British Land plc

1 Triton Square

St Anne's Ground Contamination Risk Assessment and Remediation Strategy

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Ove Arup & Partners Ltd
13 Fitzroy Street
London
W1T 4BQ
United Kingdom
www.arup.com

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		Name	Rachael Clark	Tim Morgan	
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		Name	Rachael Clark	Tim Morgan	Chris Barrett
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Background

Ove Arup and Partners (Arup) has been commissioned by British Land plc (British Land) to provide geoenvironmental consultancy services for 1 Triton Square. The development has been divided into three areas reflecting the phasing of the works. The scheme includes a commercial element (1 Triton Square), an area of public realm (Longford Place) and a residential element (St Anne's). This report specifically relates to the St Anne's site.

Arup previously prepared a contamination desk study and programme of investigation for the site which presented a preliminary risk assessment based upon a conceptual site model (CSM). The desk study highlighted the potential presence of several sources of contamination onsite including an electrical power station, a works, and the potential for asbestos to be present within former modular buildings. Offsite potential sources include a substation, petrol filling station with tanks and a 'planing and saw' mill. The desk study report was approved by London Borough of Camden (LBC) allowing discharge of part (a) of condition 12. The objective of this report is to discharge part (b).

Ground investigation

An intrusive ground investigation was carried out by Concept Ltd between 24 April 2018 and 4 May 2018 and comprised two cable percussion boreholes, with groundwater and ground gas monitoring wells in the south east and western part of the site, 11 trial pits in the north and east. Two rounds of groundwater sampling and monitoring and six rounds of ground gas monitoring were completed.

Results

The findings of the investigation are summarised below:

- concentrations of metals in soils were generally very low. Concentrations of lead were above the assessment criteria in ten samples;
- concentrations of three polycyclic aromatic hydrocarbons (PAH) compounds were above the residential assessment criteria in one sample;
- total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX) concentrations in soils were well below the residential assessment criteria;
- low concentrations of asbestos (chrysotile and amosite fibres) were identified in six soil samples within the Made Ground and potential asbestos containing material (ACM) was identified in four locations;
- TPH, PAH and BTEX concentrations in groundwater were below the detection limit;

- concentrations selenium in groundwater were slightly higher than initial assessment levels but generally the results indicate that the groundwater is relatively good quality given the environmental setting; and,
- ground gas concentrations and flow rates were very low and indicate gas protection measures are not required.

Conclusions

The contamination ground investigation and assessment confirmed that the site has not been impacted by significant contamination. The environmental sensitivity has been identified as low due to the low sensitivity of the shallow aquifer and the development sensitivity is high for ground floor residents as the development includes a private garden area.

Various recommendations for mitigation are provided in the report and described below. A summary of the risk assessment is provided below.

Summary of risk assessment

Description	Classification
Risk assessment	
Risk of harm to human health during construction	Very low (with mitigation)
Risk of harm to human health during operation	Very low (with mitigation)
Risk of pollution to groundwater	Very low
Risk of pollution to surface water	Negligible
Risk to construction materials and services	Very low (with mitigation)
Risk to designated ecological receptors	Negligible
Risk to planting in garden area	Very low (with mitigation)

Recommendations

There is no requirement for a specific advance phase of remediation based on the findings of the risk assessment. However, specifically enhanced control and safety measures are presented in this report to be put in place during the construction work to minimise potential exposure (primarily to asbestos) of receptors during the construction and operational phases.

The ground investigation identified elevated lead, PAH and asbestos. A clean cover layer of a minimum 1.0m thickness is recommended in the garden area that should be underlain by a hard no dig layer. A marker layer should be placed beneath hard surfaced areas and used to line service trenches to mitigate potential risks to future maintenance workers.

A verification report should be prepared following completion of the works to demonstrate that the objectives of the remediation strategy have been achieved. This report sets out the information which is required for the verification report and should be submitted to LBC.

1 Introduction

1.1 General

Ove Arup and Partners (Arup) has been commissioned by British Land plc (British Land) to provide geoenvironmental consultancy services for the development at St. Anne's, Laxton Place, London, NW1 3PT (the site). The site is part of the wider development at 1 Triton Square. The site location is shown on Figure 1.

The 1 Triton Square redevelopment has been divided into three areas to reflect the phased nature of the works, as shown on Figure 2. The scheme includes a commercial element (1 Triton Square), an area of public realm (Longford Place) and a residential element (St Anne's).

This report relates to the redevelopment of the St Anne's site. The development will comprise a part six storey, part nine storey residential building, a residential garden in the north east corner of the site and a pavement area at the main entrance of the property.

1.2 Planning background

Planning permission for the 1 Triton Square development was granted by London Borough of Camden (LBC), reference 2016/6069/P. Arup previously prepared a contamination desk study and programme of investigation (2018) [1] for the site which presented a preliminary risk assessment based upon a conceptual site model (CSM). The desk study report was approved by LBC allowing discharge of part 12 (a) of the condition. Condition 12 (b) is as follows:

At least 28 days before development commences on the residential element of the development:

- *(b) following the approval detailed in paragraph (a), an investigation shall be carried out on land within the residential element in accordance with the approved programme and the results and a written scheme of remediation measures relevant to that land [if necessary] shall be submitted to and approved by the local planning authority in writing.*

The following parts of condition 12 apply to the overall development scheme:

- *Any remediation measures [if necessary] shall be implemented strictly in accordance with the approved scheme(s) and where relevant a written report detailing the remediation for either the commercial element or the residential element shall be submitted to and approved by the local planning authority in writing prior to occupation of that element.*
- *Reporting and management of significant additional contamination. additional significant contamination discovered during development shall be fully assessed and any necessary modifications made to the remediation schemes shall be submitted to the Local Planning Authority for written*

approval. Before any part of either the commercial element or the residential element hereby permitted is occupied, where relevant the developer shall provide written confirmation that all works were completed in accordance with the revised remediation scheme(s) for that element.

1.3 Objectives and scope

The objective of this report is to enable the discharge of part (b) of planning condition 12. To meet the requirements of the condition this report:

- presents the scope of intrusive ground investigation and describes the findings;
- assesses the data obtained from the 2018 ground investigation and the risks posed to human health and environmental receptors;
- provides a remediation strategy based upon the results of the quantitative assessment to address any risks identified; and,
- presents a verification plan to ensure appropriate data and information is collected to form a verification report.

