod A (mm2):	1083
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	321

Energy Ratio E_r (%): **68**

Signed:

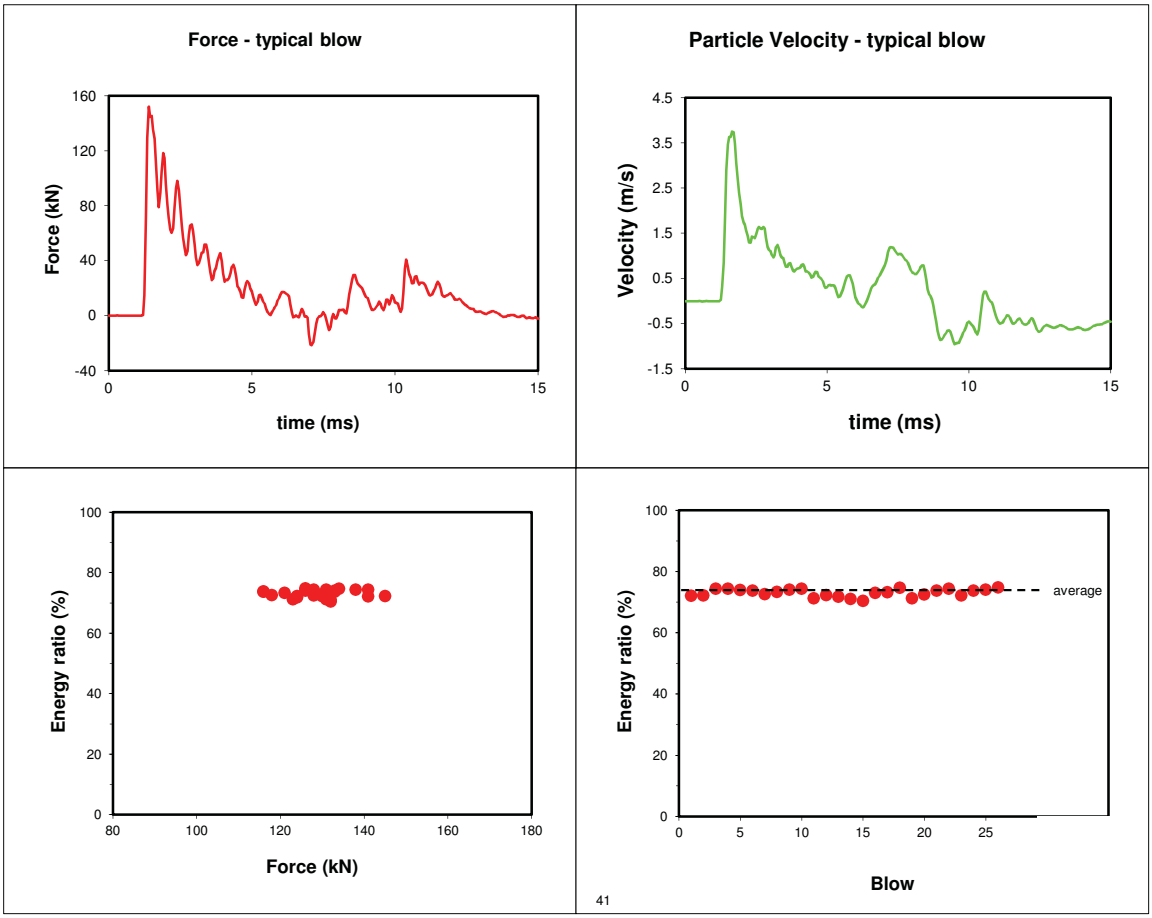
Title: SMALL RIGS PRODUCT MANAGER.

The recommended calibration interval is 12 months

Hammer Energy Report

Date of test:	01/02/2017	**Hammer ID:**	COM116
		Hammer mass (*m*)	63.5 kg
Instrumented rod:		**Fall height (*h*)**	0.75 m
Type	BW	**Test type:**	DPSH-B
Cross-sectional area (*A*a)	11.30 cm^2	**Manufacturer:**	Archway
Young's modulus (*E*a)	207000 MPa	**Model:**	Free fall drop weight
Length	0.60 m		
		Rig:	Archway Competitor
Test rod type:	1½" Whitworth WS	**Rig ID:**	SN 116
		Type:	Dynamic Sampler
		Foreman:	S Walsh

Remarks:
Data obtained from test carried out in BH1, located in ESG Doncaster yard. Test carried out at depth of 5.53mbgl, with a blow count of 25. Energy determined from every blow.



Theoretical energy (E_{theor}) = *m x g x h* = **0.467 kN-m (467 J)**

Measured energy (E_{meas}) *average of 38 blows* = **0.346 kN-m**

Energy ratio = $\frac{E_{meas}}{E_{theor}}$ = **74 %**

Test carried out by: John Holt

Signed for issue:

Test carried out in accordance with BS EN ISO 22476-3:2005

Equipment used: SPT Analyzer Serial No. 4032T

Borehole Log

SOCOTEC

Drilled	DJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	23.01 mOD
Logged	JC	05/02/2018	Dando 4000	0.00	3.00	200	3.00	**Coordinates (m)**	E 530454.93
Checked	MH	**End**	Concrete coring to 0.24m. Service inspection pit hand dug to 1.20m. Cable percussion boring to 30.00m.	3.00	30.00	150	6.00	**National Grid**	N 182069.38
Approved	MW	06/02/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
			05/02/18	0800
0.25		PID=0.0 ppmv		
0.25	ES 1			
0.30	D 2			
0.30 - 0.50	B 3			
0.50		PID=0.0 ppmv		
0.50	ES 4			
0.50 - 1.00	B 6			
0.70	D 5			
1.00		PID=0.0 ppmv		
1.00	ES 7			Dry
1.20 - 1.65	SPTC	N=1 (1,0/0,0,1,0)		
1.20	B 8			
2.00		PID=0.0 ppmv		
2.00	ES 9		2.10	Dry
2.10 - 2.55	SPTC	N=2 (1,0/1,1,0,0)		
2.10	B 10			
3.00 - 3.45	SPTC	N=5 (2,2/1,2,1,1) PID=0.0 ppmv	3.00	Dry
3.00				
3.00	ES 11			
3.00	B 12			
4.00 - 4.45	SPTS	N=8 (3,1/1,1,3,3) PID=0.0 ppmv	3.00	Dry
4.00				
4.00	ES 13			
4.00	D 14			
4.00 - 4.40	B 15			
5.00 - 5.45	SPTS	N=11 (1,2/2,3,3,3) PID=0.0 ppmv	4.50	Dry
5.00				
5.00	ES 16			
5.00	D 17			
5.00 - 5.40	B 18			
6.00	D 19			
6.50 - 6.90	UT 20	55 blows 78% rec	6.00	Dry
6.90	D 21			
7.50	D 22			
8.00 - 8.45	SPTS	N=15 (1,3/3,3,4,5)	6.00	Dry
8.00	D 23			
8.00 - 8.40	B 23A			
9.00	D 24			
9.50 - 9.90	UT 25	70 blows 82% rec		
			05/02/18	1600
			6.00	Dry
9.90	D 26			
			~~06/02/18~~	~~0800~~
			6.00	Dry

Strata Description

Main	Detail	Depth, Level (Thickness)
MADE GROUND: Black MACADAM		0.04 (0.04) +22.97
MADE GROUND: Black medium strong CONCRETE with macadam.		0.12 (0.08) +22.89
MADE GROUND: Strong light grey CONCRETE.		0.24 (0.12) +22.77
MADE GROUND: Light yellowish brown slightly gravelly medium to coarse SAND with low cobble content of white brick and tile. Gravel is subangular to subrounded medium to coarse of tile and and cement.	1.20-2.00 Becoming slightly silty	(1.76)
MADE GROUND: Soft to firm brown slightly gravelly sandy SILT with low cobble content of whole brick. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint, brick, tile, quartzite and macadam.	2.40-2.50 Isolated soft brown clay pocket surrounding gravel.	2.00 +21.01 (1.00)
MADE GROUND: Soft to firm dark brown slightly gravelly CLAY with low cobble content of red brick. Gravel is subangular to subrounded fine to coarse of brick, macadam, flint, quartz and rare chalk.		3.00 +20.01 (1.00)
POSSIBLE MADE GROUND: Soft to firm brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of predominately flint and quartzite with rare chalk and traces of brick.		4.00 +19.01 (0.90)
Firm becoming stiff very closely to indistinctly fissured brown mottled grey CLAY with occasional fine grained sized crystals of selenite. (LONDON CLAY)	6.90-7.50 Fossil relic rootlets present with orangish brown lenses of firm clay.	4.90 +18.11 (3.10)
Stiff very closely to indistinctly fissured grey CLAY with occasional fine grained size crystals of selenite. (LONDON CLAY)		8.00 +15.01

Legend

Backfill

1

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	6.50	Seepage	

Depth Related Remarks

Depths (m)	Remarks
0.00 - 30.00	SPT Hammer ID: AR803 ER=68%

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:57:32

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole BH01

Borehole Log

SOCOTEC

Drilled	DJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	23.01 mOD
Logged	JC	05/02/2018	Dando 4000	0.00	3.00	200	3.00	**Coordinates (m)**	E 530454.93
Checked	MH	**End**	Concrete coring to 0.24m. Service inspection pit hand dug to 1.20m. Cable percussion boring to 30.00m.	3.00	30.00	150	6.00	**National Grid**	N 182069.38
Approved	MW	06/02/2018							

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
					Stiff very closely to indistinctly fissured grey CLAY with occasional fine grained size crystals of selenite. (LONDON CLAY)				
11.00 - 11.45 11.00 11.00 - 11.40	SPTS D 28 B 29	N=23 (3,3/4,5,6,8)	6.00	Dry			(7.00)		
12.00	D 30								
13.00 - 13.40	UT 31	70 blows 84% rec	6.00	Damp					
13.40	D 32								
14.00	D 33								
15.00 - 15.45 15.00	SPTS D 34	N=28 (3,4/6,6,8,8)	6.00	Damp	Very stiff very closely to indistinctly fissured dark grey CLAY with occasional fine grained crystals of selenite with rare traces of elongated selenite crystals. (LONDON CLAY)		15.00 +8.01		2
15.40	B 35								
16.00	D 36								
17.00 - 17.45	UT 37	70 blows 98% rec	6.00	Dry					
17.45	D 38						(5.50)		
18.00	D 39								
19.00 - 19.45 19.00 19.00 - 19.40	SPTS D 40 B 41	N=31 (3,5/7,7,8,9)	6.00	Dry					

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
2	15.00	Seepage	

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:57:32

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole BH01

Borehole Log

SOCOTEC

Drilled	DJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	23.01 mOD
Logged	JC	05/02/2018	Dando 4000	0.00	3.00	200	3.00	**Coordinates (m)**	E 530454.93
Checked	MH	**End**	Concrete coring to 0.24m. Service inspection pit hand dug to 1.20m. Cable percussion boring to 30.00m.	3.00	30.00	150	6.00	**National Grid**	N 182069.38
Approved	MW	06/02/2018							

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
					Very stiff very closely to indistinctly fissured dark grey CLAY with occasional fine grained crystals of selenite with rare traces of elongated selenite crystals. (LONDON CLAY)		20.50 +2.51		
21.00 - 21.30	UT 44	70 blows 47% rec	6.00	Dry	Very stiff indistinctly fissured reddish brown mottled grey and light brown CLAY with traces of fine grained gravel size rounded ammonite fossils. (LAMBETH GROUP)				
21.30	D 45								
22.00	D 46								
23.00 - 23.36 23.00	SPTS D 47	50 (6,11/15,18,17 for 65mm)	6.00	Dry		23.00 White speckling of white sand size crystals.	(5.50)		
25.00 - 25.35	UT 50	70 blows 67% rec	6.00	Dry					
25.35	D 51								
26.00	B 52				Very stiff indistinctly fissured greenish grey slightly sandy CLAY. (LAMBETH GROUP)		26.00 -2.99		
27.00 - 27.45 27.00 27.00 - 27.40	SPTS D 53 B 54	N=43 (4,5/8,10,11,14)	6.00	Dry			(2.40)		
					Stiff friable dark grey slightly sandy SILT. Sand is fine to medium. (LAMBETH GROUP)		28.40 -5.39 (0.60)		
29.00 - 29.45	UT 57	70 blows 93% rec	6.00	Dry	Very stiff very closely fissured dark grey mottled greenish grey CLAY with rare traces of fine gravel size rounded ammonite fossil. (LAMBETH GROUP)		29.00 -5.99		
29.45	D 58						(1.00)		
			06/02/18 6.00	1600 Dry		29.80-30.00 Becomes slightly mottled brown.	30.00 -6.99		
					END OF EXPLORATORY HOLE				

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:57:32

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole BH01

Borehole Log

SOCOTEC

Drilled	DJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	23.01 mOD
Logged	JC	06/02/2018	Dando 4000	0.00	3.00	200	3.00	**Coordinates (m)**	E 530452.97
Checked	MH	**End**	Concrete coring to 0.25m. Service inspection pit hand dug to 1.20m. Cable percussion boring to 15.50m.	3.00	15.45	150	5.50	**National Grid**	N 182074.20
Approved	MW	07/02/2018							

Samples and Tests

Depth	Type & No.	Records	Date Casing	Time Water
			06/02/18	0800
0.25		PID=0.0 ppmv		
0.25	ES 1			
0.50		PID=0.0 ppmv		
0.50	ES 3			
0.50 - 0.70	B 2			
0.90 - 1.10	B 4			
1.00		PID=0.0 ppmv		
1.00	ES 5			
1.20 - 1.65	SPTC	N=5 (1,1/2,1,1,1)		Dry
1.20	B 6			
2.00 - 2.45	SPTC	N=10 (5,3/2,3,3,2)	1.50	Dry
2.00		PID=0.0 ppmv		
2.00	ES 7			
2.00	B 8			
3.00 - 3.45	SPTC	N=11 (6,4/4,3,2,2)	3.00	Dry
3.00		PID=0.0 ppmv		
3.00	ES 10			
3.00	B 9			
3.70 - 4.00	B 11			
4.00 - 4.45	SPTS	N=7 (1,2/2,1,2,2)	3.00	Dry
4.00		PID=0.0 ppmv		
4.00	ES 12			
4.00	D 13			
4.00 - 4.40	B 14			
5.00 - 5.45	SPTS	N=8 (1,1/1,2,2,3)	4.50	Dry
5.00		PID=0.0 ppmv		
5.00	ES 15			
5.00	D 16		06/02/18	1600
5.00 - 5.40	B 17		5.50	Dry
			07/02/18	0800
			5.50	Dry
6.50 - 6.80	UT 19	70 blows 62% rec	5.50	Damp
6.80	D 20			
7.90	D 22			
8.00 - 8.45	SPTS	N=14 (1,2/3,3,4,4)	5.50	Dry
8.00 - 8.40	B 24			
9.00	D 25			
9.50 - 9.95	UT 26	70 blows 100% rec	5.50	Dry
9.95	D 27			

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
MADE GROUND: Black MACADAM.		0.04 (0.08) +22.97		
MADE GROUND: Medium strong black mottled greyish CONCRETE with macadam.		0.12 (0.13) +22.89		
MADE GROUND: Strong light grey CONCRETE.		0.25 +22.76		
MADE GROUND: Yellowish brown gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse macadam, brick, tile, flint and concrete.	1.20-1.50 Low cobble content of half brick.	(1.25)		
MADE GROUND: Loose dark reddish brown very gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse of predominately brick with concrete flint and macadam.		1.50 +21.51		
MADE GROUND: Soft to firm dark brown slightly sandy gravelly CLAY with low cobble content of half brick. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of predominately brick with macadam, flint quartzite.		(1.50)		
Soft to firm greenish grey mottled black slightly sandy slightly gravelly slightly organic with plant remnants CLAY with slight organic humic odour. Gravel is subangular fine to medium of shell fragments. (LONDON CLAY)		3.00 +20.01		
Firm becoming stiff indistinctly fissured light brown mottled greenish grey CLAY. (LONDON CLAY)		(0.70)		
Firm to stiff fissured greenish grey CLAY. (LONDON CLAY)	6.80 Greenish grey slightly clayey gravel band.	3.70 +19.31		
Stiff very closely fissured to indistinctly fissured greyish brown CLAY with occasional fine sand size crystals of selenite. (LONDON CLAY)		(1.30)		
		5.00 +18.01		
		(1.80)		
		6.80 +16.21		
		(1.70)		
		8.50 +14.51		
		(1.45)		
		9.95 +13.06		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)
1	6.50	Seepage	

Depth Related Remarks

Depths (m)	Remarks
0.00 - 15.40	SPT Hammer ID: AR803 ER=68%

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:57:33

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole BH02

Borehole Log

SOCOTEC

Drilled	DJ	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	23.01 mOD
Logged	JC	06/02/2018	Dando 4000	0.00	3.00	200	3.00	**Coordinates (m)**	E 530452.97
Checked	MH	**End**	Concrete coring to 0.25m. Service inspection pit hand dug to 1.20m. Cable percussion boring to 15.50m.	3.00	15.45	150	5.50	**National Grid**	N 182074.20
Approved	MW	07/02/2018							

Samples and Tests

Strata Description

Depth	Type & No.	Records	Date / Time Casing / Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
10.50	D 28			Stiff becoming very stiff fissured dark grey slightly sandy CLAY with occasional fine grained sand size crystals of selenite. Fissures are very closely spaced. (LONDON CLAY)				
11.00 - 11.45 11.00	SPTS D 29	N=20 (3,3/4,5,5,6)	5.50 Dry					
						(5.50)		
13.00 - 13.45	UT 32	70 blows 82% rec	5.50 Dry					
13.45	D 33							
14.00	D 34							
15.00 - 15.45 15.00	SPTS D 35	N=27 (3,5/5,6,7,9)	5.50 Dry 07/02/18 1600 5.50 Dry					
				END OF EXPLORATORY HOLE		15.45 +7.56		

Groundwater Entries

No.	Depth Strike (m)	Remarks	Depth Sealed (m)

Depth Related Remarks

Depths (m)	Remarks

Hard Boring

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:57:33

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole BH02

Borehole Log

SOCOTEC

Drilled	LW	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	22.96 mOD
Logged	JC	01/02/2018	Archway Competitor	0.00	2.00	87		**Coordinates (m)**	E 530456.56
Checked	MH	**End**	Concrete coring to 0.20m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampling to 6.00m. No groundwater encountered.	2.00	3.00	75		**National Grid**	N 182070.08
Approved	MW	01/02/2018		3.00	4.00	65			
				4.00	5.00	55			
				5.00	6.00	45			

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
				01/02/18	0800	MADE GROUND: Black MACADAM.		0.04 (0.04) +22.92		
						MADE GROUND: Black medium strong CONCRETE.		0.10 (0.06) +22.86		
						MADE GROUND: Strong light grey CONCRETE.		0.20 (0.10) +22.76		
0.25			PID=0.0 ppmv			MADE GROUND: Loose yellowish brown slightly gravelly medium to coarse SAND with low cobble content content of whole brick. Gravel is subangular to subrounded fine to coarse of concrete and tile.				
0.25	ES 1									
0.30	D 2									
0.30 - 0.50	B 3									
0.50			PID=0.0 ppmv					(1.45)		
0.50	ES 4									
0.50 - 0.90	B 6									
0.70	D 5									
1.00			PID=0.0 ppmv							
1.00	ES 7				Dry					
1.20 - 1.65	SPTS		N=5 (1,1/1,1,2,1)							
1.20 - 1.65	D 8									
1.20 - 1.70	B 9									
1.20 - 2.00	L		100% rec, diameter 87mm							
1.70			PID=0.0 ppmv			MADE GROUND: Soft to firm brown mottled black slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of brick, macadam and concrete.		1.65 +21.31		
1.70	ES 10									
2.00 - 2.45	SPTS		N=6 (1,1/1,1,2,2)		Dry			(0.65)		
2.00 - 2.45	D 11									
2.00 - 2.70	B 12									
2.00 - 3.00	L		90% rec, diameter 75mm			MADE GROUND: Firm brown mottled black slightly gravelly CLAY. Gravel is subangular to subrounded medium to coarse of brick, concrete and macadam.		2.30 +20.66		
2.70			PID=0.0 ppmv							
2.70	ES 13									
3.00 - 3.45	SPTS		N=9 (2,2/2,2,2,3)		Dry		3.00-4.00 Poor recovery.			
3.00 - 3.45	D 14									
3.00 - 4.00	D 15									
3.00 - 4.00	L		50% rec, diameter 65mm					(2.50)		
4.00 - 4.45	SPTS		N=4 (2,1/1,1,1,1)		Dry					
4.00 - 4.45	D 16									
4.00 - 4.50	B 17									
4.00 - 5.00	L		90% rec, diameter 55mm							
4.50			PID=0.0 ppmv							
4.50	ES 18									
						Firm to stiff dark grey slightly gravelly CLAY with relic rootlets. (LONDON CLAY)		4.80 +18.16		
5.00 - 5.45	SPTS		N=8 (2,2/2,2,2,2)		Dry					
5.00 - 6.00	B 19		No recovery					(0.70)		
5.00 - 6.00	L		80% rec, diameter 45mm							
						Firm grey mottled brown CLAY with relic rootlets. (LONDON CLAY)		5.50 +17.46		
				01/02/18	1600			(0.50)		
						END OF EXPLORATORY HOLE		6.00 +16.96		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 5.45	SPT Hammer ID: COM116 ER: 74%

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:56

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole WS01

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	LW	**Start**	31/01/2018
Logged	JC	**End**	01/02/2018
Checked	MH		
Approved	MW		

Equipment, Methods and Remarks

Archway Competitor
Concrete coring to 0.24m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampling to 6.45m. No groundwater encountered.

Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)
0.00	2.00	102	
2.00	3.00	87	
3.00	4.00	75	
4.00	5.00	65	
5.00	6.00	53	

Ground Level	23.00 mOD
Coordinates (m)	E 530454.78
National Grid	N 182075.26

Samples and Tests

Strata Description

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water	Main	Detail	Depth, Level (Thickness)	Legend	Backfill
			0.00-0.50 No ES sample collected due to surface cross contamination hydrocarbon from concrete core flush.	31/01/18	0800	MADE GROUND: Black MACADAM.		0.02 (0.02) +22.98		
						MADE GROUND: Black medium strong CONCRETE with macadam.		0.10 (0.08) +22.90		
						MADE GROUND: Strong light grey CONCRETE.		0.24 (0.14) +22.76		
0.35	D 1					MADE GROUND: Brown slightly gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse of flint, brick and tile.		0.40 (0.16) +22.60		
0.40 - 0.60	B 3									
0.50										
0.50	ES 2									
0.50	D 4		PID=0.0 ppmv							
0.70 - 0.90	B 5									
1.00				31/01/18	1600	MADE GROUND: Loose yellowish brown slightly gravelly medium to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, tile and concrete. Cobbles are subangular to subrounded of whole brick.	1.00 Metal rod	(1.25)		
1.00	ES 6				Dry					
1.20 - 1.65	SPTS		PID=0.0 ppmv	01/02/18	0800					
1.20 - 1.65	D 7									
1.20 - 1.70	B 8		N=6 (1,0/0,0,3,3)							
1.20 - 2.00	L									
1.70			81% rec, diameter 102mm PID=0.0 ppmv					1.65 +21.35		
2.00 - 2.45	SPTS		N=4 (1,1/1,1,1,1)		Dry	MADE GROUND: Soft dark blackish brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of macadam, brick, tile and flint.		(0.75)		
2.00 - 2.45	D 10									
2.00 - 2.70	B 11									
2.00 - 3.00	L		84% rec, diameter 87mm					2.40 +20.60		
2.80			PID=0.0 ppmv			MADE GROUND: Firm to stiff brown slightly gravelly CLAY. Gravel is subangular to subrounded medium to coarse of brick.				
3.00 - 3.45	SPTS		N=4 (1,1/1,1,1,1)		Dry		3.00-4.00 Poor recovery.			
3.00 - 3.45	D 13									
3.00 - 4.00	D 14									
3.00 - 4.00	L		45% rec, diameter 75mm					(2.10)		
4.00 - 4.45	SPTS		N=8 (2,2/2,2,2,2)		Dry					
4.00			PID=0.0 ppmv							
4.00 - 4.45	D 15									
4.00 - 5.00	L		75% rec, diameter 65mm					4.50 +18.50		
						Firm grey mottled brown CLAY with relic rootlets. (LONDON CLAY)				
4.80	D 17							(0.50)		
5.00 - 5.45	SPTS		N=22 (5,5/5,5,6,6)		Dry			5.00 +18.00		
5.00 - 6.00	L		No recovery 0% rec, diameter 55mm			NO RECOVERY.				
								(1.45)		
6.00 - 6.45	SPTS		N=18 (5,5/4,4,5,5) No recovery		Dry					
				01/02/18	1600					
						END OF EXPLORATORY HOLE		6.45 +16.55		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 0.50	No ES sample collected due to surface cross contamination hydrocarbon from concrete core flush.

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:56

Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT
Project No.	E8013-18
Carried out for	Kier Construction

Borehole

WS02

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	LW	**Start**	31/01/2018
Logged	JC	**End**	01/02/2018
Checked	MH		
Approved	MW		

Equipment, Methods and Remarks

Archway Competitor
Concrete coring to 0.30m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampling to 6.45m. No groundwater encountered.

Depth from (m)	to (m)	Diameter (mm)	Casing Depth (m)
0.00	2.00	102	
2.00	3.00	87	
3.00	4.00	75	
4.00	5.00	65	
5.00	6.00	55	

Ground Level	23.03 mOD
Coordinates (m)	E 530452.91
National Grid	N 182078.07

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.20 - 0.50	B 3			31/01/18	0800
0.25			PID=0.0 ppmv		
0.25	ES 1				
0.30	D 2				
0.50			PID=0.0 ppmv		
0.50	ES 4				
0.60 - 0.90	B 6				
0.70	D 5				
1.00			PID=0.0 ppmv	31/01/18	1600
1.00	ES 7				Dry
1.00 - 1.20	B 8			01/02/18	0800
1.20 - 1.65	SPTS		N=1 (1,1/1,0,0,0)		
1.20 - 1.65	D 9				
1.20 - 1.80	B 10				
1.20 - 2.00	L		100% rec, diameter 102mm		
1.80			PID=0.0 ppmv		
1.80	ES 11				
2.00 - 2.45	SPTS		N=6 (1,1/1,2,2,1)		Dry
2.00 - 2.45	D 12				
2.00 - 2.80	B 13				
2.00 - 3.00	L		75% rec, diameter 87mm		
2.80			PID=0.0 ppmv		
2.80	ES 14				
3.00 - 3.45	SPTS		N=4 (1,1/1,1,1,1)		Dry
3.00 - 3.45	D 15				
3.00 - 3.80	B 16				
3.00 - 4.00	L		95% rec, diameter 75mm		
3.80			PID=0.0 ppmv		
3.80	ES 17				
4.00 - 4.45	SPTS		N=4 (0,1/1,1,1,1)		Dry
4.00 - 5.00	B 18		No recovery		
4.00 - 5.00	L		80% rec, diameter 65mm		
5.00 - 5.45	SPTS		N=12 (2,1/2,3,3,4)		Dry
5.00 - 5.45	D 19				
5.00 - 6.00	B 20				
5.00 - 6.00	L		65% rec, diameter 55mm		
6.00 - 6.45	SPTS		N=20 (3,5/4,4,6,6)		Dry
6.00 - 6.45	D 21				
				01/02/18	1600 Dry

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
MADE GROUND: MACADAM		0.04 (0.04) +22.99		
MADE GROUND: Black macadam with CONCRETE.		0.12 (0.08) +22.91		
MADE GROUND: Light grey strong CONCRETE.		0.22 (0.10) +22.81		
MADE GROUND: Dark orangish brown gravelly slightly silty medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of flint and concrete.		0.30 (0.08) +22.73		
		(0.90)		
MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with high cobble content. Gravel is angular to subrounded fine to coarse of brick, tile, macadam, concrete and ceramic. Cobbles are angular to subangular of whole brick and concrete.		1.20 +21.83		
MADE GROUND: Soft to firm brown slightly sandy gravelly CLAY with low cobble content. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of brick, macadam, flint and concrete. Cobbles are subangular to subrounded of red brick.		(1.45)		
MADE GROUND: Light grey medium to coarse SAND.		2.65 (0.10) +20.38		
MADE GROUND: Firm brown slightly gravelly CLAY with rootlets. Gravel is subangular to subrounded medium to coarse of macadam, brick and flint.		2.75 +20.28		
		(0.55)		
Firm brown slightly gravelly CLAY with rootlets. Gravel is subangular to subrounded fine to medium flint. (LONDON CLAY)		3.30 +19.73		
		(0.70)		
Firm grey mottled brown CLAY with rootlets with traces of subangular to subrounded fine and medium flint gravel. (LONDON CLAY)		4.00 +19.03		
		(2.45)		
END OF EXPLORATORY HOLE		6.45 +16.58		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 6.45	SPT Hammer ID: COM116 ER: 74%

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:57

Project	GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT
Project No.	E8013-18
Carried out for	Kier Construction

Borehole

WS03

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	LW	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	22.96 mOD
Logged	JC	30/01/2018	Archway Competitor Concrete coring to 0.20m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampling to 6.45m. No groundwater encountered.	0.00	2.00	102		**Coordinates (m)**	E 530452.91
Checked	MH	**End**		2.00	3.00	87		**National Grid**	N 182082.58
Approved	MW	31/01/2018		3.00	4.00	75			
				4.00	5.00	65			
				5.00	6.00	55			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.05			PID=0.9 ppmv	30/01/18	0800
0.25			PID=0.0 ppmv		
0.25	ES 1				
0.25 - 0.50	B 3				
0.30	D 2				
0.50			PID=0.0 ppmv		
0.50	ES 4				
0.50 - 0.90	B 6				
0.70	D 5			30/01/18	1600
1.00			PID=0.0 ppmv		
1.00	ES 7				Dry
1.00 - 1.20	B 8			31/01/18	0800
1.20 - 1.65	SPTS		0 (for 0mm for 0mm/ for 0mm) SW=450		
1.20 - 1.65	D 10				
1.20 - 1.70	B 11				
1.20 - 2.00	L				
1.70			63% rec, diameter 102mm		
2.00 - 2.45	SPTS		PID=0.0 ppmv		Dry
2.00 - 2.45	D 13				
2.00 - 2.80	B 14		N=2 (2,0/1,1,0,0)		
2.00 - 3.00	L				
			60% rec, diameter 87mm		
2.80			PID=0.0 ppmv		
3.00 - 3.45	SPTS		N=8 (2,2/2,2,2,2)		Dry
3.00 - 3.45	D 16				
3.00 - 3.70	B 17				
3.00 - 4.00	L		100% rec, diameter 75mm		
3.70			PID=0.0 ppmv		
4.00 - 4.45	SPTS		N=9 (2,2/2,2,2,3)		Dry
4.00 - 4.45	D 19				
4.00 - 4.60	B 20				
4.00 - 5.00	L		60% rec, diameter 65mm		
4.60			PID=0.0 ppmv		
5.00 - 5.45	SPTS		N=11 (3,3/2,2,3,4)		Dry
5.00 - 5.45	D 22				
5.00 - 6.00	D 23				
5.00 - 6.00	L		65% rec, diameter 55mm		
6.00 - 6.45	SPTS		N=13 (3,2/2,3,3,5)		Dry
6.00 - 6.45	D 24				
				31/01/18	1600 Dry

Strata Description

Main	Detail	Depth, Level (Thickness)
MADE GROUND: Black MACADAM		0.08 (0.08) +22.88
MADE GROUND: Light grey strong CONCRETE.		0.20 (0.12) +22.76
MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low to medium cobble content. Gravel is angular to subrounded medium to coarse of tile and brick with rare metal. Cobble are subangular of half and whole brick.		(0.80)
MADE GROUND: Brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is angular to subrounded medium to coarse of brick, macadam, concrete and tile.		1.00 (0.20) +21.96 1.20 +21.76
MADE GROUND: Soft to firm brown slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded medium to coarse of brick, concrete and macadam. Cobble is subangular of red brick.		(1.80)
MADE GROUND: Concrete COBBLE.		3.00 (0.20) +19.96 3.20 +19.76
MADE GROUND: Firm brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of flint, rare brick and quartzite.		(1.10)
Firm grey mottled brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of flint. (LONDON CLAY)		4.30 +18.66 (0.70)
Firm brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded medium to coarse flint. (LONDON CLAY)		5.00 +17.96 (1.45)
END OF EXPLORATORY HOLE		6.45 +16.51

Legend

Backfill

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 6.45	SPT Hammer ID: COM116 ER: 74%

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:57

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WS04

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	LW	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	22.90 mOD
Logged	JC	30/01/2018	Archway Competitor Concrete coring to 0.20m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampling to 6.45m.	0.00	2.00	87		**Coordinates (m)**	E 530458.20
Checked	MH	**End**		2.00	3.00	75		**National Grid**	N 182081.76
Approved	MW	31/01/2018		3.00	4.00	65			
				4.00	5.00	55			
				5.00	6.00	45			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.25			PID=0.0 ppmv	30/01/18	0800
0.25	ES 1				
0.25 - 0.45	B 3				
0.30	D 2				
0.50			PID=0.0 ppmv		
0.50	ES 4				
0.50	D 5				
0.50 - 0.90	B 6			30/01/18	1600
1.00			PID=0.0 ppmv		
1.00	ES 7				Dry
1.00 - 1.20	B 8			31/01/18	0800
1.20 - 1.65	SPTS		N=4 (1,0/1,1,1,1)		
1.20 - 1.65	D 9				
1.20 - 1.80	B 10				
1.20 - 2.00	L		75% rec, diameter 87mm		
1.80			PID=0.0 ppmv		
2.00 - 2.45	SPTS		N=5 (1,1/1,1,1,2)		Dry
2.00 - 2.45	D 12				
2.00 - 2.60	B 13				
2.00 - 3.00	L		50% rec, diameter 75mm		
2.70			PID=0.0 ppmv		
3.00 - 3.45	SPTS		N=5 (1,1/1,1,1,2)		Dry
3.00 - 3.45	D 15				
3.00 - 3.70	B 16				
3.00 - 4.00	L		80% rec, diameter 65mm		
3.70			PID=0.0 ppmv		
4.00 - 4.45	SPTS		N=8 (1,1/2,2,2,2)		Dry
4.00 - 4.45	D 18				
4.00 - 5.00	L		75% rec, diameter 55mm		
4.20 - 4.70	B 19				
4.70	D 20				
5.00 - 5.45	SPTS		N=21 (8,8/8,7,3,3)		Dry
5.00 - 5.45	D 21				
5.00 - 5.60	D 22				
5.00 - 6.00	L		90% rec, diameter 45mm		
5.60 - 6.00	D 23				
6.00 - 6.45	SPTS		N=16 (4,5/4,4,4,4)		
6.00 - 6.45	D 24				
				31/01/18	1600

Strata Description

Main	Detail	Depth, Level (Thickness)
MADE GROUND: Black MACADAM		0.08 (0.08) +22.82
MADE GROUND: Light grey strong CONCRETE.		0.21 (0.13) +22.69
MADE GROUND: Dark brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete, metal, flint and quartzite.		(0.24) 0.45 +22.45
MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low cobble content of subangular whole brick.		(0.75) 1.20 +21.70
MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly CLAY. Sand is medium to coarse. Gravel is angular to subangular fine to coarse of brick, macadam, flint and tile.		(1.40) 2.60 +20.30
MADE GROUND: Orangish brown slightly gravelly slightly clayey medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of brick, macadam and flint.		(0.50) 3.10 +19.80
Firm grey and brown mottled orangish and black slightly gravelly slightly organic CLAY with slight organic (humic) odour and traces of rootlets. Gravel is subangular to subrounded medium to coarse of flint. (POSSIBLE MADE GROUND)		(1.60) 4.70 +18.20
Medium dense yellow brownish slightly gravelly medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of flint. (LYNCH HILL GRAVEL)		(0.90) 5.60 +17.30
Firm grey slightly gravelly CLAY. Gravel is subangular medium to coarse of flint. (LONDON CLAY)		(0.85) 6.45 +16.45
END OF EXPLORATORY HOLE		

Legend

Backfill

1

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed
1	5.00		

Depth Related Remarks

Depths (m)	Remarks
0.00 - 6.45	SPT Hammer ID: COM116 ER: 74%

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:57

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WS05

Sheet 1 of 1

Borehole Log

SOCOTEC

Drilled	LW	**Start**	**Equipment, Methods and Remarks**	**Depth from (m)**	**to (m)**	**Diameter (mm)**	**Casing Depth (m)**	**Ground Level**	22.91 mOD
Logged	JC	30/01/2018	Archway Competitor	0.00	2.00	102		**Coordinates (m)**	E 530458.71
Checked	MH	**End**	Concrete coring to 0.20m. Service inspection pit hand dug to 1.20m. Dynamic (windowless) sampled to 5.45m. No groundwater encountered.	2.00	3.00	87		**National Grid**	N 182077.39
Approved	MW	30/01/2018		3.00	4.00	75			
				4.00	5.00	65			

Samples and Tests

Depth	TCR SCR RQD	If	Records/Samples	Date Casing	Time Water
0.20 - 0.45	B 3			30/01/18	0800
0.25			PID=0.0 ppmv		
0.25	ES 1				
0.30	D 2				
0.50			PID=0.0 ppmv		
0.50	ES 4				
0.50	B 6				
0.60	D 5				
1.00			PID=5.5 ppmv		
1.00	ES 7				Dry
1.00 - 1.20	B 8				
1.20 - 1.65	SPTS		N=1 (1,0/0,0,0,1)		
1.20 - 1.65	D 9				
1.20 - 1.80	B 10				
1.20 - 2.00	L		100% rec, diameter 102mm		
1.80			PID=0.0 ppmv		
1.80	ES 11				
2.00 - 2.45	SPTS		N=6 (1,1/2,2,1,1)		Dry
2.00 - 2.45	D 12				
2.00 - 2.80	B 13				
2.00 - 3.00	L		90% rec, diameter 87mm		
3.00 - 3.45	SPTS		N=7 (2,1/1,1,3,2)		Dry
3.00			PID=0.0 ppmv		
3.00	ES 14				
3.00 - 3.45	D 20				
3.00 - 3.70	B 15				
3.00 - 4.00	L		100% rec, diameter 75mm		
3.70			PID=0.0 ppmv		
3.70	ES 16				
4.00 - 4.45	SPTS		N=8 (1,1/2,2,2,2)		Dry
4.00 - 4.45	D 17				
4.00 - 5.00	B 18				
4.00 - 5.00	L		80% rec, diameter 65mm		
5.00 - 5.30	SPTS		50 (8,17/25,25 for 70mm)		Dry
5.00 - 5.30	D 19				
				30/01/18	1600 Dry

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
MADE GROUND: MACADAM		0.08 (0.08) +22.83		
MADE GROUND: Light grey strong CONCRETE.		0.20 (0.12) +22.71		
MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low to medium cobble content of whole red brick. Gravel is subangular to subrounded fine to coarse of tile and brick.	0.40-0.50 Becoming slightly silty.	(0.30) 0.50 +22.41		
MADE GROUND: Brown gravelly sandy SILT. Sand is medium to coarse. Gravel is angular to subrounded fine to coarse of brick, macadam and concrete, low to medium cobble content of brick and macadam hydrocarbon odour present.		(0.70) 1.20 +21.71		
MADE GROUND: Soft to firm becoming firm brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of brick, tile, quartzite and flint.	1.70-1.75 Small band of macadam.	(1.80) 3.00 +19.91		
MADE GROUND: Firm brown slightly gravelly CLAY. Gravel is angular to subrounded medium to coarse of brick and concrete.		(0.75) 3.75 +19.16		
Firm dark grey slightly gravelly slightly organic with plant remnants CLAY with slight organic (humic) odour. Gravel is subrounded medium of quartz. (DISTURBED LONDON CLAY)		(0.45) 4.20 +18.71		
Firm to stiff dark grey slightly gravelly CLAY. Gravel is subrounded medium to coarse of flint and quartzite. (DISTURBED LONDON CLAY)		(1.05)		
Light brown and blackish subangular to subrounded medium to coarse GRAVEL of flint. (DISTURBED LONDON CLAY)		5.25 (0.20) +17.66		
END OF EXPLORATORY HOLE		5.45 +17.46		

Groundwater Entries

No.	Depth Strike	Remarks	Depth Sealed

Depth Related Remarks

Depths (m)	Remarks
0.00 - 5.45	SPT Hammer ID: COM116 ER: 74%

Chiselling Details

Depths (m)	Duration (mins)	Tools used

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

Scale 1:50

23/03/2018 11:58:58

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WS06

Sheet 1 of 1

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	23.01 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530454.93
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	01/02/2018	**National Grid**	N 182069.38
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.81 to +21.51	1.50	1 1 1 1 1 1	0	MADE GROUND: Black MACADAM MADE GROUND: Black medium strong CONCRETE with macadam. MADE GROUND: Strong light grey CONCRETE. MADE GROUND: Light yellowish brown slightly gravelly medium to coarse SAND with low cobble content of white brick and tile. Gravel is subangular to subrounded medium to coarse of tile and and cement.		
+21.41 to +20.81	2.00	2 1 1 1 1 1				
+20.71 to +20.31	2.50	1 1 1 1 1 1	2	MADE GROUND: Soft to firm brown slightly gravelly sandy SILT with low cobble content of whole brick. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of flint, brick, tile, quartzite and macadam.		
+20.21 to +19.81	3.00	1 1 1 1 1 1				
+19.71 to +19.31	3.50	2 0 0 0 0 0		MADE GROUND: Soft to firm dark brown slightly gravelly CLAY with low cobble content of red brick. Gravel is subangular to subrounded fine to coarse of brick, macadam, flint, quartz and rare chalk.		
+19.21 to +18.81	4.00	2 1 1 1 1 1		POSSIBLE MADE GROUND: Soft to firm brown mottled grey slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of predominately flint and quartzite with rare chalk and traces of brick.		
+18.71 to +18.31	4.50	2 1 1 1 1 1	3			
+18.21 to +17.81	5.00	2 2 2 2 2 2		Firm becoming stiff very closely to indistinctly fissured brown mottled grey CLAY with occasional fine grained sized crystals of selenite. (LONDON CLAY)		
+17.71 to +17.31	5.50	2 2 2 2 2 2	7			
+17.21 to +16.81	6.00	3 4 3 5 4 5				
+16.71 to +16.41	6.50	4 4 4 4		END OF PROBING HOLE		
+16.31 to +16.11						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit to BH01 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 6.95m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:33

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

BHDP01

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	22.96 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 539456.56
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	01/02/2018	**National Grid**	N 182070.08
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.76				MADE GROUND: Black MACADAM.		
+21.66				MADE GROUND: Black medium strong CONCRETE.		
+21.56				MADE GROUND: Strong light grey CONCRETE.		
+21.46	1.50	1 1 1 1 1		MADE GROUND: Loose yellowish brown slightly gravelly medium to coarse SAND with low cobble content content of whole brick. Gravel is subangular to subrounded fine to coarse of concrete and tile.		
+21.36						
+21.26						
+21.16						
+21.06	2.00	1 1 1 1 1	0	MADE GROUND: Soft to firm brown mottled black slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of brick, macadam and concrete.		
+20.96						
+20.86						
+20.76						
+20.66						
+20.56	2.50	1 1 1 1 1		MADE GROUND: Firm brown mottled black slightly gravelly CLAY. Gravel is subangular to subrounded medium to coarse of brick, concrete and macadam.		
+20.46						
+20.36						
+20.26						
+20.16			1			
+20.06	3.00	1 0 0 0 0				
+19.96						
+19.86						
+19.76						
+19.66	3.50	1 1 1 1 1				
+19.56						
+19.46						
+19.36						
+19.26						
+19.16	4.00	1 3 3 2 2	1			
+19.06						
+18.96						
+18.86						
+18.76						
+18.66	4.50	2 2 3 3 3				
+18.56						
+18.46						
+18.36						
+18.26						
+18.16	5.00	3 3 2 3 3		Firm to stiff dark grey slightly gravelly CLAY with relic rootlets. (LONDON CLAY)		
+18.06						
+17.96						
+17.86						
+17.76	5.50	3 3 5 5 5		Firm grey mottled brown CLAY with relic rootlets. (LONDON CLAY		
+17.66						
+17.56						
+17.46						
+17.36						
+17.26	6.00	5 6 4 6 6		DYNAMIC PROBING		
+17.16						
+17.06						
+16.96						
+16.86						
+16.76	6.50	7 7 6 6 7				
+16.66						
+16.56						
+16.46						
+16.36	7.00	7	5	END OF PROBING HOLE		
+16.26						
+16.16						
+16.06						
+15.96						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit of WS01 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 7.00m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:34

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP01

Sheet 1 of 1

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	23.00 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530454.78
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	01/02/2018	**National Grid**	N 182075.27
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.80 to +21.70		3 4 8	0	MADE GROUND: Black MACADAM.		
+21.60 to +21.50	1.50	3 2 3 2 2		MADE GROUND: Black medium strong CONCRETE with macadam.		
+21.40 to +21.10				MADE GROUND: Strong light grey CONCRETE.		
+21.00 to +20.70	2.00	1 0 0 0 0	0	MADE GROUND: Brown slightly gravelly medium to coarse SAND. Gravel is subangular to subrounded fine to coarse of flint, brick and tile.		
+20.60 to +20.20	2.50	2 2 2 2 2		MADE GROUND: Loose yellowish brown slightly gravelly medium to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of brick, tile and concrete. Cobbles are subangular to subrounded of whole brick.		
+20.10 to +19.80	3.00	2 2 2 1 1		MADE GROUND: Soft dark blackish brown slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse of macadam, brick, tile and flint.		
+19.70 to +19.30	3.50	1 2 2 2 2		MADE GROUND: Firm to stiff brown slightly gravelly CLAY. Gravel is subangular to subrounded medium to coarse of brick.		
+19.20 to +18.80	4.00	2 2 2 1 2	1			
+18.70 to +18.40	4.50	3 9 5 3 2		Firm grey mottled brown CLAY with relic rootlets. (LONDON CLAY)		
+18.30 to +18.00	5.00	2 3 3 2 3	9	NO RECOVERY OF DYNAMIC SAMPLER / DYNAMIC PROBING		
+17.90 to +17.60	5.50	3 3 4 5 6				
+17.50 to +17.10	6.00	7 7 5 5 4	11			
+17.00 to +16.70	6.50	6 5 5 5 6				
+16.60 to +16.30	7.00	6		END OF PROBING HOLE		
+16.20 to +16.00						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit of WS02 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 7.00m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:34