1.4 Report structure

This report has the following structure:

- Section 2 introduces the site and summarises the preliminary conceptual model described in the previous report;
- Section 3 provides the scope of ground investigation;
- Section 4 describes the findings of the ground investigation;
- Section 5 presents the methodology and assessment of the laboratory and monitoring data obtained from the ground investigation;
- Section 6 presents the quantitative risk assessment;
- Section 7 presents the revised conceptual site model;
- Section 8 presents the preliminary waste classification assessment;
- Section 9 presents the conclusions and recommendations including the remediation strategy and the verification plan.

1.5 Information sources

The following information sources have informed this report:

- Arup (2018), 1 Triton Square, St Anne's Contamination Desk Study and Programme of Investigation [1].
- Concept (2018) Site Investigation report, St Anne's, 1 Triton Square (included in Appendix A) [2];
- Groundsure (2016) Enviro Insight, St Anne's Church (Appendix A of St Anne's desk study) [3].

- Landmark (2015) Envirocheck Report (Appendix B of St Anne's desk study) [4].

1.6 Limitations

This report has been prepared for use by British Land in relation to the approved development of the St Anne's site. It takes into account our client's particular instructions and requirements and addresses their priorities at the time. It is not intended for, and should not be relied upon by any third party and no responsibility is undertaken to any third party in relation to it, except as provided for in Arup's agreement with British Land.

Arup has based the site appraisal on the sources of information detailed within the report text and believes them to be reliable, but cannot and does not guarantee the authenticity or reliability of this third party information. Notwithstanding the efforts made by the professional team in undertaking this contamination assessment it is possible that ground and contamination conditions other than those potentially indicated by this report may exist at the site.

This report does not present a survey or assessment of the location, condition or liabilities associated with hazardous materials in building fabric such as (but not limited to) asbestos containing material (ACM), radiological or bacterial substances or lead.

This report has been prepared based on current legislation, statutory requirements, planning policy and industry good practice prevalent at the time of writing. Any subsequent changes or new guidance may require the findings, conclusions and recommendations made in this report to be reassessed considering the circumstances. Should the approved layout or use of the site change, the assessments and conclusions presented in this report may need to be revised.

2 Preliminary conceptual model

2.1 Proposed development

The proposed development at the site will involve:

- the demolition of the existing church;
- construction of a part six storey, part nine storey residential building;
- a private garden at the northeast corner of the site; and,
- a pavement area at the main entrance.

The development approved under application ref 2016/6069/P also includes 1 Triton Square and Longford Place (shown on Figure 2). Table 1 shows the proposed layout of the ground floor including the residential garden in the north east corner.

Table 1 Layout of ground floor of proposed development at St Anne's

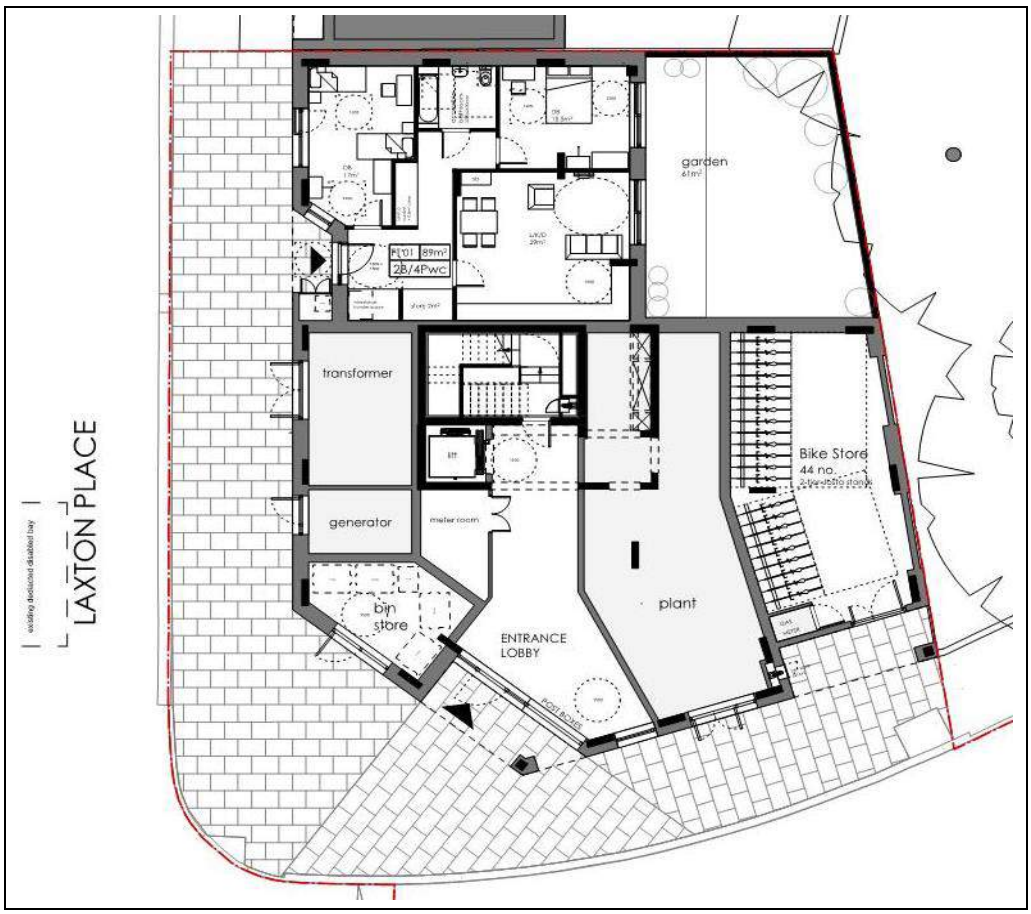

Table 2 shows an architect's drawing of the proposed development at St Anne's.

Table 2 Architectural drawing of the proposed development at St Anne's

2.2 Initial plausible contaminant linkages

The plausible contaminant linkages (PCLs) associated with the construction and operational phases of the development were set out in the desk based assessment [1]. The report was agreed with LBC. The identified linkages have been reproduced in Table 3.

Table 3 Plausible contaminant linkages

Receptors	Pathways	PCL
Human health		
Site workers (during construction)	Ingestion of soils, dust and/or groundwater. Dermal contact with soils, dust and/or groundwater. Inhalation of dust fibres and/or gas and vapours	Yes Workers are likely to come into contact with soil and perched water (if present) when carrying out ground works. Workers may be exposed to gases/vapours if working in confined spaces.
Neighbours (during construction)		Yes Principally due to dust or fibre emissions
Future site users (after construction)	Ingestion of soils, dust and/or groundwater. Dermal contact with soils and/or groundwater. Inhalation of dust, fibres and/or gas and vapours. Consumption of home-grown produce	Yes Future development will comprise residential apartments with a garden area and hard landscaping. Potential exposure to soils and consumption of home-grown produce. Dust and fibres may be released due to new soft landscaping. Gas and vapour pathways may be active if contamination or ground gas is present.

Receptors	Pathways	PCL
Controlled waters		
Shallow groundwater (secondary aquifer)	Vertical migration of contamination from Made Ground to the RTD	Yes If contamination is present in shallow soils it could migrate to the RTD.
	Migration pathways created by piling	Yes If contamination is present in shallow soils, pathways could be created during piling.
Building materials and services		
New building, hard landscaping and services	Direct contact with ground and/or groundwater	Yes New services and foundations may be in contact with contaminated soils.
Ecological		
Designated ecological receptors Planting within garden area	Uptake from contaminated soils or groundwater	There are no designated ecological receptors. Yes, for plant uptake (but limited) Made Ground is expected to be present across the site. All new planting will be within clean imported soils.

A ground investigation was proposed to obtain further information on ground conditions and contaminant concentrations at the site. The scope of the investigation is outlined in Section 3.

3 Scope of ground investigation

3.1 Scope

The intrusive ground investigation was carried out by Concept Ltd between 24 April 2018 and 4 May 2018. The scope of works comprised:

- two cable percussion boreholes within the north west (outside the building) and south east (within the building) portion of the site (BH01 and BH02B);
- five trial pits located along the northern boundary of the site and to the southeast corner (TP01-TP05);
- four shallow hand dug pits to provide information on shallow soils in the garden area in the northeast corner of the site (HP01-HP04);
- two shallow hand dug pits on the eastern boundary to provide information on tree roots from the adjacent property (HP05-HP06);
- chemical laboratory testing of 19 soil samples (solid and leachable) from 10 locations for a comprehensive suite of determinands;
- chemical laboratory testing of 4 groundwater samples from the two monitoring wells (BH01 and BH02B) for a comprehensive suite of determinands;
- two rounds of groundwater (RTD) monitoring in the two monitoring wells.

The locations of the intrusive investigation positions can be found within the factual report in Appendix A**Error! Reference source not found.**.

3.2 Objectives

The site is currently occupied by St Anne's church and hard landscaped areas. The objective of the investigation was to:

- confirm levels and thicknesses of the stratigraphy present at the site;
- investigate the potential presence of contamination at the site;
- confirm ground gas concentrations and vapour;
- confirm groundwater levels within the RTD and obtain groundwater samples for laboratory analysis; and,
- undertake geotechnical soil sampling and testing.

3.3 Monitoring installations

Groundwater monitoring wells were installed in BH01 and BH02B. Table 4 provides a summary of the installation details of the exploratory holes.

Table 4 Exploratory hole depth and installation details

Hole	Type	Depth (m)	Installation
BH01	CP	30	Groundwater well within RTD from 5.0m to 7.9m bgl
BH02B	CP	30	Groundwater well within RTD from 6.5m to 8.3m bgl
Key CP; Cable percussion			

3.4 Monitoring

Two rounds of groundwater sampling were completed in BH01 and BH2B on 29 May 2018 and 13 June 2018. The insitu groundwater monitoring included the assessment of non-aqueous phase liquids (NAPL) if present and groundwater testing in the secondary aquifer (RTD).

Several PCLs were identified within the CSM [1] and subsequently ground gas monitoring was undertaken as part of the investigation. Six rounds of ground gas monitoring were completed in BH01 and BH2B between 18 May 2018 and 2 July 2018.

3.5 Chemical analysis

The soil and groundwater analysis is described below. The testing was conducted by i2 Analytical Environmental Science laboratory to UKAS and MCERTS accredited methods, where appropriate and available. Testing of ground gas samples was subcontracted to Concept Life Sciences.

3.5.1 Soil

19 soil samples were collected from 10 locations and were submitted for laboratory analysis. This included 15 samples from the Made Ground, two samples from the RTD and two samples from the London Clay, which were tested for a range of contaminants. Contaminants included metals, detailed quantified asbestos analysis (two stages by initial stereo-binocular PLM and quantitative phase contrast microscopy assessment), speciated total petroleum hydrocarbons (TPHCWG carbon banding), MTBE, speciated PAH, BTEX, volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC), phenols, cyanide, polychlorinated biphenyls (PCB) and other inorganic compounds. Soil leachability testing was also undertaken.

3.5.2 Groundwater

Four groundwater samples were collected from the two boreholes onsite (BH01 and BH02B) and scheduled for a similar suite of analysis to the soil samples. It was not tested for asbestos but included additional testing for hardness, ammoniacal nitrogen, chloride, dissolved organic carbon, calcium and manganese.

3.5.3 Ground gas

Six samples of ground gas were collected to verify the monitoring results. One sample was collected from the location with the highest gas reading during each round of ground gas monitoring. The samples were tested for methane, carbon dioxide, oxygen, nitrogen, hydrogen, carbon monoxide and hydrogen sulphide.

4 Ground investigation findings

4.1 Geology and stratigraphy

The ground conditions encountered during the 2018 investigation are summarised in Table 5. The exploratory hole logs are included in the factual report presented in Appendix A.