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP02

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	23.03 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530452.91
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	31/01/2018	**National Grid**	N 182078.07
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.83				MADE GROUND: MACADAM		
+21.73		1		MADE GROUND: Black macadam with CONCRETE.		
+21.63		1		MADE GROUND: Light grey strong CONCRETE.		
+21.53	1.50	2		MADE GROUND: Dark orangish brown gravelly slightly silty medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of flint and concrete.		
+21.43		2		MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with high cobble content. Gravel is angular to subrounded fine to coarse of brick, tile, macadam, concrete and ceramic. Cobbles are angular to subangular of whole brick and concrete.		
+21.33		0				
+21.23		0				
+21.13	2.00	0				
+21.03		0				
+20.93		0		MADE GROUND: Soft to firm brown slightly sandy gravelly CLAY with low cobble content. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of brick, macadam, flint and concrete. Cobbles are subangular to subrounded of red brick.		
+20.83		0				
+20.73		1				
+20.63	2.50	1				
+20.53		1				
+20.43		1				
+20.33		1				
+20.23		1	0			
+20.13	3.00	1				
+20.03		1		MADE GROUND: Light grey medium to coarse SAND.		
+19.93		2				
+19.83		2		MADE GROUND: Firm brown slightly gravelly CLAY with rootlets. Gravel is subangular to subrounded medium to coarse of macadam, brick and flint.		
+19.73	3.50	2				
+19.63		2				
+19.53		2				
+19.43		2				
+19.33		2	1	Firm brown slightly gravelly CLAY with rootlets. Gravel is subangular to subrounded fine to medium flint. (LONDON CLAY)		
+19.23	4.00	2				
+19.13		2				
+19.03		2				
+18.93		2				
+18.83		2				
+18.73	4.50	1		Firm grey mottled brown CLAY with rootlets with traces of subangular to subrounded fine and medium flint gravel. (LONDON CLAY)		
+18.63		1				
+18.53		1				
+18.43		1				
+18.33		1	3			
+18.23	5.00	2				
+18.13		2				
+18.03		1				
+17.93		2				
+17.83	5.50	2				
+17.73		2				
+17.63		2				
+17.53		2				
+17.43		2	5			
+17.33	6.00	4				
+17.23		6				
+17.13		3				
+17.03		3				
+16.93		3				
+16.83	6.50	3		DYNAMIC PROBING		
+16.73		3				
+16.63		2				
+16.53		3				
+16.43		3	6			
+16.33	7.00	3				
+16.23		2				
+16.13		3				
+16.03		2				
+15.93	7.50	2				
+15.83		3				
+15.73		3				
+15.63		2				
+15.53		3				
+15.43	8.00	3	7			
+15.33		3				
+15.23		2				
+15.13		3				
+15.03		3				
+14.93	8.50	4				
+14.83		3				
+14.73		3				
+14.63		4				
+14.53	9.00	4	8			
+14.43		3				
+14.33		3				
+14.23		3				
+14.13		4				
+14.03	9.50	3				
+13.93		3				
+13.83		4				
+13.73		4				
+13.63						
+13.53				Continued on next sheet		
+13.43						
+13.33						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit at WS03 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 10.00m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:34

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP03

Dynamic Probing Log

SOCOTEC

Operator	**LW**	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	23.03 mOD
Logged by	**JC**	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530452.91
Checked by	**MH**	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	31/01/2018	**National Grid**	N 182078.07
Approved	**MW**	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	5 10 15 20 25	Torque (Nm)	Description	Legend	Backfill/ Instruments
+13.23 +13.13		4			END OF PROBING HOLE		

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit at WS03 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 10.00m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:34

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP03

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	22.96 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530452.91
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	31/01/2018	**National Grid**	N 182082.58
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.76				MADE GROUND: Black MACADAM		
+21.66				MADE GROUND: Light grey strong CONCRETE.		
+21.56		0		MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low to medium cobble content. Gravel is angular to subrounded medium to coarse of tile and brick with rare metal. Cobble are subangular of half and whole brick.		
+21.46	1.50	0 0	0	MADE GROUND: Brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is angular to subrounded medium to coarse of brick, macadam, concrete and tile.		
+21.36		1		MADE GROUND: Soft to firm brown slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded medium to coarse of brick, concrete and macadam. Cobble is subangular of red brick.		
+21.26		1				
+21.16		1				
+21.06	2.00	1 1	0			
+20.96		1				
+20.86		1				
+20.76		1				
+20.66		0				
+20.56	2.50	0 0				
+20.46		1				
+20.36		2				
+20.26		2				
+20.16		1				
+20.06	3.00	1	1	MADE GROUND: Concrete COBBLE.		
+19.96				END OF PROBING HOLE		

Remarks

SPT Hammer ID: COM116 ER= 74%

Bouncing at 3.1 Possible brick obstruction.

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit of WS04 prior to dynamic samling. Dynamic super heavy probing (DPSH) to 3.10m. Terminated on concrete cobble.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:35

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP04

Sheet 1 of 1

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	22.90 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530458.20
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	30/01/2018	**National Grid**	N 182081.76
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+21.70		1 0 0		MADE GROUND: Black MACADAM		
+21.60				MADE GROUND: Light grey strong CONCRETE.		
+21.50				MADE GROUND: Dark brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete, metal, flint and quartzite.		
+21.40	1.50	0 0 1 1 1		MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low cobble content of subangular whole brick.		
+21.30				MADE GROUND: Soft to firm dark brown slightly sandy slightly gravelly CLAY. Sand is medium to coarse. Gravel is angular to subangular fine to coarse of brick, macadam, flint and tile.		
+21.20						
+21.10			1			
+21.00	2.00	2 2 2 1 1				
+20.90						
+20.80						
+20.70						
+20.60						
+20.50						
+20.20		1 1 1		MADE GROUND: Orangish brown slightly gravelly slightly clayey medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of brick, macadam and flint.		
+20.10						
+20.00			1			
+19.90	3.00	2 1 1 1 2		Firm grey and brown mottled orangish and black slightly gravelly slightly organic CLAY with slight organic (humic) odour and traces of rootlets. Gravel is subangular to subrounded medium to coarse of flint. (POSSIBLE MADE GROUND)		
+19.80						
+19.70						
+19.60						
+19.50	3.50	2 2 2 2 2				
+19.40						
+19.30						
+19.20						
+19.10						
+19.00	4.00	2 1 2 1 3	4			
+18.90						
+18.80						
+18.70						
+18.60						
+18.50	4.50	10 13 12 10 11		Medium dense yellow brownish slightly gravelly medium to coarse SAND. Gravel is subangular to subrounded medium to coarse of flint. (LYNCH HILL GRAVEL)		
+18.40						
+18.30						
+18.20						
+18.10			4			
+18.00	5.00	9 5 3 4 4		Firm grey slightly gravelly CLAY. Gravel is subangular medium to coarse of flint. (LONDON CLAY)		
+17.90						
+17.80						
+17.70						
+17.60	5.50	3 3 3 3 2				
+17.50						
+17.40						
+17.30						
+17.20			8			
+17.10	6.00	3 3 3 3 4		DYNAMIC PROBING		
+17.00						
+16.90						
+16.80						
+16.70						
+16.60	6.50	5 4 4 5 7				
+16.50						
+16.40						
+16.30						
+16.20			10			
+16.10				END OF PROBING HOLE		
+16.00						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within inspection pit at WS05 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 7.00m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:35

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP05

Sheet 1 of 1

Dynamic Probing Log

SOCOTEC

Operator	LW	**Probe Type**	DPSH-B	**Cone Diameter (mm)**		**Cone tip abandoned at (m)**		**Ground Level**	22.91 mOD
Logged by	JC	**Rod Diameter (mm)**	35	**Hammer Mass (kg)**	64.0			**Coordinates (m)**	E 530458.71
Checked by	MH	**Rod Mass (kg/m)**		**Fall Height (mm)**	750	**Date of Test**	30/01/2018	**National Grid**	N 182077.39
Approved	MW	**Rig Reference**		**Hammer Energy Ratio (%)**					

Level	Depth (m)	Blows per 100mm	Torque (Nm)	Description	Legend	Backfill/ Instruments
+22.91	0.00	1		MADE GROUND: MACADAM		
+22.81		0		MADE GROUND: Light grey strong CONCRETE.		
+22.71		0		MADE GROUND: Yellowish brown slightly gravelly medium to coarse SAND with low to medium cobble content of whole red brick. Gravel is subangular to subrounded fine to coarse of tile and brick.		
+22.61		0				
+22.51	0.50	2				
+22.41		1				
+22.31		1				
+22.21		1				
+22.11		1				
+22.01	1.00	0				
+21.91		0				
+21.81		1	0	MADE GROUND: Brown gravelly sandy SILT. Sand is medium to coarse. Gravel is angular to subrounded fine to coarse of brick, macadam and concrete, low to medium cobble content of brick and macadam hydrocarbon odour present.		
+21.71		0				
+21.61	1.50	0				
+21.51		0				
+21.41		0				
+21.31		2				
+21.21		2				
+21.11	2.00	2	0	MADE GROUND: Soft to firm becoming firm brown slightly sandy gravelly CLAY. Sand is medium to coarse. Gravel is subangular to subrounded fine to coarse of brick, tile, quartzite and flint.		
+21.01		2				
+20.91		2				
+20.81		3				
+20.71		1				
+20.61	2.50	1				
+20.51		1				
+20.41		2				
+20.31		2				
+20.21		2	0			
+20.11	3.00	3	2	MADE GROUND: Firm brown slightly gravelly CLAY. Gravel is angular to subrounded medium to coarse of brick and concrete.		
+20.01						
+19.91						
+19.61		2				
+19.51	3.50	2				
+19.41		1				
+19.31		1				
+19.21		1				
+19.11		1	3	Firm dark grey slightly gravelly slightly organic with plant remnants CLAY with slight organic (humic) odour. Gravel is subrounded medium of quartz. (DISTURBED LONDON CLAY)		
+19.01	4.00	2				
+18.91		1				
+18.81		1				
+18.71		2				
+18.61		2		Firm to stiff dark grey slightly gravelly CLAY. Gravel is subrounded medium to coarse of flint and quartzite. (DISTURBED LONDON CLAY)		
+18.51	4.50	2				
+18.41		2				
+18.31		2				
+18.21		2				
+18.11	5.00	2	7			
+18.01		3				
+17.91		15				
+17.81		25				
+17.71		26		Light brown and blackish subangular to subrounded medium to coarse GRAVEL of flint. (DISTURBED LONDON CLAY)		
+17.61		38		END OF PROBING HOLE		
+17.51						

Remarks

SPT Hammer ID: COM116 ER= 74%

Equipment, Methods and Comments

Archway Competitor
Carried out within location of WS06 prior to dynamic sampling. Dynamic super heavy probing (DPSH) to 5.45m.

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres.

AGS

Scale 1:50

23/03/2018 11:58:35

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Borehole

WSDP06

Sheet 1 of 1

APPENDIX C
INSTRUMENTATION AND MONITORING

Installation Details

Instrument Reference	Instrument Type (See Notes)	Installation Date, dd/mm/yyyy	Pipe Diameter, mm	Instrument Base, mbgl	Response Zone Range, mbgl	Pipe Top Details	Headworks	Remarks
BH02 (1)	SP	07/02/2018	50	4.00	1.00 to 4.00	Gas tap	Flush cover	
BH02 (2)	SPIE	07/02/2018	19	10.00	5.00 to 10.00	Gas tap	Flush cover	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer

AGS

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Table C1

Groundwater Monitoring

Instrument Reference	Instrument Type	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Groundwater depth, mbgl	Comments
BH02 (1)	SP	4.00	05/03/2018 13:24:00	3.61	
BH02 (1)	SP	4.00	19/03/2018 12:13:00	3.42	
BH02 (1)	SP	4.00	28/03/2018 11:18:00	3.48	
BH02 (2)	SPIE	10.00	05/03/2018 13:29:00	4.27	
BH02 (2)	SPIE	10.00	19/03/2018 12:18:00	3.26	
BH02 (2)	SPIE	10.00	28/03/2018 11:33:00	4.19	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer,

Gas Monitoring

SOCOTEC

							Gas Concentrations						
Instrument Reference	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Air Temperature, oC	Barometric Pressure, mbar	Gas Differential Pressure, Pa	Gas Flow Rate, l/hr	Carbon Dioxide, %vol	Carbon Monoxide, ppm	Hydrogen Sulphide, ppm	Methane Lower Explosive Limit, %LEL	Methane, %vol	Nitrogen, %vol	Oxygen, %vol
BH02 (1)	4.00	05/03/2018 13:21:00	10.0	988	0.0	0.0	0.2	ND	ND	ND	ND	78.1	20.9
BH02 (1)	4.00	05/03/2018 13:21:30			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	05/03/2018 13:22:00			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	05/03/2018 13:22:30			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	05/03/2018 13:23:00			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	05/03/2018 13:23:30			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	05/03/2018 13:24:00			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.5
BH02 (1)	4.00	19/03/2018 12:10:00	1.0	1003	0.0	0.1	ND	ND	ND	ND	ND	79.0	20.9
BH02 (1)	4.00	19/03/2018 12:10:30			0.0	0.1	ND	ND	ND	ND	ND	78.1	21.8
BH02 (1)	4.00	19/03/2018 12:11:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	19/03/2018 12:11:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	19/03/2018 12:12:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	19/03/2018 12:12:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	19/03/2018 12:13:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:15:00	3.0	1003	0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:15:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:16:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:16:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:17:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:17:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (1)	4.00	28/03/2018 11:18:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7

Notes: ND - not detected

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Figure C3

Gas Monitoring

SOCOTEC

							Gas Concentrations						
Instrument Reference	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Air Temperature, oC	Barometric Pressure, mbar	Gas Differential Pressure, Pa	Gas Flow Rate, l/hr	Carbon Dioxide, %vol	Carbon Monoxide, ppm	Hydrogen Sulphide, ppm	Methane Lower Explosive Limit, %LEL	Methane, %vol	Nitrogen, %vol	Oxygen, %vol
BH02 (2)	10.00	05/03/2018 13:26:00	10.0	988	0.0	0.1	0.1	ND	ND	ND	ND	78.1	20.9
BH02 (2)	10.00	05/03/2018 13:26:30			0.0	0.0	ND	ND	ND	ND	ND	78.4	21.4
BH02 (2)	10.00	05/03/2018 13:27:00			0.0	0.0	ND	ND	ND	ND	ND	78.5	21.4
BH02 (2)	10.00	05/03/2018 13:27:30			0.0	0.0	ND	ND	ND	ND	ND	78.5	21.4
BH02 (2)	10.00	05/03/2018 13:28:00			0.0	0.0	ND	ND	ND	ND	ND	78.5	21.4
BH02 (2)	10.00	05/03/2018 13:28:30			0.0	0.0	ND	ND	ND	ND	ND	78.5	21.4
BH02 (2)	10.00	05/03/2018 13:29:00			0.0	0.0	ND	ND	ND	ND	ND	78.5	21.4
BH02 (2)	10.00	19/03/2018 12:15:00	1.0	1002	0.0	0.1	ND	ND	ND	ND	ND	78.1	21.8
BH02 (2)	10.00	19/03/2018 12:15:30			0.0	0.0	ND	ND	ND	ND	ND	78.1	21.8
BH02 (2)	10.00	19/03/2018 12:16:00			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	19/03/2018 12:16:30			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	19/03/2018 12:17:00			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	19/03/2018 12:17:30			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	19/03/2018 12:18:00			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	28/03/2018 11:30:00	3.0	1002	0.0	0.0	ND	ND	ND	ND	ND	77.9	22.0
BH02 (2)	10.00	28/03/2018 11:30:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (2)	10.00	28/03/2018 11:31:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (2)	10.00	28/03/2018 11:31:30			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (2)	10.00	28/03/2018 11:32:00			0.0	0.0	ND	ND	ND	ND	ND	78.2	21.7
BH02 (2)	10.00	28/03/2018 11:32:30			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6
BH02 (2)	10.00	28/03/2018 11:33:00			0.0	0.0	ND	ND	ND	ND	ND	78.3	21.6

Notes: ND - not detected

Project GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Project No. E8013-18

Carried out for Kier Construction

Figure C3

APPENDIX D
GEOTECHNICAL LABORATORY TEST RESULTS

Index Properties – Summary of Results	INDX
Unconsolidated Undrained Triaxial Compression Tests – Summary of Results	UUSUM
One Dimensional Consolidation Test	OED
Chemical Tests - BRE	EFS/183327 EFS/183378

INDEX PROPERTIES - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	p	p_d	w	< 425 µm sieve	W_L	W_P	I_P	p_s	Remarks
	No.	Depth (m)		type		Mg/m3		%	%	%	%		Mg/m3	
		from	to											
BH01	23	8.00		D	Brown slightly sandy CLAY			27						
BH01	28	11.00		D	Brown slightly sandy CLAY			25						
BH01	34	15.00		D	Brown slightly sandy CLAY			21						
BH01	38	17.45		D	Brown slightly sandy CLAY			24	82	53 a	22	31		
BH01	45	21.30		D	Brown mottled grey slightly sandy CLAY			21	100	65 a	27	38		
BH01	51	25.35		D	Brown slightly sandy CLAY			22	100	72 a	31	41		
BH01	58	29.45		D	Grey slightly sandy CLAY.			27	100	76 a	28	48		
BH02	13	4.00		D	Dark brown slightly sandy slightly gravelly CLAY			18						
BH02	19	6.50	6.80	UT	Stiff laminated brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is mudstone.				100	89 a	35	54		
BH02	20	6.80		D	Light grey slightly clayey GRAVEL			9.5						
BH02	27	9.95		D	Brown slightly sandy CLAY			29	100	77 a	30	47		
BH02	33	13.45		D	Brown slightly sandy CLAY			25	100	74 a	31	43		
WS02	13	3.00		D	Light brown mottled dark brown slightly sandy slightly gravelly CLAY			17						
WS04	22	5.00		D	Brown mottled grey slightly sandy slightly gravelly CLAY			32	93	73 a	26	47		
WS05	18	4.00		D	Brown slightly sandy slightly gravelly CLAY			25	72	47 a	24	23		
WS06	12	2.00		D	Brown slightly sandy slightly gravelly CLAY			14	47	33 a	17	16		

General notes: All above tests carried out to BS1377 : 1990 unless annotated otherwise. See Remarks for further details

Key :

p	bulk density, linear	WL Liquid limit	WP	Plastic limit	<425um preparation	*ps particle density*
pd	dry density	a 4 point cone test	NP	non - plastic	n from natural soil	-g = gas jar
w	moisture content	b 1 point cone test	IP	Plasticity Index	s sieved specimen	-p = small pyknometer
*	test carried out to BS EN ISO 17892-1 2014					

QA Ref
SLR 1
Rev 2.91
Mar 17

SOCOTEC

Project No E8013-18

Project Name GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Figure

INDX

Printed: 09/03/2018 11:10

UNCONSOLIDATED UNDRAINED TRIAXIAL COMPRESSION TESTS WITHOUT MEASUREMENT OF PORE PRESSURE - SUMMARY OF RESULTS

Hole No.	Sample				Soil Description	Density		*w*	Test type	Dia.	ó3	At failure / end of stage				Membrane Thickness	Remarks
	No.	Depth (m)		type		bulk	dry					Axial strain	ó1 - ó3	*CU*	MODE		
		from	to			Mg/m3		%		mm	kPa	%	kPa	kPa		mm	
BH01	20	6.50	6.90	UT	Very stiff laminated greyish brown slightly sandy CLAY.	1.9	1.43	33	UU	102.2	140	5.5	194	97	B	0.2	
BH01	25	9.50	9.90	UT	Very stiff laminated greyish brown slightly sandy CLAY.	1.96	1.52	29	UU	103.1	200	5.5	274	137	B	0.2	
BH01	31	13.00	13.40	UT	Stiff laminated greyish brown slightly sandy CLAY.	2.04	1.65	24	UU	102.9	270	3.5	202	101	B	0.2	
BH01	37	17.00	17.45	UT	Stiff very laminated greyish brown slightly sandy slightly silty CLAY.	2	1.58	27	UU	103.4	350	6.5	298	149	B	0.2	
BH01	44	21.00	21.30	UT	Very stiff laminated multicoloured slightly sandy CLAY.	2.14	1.76	22	UU	103.3	430	13.4	295	147	B	0.2	
BH01	50	25.00	25.35	UT	Very stiff brown mottled grey slightly sandy CLAY.	2.07	1.67	24	UU	103.5	510	19.9	483	241	B	0.2	
BH01	57	29.00	29.45	UT	Very stiff laminated brownish grey slightly sandy slightly gravelly CLAY.	2.09	1.71	23	UU	103.5	590	5	824	412	B	0.2	
BH02	19	6.50	6.80	UT	Stiff laminated brown mottled grey slightly sandy slightly gravelly CLAY gravel is mudstone.	1.88	1.43	32	UU	103.7	140	11.1	99	50	B	0.2	
BH02	26	9.50	9.95	UT	Very stiff laminated greyish brown slightly sandy CLAY.	1.99	1.55	29	UU	103.2	200	4.5	275	138	B	0.2	
BH02	32	13.00	13.45	UT	Very stiff laminated greyish brown slightly sandy CLAY.	2	1.56	28	UU	103.5	270	3.5	270	135	B	0.2	

General notes: Tests carried out in accordance with BS1377: Part 7: 1990, clause 8 for single stage, clause 9 for multistage tests. Specimens nominally 2:1 height diameter ratio and tested at a rate of strain of 2%/minute, unless annotated otherwise. Latex rubber membrane used and membrane correction applied in accordance with BS1377-7 8.5.1.4 unless stated.