Table 5 Summary of the depths and composition of encountered strata

Formation	Top of stratum (mOD)	Thickness (m)	Description
Made Ground	28.71	3.9 to 6.0	Soft to firm brown to yellowish brown gravelly very sandy clay with flint, brick, concrete and chalk fragments or loose dark brown to dark grey gravelly fine to coarse sand with high brick and concrete cobble content or light grey sandy gravel with low brick and concrete cobble content.
RTD	24.14	2.0 to 3.2	Medium dense yellowish brown slightly sandy angular to rounded fine to medium flint gravels. Sand is fine to coarse.
London Clay	20.94	22 to 22.4	Stiff dark grey slightly sandy clay with rare pockets of silty fine sand.
Lambeth Group	-1.76	Not proven	Very stiff reddish brown mottled bluish grey clay.

Made Ground was encountered in all 13 locations. Unproven thicknesses were recorded in the hand pits in the north and east of the site which ranged from 0.4m to 1.2m. Unproven thicknesses were also recorded in the hand dug trial pits in on the north and east boundaries which ranged from 0.6m to 1.5m. The boreholes in the south and west of the site recorded Made Ground thicknesses of 3.9m and 6.0m. The Made Ground was reported to include various anthropogenic materials such as brick, concrete, glass, slag, metal, clinker and ceramic fragments. A black plastic membrane was recorded at 0.55m depth in TP03.

4.2 Groundwater

Groundwater levels were recorded on six occasions in BH01 and BH2B between 18 May and 2 July 2018. The results of the groundwater level monitoring are summarised in Table 6.

Table 6 Summary of groundwater levels recorded in the RTD

Location	Monitoring rounds	Response zone (m bgl)		Water level (m bgl)		Water level (m above Ordnance Datum)	
		Top	Bottom	Max	Min	Max	Min
BH01	6	5	7.9	6.02	6.15	22.02	21.89
BH2B	7	6.5	8.3	6.52	6.67	22.19	22.04

4.3 Ground gas

Ground gas monitoring results are included in full in Appendix A. A summary of the atmospheric pressures recorded during the four ground gas monitoring visits are given in Table 7 below.

Table 7 Atmospheric conditions during ground gas monitoring

Monitoring round	Date	Barometric pressure (before) (mb)	Barometric pressure (after) (mb)	Rising or falling
1	18/05/18	1024	1022	Falling
2	29/05/18	1014	1013	Falling
3	06/06/18	1012	1012	Stable
4	13/06/18	1016	1015	Falling
5	20/06/18	1018	1017	Falling
6	27/06/18 (BH01 only) 02/07/18 (BH02 only)	1024 1011	1024 1011	Stable

The third and sixth rounds of monitoring were undertaken during a period of stable atmospheric pressure. The first, second, fourth and fifth rounds of monitoring were completed during periods of falling atmospheric pressure.

4.4 Observations of contamination

The results of PID headspace testing were below 1ppm in all samples apart from one sample from HP03 at 0.2m (1.8ppm) which is very low. This indicates that no significant hydrocarbon vapours are present in the materials monitored. A slight hydrocarbon odour was noted at 0.3m in HP02 but the PID results recorded 0.1ppm. Metal paint cans were found at 0.5m in HP04 and 0.5m in TP03.

Potential asbestos containing material (ACM) was encountered in TP02 at 0.6m. A sample was collected and analysed by a specialist contractor (4rail). The results are included in Appendix A and indicate that chrysotile asbestos was present in the sample, although the form was not specified within the test results. The trial pit was aborted and no further soil sampling was undertaken at this location. Potential ACMs were also encountered in HP05 (aborted at 0.4m), HP06 (aborted at 0.65m) and TP03 (within arisings). Samples of these potential ACMs were not collected. The material was assumed to contain asbestos based on the positive identification of ACM in TP02. Due to the presence of potential ACMs soil samples weren't collected from HP05 and HP06.

5 Data assessment

5.1 Assessment criteria

5.1.1 Rationale

The assessment criteria have been selected based on the preliminary conceptual model including a consideration of the proposed development. The evaluation of ground investigation data has been carried out in accordance with the risk assessment methodology outlined in Appendix B and following CIRIA C552 [5] and CLR11 [6]. Appendix B describes the background and context of the assessment and defines the criteria used to assess soils and groundwater, which are further discussed below.

5.1.2 Human health soil criteria

The UK statutory guidance [7] suggests that generic soil quality guideline values may be used for an initial screening of results in regard to human health risk assessment. Generic assessment criteria (GAC) provide an indication of concentrations in soil below which the long-term human health risks for various generic land-use scenarios are minimal. Concentrations above GAC do not necessarily indicate that significant contamination is present, but rather that further assessment or risk management measures may be warranted.

A generic end use based on residential with consumption of homegrown produce has been considered in the assessment to provide an initial appraisal of the results. The residential end use assumes a small two storey terraced house with a garden area, which could be used for growing fruit and vegetables. It is based on assessing risks to a female child from birth to six years old. It assumes the child is at the property 365 days a year and uses the garden for an hour every day apart from in the first six months of life. The child is assumed to spend 23 hours a day indoors until they are five when they are at school for part of the day. Soil organic matter (SOM) content in Made Ground soil samples ranged from 0.52% to 4.31% with an average of 1.40%. Criteria based on the lowest SOM level available (1%) have been used in the first instance.

Arup has derived GAC, using CLEA v1.07, based on data for exposure parameters included in the Category 4 Screening Levels (C4SL), released by Defra, but that maintain the traditional minimal risk toxicological benchmarks (where available). Input data for the toxicological effects, physical characteristics and contaminant fate and transport parameters for the determinands have been taken from sources published by the Environment Agency and other industry sources (including LQM/CIEH S4ULs (Copyright Land Quality Management Limited Publication Number S4UL3227) and the European Food Safety Authority (EFSA)).

5.1.3 Controlled waters quality standards

Groundwater and soil leachability results have been compared to the appropriate water quality standards (WQS). Appendix B sets out a hierarchy of WQS which has been used in the assessment of groundwater and leachability chemical data. Due to the limited controlled waters receptors the higher of Environmental Quality Standards (EQS) set out in the Water Framework Directive (2000) and UK Drinking Water Standards have been used.

Results above the WQS do not necessarily indicate significant contamination but may require further assessment. The values are set relatively low as they are protective of a sensitive water environment, whereas in this case inner London groundwater is being assessed. Concentrations above the WQS have been reviewed for high concentrations which may be indicative of other issues (free product or primary sources such as tanks) and might warrant further intervention.

5.2 Results

Laboratory analytical certificates are presented in the factual report in Appendix A and the results of a comparison of the concentrations against the relevant assessment criteria is presented as Appendix C.

5.2.1 Soil

The measured concentrations of contaminants in soil were generally very low. The concentrations of metals were generally very low and below the GAC except for:

- concentrations of beryllium were marginally above the GAC (1.7mg/kg) in BH01 at 3m bgl (2.5mg/kg), and TP03 at 0.5m bgl (2.1mg/kg); and,
- concentrations of lead were higher than the GAC (200mg/kg) in ten samples at concentrations ranging from 230mg/kg to 1,200mg/kg.

Concentrations of BTEX were all below the detection limit. Concentrations of three PAH compounds (benzo(a)pyrene, benzo(b)fluoranthene and dibenzo(ah)anthracene) were above the GAC in one sample from TP03 at 0.5m.

Concentrations of TPH were generally low and below the GAC. The concentrations of heavier end aliphatic fractions >EC16 to EC35 and/or >EC35 to EC44 were above the theoretical saturation limits for these compounds in nine locations but no evidence of free phase hydrocarbons was recorded during the investigation. The concentrations reported were significantly below the health-based GAC for these TPH fractions.

Asbestos was identified in six Made Ground samples in the form of chrysotile and/or amosite as loose fibres or fibrous debris at concentrations ranging from <0.001% to 0.002%. Additionally, a sample of possible ACM, described as cement, was taken from TP02 and contained chrysotile asbestos. The testing results did not identify the form of asbestos. The results are included in the factual report in Appendix A. Potential ACMs were also encountered in HP05 (aborted at

0.4m), HP06 (0.65m) and TP03 (arisings). The potential ACM were not tested from these locations.

Concentrations of PCBs were below detection in all samples apart from detectable concentrations of PCB-118 in BH01 at 1.1m, TP03 at 0.5m and TP04 at 0.25m. The maximum concentration recorded was 0.011mg/kg in BH01.

5.2.2 Controlled waters

Groundwater

The groundwater data were assessed initially by comparison to WQS and are presented in Appendix C. In general, the concentrations recorded in groundwater were very low and below the respective WQS with most recorded at concentrations below the MDL.

From the four groundwater samples collected, two concentrations above the relevant WQS were recorded as follows:

- manganese was marginally above the WQS (100µg/l) in BH2B (130µg/l); and,
- selenium was marginally above the WQS (10µg/l) in BH2B (12µg/l).

These results are very low and only marginally about the highly protective WQS used for the initial assessment., The results of the testing indicate that the groundwater in this area is relatively good quality given the environmental setting (a shallow aquifer in central London).

Soil leachability

The soil leachability data were compared to relevant WQS and are presented in Appendix C. In general, the soil leachability concentrations were low and below their respective WQS. No leachable concentrations were recorded above the WQS and leaching of these contaminants to groundwater is not considered significant. .

5.2.3 Ground gas

The results of the six monitoring rounds are summarised below:

- carbon dioxide ranged from 0.2% to 4.3% v/v;
- methane was not detected above the detection limit (<0.1% v/v); and,
- no flow rates were measured above the reporting limit of <0.1 litres/hr (l/hr).

A maximum GSV of 0.0043 has been calculated based on a maximum carbon dioxide concentration of 4.3% v/v and a maximum flow rate of 0.1l/hr. This equates to a characteristic situation (CS) 1 classification, which represents a very low risk from ground gas. No specific gas protection measures are required for a CS1 category site.

6 Risk assessment

6.1 Risk classification definitions

The potential risks to various receptors have been considered in the context of the conceptual site model in accordance with the current UK approach to contaminated land assessment. The method for risk evaluation has been based on a qualitative assessment taking into consideration the magnitude of the potential severity of the risk as well as the probability of the risk occurring. The risk characterisations provided below have been assessed using a scale from very high to very low based on the CIRIA guidance C552 [5]. A brief summary of each risk classification is provided in Table 8.

Table 8 Risk classification

Classification	Description of risk
Very high	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. The risk, if realised, is likely to result in substantial liability. Remediation is likely to be required.
High	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Remedial works may be necessary
Moderate	It is possible that harm could arise to a receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Some remedial works may be required.
Low	It is possible that harm could arise to a receptor from an identified hazard but it is likely that this harm, if realised, would typically be mild.
Very low	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised the consequence would at worst be mild.
Negligible	There is no plausible pollutant linkage due to the absence of a pathway or receptor (without any intervention).

6.2 Site sensitivity

6.2.1 Environmental sensitivity

The secondary aquifer within the RTD is of relatively low sensitivity and will be truncated by existing basements particularly to the south. The deeper principal aquifer within the Chalk is overlain by a significant thickness of London Clay (over 20m) which will provide significant protection. There are no source protection zones, surface water receptors, abstractions, environmentally sensitive areas or historic or current landfills near the site. The environmental sensitivity of the site is **low**.

6.2.2 Development sensitivity

The development comprises a new residential apartment building including a private garden in the north east corner. Residents will include adults and children and therefore sensitive receptors will be present at the site. Fewer pathways will be active for residents on upper floors since they will not have access to the private garden and gas and vapour pathways will be less relevant. The development sensitivity is **high** for ground floor residents with access to private gardens; elsewhere on site it will be low.

6.3 Summary of results

Most soil results were below the protective initial GAC used in the assessment. Concentrations of beryllium marginally the GAC were recorded in two samples and concentrations of lead above the GAC were recorded in ten samples. Six samples (30%) reported low concentrations of chrysotile and/or amosite fibres and asbestos was identified during the ground investigation works at several locations.

The results of the testing indicate the groundwater in this area is relatively good quality given the environmental setting (a shallow aquifer in central London).

The soil leachability results were generally low and none of the recorded concentrations were above the WQS.

6.4 Human health risk assessment

6.4.1 During construction

A PCL was identified in the preliminary risk assessment between ground contamination and site workers (including visitors) during construction works. Made Ground was identified in all exploratory locations to depths of between 3.9m and 6.0m bgl.