Legend						
	UU - single stage test (may be in sets of specimens)	ó3	cell pressure	Mode of failure	P	plastic
	UUM - multistage test on a single specimen	ó1 - ó3	deviator stress		B	brittle
	suffix R - remoulded or recompacted	*CU*	undrained shear strength		C	compound

QA Ref
SLR 2
Rev 2.7
Apr 15

UKAS TESTING
1157

SOCOTEC

Project No E8013-18

Project Name GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Figure

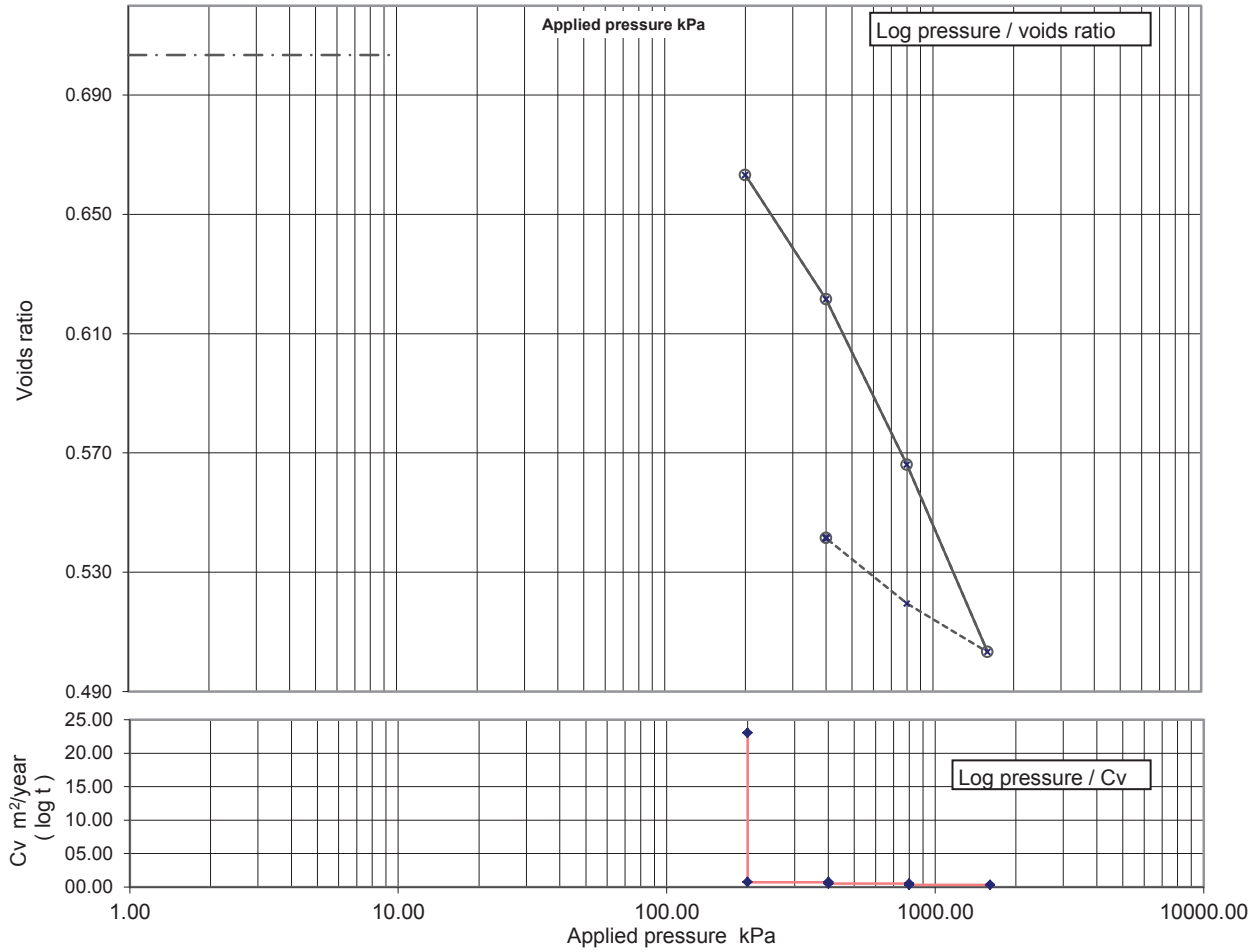
UUSUM

Printed: 09/03/2018 11:12

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	E8013-1820180209110045

Hole No	BH01
Sample Depth (m BGL)	17.00 - 17.45
Sample Type and No	UT37
Specimen Ref	



Soil description	Stiff very laminated greyish brown slightly sandy slightly silty CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.08		mm
Height	18.86	17.06	mm
Voids ratio	0.703	0.541	
Moisture content	25	21	%
Bulk density	1.94	2.09	Mg/m3
Dry density	1.56	1.72	Mg/m3
Saturation	94	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

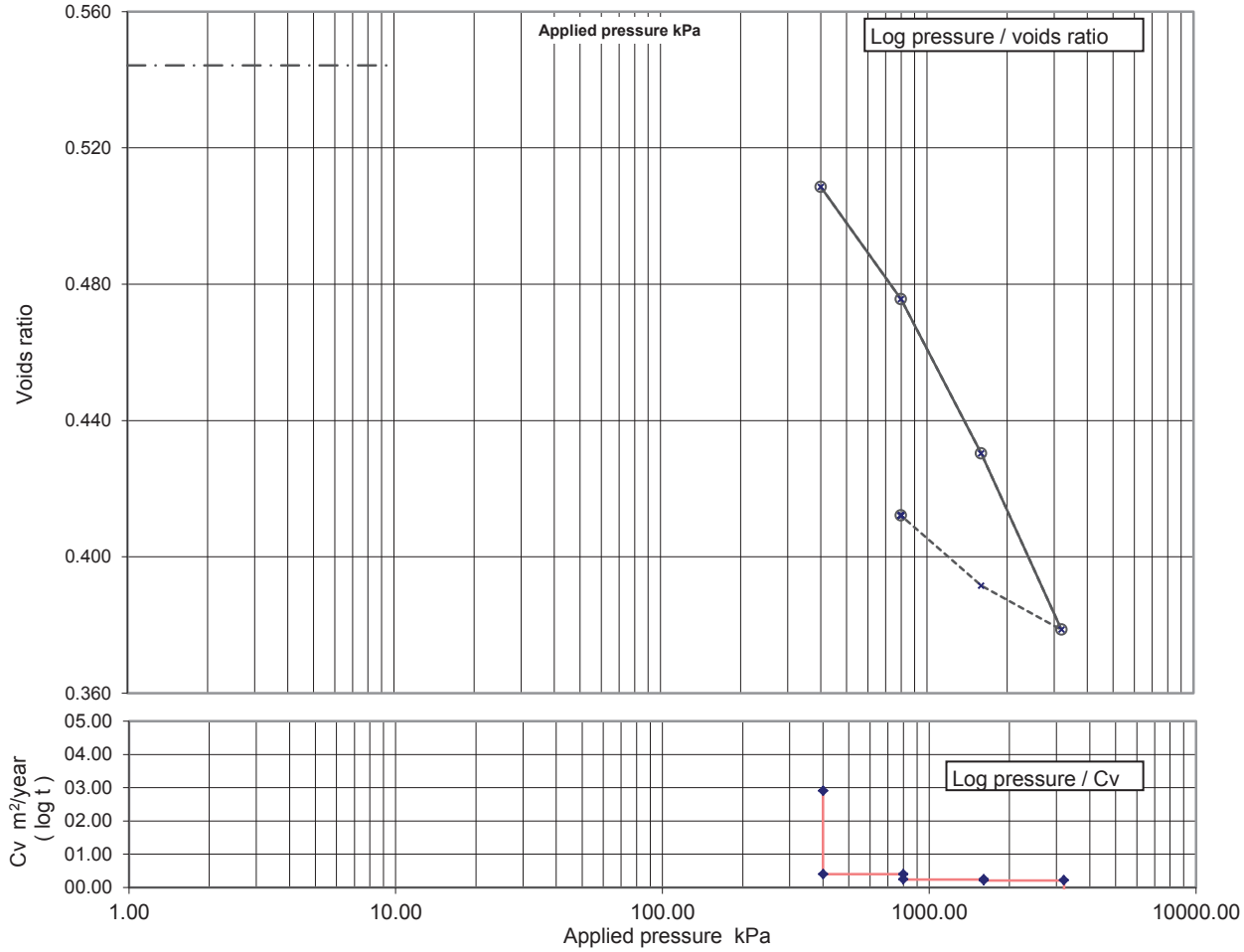
Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.7035				
200	0.6632	0.118	23	24	
400	0.6215	0.125	0.72	0.81	
800	0.5660	0.086	0.51	0.54	
1600	0.5032	0.050	0.31	0.33	
800	0.5194	0.014	-	-	
400	0.5414	0.036	-	-	

Specimen taken 30 mm from base of sample

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	E8013-1820180209110943

Hole No	BH01
Sample Depth (m BGL)	29.00 - 29.45
Sample Type and No	UT57
Specimen Ref	



Soil description	Very stiff laminated brownish grey slightly sandy slightly gravelly CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.05		mm
Height	19.00	17.37	mm
Voids ratio	0.544	0.412	
Moisture content	21	16	%
Bulk density	2.07	2.18	Mg/m3
Dry density	1.72	1.88	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure	not measured	kPa

Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
0	0.5442				
400	0.5085	0.058	2.9	3.7	
800	0.4755	0.055	0.4	0.43	
1600	0.4303	0.038	0.24	0.26	
3200	0.3786	0.023	0.21	0.22	
1600	0.3915	0.006	-	-	
800	0.4121	0.018	-	-	

Specimen taken 20 mm from base of sample

QA Ref
SLR 5.3
Rev 2.16
Nov 16

UKAS TESTING
1157

SOCOTEC

Project No E8013-18

Project Name GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Figure

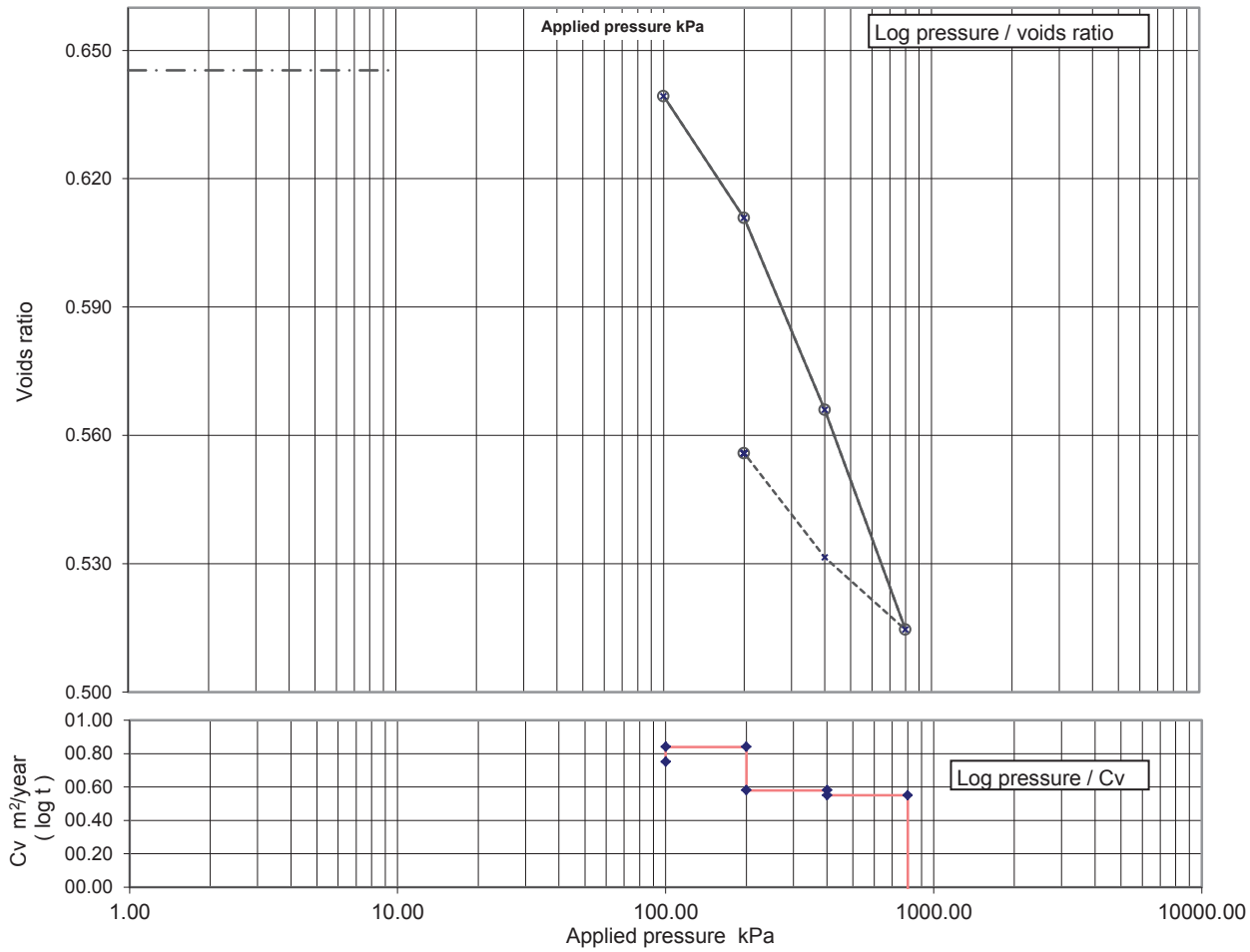
OED

Printed:
09/03/2018 11:11

ONE DIMENSIONAL CONSOLIDATION TEST

Sample Details:	SAMPLE ID:
	E8013-1820180209014643

Hole No	BH02
Sample Depth (m BGL)	9.50 - 9.95
Sample Type and No	UT26
Specimen Ref	



Soil description	Very stiff laminated greyish brown slightly sandy CLAY.
Preparation	Undisturbed
Index properties	Liquid limit % / Plastic limit %

(if available)

Specimen details	Initial	Final	
Particle density	2.65	assumed	Mg/m3
Diameter	75.04		mm
Height	18.79	17.76	mm
Voids ratio	0.645	0.556	
Moisture content	24	22	%
Bulk density	2.00	2.08	Mg/m3
Dry density	1.61	1.70	Mg/m3
Saturation	100	105	%
Average temperature for test	20		oC

Swelling pressure: 74 kPa

Notes :

Applied Pressure kPa	Voids ratio	mv m2/MN	cv (t50, log) m2/year	cv (t90, root) m2/year	
74	0.6453				
100	0.6393	0.141	0.75	0.8	
200	0.6108	0.174	0.84	0.88	
400	0.5660	0.139	0.58	0.63	
800	0.5146	0.082	0.55	0.57	
400	0.5315	0.028	-	-	
200	0.5558	0.079	-	-	

Specimen taken 20 mm from base of sample

QA Ref
SLR 5.3
Rev 2.16
Nov 16

UKAS TESTING
1157

SOCOTEC

Project No E8013-18

Project Name GREAT ORMOND STREET HOSPITAL P22 IMRI PROJECT

Figure
OED

Printed: 09/03/2018 11:11

TEST REPORT

UKAS TESTING
1252

Report No. EFS/183327 (Ver. 1)

SOCOTEC UK Limited Deeside
Unit 18
Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Site: E8013 - G.O.S.H

The 7 samples described in this report were registered for analysis by SOCOTEC UK Limited on 20-Feb-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 27-Feb-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes
Operations Director
Energy & Waste Services

Date of Issue: 27-Feb-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/l	%	pH Units												
Method Codes :			ICPACIDS	ICPWSS	TSBRE1	WSLM50												
Method Reporting Limits :			20	10	0.005													
UKAS Accredited :			Yes	Yes	No	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Total Sulphur.**	**pH (BS1377)**												
1894789	BH02 ES 3 0.50	06-Feb-18	3150	451	0.105	8.8												
1894790	BH02 ES 10 3.00	06-Feb-18	1510	353	0.068	8.3												
1894791	BH02 ES 12 4.00	06-Feb-18	1150 §	328 §	0.125	7.8												
1894792	WS03 ES 11 1.80	01-Feb-18	1180	383	0.100	8.0												
1894793	WS04 ES 21 4.60	31-Jan-18	532 §	129 §	0.042	8.2												
1894794	WS05 ES 4 0.50	30-Jan-18	4340	217	0.141	8.8												
1894795	WS06 ES 4 0.50	30-Jan-18	3260	173	0.122	11.6												

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Client Name	**SOCOTEC UK Limited Deeside**
Contact	Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183327**
Table Number	**1**

Where individual results are flagged see report notes for status.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183327

Consignment No S72389
Date Logged 20-Feb-2018
In-House Report Due 27-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	CustServ	Dep.Opt			ICPACIDS	ICPBRE	ICPWSS	KONECL	KoneNO3	TSBRE1	WSLM50
		Sampled	REPORT A	DO Cl if pH<5.5	DO Mg if SO4(W)>3000	DO NO3 if pH<5.5	SO4-- (acid sol)	Magnesium (BRE)	SO4-- (H2O sol) mg/l	Chloride:(2:1)	Nitrate (BRE 2:1): mg/l	Total Sulphur.	pH (BS1377)
							✓		✓				
CL/1894789	BH02 0.50	06/02/18											
CL/1894790	BH02 3.00	06/02/18											
CL/1894791	BH02 4.00	06/02/18											
CL/1894792	WS03 1.80	01/02/18											
CL/1894793	WS04 4.60	31/01/18											
CL/1894794	WS05 0.50	30/01/18											
CL/1894795	WS06 0.50	30/01/18											

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
TR Denotes Tremolite
AC Denotes Actinolite
AN Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Deeside

Site : E8013 - G.O.S.H

Report Number : S18_3327

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1894789	BH02 ES 3 0.50	SAND
CL/1894790	BH02 ES 10 3.00	CLAY
CL/1894791	BH02 ES 12 4.00	PEAT
CL/1894792	WS03 ES 11 1.80	CLAY
CL/1894793	WS04 ES 21 4.60	OTHER
CL/1894794	WS05 ES 4 0.50	SAND
CL/1894795	WS06 ES 4 0.50	SILT

TEST REPORT

UKAS TESTING
1252

Report No. EFS/183378 (Ver. 1)

SOCOTEC UK Limited Deeside
Unit 18
Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Site: E8013 G.O.S.H

The 4 samples described in this report were registered for analysis by SOCOTEC UK Limited on 21-Feb-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 28-Feb-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 28-Feb-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/l	%	pH Units												
Method Codes :			ICPACIDS	ICPWSS	TSBRE1	WSLM50												
Method Reporting Limits :			20	10	0.005													
UKAS Accredited :			Yes	Yes	No	No												
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**SO4-- (acid sol)**	**SO4-- (H2O sol) mg/l**	**Total Sulphur.**	**pH (BS1377)**												
1894947	BH01 D 21 6.90	05-Feb-18	932	302	0.063	8.3												
1894948	BH01 D 39 18.00	06-Feb-18	650	382	0.491	8.8												
1894949	BH02 D 28 10.50	07-Feb-18	824	462	0.576	8.6												
1894950	BH02 D 34 14.00	07-Feb-18	708	395	0.498	8.6												

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Client Name SOCOTEC UK Limited Deeside

Contact Mark Hamill

E8013 G.O.S.H

Sample Analysis

Date Printed	**28-Feb-2018**
Report Number	**EFS/183378**
Table Number	**1**

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 G.O.S.H
Report No S183378

Consignment No S72696
Date Logged 21-Feb-2018
In-House Report Due 28-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	CustServ	ICPACIDS	ICPWSS	TSBRE1	WSLM50
				REPORT A	SO4-- (acid sol)	SO4-- (H2O sol) mg/l	Total Sulphur.	pH (BS1377)
					✓	✓		
CL/1894947	BH01 6.90	05/02/18						
CL/1894948	BH01 18.00	06/02/18						
CL/1894949	BH02 10.50	07/02/18						
CL/1894950	BH02 14.00	07/02/18						

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

 The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPWSS	Oven Dried @ < 35°C	Determination of Water Soluble Sulphate in soil samples by water extraction followed by ICPOES detection
Soil	TSBRE1	Oven Dried @ < 35°C	Determination of Total Carbon and/or Total Sulphur in solid samples by high temperature combustion/infrared detection
Soil	WSLM50	Oven Dried @ < 35°C	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
TR Denotes Tremolite
AC Denotes Actinolite
AN Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Deeside

Site : E8013 G.O.S.H

Report Number : S18_3378

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1894947	BH01 D 21 6.90	CLAY
CL/1894948	BH01 D 39 18.00	CLAY
CL/1894949	BH02 D 28 10.50	CLAY
CL/1894950	BH02 D 34 14.00	CLAY

APPENDIX E

GEOENVIRONMENTAL LABORATORY TEST RESULTS

Test Reports - soil	EFS/183175 EFS/183180
Test Report - water	EXR/259655

TEST REPORT

UKAS TESTING
1252

Report No. EFS/183175 (Ver. 1)

SOCOTEC UK Limited Deeside
Unit 18
Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Site: E8013 - G.O.S.H

The 17 samples described in this report were registered for analysis by SOCOTEC UK Limited on 15-Feb-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 27-Feb-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 27-Feb-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			AMMAR	ICPACIDS	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	PAHMSUS	PCBECD	PCBECD	PCBECD
Method Reporting Limits :			0.5	20	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	3	0.08	5	5	5
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Exchange.Ammonium AR**	**SO4-- (acid sol)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Zinc (MS)**	**Naphthalene**	**PCB 101**	**PCB 118**	**PCB 138**
1894166	BH01 ES 4 0.50	05-Feb-18	<0.5	2120	1.4	11.3	0.16	21.5	23.4	4218	<0.1	14.6	<0.5	106.6	< 0.08	< 5.00	< 5.00	< 5.00
1894167	BH01 ES 9 2.00	05-Feb-18	0.6	3490	1.1	9.6	<0.1	21.9	17.1	136.9	0.27	17	<0.5	51.6	< 0.08	< 5.00	< 5.00	< 5.00
1894168	BH01 ES 11 3.00	05-Feb-18	<0.5	1390	1.4	11.2	<0.1	20	21.1	73.6	0.23	17	<0.5	42.9	< 0.08	< 5.00	< 5.00	< 5.00
1894169	BH02 ES 5 1.00	06-Feb-18	<0.5	3430	1.6	10	<0.1	18.4	12.3	223.1	<0.1	13.3	<0.5	34.8	< 0.08	< 5.00	< 5.00	< 5.00
1894170	WS01 ES 1 0.25	01-Feb-18	<0.5	3460	2.2	10.2	<0.1	22.7	19	178.7	<0.1	14.8	<0.5	85.1	< 0.08	< 5.00	< 5.00	< 5.00
1894171	WS01 ES 18 4.50	01-Feb-18	24.3	1920	2.7	13.3	0.16	30.5	57.9	159.9	0.68	22.3	0.8	75.2	< 0.08	< 5.00	< 5.00	< 5.00
1894172	WS02 ES 9 1.70	01-Feb-18	<0.5	1680	2	15.9	0.24	20.9	38.2	425	0.91	20.1	<0.5	119	< 0.08	< 5.00	< 5.00	< 5.00
1894173	WS03 ES 4 0.50	31-Jan-18	<0.5	4960	1.2	9.4	0.13	17.9	103.1	1082	0.14	14	<0.5	136.7	< 0.08	< 5.00	< 5.00	< 5.00
1894174	WS03 ES 14 2.80	01-Feb-18	<0.5	554	1.6	15.1	<0.1	23	29.4	124.3	1.77	19.9	<0.5	52	< 0.08	< 5.00	< 5.00	< 5.00
1894175	WS04 ES 9 0.05	30-Jan-18													7.00 §			
1894176	WS04 ES 4 0.50	30-Jan-18	<0.5	5200	1	18.8	0.15	24.2	44.9	938.1	0.19	20.8	<0.5	136.2	< 0.08	< 5.00	< 5.00	< 5.00
1894177	WS04 ES 12 1.70	31-Jan-18	<0.5	588	1.5	13.6	0.13	18	39.3	322.9	1.47	20.7	0.6	75.7	< 0.08	< 5.00	< 5.00	< 5.00
1894178	WS04 ES 18 3.70	31-Jan-18	0.6	774	2.6	13.7	0.13	25.3	36	159	0.92	23.4	1.1	70.2	< 0.08	< 5.00	< 5.00	< 5.00
1894179	WS05 ES 1 0.25	30-Jan-18	<0.5	794	2.2	13.9	0.12	20.8	62.8	413.8	1.34	21.2	<0.5	76.2	< 0.08	< 5.00	< 5.00	< 5.00
1894180	WS05 ES 7 1.00	30-Jan-18	<0.5	2810	1.4	12.3	0.17	20.4	31.2	277.4	0.76	17.3	<0.5	104.3	0.29	< 5.00	< 5.00	< 5.00
1894181	WS05 ES 11 1.80	31-Jan-18	<0.5	1730	1.4	25.1	0.23	24.6	56.3	341.4	1.08	30.4	1	171.7	< 0.08	< 5.00	< 5.00	< 5.00
1894182	WS05 ES 14 2.70	31-Jan-18	<0.5	158	0.7	9.1	<0.1	28	13.6	34.7	0.19	23.3	<0.5	25	< 0.08	< 5.00	< 5.00	< 5.00