Asbestos as chrysotile and amosite loose fibres was identified in six samples (from BH02B, HP03, HP04, TP03 and TP04) typically within the top 1.0m at concentrations of between <0.001% and 0.002%. There are no specific thresholds for safe levels of asbestos fibres in soils. ACMs were identified and therefore higher concentrations may be present within Made Ground. The risks associated with the asbestos identified can be managed during construction with enhanced health and safety measures.

Based on the findings of the ground investigation the risk of harm to human health during construction of the development is assessed to be **moderate** principally due to the relatively frequent identification of asbestos (both visual and in the laboratory). The identified receptors which could be affected include construction workers onsite and site neighbours offsite.

With mitigation comprising appropriate enhanced control and risk management measures during construction the risk of harm to construction workers and site neighbours can be reduced to **very low**. Recommendations are presented in Section 9.

6.4.2 During operation

After development the main receptors at the site will be site residents, visitors and maintenance workers.

The results of the ground investigation have identified generally low concentrations of contaminants in the ground. Concentrations of lead and three PAH compounds above the residential GAC and asbestos fibres have been identified relatively frequently. These contaminants were found at locations in the north east of the site which will be a private garden following development. The garden should therefore be provided above a suitable thickness of clean cover (minimum of 1m) with a no dig layer (150mm thick hard layer which allows drainage) beneath. Further details are provided in Section 9.

There is the potential for maintenance workers to be exposed to underlying Made Ground soils if the hard and/or soft surfacing is penetrated during future maintenance works. Mitigation in the form of a marker layer and safety controls are described in Section 9.

Assuming the various mitigation measures (including the cover layer within the garden area) are implemented as described in Section 9 the risk of harm to future site users and maintenance workers will be **very low**.

6.5 Controlled waters

The conceptual model identified that controlled waters receptors are limited to the shallow RTD secondary A aquifer. The aquifer is of low sensitivity.

The new building will have a suspended reinforced concrete ground floor slab and piled foundations. The slab will be suspended from the pile caps. Due to the presence of the garden area (in place of the existing hard surfaced yard), the net effect of the development is expected to be a small increase in infiltration of water into the ground.

The results of the ground investigation have identified no significant contamination onsite within the groundwater and low concentrations of leachable contaminants. The risk of pollution of controlled waters is therefore **very low**.

6.6 Risk to building materials

Building materials normally identified as being at risk on contaminated sites are concrete, plastic and metals. The results of the ground investigation have not identified significant contamination onsite. Because detectable concentrations of TPH and PAHs were recorded, suitable pipe materials may need to be selected for any new or existing potable water supply at the site.

Assuming building materials and services are appropriately specified the risks are assessed to be **very low.**

6.7 Risk to ecological receptors

The site is not located in an area of ecological importance and the risk of harm to designated ecological receptors from contaminated ground is therefore **negligible**.

The principal (non-designated) ecological receptors identified are new planting (grass, trees and shrubs etc.) within the garden area in the northeast corner of the site. Three concentrations of zinc within shallow soils were above the phytotoxicity thresholds given in BS3882 [8]. A suitable thickness of clean imported soils will be provided within the development and is required to mitigate the risks from other contaminants; site won soils will not be reused in the upper layers of gardens and will therefore not present a potential risk to new planting.

The risk of harm to new planting is therefore considered to be **very low**.

7 Revised conceptual site model

The preliminary conceptual model has been updated based on the findings of the ground investigation and the risk assessment. Table 9 presents the revised conceptual model based on assessment of the PCLs for the site.

Table 9 Revised conceptual model

PCL	Summary	Mitigation measures	Risk
Construction workers (including visitors) via dermal contact, ingestion and inhalation of soils, soil-derived dust and vapours.	Generally low levels of contamination identified. Low concentrations of chrysotile and amosite asbestos fibres identified in six locations. Asbestos visually identified during investigation Lead and PAHs identified above residential criteria. Potential for other unexpected contamination.	Enhanced safety measures and material management, proactive dust control measures and PPE. Watching brief during excavation works.	Very low
Site neighbours via inhalation of soils, soil-derived dust and vapours			
Future site users via dermal contact, ingestion and inhalation of soils and soil-derived dust.		Garden area will include 1m thick cover layer of imported soils and no dig layer.	Very low
Future site maintenance workers via dermal contact, ingestion and inhalation of soils and soil-derived dust.		Marker layer below hard surfacing build up. Services laid in clean material and trenches lined with marker layer/	Very low
Secondary aquifer (RTD).	Low levels of contamination in soils and leachable contaminants.	None	Very low
Construction materials and services	No significant contamination identified in soil and groundwater.	Materials to be appropriately specified. Water supply pipes specified.	Very low
Planting within garden area	Generally low levels of contamination identified. Three concentrations of zinc were above phytotoxicity thresholds	Gardens will include 1m thick cover layer of imported soils.	Very low

8 Preliminary waste classification assessment

8.1 Background and methodology

This section provides a preliminary waste classification for the materials represented by the laboratory data obtained during the ground investigation.

The following documents have been utilised for the preliminary waste classification and disposal assessment of Made Ground and natural soil arisings generated by the proposed development:

- Environment Agency, Hazardous Waste, August 2009 Update [9];
- Environment Agency, Hazardous Waste, Technical Guidance WM3 2018 [10];
- The Hazardous Waste (England and Wales) Regulations [11]; and
- Table 3.2 of Annex VI to Regulation (EC) No. 1272/2008 [12].

8.2 Framework

There are three types of permitted landfill (inert, non-hazardous and hazardous) and four principal types of waste, as outlined below.

- Inert; generally uncontaminated natural soils that may be disposed of to an inert landfill. Other materials such as Made Ground may be classified as inert if it contains no hazardous properties and satisfies the inert waste acceptance criteria (WAC).
- Hazardous; defined by the analysis of 'total' chemical parameters to assess the hazard properties. If classed as hazardous it may only be disposed of (following treatment) if it satisfies the TOC and leachability WAC for hazardous waste.
- Stable non-reactive (SNR) hazardous waste; defined in a similar manner to hazardous waste but satisfying stricter WAC. Following treatment, it may be disposed of in specifically designed separate cells in non-hazardous landfills (if the operator has obtained a permit to operate these cells).
- Non-hazardous waste; if the waste is not classified as inert or hazardous then it is non-hazardous. There is no WAC for non-hazardous waste.