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Contact Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	Sub020	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			5	5	5	5		0.5	0.5		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**pH units (AR)**	**Cyanide(Total) (AR)**	**Phenol Index.(AR)**	**^Asbestos ID (Stage 1)**	**1,2-Dichlorobenzene**	**1,3-Dichlorobenzene**	**1,4-Dichlorobenzene**	**1-Methylnaphthalene**	**2,4,5-Trichlorophenol**	**2,4,6-Trichlorophenol**	**2,4-Dichlorophenol**	**2,4-Dimethylphenol**
1894166	BH01 ES 4 0.50	05-Feb-18	< 5.00	< 5.00	< 5.00	< 5.00	8.4	<0.5	<0.5	NAIIS	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1894167	BH01 ES 9 2.00	05-Feb-18	< 5.00	< 5.00	< 5.00	32.0	9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894168	BH01 ES 11 3.00	05-Feb-18	< 5.00	< 5.00	< 5.00	21.7	8.8	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894169	BH02 ES 5 1.00	06-Feb-18	< 5.00	< 5.00	< 5.00	31.6	9.4	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894170	WS01 ES 1 0.25	01-Feb-18	< 5.00	< 5.00	< 5.00	< 5.00	9.2	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894171	WS01 ES 18 4.50	01-Feb-18	< 5.00	< 5.00	< 5.00	< 5.00	7.8	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894172	WS02 ES 9 1.70	01-Feb-18	< 5.00	< 5.00	< 5.00	< 5.00	9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894173	WS03 ES 4 0.50	31-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	9.1	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894174	WS03 ES 14 2.80	01-Feb-18	< 5.00	< 5.00	< 5.00	< 5.00	8.3	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	0.103	< 0.100	< 0.100	< 0.100	< 0.100
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	9.2	<0.5	<0.5	NAIIS	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500
1894177	WS04 ES 12 1.70	31-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894178	WS04 ES 18 3.70	31-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.6	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894179	WS05 ES 1 0.25	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.7	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894180	WS05 ES 7 1.00	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	9.2	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894181	WS05 ES 11 1.80	31-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.7	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894182	WS05 ES 14 2.70	31-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100

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Client Name SOCOTEC UK Limited Deeside

Contact Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.2	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.2
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**2,4-Dinitrotoluene**	**2,6-Dinitrotoluene**	**2-Chloronaphthalene**	**2-Chlorophenol**	**2-Methylnaphthalene**	**2-Methylphenol**	**2-Nitrophenol**	**3- & 4-Methylphenol**	**4-Bromophenyl-phenylether**	**4-Chloro-3-methylphenol**	**4-Chlorophenol**	**4-Chlorophenyl-phenylether**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**
1894166	BH01 ES 4 0.50	05-Feb-18	< 1.000	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 1.000
1894167	BH01 ES 9 2.00	05-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894168	BH01 ES 11 3.00	05-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894169	BH02 ES 5 1.00	06-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	0.136	< 0.100	0.503	0.914
1894170	WS01 ES 1 0.25	01-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894171	WS01 ES 18 4.50	01-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	0.188	< 0.200
1894172	WS02 ES 9 1.70	01-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894173	WS03 ES 4 0.50	31-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894174	WS03 ES 14 2.80	01-Feb-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 1.000	< 2.50	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 0.500	< 2.50	< 0.500	0.977	< 0.500	3.01	8.02
1894177	WS04 ES 12 1.70	31-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894178	WS04 ES 18 3.70	31-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894179	WS05 ES 1 0.25	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	0.256	< 0.200
1894180	WS05 ES 7 1.00	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894181	WS05 ES 11 1.80	31-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894182	WS05 ES 14 2.70	31-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200

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Client Name	**SOCOTEC UK Limited Deeside**
Contact	Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
		Method Codes :	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
		Method Reporting Limits :	0.2	0.2	0.5	0.2	0.5	0.1	0.1	0.1	0.5	0.2	0.2	0.1	0.5	0.1	0.1	0.1	
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
LAB ID Number CL/	Client Sample Description	Sample Date	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Benzyl alcohol	Biphenyl	bis(2-Chloroethoxy)methane	bis(2-Chloroethyl)ether	bis(2-Chloroisopropyl)ether	bis(2-Ethylhexyl)phthalate	Butylbenzylphthalate	Chrysene	Dibenzo(ah)anthracene	Dibenzofuran	Diethylphthalate	Dimethylphthalate	
1894166	BH01 ES 4 0.50	05-Feb-18	< 1.000	< 1.000	< 2.50	< 1.000	< 2.50	< 0.500	< 0.500	< 0.500	< 2.50	< 1.000	< 1.000	< 0.500	< 2.50	< 0.500	< 0.500	< 0.500	
1894167	BH01 ES 9 2.00	05-Feb-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894168	BH01 ES 11 3.00	05-Feb-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894169	BH02 ES 5 1.00	06-Feb-18	0.652	0.942	< 0.500	0.367	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	0.812	< 0.500	0.182	< 0.100	< 0.100	
1894170	WS01 ES 1 0.25	01-Feb-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894171	WS01 ES 18 4.50	01-Feb-18	0.235	0.321	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	0.281	< 0.500	< 0.100	< 0.100	< 0.100	
1894172	WS02 ES 9 1.70	01-Feb-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894173	WS03 ES 4 0.50	31-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894174	WS03 ES 14 2.80	01-Feb-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894175	WS04 ES 9 0.05	30-Jan-18																	
1894176	WS04 ES 4 0.50	30-Jan-18	5.42	7.54	< 2.50	3.20	< 2.50	< 0.500	< 0.500	< 0.500	< 2.50	< 1.000	< 1.000	6.82	< 2.50	0.998	< 0.500	< 0.500	
1894177	WS04 ES 12 1.70	31-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894178	WS04 ES 18 3.70	31-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894179	WS05 ES 1 0.25	30-Jan-18	0.335	0.455	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	0.356	< 0.500	0.115	< 0.100	< 0.100	
1894180	WS05 ES 7 1.00	30-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894181	WS05 ES 11 1.80	31-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894182	WS05 ES 14 2.70	31-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	

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Contact	Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	27-Feb-2018
Report Number	EFS/183175
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	TMSS	TPHFIDUS	TPHFIDUS
Method Reporting Limits :			0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.5	0.1	0.5	0.1	0.1	0.2	0.1	10	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Di-n-butylphthalate**	**Di-n-octylphthalate**	**Diphenyl Ether**	**Fluoranthene**	**Fluorene**	**Hexachlorobenzene**	**Hexachloroethane**	**Indeno(123-cd)pyrene**	**Naphthalene**	**Nitrobenzene**	**Phenanthrene**	**Phenol**	**Pyrene**	**Tot.Moisture @ 105C**	**TPH Band (>C10-C40)**	**TPH by GCFID (AR)**
1894166	BH01 ES 4 0.50	05-Feb-18	< 0.500	< 1.000	< 0.500	< 1.000	< 1.000	< 0.500	< 0.500	< 2.50	< 0.500	< 2.50	< 0.500	< 0.500	< 1.000	14.9	218	219
1894167	BH01 ES 9 2.00	05-Feb-18	< 0.100	< 0.200	< 0.100	0.234	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.151	< 0.100	0.202			91.3
1894168	BH01 ES 11 3.00	05-Feb-18	< 0.100	< 0.200	< 0.100	0.223	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.226	< 0.100	0.202			69.3
1894169	BH02 ES 5 1.00	06-Feb-18	< 0.100	< 0.200	< 0.100	2.47	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	1.85	< 0.100	1.97			158
1894170	WS01 ES 1 0.25	01-Feb-18	< 0.100	< 0.200	< 0.100	0.351	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.152	< 0.100	0.291			104
1894171	WS01 ES 18 4.50	01-Feb-18	< 0.100	< 0.200	< 0.100	0.845	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.621	< 0.100	0.671			136
1894172	WS02 ES 9 1.70	01-Feb-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200	13.9	178	179
1894173	WS03 ES 4 0.50	31-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200	16.0	186	187
1894174	WS03 ES 14 2.80	01-Feb-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.136	< 0.100	< 0.200			53.2
1894175	WS04 ES 9 0.05	30-Jan-18																13800 §
1894176	WS04 ES 4 0.50	30-Jan-18	< 0.500	< 1.000	< 0.500	19.2	< 1.000	< 0.500	< 0.500	3.16	< 0.500	< 2.50	9.72	< 0.500	16.6	18.0	492	493
1894177	WS04 ES 12 1.70	31-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200			134
1894178	WS04 ES 18 3.70	31-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200			66.2
1894179	WS05 ES 1 0.25	30-Jan-18	< 0.100	< 0.200	< 0.100	1.04	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.802	< 0.100	0.844			200
1894180	WS05 ES 7 1.00	30-Jan-18	< 0.100	< 0.200	< 0.100	0.292	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.249	< 0.100	0.228			174
1894181	WS05 ES 11 1.80	31-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200	18.9	76.0	77.0
1894182	WS05 ES 14 2.70	31-Jan-18	< 0.100	< 0.200	< 0.100	0.310	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.213	< 0.100	0.263			54.0

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

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Units :			mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			TPHFIDUS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			10	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Carbon Banding.**	**1,1,1,2-Tetrachloroethane**	**1,1,1-Trichloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,1-Dichloropropene**	**1,2,3-Trichlorobenzene**	**1,2,3-Trichloropropane**	**1,2,4-Trimethylbenzene**	**1,2-Dibromoethane**	**1,2-Dichlorobenzene**	**1,2-Dichloroethane**	**1,2-Dichloropropane**	**1,3,5-Trimethylbenzene**	**1,3-Dichlorobenzene**
1894166	BH01 ES 4 0.50	05-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894167	BH01 ES 9 2.00	05-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894168	BH01 ES 11 3.00	05-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894169	BH02 ES 5 1.00	06-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894170	WS01 ES 1 0.25	01-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894171	WS01 ES 18 4.50	01-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894172	WS02 ES 9 1.70	01-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894173	WS03 ES 4 0.50	31-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894174	WS03 ES 14 2.80	01-Feb-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894177	WS04 ES 12 1.70	31-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894178	WS04 ES 18 3.70	31-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894179	WS05 ES 1 0.25	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894180	WS05 ES 7 1.00	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894181	WS05 ES 11 1.80	31-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894182	WS05 ES 14 2.70	31-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**1,3-Dichloropropane**	**1,4-Dichlorobenzene**	**2,2-Dichloropropane**	**2-Chlorotoluene**	**4-Chlorotoluene**	**Benzene**	**Bromobenzene**	**Bromochloromethane**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**	**Carbon Tetrachloride**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**
1894166	BH01 ES 4 0.50	05-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894167	BH01 ES 9 2.00	05-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894168	BH01 ES 11 3.00	05-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894169	BH02 ES 5 1.00	06-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894170	WS01 ES 1 0.25	01-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894171	WS01 ES 18 4.50	01-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894172	WS02 ES 9 1.70	01-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894173	WS03 ES 4 0.50	31-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894174	WS03 ES 14 2.80	01-Feb-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894177	WS04 ES 12 1.70	31-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894178	WS04 ES 18 3.70	31-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894179	WS05 ES 1 0.25	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894180	WS05 ES 7 1.00	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894181	WS05 ES 11 1.80	31-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894182	WS05 ES 14 2.70	31-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*

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Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			5	1	1	1	2	1	4	1	5	1	2	1	1	1	1	1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**cis 1,2-Dichloroethene**	**cis 1,3-Dichloropropene**	**Dibromochloromethane**	**Dibromomethane**	**Ethylbenzene**	**iso-Propylbenzene**	**m and p-Xylene**	**MTBE**	**Naphthalene**	**n-Butylbenzene**	**o-Xylene**	**p-Isopropyltoluene**	**Propylbenzene**	**sec-Butylbenzene**	**Styrene**	**tert-Butylbenzene**
1894166	BH01 ES 4 0.50	05-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894167	BH01 ES 9 2.00	05-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	13.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894168	BH01 ES 11 3.00	05-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894169	BH02 ES 5 1.00	06-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894170	WS01 ES 1 0.25	01-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894171	WS01 ES 18 4.50	01-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894172	WS02 ES 9 1.70	01-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894173	WS03 ES 4 0.50	31-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894174	WS03 ES 14 2.80	01-Feb-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894177	WS04 ES 12 1.70	31-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894178	WS04 ES 18 3.70	31-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894179	WS05 ES 1 0.25	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	31.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894180	WS05 ES 7 1.00	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894181	WS05 ES 11 1.80	31-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894182	WS05 ES 14 2.70	31-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	WSLM59	KONECR	ORGMAT	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			3	5	1	1	1	1	1	0.02	0.1	0.1	0.1	0.5	0.5	14.5	0.2	0.5
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Tetrachloroethene**	**Toluene**	**trans 1,2-Dichloroethene**	**trans 1,3-Dichloropropene**	**Trichloroethene**	**Trichlorofluoromethane**	**Vinyl Chloride**	**Total Organic Carbon**	**Chromium vi:**	**Organic Matter %**	**1,2,4-Trichlorobenzene**	**2,4-Dinitrophenol**	**2-Nitroaniline**	**3-Nitroaniline**	**4,6-Dinitro-2-methylphenol**	**4-Chloroaniline**
1894166	BH01 ES 4 0.50	05-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.27	0.3	0.6	< 0.500	< 2.50	< 2.50	< 72.5	< 1.000	< 2.50
1894167	BH01 ES 9 2.00	05-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	0.8	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894168	BH01 ES 11 3.00	05-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	1.7	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894169	BH02 ES 5 1.00	06-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		0.3	1.2	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894170	WS01 ES 1 0.25	01-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		0.2	1.4	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894171	WS01 ES 18 4.50	01-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	5.9	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894172	WS02 ES 9 1.70	01-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.62	<0.1	2.9	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894173	WS03 ES 4 0.50	31-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.41	0.2	1.7	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894174	WS03 ES 14 2.80	01-Feb-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	3.5	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.92	0.1	2.3	< 0.500	< 2.50	< 2.50	< 72.5	< 1.000	< 2.50
1894177	WS04 ES 12 1.70	31-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	3.0	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894178	WS04 ES 18 3.70	31-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	3.0	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894179	WS05 ES 1 0.25	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	3.7	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894180	WS05 ES 7 1.00	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		0.2	2.5	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894181	WS05 ES 11 1.80	31-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.03	<0.1	4.0	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894182	WS05 ES 14 2.70	31-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0		<0.1	1.6	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	BTEXHSA
Method Reporting Limits :			0.6	0.5	0.5	0.3	0.1	0.1	0.1	0.9	0.1	0.5	1	3	1	1	2	10
UKAS Accredited :			No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**4-Nitroaniline**	**4-Nitrophenol**	**Benzoic Acid**	**Coronene**	**Hexachlorobutadiene**	**Hexachlorocyclopentadiene**	**Isophorone**	**N-Nitroso-di-n-propylamine**	**N-Nitrosodiphenylamine**	**Pentachlorophenol**	**1,1,2,2-Tetrachloroethane**	**1,2,4-Trichlorobenzene**	**1,2-Dibromo-3-chloropropane**	**Dichlorodifluoromethane**	**Hexachlorobutadiene**	**Benzene**
1894166	BH01 ES 4 0.50	05-Feb-18	< 3.00	< 2.50	< 2.50	< 1.50	< 0.500	< 0.500	< 0.500	< 4.50	< 0.500	< 2.50	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894167	BH01 ES 9 2.00	05-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894168	BH01 ES 11 3.00	05-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894169	BH02 ES 5 1.00	06-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894170	WS01 ES 1 0.25	01-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894171	WS01 ES 18 4.50	01-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894172	WS02 ES 9 1.70	01-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894173	WS03 ES 4 0.50	31-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894174	WS03 ES 14 2.80	01-Feb-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894175	WS04 ES 9 0.05	30-Jan-18																
1894176	WS04 ES 4 0.50	30-Jan-18	< 3.00	< 2.50	< 2.50	< 1.50	< 0.500	< 0.500	< 0.500	< 4.50	< 0.500	< 2.50	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894177	WS04 ES 12 1.70	31-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894178	WS04 ES 18 3.70	31-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894179	WS05 ES 1 0.25	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894180	WS05 ES 7 1.00	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894181	WS05 ES 11 1.80	31-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10
1894182	WS05 ES 14 2.70	31-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0	< 2.0	<10

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			10	10	20	30	20	10	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Toluene**	**Ethyl Benzene**	**MTBE**	**Xylenes**	**m/p Xylenes**	**o Xylene**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenzo(ah)anthracene**
1894166	BH01 ES 4 0.50	05-Feb-18	<10	<10	<20	<30	<20	<10	< 0.08	< 0.08	< 0.08	0.12	0.08	0.08	< 0.08	< 0.08	0.09	< 0.08
1894167	BH01 ES 9 2.00	05-Feb-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	0.13	0.24	0.17	0.19	0.12	0.09	0.21	< 0.08
1894168	BH01 ES 11 3.00	05-Feb-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	0.09	0.17	0.13	0.14	0.08	< 0.08	0.17	< 0.08
1894169	BH02 ES 5 1.00	06-Feb-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	0.26	0.56	0.37	0.47	0.20	0.20	0.49	< 0.08
1894170	WS01 ES 1 0.25	01-Feb-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1894171	WS01 ES 18 4.50	01-Feb-18	<10	<10		<30	<20	<10	0.11	0.09	0.39	0.99	0.90	1.10	0.50	0.45	0.94	0.12
1894172	WS02 ES 9 1.70	01-Feb-18	<10	<10	<20	<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1894173	WS03 ES 4 0.50	31-Jan-18	<10	<10	<20	<30	<20	<10	< 0.08	< 0.08	< 0.08	0.12	0.09	0.09	< 0.08	< 0.08	0.10	< 0.08
1894174	WS03 ES 14 2.80	01-Feb-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1894175	WS04 ES 9 0.05	30-Jan-18							46.9 §	15.0 §	161 §	269 §	190 §	218 §	86.7 §	82.9 §	210 §	23.0 §
1894176	WS04 ES 4 0.50	30-Jan-18	<10	<10	<20	<30	<20	<10	0.26	0.14	0.91	1.65	1.16	1.22	0.55	0.45	1.15	0.15
1894177	WS04 ES 12 1.70	31-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	0.21	0.17	0.17	0.09	< 0.08	0.16	< 0.08
1894178	WS04 ES 18 3.70	31-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1894179	WS05 ES 1 0.25	30-Jan-18	<10	<10		<30	<20	<10	0.11	0.11	0.26	0.46	0.33	0.47	0.19	0.17	0.31	< 0.08
1894180	WS05 ES 7 1.00	30-Jan-18	<10	<10		<30	<20	<10	0.25	0.10	0.64	0.59	0.50	0.50	0.25	0.20	0.43	0.08
1894181	WS05 ES 11 1.80	31-Jan-18	<10	<10	<20	<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
1894182	WS05 ES 14 2.70	31-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	0.13	0.09	0.10	< 0.08	< 0.08	0.10	< 0.08

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Sample Analysis

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Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg									
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS									
Method Reporting Limits :			0.08	0.08	0.08	0.08	0.08	1.28	0.08									
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	No									
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**Coronene**									
1894166	BH01 ES 4 0.50	05-Feb-18	0.24	< 0.08	< 0.08	0.18	0.18	< 1.69	< 0.08									
1894167	BH01 ES 9 2.00	05-Feb-18	0.52	< 0.08	0.12	0.46	0.40	< 3.06										
1894168	BH01 ES 11 3.00	05-Feb-18	0.37	< 0.08	0.09	0.41	0.30	< 2.43										
1894169	BH02 ES 5 1.00	06-Feb-18	1.48	< 0.08	0.24	1.04	1.13	< 6.86										
1894170	WS01 ES 1 0.25	01-Feb-18	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 1.28										
1894171	WS01 ES 18 4.50	01-Feb-18	2.43	0.12	0.60	1.29	1.99	< 12.1										
1894172	WS02 ES 9 1.70	01-Feb-18	0.09	< 0.08	< 0.08	< 0.08	< 0.08	< 1.29	< 0.08									
1894173	WS03 ES 4 0.50	31-Jan-18	0.23	< 0.08	< 0.08	0.19	0.18	< 1.73	< 0.08									
1894174	WS03 ES 14 2.80	01-Feb-18	< 0.08	< 0.08	< 0.08	0.08	< 0.08	< 1.28										
1894175	WS04 ES 9 0.05	30-Jan-18	759 §	50.1 §	113 §	696 §	568 §	3500 §										
1894176	WS04 ES 4 0.50	30-Jan-18	3.86	0.23	0.76	2.78	3.02	< 18.4	0.19									
1894177	WS04 ES 12 1.70	31-Jan-18	0.30	< 0.08	0.12	0.21	0.24	< 2.22										
1894178	WS04 ES 18 3.70	31-Jan-18	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 1.28										
1894179	WS05 ES 1 0.25	30-Jan-18	1.37	0.12	0.26	0.76	1.28	< 6.35										
1894180	WS05 ES 7 1.00	30-Jan-18	1.42	0.40	0.36	1.73	1.06	8.79										
1894181	WS05 ES 11 1.80	31-Jan-18	< 0.08	< 0.08	< 0.08	0.09	< 0.08	< 1.29	< 0.08									
1894182	WS05 ES 14 2.70	31-Jan-18	0.28	< 0.08	< 0.08	0.22	0.21	< 1.86										

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Client Name	**SOCOTEC UK Limited Deeside**
Contact	Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183175**
Table Number	**1**

Where individual results are flagged see report notes for status.