8.3 Hazardous waste

The concentrations of TPH, BTEX, TOC, PCB and PAHs were all below hazardous waste thresholds as were the results for asbestos.

The concentrations of asbestos in soil were generally below the 0.1% threshold for hazardous waste. However, ACM was identified visually in a sample from TP02 and potential ACMs were also encountered in HP05 (aborted at 0.4m),

HP06 (0.65m) and TP03 (arisings). Soils containing visible fragments of materials that might reasonably be ACM will be classed as hazardous (mixed) waste unless that ACM can be segregated.

Where soils are excavated that might contain visually identifiable fragments of ACM these should be segregated by picking or other means where possible. The soils would then be tested and might be classed as non-hazardous waste and the fragments of ACM as hazardous waste. If that is not practical, then the entire excavation might be classed as hazardous waste.

8.4 Non-hazardous and inert waste

Waste soils not classed as hazardous waste could be classified either as non-hazardous or inert waste. The 19 samples were analysed for leachability WAC testing.

Six of the 19 samples recorded leachable concentrations of antimony, selenium, sulphate and total dissolved solids above the inert WAC. Of these samples two had leachable concentrations of only sulphate or total dissolved solids which might not prevent an inert classification.

Two samples from the London Clay had concentrations of selenium above the inert WAC, which is not unusual. The remaining two Made Ground samples contained concentrations of antimony and sulphate and/or total dissolved solids above the inert WAC.

8.5 Summary

The results suggest that Made Ground material arising from the works will be classified as non-hazardous if ACM can be segregated. The potential presence of low levels of asbestos would prevent a classification of inert. Soils containing visible fragments of materials that might reasonably be ACM will be classed as hazardous waste unless that ACM can be segregated.

Natural soils, not suspected of being contaminated should be classed as inert waste. The contractor will be responsible for undertaking sufficient testing of material to confirm their waste classification prior to off-site disposal.

9 Conclusions and recommendations

9.1 Conclusions

Soil and groundwater contamination levels at the site were generally low. Concentrations of lead above the GAC were reported in ten soil samples from eight locations and PAH in one sample at shallow depths. Low concentrations of chrysotile and amosite asbestos fibres were reported in six soil samples (30%) from five locations. ACM were identified during the investigation TPH concentrations were below the residential assessment criteria.

The environmental sensitivity of the site is low. The development sensitivity is high in some areas because it comprises a residential building which includes a garden area at ground level.

Based on the risk assessment for the proposed development, risks to human health and the environment have been assessed as either low, very low or negligible (without mitigation). Proposed mitigation measures including good and enhanced construction practices (e.g. health and safety, environmental controls) and the form of development (1m clean cover and no dig layer in garden areas, marker layer beneath hard landscaping and utilities laid in clean material) will reduce any residual risk to very low or negligible (with mitigation).

Table 10 below summarises the risk of harm to receptors through the identified PCLs.

Table 10 Summary of risk assessment

Description	Classification
Contaminant sources and site sensitivity	
Environmental sensitivity	Low
Development sensitivity	High (ground floor residents)
Risk assessment	
Risk of harm to human health during construction	Very low (with mitigation)
Risk of harm to human health during operation	Very low (with mitigation)
Risk of pollution to groundwater	Very low
Risk of pollution to surface water	Negligible
Risk to construction materials and services	Very low (with mitigation)
Risk to designated ecological receptors	Negligible
Risk to planting in garden area	Very low (with mitigation)

9.2 Recommendations

Based on the findings of the ground investigation and risk assessment, there is no requirement for a specific advance phase of remediation. However, specifically enhanced control and safety measures are presented in the following sections to be

put in place during the construction work to minimise potential exposure of receptors during the construction and operational phases. Additional soil cover layers will be included in gardens, with other measures for services and hardstanding implemented elsewhere.

The contractor(s) should incorporate the findings of this report applicable to their works as part of their risk assessment process, to determine the appropriate level of mitigation and control measures. As with most brownfield sites, there is the potential for conditions different to those identified in this report to exist onsite, for example between investigation locations.

9.3 Site safety and control

The development works should be undertaken in a fashion to prevent the creation of dusts and appropriately specified PPE and good control of arisings is necessary, where the following may apply:

- The requirements described in Control of Asbestos Regulations (CAR) 2012 [13] and CL:AIRE CAR SOIL [14] guidance should be adhered to where they apply.
- The low levels of asbestos identified by the laboratory during the recent investigation are typical of Made Ground in London. However, the identification of the low levels was relatively frequent and it was visually identified during site works. It will not necessarily be identifiable during all groundworks so a protective and pragmatic approach will be necessary, primarily through prevention of dust, control of materials, appropriate PPE and asbestos awareness briefings.
- An assessment should be undertaken by a competent assessor (asbestos specialist) in accordance with CAR 2012 and the associated code of practice to determine the likely exposure resulting from the works and the level of protection and management required by CAR 2012.
- Air monitoring may be required which will be advised by the specialist. If the works will take place adjacent to occupied premises (neighbours), a lower detection limit (than used for occupational monitoring), i.e. 0.00001 f/ml, for air monitoring at the boundary may be appropriate.
- Sufficient hygiene units and PPE should be provided for the works. Suitably competent personnel should advise on and supervise the works and all staff should be briefed on the working methods.

9.4 Clean cover and marker layer

The ground investigation identified elevated lead, PAH and asbestos concentrations. The proposed development includes both hard and soft surfaced areas.

It is recommended that a clean cover layer and a marker sheet are placed to limit any future contact with potentially contaminated soils. A clean cover layer of a minimum 1.0m thickness is recommended in the garden area that should be

underlain by a hard no dig layer which allows drainage. A marker layer should be placed beneath hard surfaced areas to mitigate potential risks to future maintenance workers. This should be recorded in the verification report.

Any services, utilities and other parts of the public realm that may require future maintenance should be provided with a marker layer, denoting the potential presence of asbestos and contamination below that layer and clean backfill provided so that the potential for future exposure is limited.