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details: SOCOTEC UK Limited Deeside : E8013 - G.O.S.H
Job Number: s18_3175
QC Batch Number: 180182
Directory: D:\TES\DATA\2018\022018\022018 2018-02-20 10-35-25\F-057-74-CL1894182.D
Method: Ultra Sonic

Matrix: Soil
Date Booked in: 15-Feb-18
Date Extracted: 19-Feb-18
Date Analysed: 20-Feb-18, 21:47:37

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight				
Sample ID	**Client ID**	**>C8 - C10**	**>C10 - C12**	**>C12 - C16**	**>C16 - C21**	**>C21 - C35**
CL1894166	BH01 ES 4 0.50	<2	<2	8.76	36.2	161
CL1894167	BH01 ES 9 2.00	<2	<2	2.84	12.4	71.7
CL1894168	BH01 ES 11 3.00	<2	<2	3.15	11	52.1
CL1894169	BH02 ES 5 1.00	<2	<2	3.84	27.4	122
CL1894170	WS01 ES 1 0.25	<2	<2	2.71	20	78.3
CL1894171	WS01 ES 18 4.50	<2	<2	8.25	24.5	99
CL1894172	WS02 ES 9 1.70	<2	<2	3.24	36.8	136
CL1894173	WS03 ES 4 0.50	<2	<2	2.26	28.4	147
CL1894174	WS03 ES 14 2.80	<2	<2	5.27	12.1	33.1
CL1894176	WS04 ES 4 0.50	<2	<2	8.91	73.4	367
CL1894177	WS04 ES 12 1.70	<2	<2	5.89	21.5	75.3
CL1894178	WS04 ES 18 3.70	<2	<2	6.99	12.9	38.4
CL1894179	WS05 ES 1 0.25	<2	<2	5.45	26.2	147
CL1894180	WS05 ES 7 1.00	<2	<2	8.09	36.3	119
CL1894181	WS05 ES 11 1.80	<2	<2	6.87	15.9	46.4
CL1894182	WS05 ES 14 2.70	<2	<2	4.28	10.4	31.1

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.259
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	14.9
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.416
					Fraction of sample above 4 mm %	64.500
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
BH01 ES 4 0.50		s18_3175	CL/1894166	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.28	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	256	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.08	100		
U	PHSOIL	pH (pH units)	8.4		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except °°		mg/kg (dry weight)				
U	WSLM3	pH (pH units) °°	9.9	10.2	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) °°	1080	408					
U	ICPMSW	Arsenic	0.009	0.005	0.018	0.06	0.5	2	25
U	ICPWATVAR	Barium	0.01	<0.01	0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.057	0.02	0.114	0.25	0.5	10	70
U	ICPMSW	Copper	0.006	0.002	0.012	0.03	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.024	0.004	0.048	0.07	0.5	10	30
U	ICPMSW	Nickel	0.004	0.001	0.008	0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.003	0.002	0.006	0.02	0.06	0.7	5
U	ICPMSW	Selenium	0.003	<0.001	0.006	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	29	5	58	82	800	15000	25000
U	ISEF	Fluoride	0.1	0.2	0.2	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	448	124	896	1672	1000	20000	50000
N	WSLM27	Total Dissolved Solids	842	318	1684	3879	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	14	2.9	28	44	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.259
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	13.9
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.416
					Fraction of sample above 4 mm %	28.100
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS02 ES 9 1.70		s18_3175	CL/1894172	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.65	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.06	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	207	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.59	100		
U	PHSOIL	pH (pH units)	9		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	8.5	8.7	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	691	211					
U	ICPMSW	Arsenic	0.05	0.057	0.1	0.56	0.5	2	25
U	ICPWATVAR	Barium	<0.01	0.02	<0.02	<0.2	20	100	300
U	ICPMSW	Cadmium	<0.0001	0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.004	0.003	0.008	0.03	0.5	10	70
U	ICPMSW	Copper	0.007	0.027	0.014	0.24	2	50	100
U	ICPMSW	Mercury	0.0002	0.0004	0.0004	0.004	0.01	0.2	2
U	ICPMSW	Molybdenum	0.033	0.005	0.066	0.09	0.5	10	30
U	ICPMSW	Nickel	0.001	0.003	0.002	0.03	0.4	10	40
U	ICPMSW	Lead	0.005	0.124	0.01	1.08	0.5	10	50
U	ICPMSW	Antimony	0.006	0.003	0.012	0.03	0.06	0.7	5
U	ICPMSW	Selenium	0.008	0.001	0.016	0.02	0.1	0.5	7
U	ICPMSW	Zinc	0.003	0.037	0.006	0.32	4	50	200
U	KONENS	Chloride	22	8	44	99	800	15000	25000
U	ISEF	Fluoride	1.8	0.9	3.6	10	10	150	500
U	ICPWATVAR	Sulphate as SO4	199	20	398	439	1000	20000	50000
N	WSLM27	Total Dissolved Solids	539	164	1078	2140	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	6.1	9.9	12.2	94	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.262
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	16.0
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.413
					Fraction of sample above 4 mm %	52.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS03 ES 4 0.50		s18_3175	CL/1894173	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.42	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	221	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.15	100		
U	PHSOIL	pH (pH units)	9.1		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	10.1	10.3	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	1270	377					
U	ICPMSW	Arsenic	0.003	0.002	0.006	0.02	0.5	2	25
U	ICPWATVAR	Barium	0.01	<0.01	0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.057	0.013	0.114	0.19	0.5	10	70
U	ICPMSW	Copper	0.011	0.003	0.022	0.04	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.013	0.002	0.026	0.03	0.5	10	30
U	ICPMSW	Nickel	0.002	<0.001	0.004	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.007	0.006	0.014	0.06	0.06	0.7	5
U	ICPMSW	Selenium	0.002	<0.001	0.004	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.009	<0.002	0.018	<0.03	4	50	200
U	KONENS	Chloride	42	7	84	117	800	15000	25000
U	ISEF	Fluoride	0.2	0.2	0.4	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	527	94	1054	1517	1000	20000	50000
N	WSLM27	Total Dissolved Solids	991	294	1982	3869	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	11	2.1	22	33	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.265
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	16.0
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.410
					Fraction of sample above 4 mm %	83.900
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS04 ES 4 0.50		s18_3175	CL/1894176	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	0.93	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	586	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<22.13	100		
U	PHSOIL	pH (pH units)	9.2		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	11.3	11.2	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	1020	531					
U	ICPMSW	Arsenic	0.015	0.005	0.03	0.06	0.5	2	25
U	ICPWATVAR	Barium	0.02	0.01	0.04	0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.026	0.011	0.052	0.13	0.5	10	70
U	ICPMSW	Copper	0.014	0.004	0.028	0.05	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.02	0.004	0.04	0.06	0.5	10	30
U	ICPMSW	Nickel	0.002	<0.001	0.004	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.003	0.003	0.006	0.03	0.06	0.7	5
U	ICPMSW	Selenium	0.001	<0.001	0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	52	10	104	156	800	15000	25000
U	ISEF	Fluoride	0.1	0.2	0.2	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	62	34	124	377	1000	20000	50000
N	WSLM27	Total Dissolved Solids	793	414	1586	4645	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	9.9	2.7	19.8	37	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

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Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.265
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	18.9
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.410
					Fraction of sample above 4 mm %	#VALUE!
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS05 ES 11 1.80		s18_3175	CL/1894181	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.07	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	93.7	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.69	100		
U	PHSOIL	pH (pH units)	8.7		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	9.8	9.8	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	529	239					
U	ICPMSW	Arsenic	0.021	0.021	0.042	0.21	0.5	2	25
U	ICPWATVAR	Barium	0.01	<0.01	0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.005	0.002	0.01	0.02	0.5	10	70
U	ICPMSW	Copper	0.015	0.005	0.03	0.06	2	50	100
U	ICPMSW	Mercury	0.0001	<0.0001	0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.038	0.006	0.076	0.1	0.5	10	30
U	ICPMSW	Nickel	0.003	<0.001	0.006	<0.01	0.4	10	40
U	ICPMSW	Lead	0.007	0.005	0.014	0.05	0.5	10	50
U	ICPMSW	Antimony	0.005	0.003	0.01	0.03	0.06	0.7	5
U	ICPMSW	Selenium	0.008	0.002	0.016	0.03	0.1	0.5	7
U	ICPMSW	Zinc	0.005	0.004	0.01	0.04	4	50	200
U	KONENS	Chloride	15	4	30	55	800	15000	25000
U	ISEF	Fluoride	0.3	0.2	0.6	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	177	25	354	453	1000	20000	50000
N	WSLM27	Total Dissolved Solids	412	186	824	2161	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	14	3.3	28	47	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

IOM

WORKING FOR A HEALTHIER FUTURE

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: 57187-1

PROJECT NO: 610

DATE OF ISSUE: 27.02.18

DATE SAMPLES RECEIVED: 19.02.18

DATE SAMPLES ANALYSED: 26.02.18

SAMPLE DESCRIPTION: Sixteen soil/loose aggregate samples.

ANALYSIS REQUESTED: Qualitative analysis of samples for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of entire samples followed by detailed analysis of representative sub-samples. The sub-samples are analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

No asbestos was detected in any of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

www.iom-world.org

Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

UKAS TESTING
0374

CONTRACT NO: 57187-1
PROJECT NO: 610
DATE OF ISSUE: 27.02.18

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: S183175

IOM sample number	Client sample number	ACM type detected	PLM result
S54127	S1894166 BH01 0.50	-	No Asbestos Detected
S54128	S1894167 BH01 2.00	-	No Asbestos Detected
S54129	S1894168 BH01 3.00	-	No Asbestos Detected
S54130	S1894169 BH02 1.00	-	No Asbestos Detected
S54131	S1894170 WS01 0.25	-	No Asbestos Detected
S54132	S1894171 WS01 4.50	-	No Asbestos Detected
S54133	S1894172 WS02 1.70	-	No Asbestos Detected
S54134	S1894173 WS03 0.50	-	No Asbestos Detected
S54135	S1894174 WS03 2.80	-	No Asbestos Detected
S54136	S1894176 WS04 0.50	-	No Asbestos Detected
S54137	S1894177 WS04 1.70	-	No Asbestos Detected
S54138	S1894178 WS04 3.70	-	No Asbestos Detected
S54139	S1894179 WS05 0.25	-	No Asbestos Detected
S54140	S1894180 WS05 1.00	-	No Asbestos Detected
S54141	S1894181 WS05 1.80	-	No Asbestos Detected
S54142	S1894182 WS05 2.70	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.

AUTHORISED BY: .....
D Third
Scientific Technician

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183175

Consignment No S72259
Date Logged 15-Feb-2018
In-House Report Due 22-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	AMMAR	BTEXHSA			CEN Leachate		CustServ	ICPACIDS	ICPBOR	ICPMSS									KONECR	ORGMAT	PAHMSUS		PCBECD	PHSOIL	SFAPI
		Sampled	Exchange.Ammonium AR	BTEX-HSA + MTBE analysis	BTEX-HSA Analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	SO4-- (acid sol)	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	Chromium vi:	Organic Matter %	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)	Cyanide(Total) (AR)
			✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓
CL/1894166	BH01 0.50	05/02/18		E	E	E																			E	E	
CL/1894167	BH01 2.00	05/02/18			E																				E	E	
CL/1894168	BH01 3.00	05/02/18			E																				E	E	
CL/1894169	BH02 1.00	06/02/18																							E	E	
CL/1894170	WS01 0.25	01/02/18			E																				E	E	
CL/1894171	WS01 4.50	01/02/18			E																				E	E	
CL/1894172	WS02 1.70	01/02/18		E	E	E																			E	E	
CL/1894173	WS03 0.50	31/01/18		E	E	E																			E	E	
CL/1894174	WS03 2.80	01/02/18			E																				E	E	
CL/1894175	WS04 0.05	30/01/18																									
CL/1894176	WS04 0.50	30/01/18		E	E	E																			E	E	
CL/1894177	WS04 1.70	31/01/18			E																				E	E	
CL/1894178	WS04 3.70	31/01/18			E																				E	E	
CL/1894179	WS05 0.25	30/01/18			E																				E	E	
CL/1894180	WS05 1.00	30/01/18			E																				E	E	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183175

Consignment No S72259
Date Logged 15-Feb-2018
In-House Report Due 22-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI	Sub020	SVOCSW	TMSS	TPHFIDUS			VOCHSAS	WSLM59
		Sampled	Phenol Index.(AR)	^Asbestos ID (Stage 1)	SVOC (AR)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Carbon Banding.	VOC HSA-GCMS	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	
CL/1894166	BH01 0.50	05/02/18			E		E	E	E	E	
CL/1894167	BH01 2.00	05/02/18			E			E	E	E	
CL/1894168	BH01 3.00	05/02/18			E			E	E	E	
CL/1894169	BH02 1.00	06/02/18			E						
CL/1894170	WS01 0.25	01/02/18			E			E	E	E	
CL/1894171	WS01 4.50	01/02/18			E			E	E	E	
CL/1894172	WS02 1.70	01/02/18			E		E	E	E	E	
CL/1894173	WS03 0.50	31/01/18			E		E	E	E	E	
CL/1894174	WS03 2.80	01/02/18			E			E	E	E	
CL/1894175	WS04 0.05	30/01/18						E			
CL/1894176	WS04 0.50	30/01/18			E		E	E	E	E	
CL/1894177	WS04 1.70	31/01/18			E			E	E	E	
CL/1894178	WS04 3.70	31/01/18			E			E	E	E	
CL/1894179	WS05 0.25	30/01/18			E			E	E	E	
CL/1894180	WS05 1.00	30/01/18			E			E	E	E	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

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Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183175

Consignment No S72259
Date Logged 15-Feb-2018
In-House Report Due 22-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	AMMAR	BTEXHSA			CEN Leachate		CustServ	ICPACIDS	ICPBOR	ICPMSS									KONECR	ORGMAT	PAHMSUS		PCBECD	PHSOIL	SFAPI
		Sampled	Exchange.Ammonium AR	BTEX-HSA + MTBE analysis	BTEX-HSA Analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	SO4-- (acid sol)	Boron (H20 Soluble)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	Chromium vi:	Organic Matter %	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)	Cyanide(Total) (AR)
			✓	✓			✓	✓		✓	✓			✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
CL/1894181	WS05 1.80	31/01/18		E	E	E																			E	E	
CL/1894182	WS05 2.70	31/01/18		E	E																				E	E	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

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SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183175

Consignment No S72259
Date Logged 15-Feb-2018
In-House Report Due 22-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI	Sub020	SVOCSW	TMSS	TPHFIDUS			VOCHSAS	WSLM59
		Sampled	Phenol Index.(AR)	^Asbestos ID (Stage 1)	SVOC (AR)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Carbon Banding.	VOC HSA-GCMS	Total Organic Carbon
			✓	✓	✓		✓	✓	✓	✓	✓
CL/1894181	WS05 1.80	31/01/18			E		E	E	E	E	
CL/1894182	WS05 2.70	31/01/18			E			E	E	E	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

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Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.
The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
PAHMSUS	CL1894175	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted to improve the signal to noise ratio but in doing so, the detection limit for this test has been elevated.
SVOCSW	CL1894166 CL1894176	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted to improve the signal to noise ratio but in doing so, the detection limit for this test has been elevated.
VOCHSAS	CL1894166 TO CL1894174 CL1894176 TO CL1894182	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (Chloromethane) . These circumstances should be taken into consideration when utilising the data.
VOCHSAS	CL1894167 TO CL1894174 CL1894176 TO CL1894182	Due to matrix interference, the Internal Standard recovery for this Test is below the required QMS specification. This has been confirmed by historic data. All other Laboratory Process Controls meet the requirements of the QMS unless otherwise stated. These circumstances should be taken into consideration when utilising the data.
BTEXHSA	CL1894176	Due to matrix interference, the Internal Standard recovery for this Test is below the required QMS specification. This has been confirmed by repeating the analysis. All other Laboratory Process Controls meet the requirements of the QMS unless otherwise stated. These circumstances should be taken into consideration when utilising the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	AMMAR	As Received	Determination of Exchangeable Ammonium in Soil using potassium chloride extraction, discrete colorimetric detection
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	KONECR	Oven Dried @ < 35°C	Determination of Chromium vi in soil samples by water extraction followed by colorimetric detection
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	SVOCSW	As Received	Determination of Semi-Volatile Organic Compounds by dichloromethane/acetone extraction followed by GCMS detection
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	VOCHSAS	As Received	Determination of Volatile Organic Compounds (VOC) by Headspace GCMS
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
TR Denotes Tremolite
AC Denotes Actinolite
AN Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Deeside

Site : E8013 - G.O.S.H

Report Number : S18_3175

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1894166	BH01 ES 4 0.50	Brown SAND
CL/1894167	BH01 ES 9 2.00	SAND
CL/1894168	BH01 ES 11 3.00	CLAY
CL/1894169	BH02 ES 5 1.00	SAND
CL/1894170	WS01 ES 1 0.25	SAND
CL/1894171	WS01 ES 18 4.50	CLAY
CL/1894172	WS02 ES 9 1.70	Brown CLAY
CL/1894173	WS03 ES 4 0.50	Brown SAND
CL/1894174	WS03 ES 14 2.80	Brown CLAY
CL/1894175	WS04 ES 9 0.05	OTHER
CL/1894176	WS04 ES 4 0.50	Brown SAND
CL/1894177	WS04 ES 12 1.70	CLAY
CL/1894178	WS04 ES 18 3.70	CLAY
CL/1894179	WS05 ES 1 0.25	CLAY
CL/1894180	WS05 ES 7 1.00	SAND
CL/1894181	WS05 ES 11 1.80	Brown CLAY
CL/1894182	WS05 ES 14 2.70	SAND

TEST REPORT

UKAS TESTING
1252

Report No. EFS/183180 (Ver. 1)

SOCOTEC UK Limited Deeside
Unit 18
Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Site: E8013 - G.O.S.H

The 4 samples described in this report were registered for analysis by SOCOTEC UK Limited on 15-Feb-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 27-Feb-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 27-Feb-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			AMMAR	ICPACIDS	ICPBOR	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	PAHMSUS	PCBECD	PCBECD	PCBECD
Method Reporting Limits :			0.5	20	0.5	0.3	0.1	0.5	0.5	0.5	0.1	0.5	0.5	3	0.08	5	5	5
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Exchange.Ammonium AR**	**SO4-- (acid sol)**	**Boron (H20 Soluble)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Zinc (MS)**	**Naphthalene**	**PCB 101**	**PCB 118**	**PCB 138**
1894231	WS06 ES 4 0.50	30-Jan-18	<0.5	1580	1.7	12.5	0.15	25.1	37.6	224.2	0.95	19.9	<0.5	80.9	< 0.08	< 5.00	< 5.00	< 5.00
1894232	WS06 ES 7 1.00	30-Jan-18	<0.5	1150	1.4	16.4	0.16	19.2	33.7	931.4	1.39	20.3	<0.5	127	< 0.08	< 5.00	< 5.00	< 5.00
1894233	WS06 ES 11 1.80	30-Jan-18	<0.5	901	1.2	16.4	0.18	22.8	47.7	576.2	2.56	22.6	<0.5	93	< 0.08	< 5.00	< 5.00	< 5.00
1894234	WS06 ES 16 3.70	30-Jan-18	79.8	693	2.4	8.2	0.11	87.4	23.4	46.9	0.3	62.5	<0.5	42.5	< 0.08	< 5.00	< 5.00	< 5.00

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183180**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	pH Units	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			PCBECD	PCBECD	PCBECD	PCBECD	PHSOIL	SFAPI	SFAPI	Sub020	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			5	5	5	5		0.5	0.5		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**pH units (AR)**	**Cyanide(Total) (AR)**	**Phenol Index.(AR)**	**^Asbestos ID (Stage 1)**	**1,2-Dichlorobenzene**	**1,3-Dichlorobenzene**	**1,4-Dichlorobenzene**	**1-Methylnaphthalene**	**2,4,5-Trichlorophenol**	**2,4,6-Trichlorophenol**	**2,4-Dichlorophenol**	**2,4-Dimethylphenol**
1894231	WS06 ES 4 0.50	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894232	WS06 ES 7 1.00	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.9	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894233	WS06 ES 11 1.80	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.4	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100
1894234	WS06 ES 16 3.70	30-Jan-18	< 5.00	< 5.00	< 5.00	< 5.00	8.2	<0.5	<0.5	NAIIS	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100

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Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.2	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.2
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**2,4-Dinitrotoluene**	**2,6-Dinitrotoluene**	**2-Chloronaphthalene**	**2-Chlorophenol**	**2-Methylnaphthalene**	**2-Methylphenol**	**2-Nitrophenol**	**3- & 4-Methylphenol**	**4-Bromophenyl-phenylether**	**4-Chloro-3-methylphenol**	**4-Chlorophenol**	**4-Chlorophenyl-phenylether**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**
1894231	WS06 ES 4 0.50	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	0.102	< 0.200
1894232	WS06 ES 7 1.00	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894233	WS06 ES 11 1.80	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200
1894234	WS06 ES 16 3.70	30-Jan-18	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	< 0.100	< 0.200

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Sample Analysis

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Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.2	0.2	0.5	0.2	0.5	0.1	0.1	0.1	0.5	0.2	0.2	0.1	0.5	0.1	0.1	0.1	
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Benzyl alcohol**	**Biphenyl**	**bis(2-Chloroethoxy)methane**	**bis(2-Chloroethyl)ether**	**bis(2-Chloroisopropyl)ether**	**bis(2-Ethylhexyl)phthalate**	**Butylbenzylphthalate**	**Chrysene**	**Dibenzo(ah)anthracene**	**Dibenzofuran**	**Diethylphthalate**	**Dimethylphthalate**	
1894231	WS06 ES 4 0.50	30-Jan-18	0.223	0.287	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	0.250	< 0.500	< 0.100	< 0.100	< 0.100	
1894232	WS06 ES 7 1.00	30-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894233	WS06 ES 11 1.80	30-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	
1894234	WS06 ES 16 3.70	30-Jan-18	< 0.200	< 0.200	< 0.500	< 0.200	< 0.500	< 0.100	< 0.100	< 0.100	< 0.500	< 0.200	< 0.200	< 0.100	< 0.500	< 0.100	< 0.100	< 0.100	

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Sample Analysis

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Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	TMSS	TPHFIDUS	TPHFIDUS
Method Reporting Limits :			0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.5	0.1	0.5	0.1	0.1	0.2	0.1	10	10
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Di-n-butylphthalate**	**Di-n-octylphthalate**	**Diphenyl Ether**	**Fluoranthene**	**Fluorene**	**Hexachlorobenzene**	**Hexachloroethane**	**Indeno(123-cd)pyrene**	**Naphthalene**	**Nitrobenzene**	**Phenanthrene**	**Phenol**	**Pyrene**	**Tot.Moisture @ 105C**	**TPH Band (>C10-C40)**	**TPH by GCFID (AR)**
1894231	WS06 ES 4 0.50	30-Jan-18	< 0.100	< 0.200	< 0.100	0.680	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.285	< 0.100	0.532	21.2	161	161
1894232	WS06 ES 7 1.00	30-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200			52
1894233	WS06 ES 11 1.80	30-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	0.118	< 0.100	< 0.200			15
1894234	WS06 ES 16 3.70	30-Jan-18	< 0.100	< 0.200	< 0.100	< 0.200	< 0.200	< 0.100	< 0.100	< 0.500	< 0.100	< 0.500	< 0.100	< 0.100	< 0.200			10

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Units :			mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			TPHFIDUS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			10	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**TPH Carbon Banding.**	**1,1,1,2-Tetrachloroethane**	**1,1,1-Trichloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,1-Dichloropropene**	**1,2,3-Trichlorobenzene**	**1,2,3-Trichloropropane**	**1,2,4-Trimethylbenzene**	**1,2-Dibromoethane**	**1,2-Dichlorobenzene**	**1,2-Dichloroethane**	**1,2-Dichloropropane**	**1,3,5-Trimethylbenzene**	**1,3-Dichlorobenzene**
1894231	WS06 ES 4 0.50	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894232	WS06 ES 7 1.00	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894233	WS06 ES 11 1.80	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894234	WS06 ES 16 3.70	30-Jan-18	Req	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 3.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	3
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**1,3-Dichloropropane**	**1,4-Dichlorobenzene**	**2,2-Dichloropropane**	**2-Chlorotoluene**	**4-Chlorotoluene**	**Benzene**	**Bromobenzene**	**Bromochloromethane**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**	**Carbon Tetrachloride**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**
1894231	WS06 ES 4 0.50	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894232	WS06 ES 7 1.00	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894233	WS06 ES 11 1.80	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*
1894234	WS06 ES 16 3.70	30-Jan-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 3.0*

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Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS
Method Reporting Limits :			5	1	1	1	2	1	4	1	5	1	2	1	1	1	1	1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	Client Sample Description	Sample Date	cis 1,2-Dichloroethene	cis 1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Ethylbenzene	iso-Propylbenzene	m and p-Xylene	MTBE	Naphthalene	n-Butylbenzene	o-Xylene	p-Isopropyltoluene	Propylbenzene	sec-Butylbenzene	Styrene	tert-Butylbenzene
1894231	WS06 ES 4 0.50	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894232	WS06 ES 7 1.00	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	6.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894233	WS06 ES 11 1.80	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1894234	WS06 ES 16 3.70	30-Jan-18	< 5.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 4.0	< 1.0	< 5.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	WSLM59	KONECR	ORGMAT	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			3	5	1	1	1	1	1	0.02	0.1	0.1	0.1	0.5	0.5	14.5	0.2	0.5
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Tetrachloroethene**	**Toluene**	**trans 1,2-Dichloroethene**	**trans 1,3-Dichloropropene**	**Trichloroethene**	**Trichlorofluoromethane**	**Vinyl Chloride**	**Total Organic Carbon**	**Chromium vi:**	**Organic Matter %**	**1,2,4-Trichlorobenzene**	**2,4-Dinitrophenol**	**2-Nitroaniline**	**3-Nitroaniline**	**4,6-Dinitro-2-methylphenol**	**4-Chloroaniline**
1894231	WS06 ES 4 0.50	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0*	1.08	<0.1	1.8	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894232	WS06 ES 7 1.00	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0*		<0.1	1.6	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894233	WS06 ES 11 1.80	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0*		<0.1	1.8	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500
1894234	WS06 ES 16 3.70	30-Jan-18	< 3.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0*		<0.1	1.9	< 0.100	< 0.500	< 0.500	< 14.5	< 0.200	< 0.500

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Client Name SOCOTEC UK Limited Deeside

Contact Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	27-Feb-2018
Report Number	EFS/183180
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	BTEXHSA
Method Reporting Limits :			0.6	0.5	0.5	0.3	0.1	0.1	0.1	0.9	0.1	0.5	1	3	1	1	2	10
UKAS Accredited :			No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**4-Nitroaniline**	**4-Nitrophenol**	**Benzoic Acid**	**Coronene**	**Hexachlorobutadiene**	**Hexachlorocyclopentadiene**	**Isophorone**	**N-Nitroso-di-n-propylamine**	**N-Nitrosodiphenylamine**	**Pentachlorophenol**	**1,1,2,2-Tetrachloroethane**	**1,2,4-Trichlorobenzene**	**1,2-Dibromo-3-chloropropane**	**Dichlorodifluoromethane**	**Hexachlorobutadiene**	**Benzene**
1894231	WS06 ES 4 0.50	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0*	< 2.0	<10
1894232	WS06 ES 7 1.00	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0*	< 2.0	<10
1894233	WS06 ES 11 1.80	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0*	< 2.0	<10
1894234	WS06 ES 16 3.70	30-Jan-18	< 0.600	< 0.500	< 0.500	< 0.300	< 0.100	< 0.100	< 0.100	< 0.900	< 0.100	< 0.500	< 1.0	< 3.0	< 1.0	< 1.0*	< 2.0	<10

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Sample Analysis

Date Printed	27-Feb-2018
Report Number	EFS/183180
Table Number	1

Where individual results are flagged see report notes for status.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	BTEXHSA	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			10	10	20	30	20	10	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Toluene**	**Ethyl Benzene**	**MTBE**	**Xylenes**	**m/p Xylenes**	**o Xylene**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Dibenzo(ah)anthracene**
1894231	WS06 ES 4 0.50	30-Jan-18	<10	<10	<20	<30	<20	<10	< 0.08	< 0.08	< 0.08	0.08	< 0.08	< 0.08	0.39	< 0.08	< 0.08	< 0.08
1894232	WS06 ES 7 1.00	30-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	0.11	0.12	0.13	0.13	< 0.08	0.10	< 0.08
1894233	WS06 ES 11 1.80	30-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	0.30	0.26	0.29	0.14	0.10	0.28	< 0.08
1894234	WS06 ES 16 3.70	30-Jan-18	<10	<10		<30	<20	<10	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08

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Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183180**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg									
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS									
Method Reporting Limits :			0.08	0.08	0.08	0.08	0.08	1.28	0.08									
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	No									
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**Coronene**									
1894231	WS06 ES 4 0.50	30-Jan-18	0.13	< 0.08	0.08	0.09	0.10	< 1.67	0.13									
1894232	WS06 ES 7 1.00	30-Jan-18	0.13	< 0.08	0.09	0.08	0.12	< 1.58										
1894233	WS06 ES 11 1.80	30-Jan-18	0.57	< 0.08	0.16	0.30	0.48	< 3.37										
1894234	WS06 ES 16 3.70	30-Jan-18	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 1.28										

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Client Name	**SOCOTEC UK Limited Deeside**
Contact	Mark Hamill

E8013 - G.O.S.H

Sample Analysis

Date Printed	**27-Feb-2018**
Report Number	**EFS/183180**
Table Number	**1**

Where individual results are flagged see report notes for status.

Total Petroleum Hydrocarbons (TPH) Carbon Ranges

Customer and Site Details:	SOCOTEC UK Limited Deeside : E8013 - G.O.S.H	**Matrix:**	Soil
Job Number:	S18_3180	**Date Booked in:**	15-Feb-18
QC Batch Number:	180183	**Date Extracted:**	19-Feb-18
Directory:	D:\TES\DATA\Y2018\021918TPH_GC17\021918 2018-02-19 15-15-04\B-047-90-CL1894234.D	**Date Analysed:**	20-Feb-18, 00:11:10
Method:	Ultra Sonic		

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/kg) - as wet weight				
Sample ID	**Client ID**	**>C8 - C10**	**>C10 - C12**	**>C12 - C16**	**>C16 - C21**	**>C21 - C35**
CL1894231	WS06 ES 4 0.50	<2	<2*	6.94	70.5	83
CL1894232	WS06 ES 7 1.00	<2	<2*	<2	16	33.9
CL1894233	WS06 ES 11 1.80	<2	<2*	<2	3.27	11.3
CL1894234	WS06 ES 16 3.70	<2	<2*	<2	<2	7.49

Where individual results are flagged see report notes for status.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/3

					Leaching Data	
Client	SOCOTEC UK Limited Deeside				Weight of sample (kg)	0.271
Contact	Mark Hamill				Moisture content @ 105°C (% of Wet Weight)	21.2
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	E8013 - G.O.S.H				Volume of water required to carry out 2:1 stage (litres)	0.404
					Fraction of sample above 4 mm %	35.200
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
WS06 ES 4 0.50		s18_3180	CL/1894231	27-Feb-18	Volume to undertake analysis (2:1 Stage) (litres)	0.300
					Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	1.18	3	5	6
	LOI450	Loss on Ignition (%)				10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.07	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	204	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.3	100		
U	PHSOIL	pH (pH units)	8.9		>6	
	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7			To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except oo		mg/kg (dry weight)				
U	WSLM3	pH (pH units) oo	12	11.8	Calculated data not UKAS Accredited				
U	WSLM2	Conductivity (µs/cm) oo	4560	2070					
U	ICPMSW	Arsenic	0.002	0.001	0.004	0.01	0.5	2	25
U	ICPWATVAR	Barium	0.06	0.02	0.12	0.3	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	0.033	0.043	0.066	0.42	0.5	10	70
U	ICPMSW	Copper	0.049	0.02	0.098	0.24	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.007	0.005	0.014	0.05	0.5	10	30
U	ICPMSW	Nickel	0.003	0.001	0.006	0.01	0.4	10	40
U	ICPMSW	Lead	0.009	0.002	0.018	0.03	0.5	10	50
U	ICPMSW	Antimony	0.002	0.002	0.004	0.02	0.06	0.7	5
U	ICPMSW	Selenium	0.001	<0.001	0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.002	<0.002	0.004	<0.02	4	50	200
U	KONENS	Chloride	19	7	38	86	800	15000	25000
U	ISEF	Fluoride	2.2	<0.1	4.4	<4	10	150	500
U	ICPWATVAR	Sulphate as SO4	4	10	8	92	1000	20000	50000
N	WSLM27	Total Dissolved Solids		1610			4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	11	3.5	22	45	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.

IOM

WORKING FOR A HEALTHIER FUTURE

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: SOCOTEC UK Ltd
Environmental Chemistry
PO Box 100
Burton upon Trent
Staffordshire
DE15 0XD

CONTRACT NO: 57187-2

PROJECT NO: 610

DATE OF ISSUE: 27.02.18

DATE SAMPLES RECEIVED: 19.02.18

DATE SAMPLES ANALYSED: 26.02.18

SAMPLE DESCRIPTION: Four soil/loose aggregate samples.

ANALYSIS REQUESTED: Qualitative analysis of samples for determination of presence/type of asbestos.

METHODS:

Our method involves initial examination of entire samples followed by detailed analysis of representative sub-samples. The sub-samples are analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

RESULTS:

Initial Screening

No asbestos was detected in any of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

www.iom-world.org

Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

UKAS testing
0374

CONTRACT NO: 57187-2
PROJECT NO: 610
DATE OF ISSUE: 27.02.18

RESULTS: (cont.)

Table 1: Qualitative Results

SOCOTEC Job I.D: S183180

IOM sample number	Client sample number	ACM type detected	PLM result
S54143	S1894231 WS06 0.50	-	No Asbestos Detected
S54144	S1894232 WS06 1.00	-	No Asbestos Detected
S54145	S1894233 WS06 1.80	-	No Asbestos Detected
S54146	S1894234 WS06 3.70	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are outwith the scope of our UKAS accreditation.

AUTHORISED BY: .....
D Third
Scientific Technician

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183180

Consignment No S72181
Date Logged 15-Feb-2018
In-House Report Due 27-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	AMMAR	BTEXHSA			CEN Leachate		CustServ	ICPACIDS	ICPBOR	ICPBRE	ICPMSS									KONECR	ORGMAT	PAHMSUS		PCBECD	PHSOIL
		Sampled	Exchange.Ammonium AR	BTEX-HSA + MTBE analysis	BTEX-HSA Analysis	MTBE (µg/kg)	CEN Leac(P)1	CEN Leac(P)2	REPORT A	SO4-- (acid sol)	Boron (H20 Soluble)	Magnesium (BRE)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	Chromium vi:	Organic Matter %	PAH (16) by GCMS	PAH (17) by GCMS	PCB-7 Congeners Analysis	pH units (AR)
			✓	✓	✓	✓				✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓
CL/1894231	WS06 0.50	30/01/18		E	E	E																					
CL/1894232	WS06 1.00	30/01/18			E																						
CL/1894233	WS06 1.80	30/01/18			E																						
CL/1894234	WS06 3.70	30/01/18			E																						

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 - G.O.S.H
Report No S183180

Consignment No S72181
Date Logged 15-Feb-2018
In-House Report Due 27-Feb-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	SFAPI		Sub020	SVOCSW	TMSS	TPHFIDUS			WSLM59
		Sampled	Cyanide(Total) (AR)	Phenol Index.(AR)	^Asbestos ID (Stage 1)	SVOC (AR)	Tot.Moisture @ 105C	TPH Band (>C10-C40)	TPH by GCFID (AR)	TPH Carbon Banding.	Total Organic Carbon
			✓	✓	✓	✓	✓	✓	✓	✓	✓
CL/1894231	WS06 0.50	30/01/18						E	E	E	
CL/1894232	WS06 1.00	30/01/18							E	E	
CL/1894233	WS06 1.80	30/01/18							E	E	
CL/1894234	WS06 3.70	30/01/18							E	E	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
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C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
VOCHSAS	CL1894231 TO CL1894234	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (Chloromethane, Dichlorodifluoromethane, Vinyl Chloride) . These circumstances should be taken into consideration when utilising the data.
VOCHSAS	CL1894231 TO CL1894234	Due to matrix interference, the Internal Standard recovery for this Test is below the required QMS specification. This has been confirmed by historic data. All other Laboratory Process Controls meet the requirements of the QMS unless otherwise stated. These circumstances should be taken into consideration when utilising the data.
TPHFIDUS	CL1894231 TO CL1894234	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (C10-C12) . These circumstances should be taken into consideration when utilising the data.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	AMMAR	As Received	Determination of Exchangeable Ammonium in Soil using potassium chloride extraction, discrete colorimetric detection
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	ICPACIDS	Oven Dried @ < 35°C	Determination of Total Sulphate in soil samples by Hydrochloric Acid extraction followed by ICPOES detection
Soil	ICPBOR	Oven Dried @ < 35°C	Determination of Boron in soil samples by hot water extraction followed by ICPOES detection
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	KONECR	Oven Dried @ < 35°C	Determination of Chromium vi in soil samples by water extraction followed by colorimetric detection
Soil	ORGMAT	Oven Dried @ < 35°C	Acid Dichromate oxidation of the sample followed by colorimetric analysis of the extract
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/aroclors by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Soil	SubCon*	*	Contact Laboratory for details of the methodology used by the sub-contractor.
Soil	SVOCSW	As Received	Determination of Semi-Volatile Organic Compounds by dichloromethane/acetone extraction followed by GCMS detection
Soil	TMSS	As Received	Determination of the Total Moisture content at 105ºC by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	VOCHSAS	As Received	Determination of Volatile Organic Compounds (VOC) by Headspace GCMS
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES

Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity (µS/cm) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
TR Denotes Tremolite
AC Denotes Actinolite
AN Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Deeside

Site : E8013 - G.O.S.H

Report Number : S18_3180

Note: major constituent in upper case

Lab ID Number	Client ID	Description
CL/1894231	WS06 ES 4 0.50	Brown SILT
CL/1894232	WS06 ES 7 1.00	SILT
CL/1894233	WS06 ES 11 1.80	CLAY
CL/1894234	WS06 ES 16 3.70	CLAY

TEST REPORT

Report No. EXR/259655 (Ver. 1)

SOCOTEC UK Limited Deeside
Unit 18
Drome Road
Deeside Industrial Park
Deeside
Flintshire
CH5 2NY

Site: E8013 Great Ormond Street Hospital P22 IMRI Project

The 1 sample described in this report were registered for analysis by SOCOTEC UK Limited on 21-Mar-2018. This report supersedes any versions previously issued by the laboratory.
The analysis was completed by: 28-Mar-2018

The following tables are contained in this report:

On behalf of
SOCOTEC UK Lim
Tim Barnes Operations Director
Energy & Waste Services

Date of Issue: 28-Mar-2018

Tests marked '^' have been subcontracted to another laboratory.
Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.
SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l
Method Codes :			GROHSA	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPWATVAR	KONENS	PAHMSW	PAHMSW	PAHMSW
Method Reporting Limits :			0.1	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001	0.002	0.01	3	0.01	0.01	0.01	0.01
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**GRO-HSA (AA)**	**Arsenic as As (Dissolved)**	**Cadmium as Cd (Dissolved)**	**Chromium as Cr (Dissolved)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Mercury as Hg (Dissolved)**	**Nickel as Ni (Dissolved)**	**Selenium as Se (Dissolved)**	**Zinc as Zn (Dissolved)**	**Boron as B (Dissolved) a**	**Total Sulphur as SO4 (Dissolved) a**	**Ammoniacal Nitrogen as N**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**
1872932	BH02 EW 36 3.42	19-Mar-18	Req	<0.001	<0.0001	<0.001	0.005	<0.001	<0.0001	0.006	0.012	0.101	0.84	825	0.8	< 0.01	< 0.01	< 0.01

SOCOTEC

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Client Name	**SOCOTEC UK Limited Deeside**
Contact	Craig Curtis

E8013 Great Ormond Street Hospital P22 IMRI Project

Sample Analysis

Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Method Codes :			PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PAHMSW	PCBCONEC	PCBCONEC
Method Reporting Limits :			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.17	0.01	0.01
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Benzo(a)anthracene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Benzo-a-Pyrene**	**Chrysene**	**Dibenzo(a,h)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(1,2,3-cd)pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**PCB101**	**PCB118**
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01	< 0.02	< 0.01	0.04	< 0.2	< 0.04	< 0.04

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Contact Craig Curtis

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Sample Analysis

Date Printed	28-Mar-2018
Report Number	EXR/259655
Table Number	1

Where individual results are flagged see report notes for status.

		Units :	µg/l	µg/l	µg/l	µg/l	µg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
		Method Codes :	PCBCONEC	PCBCONEC	PCBCONEC	PCBCONEC	PCBCONEC	SFAPI	SFAPI	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
		Method Reporting Limits :	0.01	0.01	0.01	0.01	0.01	0.02	0.05	0.005	0.005	0.005	0.005	0.002	0.02	0.02	0.02	0.02
LAB ID Number EX/	Client Sample Description	Sample Date	PCB138	PCB153	PCB180	PCB28	PCB52	Cyanide (Total) as CN	Phenol Index as C6H5OH	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1-Methylnaphthalene	2,4,5-Trichlorophenol	2,4,6 - Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	<0.02	<0.05	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	< 0.020	< 0.020	< 0.020	< 0.020

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Sample Analysis

Date Printed	28-Mar-2018
Report Number	EXR/259655
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.01	0.005	0.005	0.002	0.02	0.002	0.005	0.005	0.02	0.02	0.005	0.05	0.005	0.005	0.005	0.02
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**2,4-Dinitrophenol**	**2,4-Dinitrotoluene**	**2,6 Dinitrotoluene**	**2-Chloronaphthalene**	**2-Chlorophenol**	**2-Methylnaphthalene**	**2-Methylphenol**	**2-Nitroaniline**	**2-Nitrophenol**	**3+4-Methylphenol**	**3-Nitroaniline**	**4,6-Dinitro-2-methylphenol**	**4-Bromophenyl-phenylether**	**4-Chloro-3-methylphenol**	**4-Chloroaniline**	**4-Chlorophenol**
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.010	< 0.005	< 0.005	< 0.002	< 0.020	< 0.002	< 0.005	< 0.005	< 0.020	< 0.020	< 0.005	< 0.050	< 0.005	< 0.005	< 0.005	< 0.020

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Sample Analysis

Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.005	0.005	0.05	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.1	0.005	0.002	0.005	0.005
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**4-Chlorophenyl-phenylether**	**4-Nitroaniline**	**4-Nitrophenol**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo[a]anthracene**	**Benzo[a]pyrene**	**Benzo[b]fluoranthene**	**Benzo[g,h,i]perylene**	**Benzo[k]fluoranthene**	**Benzoic Acid**	**Benzyl alcohol**	**Biphenyl**	**bis(2-Chloroethoxy)methane**	**bis(2-Chloroethyl)ether**
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.005	< 0.005	< 0.050	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.100	< 0.005	< 0.002	< 0.005	< 0.005

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Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW
Method Reporting Limits :			0.005	0.005	0.005	0.002	0.05	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.002	0.002	0.005	0.005
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**bis(2-Chloroisopropyl)ether**	**bis(2-Ethylhexyl)phthalate**	**Butylbenzylphthalate**	**Chrysene**	**Coronene**	**Dibenzo[a,h]anthracene**	**Dibenzofuran**	**Diethylphthalate**	**Dimethylphthalate**	**Di-n-butylphthalate**	**Di-n-octylphthalate**	**Diphenyl Ether**	**Fluoranthene**	**Fluorene**	**Hexachlorobenzene**	**Hexachlorobutadiene**
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.005	< 0.005	< 0.005	< 0.002	< 0.050	< 0.002	< 0.005	< 0.005	< 0.005	< 0.005	< 0.002	< 0.002	< 0.002	< 0.002	< 0.005	< 0.005

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Sample Analysis

Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l	ug/l	µg/l
Method Codes :			SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	SVOCSW	TPHFID-Si	VOCHSAW	VOCHSAW	VOCHSAW
Method Reporting Limits :			0.005	0.005	0.002	0.005	0.002	0.005	0.005	0.005	0.05	0.002	0.02	0.002	0.01	1	1	1
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Hexachlorocyclopentadiene**	**Hexachloroethane**	**Indeno[1,2,3-cd]pyrene**	**Isophorone**	**Naphthalene**	**Nitrobenzene**	**N-Nitroso-di-n-propylamine**	**n-Nitrosodiphenylamine**	**Pentachlorophenol**	**Phenanthrene**	**Phenol**	**Pyrene**	**TPH by GC(Si) o**	**1,1,1,2-Tetrachloroethane**	**1,1,1-Trichloroethane**	**1,1,2,2-Tetrachloroethane**
1872932	BH02 EW 36 3.42	19-Mar-18	< 0.005	< 0.005	< 0.002	< 0.005	< 0.002	< 0.005	< 0.005	< 0.005	< 0.050	< 0.002	< 0.020	< 0.002	Req	< 1.0	< 1.0	< 1.0

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Sample Analysis

Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

		Units :	µg/l	ug/l	µg/l	µg/l	ug/l	µg/l	ug/l	ug/l	µg/l	µg/l	ug/l	ug/l	µg/l	ug/l	ug/l	µg/l
		Method Codes :	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW
		Method Reporting Limits :	1	1	1	1	1	1	5	1	5	1	5	1	1	1	1	1
LAB ID Number EX/	Client Sample Description	Sample Date	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-chloropropane	1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene	1,3-Dichlorobenzene	1,3-Dichloropropane
1872932	BH02 EW 36 3.42	19-Mar-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 5.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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E8013 Great Ormond Street Hospital P22 IMRI Project

Sample Analysis

Date Printed	28-Mar-2018
Report Number	EXR/259655
Table Number	1

Where individual results are flagged see report notes for status.

Units :			ug/l	ug/l	µg/l	µg/l	µg/l	µg/l	µg/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	µg/l
Method Codes :			VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW
Method Reporting Limits :			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**1,4-Dichlorobenzene**	**2- Chlorotoluene**	**2,2-Dichloropropane**	**4-Chlorotoluene**	**Benzene**	**Bromobenzene**	**Bromochloromethane**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**	**Carbon Tetrachloride**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**	**cis 1,3-Dichloropropene**
1872932	BH02 EW 36 3.42	**19-Mar-18**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Sample Analysis

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Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Units :			ug/l	ug/l	µg/l	ug/l	µg/l	ug/l	ug/l	µg/l	ug/l	µg/l	µg/l	ug/l	µg/l	µg/l	ug/l	µg/l
Method Codes :			VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW
Method Reporting Limits :			1	1	1	1	1	5	1	1	5	1	1	1	1	1	1	1
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Cis-1,2-dichloroethene**	**Dibromochloromethane**	**Dibromomethane**	**Dichlorodifluoromethane**	**Ethylbenzene**	**Hexachlorobutadiene**	**Isopropylbenzene**	**m and p-Xylene**	**Naphthalene**	**n-Butylbenzene**	**o-Xylene**	**p-Isopropyltoluene**	**Propylbenzene**	**sec-Butylbenzene**	**Styrene**	**tert-Butylbenzene**
1872932	BH02 EW 36 3.42	19-Mar-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

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Sample Analysis

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Report Number	EXR/259655
Table Number	1

Where individual results are flagged see report notes for status.

Units :			ug/l	µg/l	ug/l	µg/l	ug/l	µg/l	µg/l	pH units								
Method Codes :			VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	VOCHSAW	WSLM3								
Method Reporting Limits :			1	1	1	1	1	1	1									
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Tetrachloroethene**	**Toluene**	**Trans 1,2 Dichloroethene**	**trans 1,3-Dichloropropene**	**Trichloroethene**	**Trichlorofluoromethane**	**Vinyl Chloride**	**pH units w**								
1872932	BH02 EW 36 3.42	19-Mar-18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	7.6								

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E8013 Great Ormond Street Hospital P22 IMRI Project

Sample Analysis

Date Printed	**28-Mar-2018**
Report Number	**EXR/259655**
Table Number	**1**

Where individual results are flagged see report notes for status.

Gasoline Range Organics
(BTEX and Aliphatic Carbon Ranges)

Customer and Site Details: SOCOTEC UK Limited Deeside : E8013 Great Ormond Street Hospital P22 IMRI Project
Job Number: W25_9655
Directory: D:\TES\DATA\2018\0323HSA_GC9\032318 2018-03-23 12-37-02\027F2701.D
Method: Headspace GCFID

Matrix: Water
Date Booked in: 21-Mar-18
Date extracted: 23-Mar-18
Date Analysed: 23-Mar-18, 20:20:30

*** Sample data with an asterisk are not UKAS accredited.**

		Concentration, (mg/l)					Aliphatics				
Sample ID	Client ID	Benzene	Toluene	Ethyl benzene	m/p-Xylene	o-Xylene	C5 - C6	>C6 - C7	>C7 - C8	>C8 - C10	Total GRO
* EX1872932	BH02 EW 36 3.42	<0.005	<0.005	<0.005	<0.005	<0.005	<0.1	<0.1	<0.1	<0.1	<0.1

Note: Benzene elutes between C6 and C7, toluene elutes between C7 and C8, ethyl benzene and the xylenes elute between C8 and C9.
Each BTEX compound is deducted from the appropriate band to give the aliphatic fractions, however aromatic compounds may still be contributing to these fractions

Where individual results are flagged see report notes for status.

ALIPHATIC / AROMATIC FRACTION BY GC/FID

Customer and Site Details: SOCOTEC UK Limited Deeside : E8013 Great Ormond Street Hospital P22 IMRI Project
Job Number: W25_9655
QC Batch Number: 180198
Directory: D:\TES\DATA\2018\032318\032318 2018-03-23 15-27-16\B-015-63-EX1872932ARO.D
Method: Bottle

Separation: Silica gel
Eluents: Hexane, DCM

Matrix: Water
Date Booked ir 21-Mar-18
Date Extracted 23-Mar-18
Date Analysed 23-Mar-18, 18:20:41

*** This sample data is not UKAS accredited.**

		Concentration, (mg/l)											
		>C8 - C10		>C10 - C12		>C12 - C16		>C16 - C21		>C21 - C35		>C8 - C40	
Sample ID	Client ID	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics	Aliphatics	Aromatics
* EX1872932	BH02 EW 36 3.42	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	0.027	<0.01

Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 Great Ormond Street Hospital P22 IMRI Project
Report No W259655

Consignment No W134876
Date Logged 21-Mar-2018
In-House Report Due 28-Mar-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID	CUSTSERV	GROHSA	ICPMSW									ICPWATVAR		KONENS	PAHMSW	PCBCONEC	SFAPI	
					Report A	GRO-HSA GCFID (AA)	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Total Sulphur as SO4 (Diss) VAR	Boron as B (Dissolved) VAR	Ammoniacal Nitrogen (Kone)	PAH GC-MS (16)	PCB - 7 Congeners	Cyanide (Total) as CN SFA	Phenol Index SFA
							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
EX/1872932	BH02 3.42	Unclassified	19/03/18															E			B	B

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Limited Deeside
Site E8013 Great Ormond Street Hospital P22 IMRI Project
Report No W259655

Consignment No W134876
Date Logged 21-Mar-2018
In-House Report Due 28-Mar-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	SVOC	TPH by GC(Si)	VOC HSA-GCMS	pH units
MethodID				SVOCSW	TPHFID-Si	VOCHSAW	WSLM3
					✓	✓	✓
EX/1872932	BH02 3.42	Unclassified	19/03/18				

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Water	GROHSA	As Received	Determination of Total Gasoline Range Organics Hydrocarbons (GRO) by Headspace FID
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	PAHMSW	As Received	Determination of PolyAromatic Hydrocarbons in water by pentane extraction GCMS quantitation
Water	PCBCONEC	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners by pentane extraction followed by GCECD detection
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	SVOCSW	As Received	Determination of Semi Volatile Organic Compounds (SVOC) by DCM extraction followed by GCMS detection
Water	TPHFID-Si	As Received	Determination of speciated pentane extractable hydrocarbons in water by GCFID
Water	VOCHSAW	As Received	Determination of Volatile Organics Compounds by Headspace GCMS
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,
- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
  All results on MCERTS reports are reported on a 105ºC dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,
- Results are expressed as mg/kg
- SG is expressed as g/cm^3@ 15^{o}C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile
CR Denotes Crocidolite
AM Denotes Amosite
TR Denotes Tremolite
AC Denotes Actinolite
AN Denotes Anthophylite
NAIIS No Asbestos Identified in Sample
NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.
$$ Unable to analyse due to the nature of the sample
¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols. This may have resulted in deterioration of the sample(s) during transit to the laboratory. Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling
¥ Results for guidance only due to possible interference
& Blank corrected result
I.S Insufficient sample to complete requested analysis
I.S(g) Insufficient sample to re-analyse, results for guidance only
Intf Unable to analyse due to interferences
N.D Not determined
N.Det Not detected
N.F No Flow
NS Information Not Supplied
Req Analysis requested, see attached sheets for results
Þ Raised detection limit due to nature of the sample
***** All accreditation has been removed by the laboratory for this result
‡ MCERTS accreditation has been removed for this result
§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Deeside
Site : E8013 Great Ormond Street Hospital P22 IMRI Project
Report Number : W25_9655

Lab ID Number	Client ID	Description
EX/1872932	BH02 EW 36 3.42	Unclassified

APPENDIX F
PHOTOGRAPHS

Photographs

WS01 Concrete core

WS01 Dynamic Sample liners

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F1
	Carried out for	Kier Construction	

Photographs

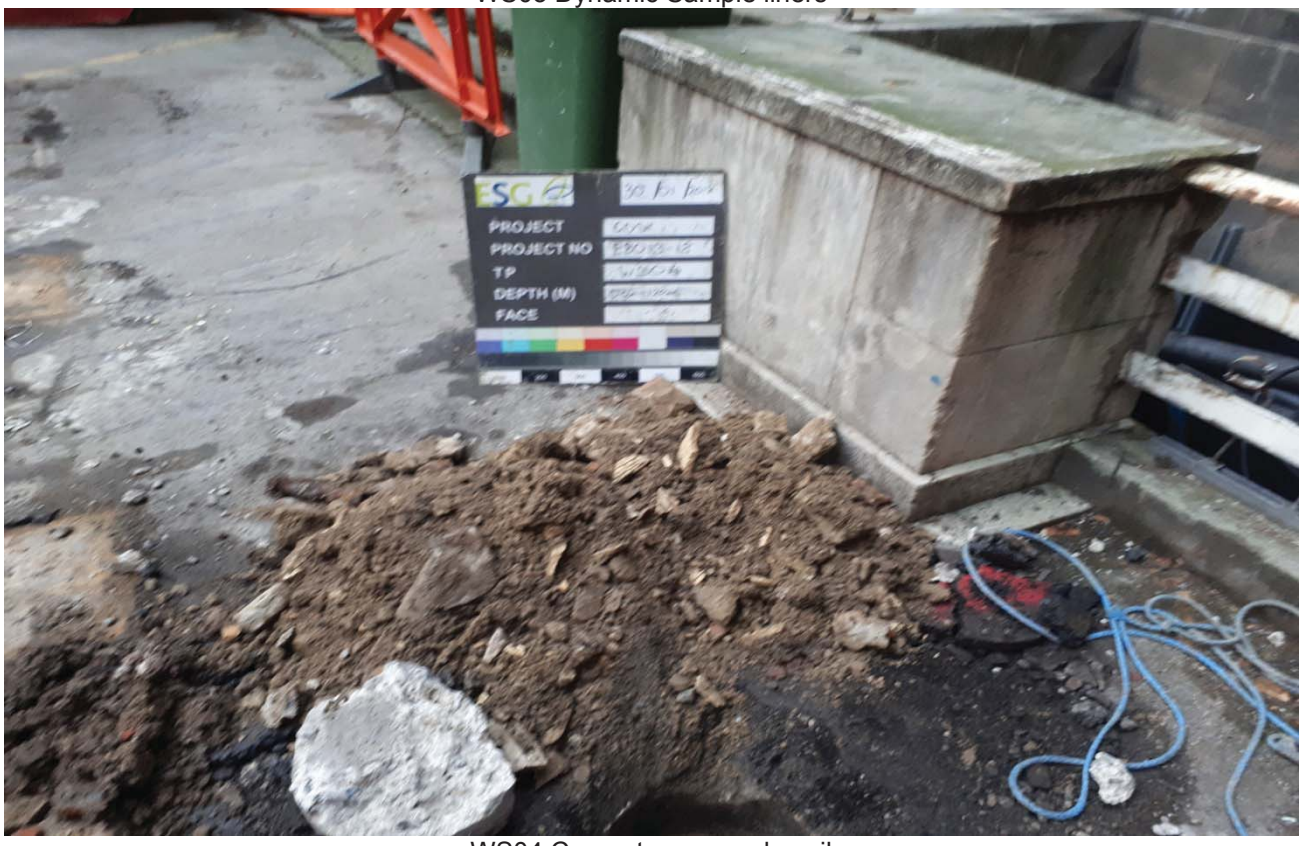
WS02 Dynamic Sample liners

WS03 Concrete Core

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F2
	Carried out for	Kier Construction	

Photographs

WS03 Dynamic Sample liners



WS04 Concrete core and spoil

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F3
	Carried out for	Kier Construction	

Photographs

WS04 Dynamic Sample liners

WS05 Concrete Core

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F4
	Carried out for	Kier Construction	

Photographs

WS05 Dynamic Sample liners

WS06 Concrete core

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F5
	Carried out for	Kier Construction	

Photographs

WS06 Dynamic Sample liners

Notes:	Project	Great Ormond Street Hospital P22 IMRI Project	Plate
	Project No.	E8013-18	F6
	Carried out for	Kier Construction	

APPENDIX G
WASTE CLASSIFICATION REPORT

Waste Classification Report ZYXA-K74FZ-KVJHL

Waste Classification Report

7ZYXA-K74FZ-KVJHL

Job name

E8013-18 Great Ormond Street Hospital

Description/Comments

Project

E8013-18

Site

Great Ormond Street Hospital

Waste Stream Template

SOCOTEC Core Contaminated Land Waste Suite WM3

Classified by

Name:
Lucy Hayes
Date:
3/28/2018 2:24:57 PM UTC
Telephone:
01244 288200

Company:
SOCOTEC UK Limited
18-19 Drome Road
Deeside Industrial Estate
Deeside
CH5 2NY

Report

Created by: Lucy Hayes
Created date: 3/28/2018 14:24 UTC

Job summary

Classification of sample: Max Concentation of Cohesive Made Ground

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

Sample details

Sample Name:
Max Concentation of Cohesive Made Ground

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: 0% No 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	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.7 mg/kg	13.43	36.261 mg/kg	0.00363 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		25.1 mg/kg	1.32	33.14 mg/kg	0.00331 %		
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.24 mg/kg	1.285	0.308 mg/kg	0.000024 %		
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		87.4 mg/kg	1.462	127.74 mg/kg	0.0128 %		
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		62.8 mg/kg	1.126	70.706 mg/kg	0.00707 %		
6	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	931.4 mg/kg		931.4 mg/kg	0.0931 %		
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		2.56 mg/kg	1.353	3.465 mg/kg	0.000346 %		
8	nickel { nickel dihydroxide }	028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]		62.5 mg/kg	1.579	98.719 mg/kg	0.00987 %		
9	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1.1 mg/kg	2.554	2.809 mg/kg	0.000281 %		
10	zinc { zinc chromate }	024-007-00-3				171.7 mg/kg	2.774	476.321 mg/kg	0.0476 %		
11	pH			PH		9 pH		9 pH	9pH		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
12		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
		006-007-00-5											
13		phenol				0.5	mg/kg		0.5	mg/kg	0.00005 %		
		604-001-00-2	203-632-7	108-95-2									
14		TPH (C6 to C40) petroleum group				200	mg/kg		200	mg/kg	0.02 %		
				TPH									
15		chromium in chromium(VI) compounds { chromium(VI) oxide }				0.1	mg/kg	1.923	0.192	mg/kg	0.0000192 %		
		024-001-00-0	215-607-8	1333-82-0									
16		naphthalene				0.08	mg/kg		0.08	mg/kg	0.000008 %		
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
			205-917-1	208-96-8									
18		acenaphthene				0.11	mg/kg		0.11	mg/kg	0.000011 %		
			201-469-6	83-32-9									
19		fluorene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
			201-695-5	86-73-7									
20		phenanthrene				1.29	mg/kg		1.29	mg/kg	0.000129 %		
			201-581-5	85-01-8									
21		anthracene				0.39	mg/kg		0.39	mg/kg	0.000039 %		
			204-371-1	120-12-7									
22		fluoranthene				2.43	mg/kg		2.43	mg/kg	0.000243 %		
			205-912-4	206-44-0									
23		pyrene				1.99	mg/kg		1.99	mg/kg	0.000199 %		
			204-927-3	129-00-0									
24		benzo[a]anthracene				0.99	mg/kg		0.99	mg/kg	0.000099 %		
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				0.94	mg/kg		0.94	mg/kg	0.000094 %		
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				1.1	mg/kg		1.1	mg/kg	0.00011 %		
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				0.45	mg/kg		0.45	mg/kg	0.000045 %		
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				0.9	mg/kg		0.9	mg/kg	0.00009 %		
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.6	mg/kg		0.6	mg/kg	0.00006 %		
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				0.12	mg/kg		0.12	mg/kg	0.000012 %		
		601-041-00-2	200-181-8	53-70-3									
31		benzo[ghi]perylene				0.5	mg/kg		0.5	mg/kg	0.00005 %		
			205-883-8	191-24-2									
32		benzene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-020-00-8	200-753-7	71-43-2									
33		toluene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-021-00-3	203-625-9	108-88-3									
34		ethylbenzene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-023-00-4	202-849-4	100-41-4									
35		xylene				0.03	mg/kg		0.03	mg/kg	0.000003 %		
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
36		polychlorobiphenyls; PCB				0.0517	mg/kg		0.0517	mg/kg	0.00000517 %		
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.199 %		

Key	
	User supplied data
	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
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"

Force this Hazardous property to non hazardous because Concentration of Chromium VI is very low therefore has been discounted

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00001%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because The hazard phase HP3(i) refers to flammable liquids however as the material is a solid this is not applicable and has been discounted

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 1.0e-06%)
toluene: (conc.: 1.0e-06%)
ethylbenzene: (conc.: 1.0e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.02%)
xylene: (conc.: 3.0e-06%)

Classification of sample: Max Concentration of Granular Made Ground

Hazardous Waste
Classified as **17 05 03 ***
in the List of Waste

Sample details

Sample Name:
Max Concentration of Granular Made Ground

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 03 * (Soil and stones containing hazardous substances)

Hazard properties

HP 7: Carcinogenic "waste which induces cancer or increases its incidence"

Hazard Statements hit:

Carc. 1A; H350 "May cause cancer [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.422%)

HP 10: Toxic for reproduction "waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring"

Hazard Statements hit:

Repr. 1A; H360Df "May damage the unborn child. Suspected of damaging fertility."

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.422%)

HP 14: Ecotoxic "waste which presents or may present immediate or delayed risks for one or more sectors of the environment"

Risk phrases hit:

R50/53 "Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment"

Because of determinand:

lead compounds with the exception of those specified elsewhere in this Annex (worst case): (Note 1 conc.: 0.422%)

Determinands

Moisture content: 0% No 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	boron { boron tribromide/trichloride/trifluoride (combined) }			10294-33-4, 10294-34-5, 7637-07-2		2.2 mg/kg	13.43	29.546 mg/kg	0.00295 %		
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		18.8 mg/kg	1.32	24.822 mg/kg	0.00248 %		
3	cadmium { cadmium sulfide }	048-010-00-4	215-147-8	1306-23-6	1	0.17 mg/kg	1.285	0.218 mg/kg	0.000017 %		
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		28 mg/kg	1.462	40.924 mg/kg	0.00409 %		

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
5		copper { dicopper oxide; copper (I) oxide }				103.1	mg/kg	1.126	116.079	mg/kg	0.0116 %		
		029-002-00-X	215-270-7	1317-39-1									
6		lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }			1	4218	mg/kg		4218	mg/kg	0.422 %		
		082-001-00-6											
7		mercury { mercury dichloride }				0.76	mg/kg	1.353	1.029	mg/kg	0.000103 %		
		080-010-00-X	231-299-8	7487-94-7									
8		nickel { nickel dihydroxide }				23.3	mg/kg	1.579	36.802	mg/kg	0.00368 %		
		028-008-00-X	235-008-5 [1] 234-348-1 [2]	12054-48-7 [1] 11113-74-9 [2]									
9		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				0.5	mg/kg	2.554	1.277	mg/kg	0.000128 %		
		034-002-00-8											
10		zinc { zinc chromate }				136.7	mg/kg	2.774	379.226	mg/kg	0.0379 %		
		024-007-00-3											
11		pH				9.4	pH		9.4	pH	9.4 pH		
				PH									
12		cyanides { salts of hydrogen cyanide with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide and those specified elsewhere in this Annex }				0.5	mg/kg	1.884	0.942	mg/kg	0.0000942 %		
		006-007-00-5											
13		phenol				0.5	mg/kg		0.5	mg/kg	0.00005 %		
		604-001-00-2	203-632-7	108-95-2									
14		TPH (C6 to C40) petroleum group				493	mg/kg		493	mg/kg	0.0493 %		
				TPH									
15		chromium in chromium(VI) compounds { chromium(VI) oxide }				0.3	mg/kg	1.923	0.577	mg/kg	0.0000577 %		
		024-001-00-0	215-607-8	1333-82-0									
16		naphthalene				0.29	mg/kg		0.29	mg/kg	0.000029 %		
		601-052-00-2	202-049-5	91-20-3									
17		acenaphthylene				0.14	mg/kg		0.14	mg/kg	0.000014 %		
			205-917-1	208-96-8									
18		acenaphthene				0.26	mg/kg		0.26	mg/kg	0.000026 %		
			201-469-6	83-32-9									
19		fluorene				0.4	mg/kg		0.4	mg/kg	0.00004 %		
			201-695-5	86-73-7									
20		phenanthrene				2.78	mg/kg		2.78	mg/kg	0.000278 %		
			201-581-5	85-01-8									
21		anthracene				0.91	mg/kg		0.91	mg/kg	0.000091 %		
			204-371-1	120-12-7									
22		fluoranthene				3.86	mg/kg		3.86	mg/kg	0.000386 %		
			205-912-4	206-44-0									
23		pyrene				3.02	mg/kg		3.02	mg/kg	0.000302 %		
			204-927-3	129-00-0									
24		benzo[a]anthracene				1.65	mg/kg		1.65	mg/kg	0.000165 %		
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				1.15	mg/kg		1.15	mg/kg	0.000115 %		
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				1.22	mg/kg		1.22	mg/kg	0.000122 %		
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				0.45	mg/kg		0.45	mg/kg	0.000045 %		
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				1.16	mg/kg		1.16	mg/kg	0.000116 %		
		601-032-00-3	200-028-5	50-32-8									
29		indeno[123-cd]pyrene				0.76	mg/kg		0.76	mg/kg	0.000076 %		
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				0.15	mg/kg		0.15	mg/kg	0.000015 %		
		601-041-00-2	200-181-8	53-70-3									

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
31		benzo[ghi]perylene				0.55	mg/kg		0.55	mg/kg	0.000055 %		
			205-883-8	191-24-2									
32		benzene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-020-00-8	200-753-7	71-43-2									
33		toluene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-021-00-3	203-625-9	108-88-3									
34		ethylbenzene				0.01	mg/kg		0.01	mg/kg	0.000001 %		
		601-023-00-4	202-849-4	100-41-4									
35		xylene				0.03	mg/kg		0.03	mg/kg	0.000003 %		
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
36		polychlorobiphenyls; PCB				0.062	mg/kg		0.062	mg/kg	0.0000062 %		
		602-039-00-4	215-648-1	1336-36-3									
										Total:	0.536 %		

Key

	User supplied data
	Hazardous result
	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
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 2: Oxidizing "waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials"
Force this Hazardous property to non hazardous because Concentration of Chromium VI is very low therefore has been discounted

Hazard Statements hit:

Ox. Sol. 1; H271 "May cause fire or explosion; strong oxidiser."

Because of determinand:

chromium(VI) oxide: (compound conc.: 0.00005%)

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"
Force this Hazardous property to non hazardous because The hazard phase HP3(i) refers to flammable liquids however as the material is a solid this is not applicable and has been discounted

Hazard Statements hit:

Flam. Liq. 2; H225 "Highly flammable liquid and vapour."

Because of determinands:

benzene: (conc.: 1.0e-06%)
toluene: (conc.: 1.0e-06%)
ethylbenzene: (conc.: 1.0e-06%)

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinands:

TPH (C6 to C40) petroleum group: (conc.: 0.0493%)
xylene: (conc.: 3.0e-06%)

Appendix A: Classifier defined and non CLP determinands

boron tribromide/trichloride/trifluoride (combined) (CAS Number: 10294-33-4, 10294-34-5, 7637-07-2)

Conversion factor: 13.43
Description/Comments: Combines the hazard statements and the average of the conversion factors for boron tribromide, boron trichloride and boron trifluoride
Data source: N/A
Data source date: 8/6/2015
Risk Phrases: C R35 , C R34 , T+ R26/28 , R14
Hazard Statements: Skin Corr. 1B H314 , Skin Corr. 1A H314 , Acute Tox. 2 H300 , Acute Tox. 2 H330 , EUH014

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: 7/17/2015
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):
10/10/2016 - N R50/53 >= 0.25 % risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases
10/10/2016 - N R50/53 risk phrase sourced from: WM3 v1 still uses ecotoxic risk phrases

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
6/3/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 5/25/2015
Risk Phrases: None.
Hazard Statements: None.

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):
12/14/2015 - EUH032 >= 0.2 % hazard statement sourced from: WM3, Table C12.2

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

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 5/25/2015
Risk Phrases: R65 , R63 , R51/53 , R46 , R45 , R10
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

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: 7/17/2015
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: 7/17/2015
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: 8/6/2015
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: 8/6/2015
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: 7/17/2015
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: 8/21/2015
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: 8/21/2015
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: 8/6/2015
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: 7/23/2015
Risk Phrases: N R50/53
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
6/3/2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Risk Phrases: None.
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
9/29/2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

Appendix B: Rationale for selection of metal species

boron {boron tribromide/trichloride/trifluoride (combined)}

Worst case species based on hazard statements

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 compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI concentration is low therefore species unlikely to be Lead Chromate

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

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

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

Worst case species based on hazard statements

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition, May 2015
HazWasteOnline Classification Engine Version: 2018.78.3515.7179 (19 Mar 2018)
HazWasteOnline Database: 2018.78.3515.7179 (19 Mar 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