A record of the installed measures, including the cover layer in the garden area and depth to marker sheet, should be maintained after completion of the development works. Any proposed belowground maintenance work should be reviewed to ensure that appropriate measures are taken.

9.5 Watching brief and unexpected contamination

A watching brief should be maintained during the works for the presence of contamination and to ensure the various recommendations provided are implemented and recorded.

The method for implementing the watching brief should be described in the construction risk assessment method statement (RAMS). The watching brief should be documented, reported on during progress meetings and compiled in the verification report. Specialist personnel will be necessary to advise on the method statement for the safe handling of asbestos materials onsite where encountered and air monitoring if required.

Where it is necessary to sample and test soils for waste classification purposes, verification, or for dealing with unexpected contamination, this should be undertaken in an appropriate manner by appropriately experienced and qualified staff. Soil testing should be to MCERTS and UKAS standards (where available). All such activities should be recorded and reported on.

These measures and any others deemed necessary by the contractor should be included in the relevant method statements. The contractor will prepare a method detailing how unexpected contamination will be dealt with should it be encountered during the works to comply with planning condition 12. This condition requires unexpected contamination to be dealt with to the satisfaction of the local authority. This would normally include;

- suspending excavation in the area and undertaking insitu soil sampling, or segregating and stockpiling the excavated material separately in an appropriate manner and then collecting soil samples;
- undertaking laboratory testing of potentially contaminated materials; and
- carrying out measures to restrict dust, odour and surface water run-off.

Any additional significant contamination will need to be reported to LBC and any necessary modifications to the remediation scheme should be submitted to and approved by LBC prior to implementation.

9.6 Materials management

9.6.1 Excavated soils

During the earthworks, the contractor will ensure that stockpiles and arisings will be appropriately managed to prevent the spread of material and potential cross contamination. The contractor will implement a robust material and waste management procedure to ensure that all necessary licences/ permits and waste documentation are compliant with the relevant regulations and guidance.

9.6.2 Imported materials

Material will be imported onto site, which is likely to consist of:

- topsoil and subsoil, to be placed in the garden area; and,
- 'product' material, such as concrete and 'virgin' quarry materials which may include drainage shingle, bedding sands and road/pavement aggregate.

The contractor will document their import of material in their works method statement, but as a minimum will implement the following:

- prior to any import: review the suppliers' certificates, including chemical testing results (where/if available);
- upon arrival to site: visual inspection to ensure that the material is free of any obvious visual or olfactory evidence of contamination and is consistent with the expected material. If suspect material is identified, any lorry loads should either be rejected or chemically tested prior to placement;
- insitu validation chemical testing (or stockpile testing onsite): topsoil and sub-soil verification sampling on a frequency of one sample every 50m^3 for a suite of chemical determinands consisting of metals, TPH, PAH and asbestos;
- the frequency may be subject to review, for example, based on Local Authority requirements or volume/consistency of source(s);
- if it proposed to import recycled material or use site won material, then testing for asbestos will be undertaken; and,
- 'product' materials will not be chemically tested on site.

9.7 Decommissioning standpipes

The two groundwater monitoring wells will require decommissioning. Where required, these wells should be decommissioned in line with the EA guidance [15]. This is required to ensure that no contaminant migration pathways are created during the development works from the surface/Made Ground to the underlying natural soils/aquifer. This shall be undertaken before any significant ground works take place.

9.8 Verification report

A verification report should be prepared following completion of the works to demonstrate that the requirements of the remediation strategy have been achieved. Typical information which is included in a verification report and which will need to be collected is set out in Table 11 below.

Table 11 Requirements relating to verification

Requirement	Method
Details of works	• details of the parties involved and a summary of the works undertaken, including method of works, health and safety and environmental control measures implemented, as-built records and photographs of key stages of the ground works.
Health and Safety	• method statement and risk assessment from earthworks contractor and specialist sub-contractors and/or consultants relating to contamination/waste/asbestos; • contamination and asbestos discovery strategies and records of communication to operatives via site induction and tool box talks; and • minutes of site progress meetings including a section on safety and environment.
Asbestos	• evidence of compliance with CAR 2012 and other legislation; • CAR assessment and asbestos management plan; • evidence of induction and toolbox talks to operatives; • evidence of control measures; • records of results above relevant exposure limits and actions undertaken as a result to mitigate associated risks; • records of air monitoring, and • waste disposal records.
Marker layer	• details of the cover layer placed in the garden area and photographic evidence of its depth; • details of marker layer beneath hard landscaped areas which should be shown on drawings to inform future maintenance works; and • Details of service runs, marker layer and record of clean material.
Watching brief	• details of any ground contamination encountered and how it was dealt with; • any other observations made by operatives during works; and • photographic records to be included.
Previously unidentified contamination	• record of actions taken and mitigation measures put in place; • records of chemical sampling to assess nature and extent of potential contamination; and • records of excavation, stockpiling and waste disposal.
Dust control	• mitigation measures to be detailed in contractor's method statements; and • evidence that proactive dust control was implemented.
Imported material	• results of testing of imported material at source (prior to import) and insitu testing following placement. This should include details of volumes, material sources and chemical testing, where appropriate, with assessment against GAC; and • record of the extent and thickness of any imported soil/soft landscaping layers.

Requirement	Method
Waste management	• results of waste classification testing (chemical laboratory results); • summary of waste disposal records, including conveyance tickets and evidence of compliance with the relevant waste regulations; • volumes or tonnage of each waste stream removed from site; • permits of all hauliers, treatment centres, landfills and other receiving facilities used to remove waste from site; and • haulage/disposal tickets.
Photographs	• photographic record of activities undertaken onsite, with particular attention to key tasks; and • if fixed points can be set out at the site which will remain constant for periodic photographs to be taken to document the progress of the site, this would be beneficial.
Regulatory correspondence	• evidence of communication with the regulators, such as the Local Authority Environmental Health Officer (EHO) and Environment Agency and compliance with any permit, consent and licence and relevant planning condition requirements.
Outstanding actions	• details of any outstanding actions and site constraints and how these will be addressed, including maintenance plan; and • description of final site conditions

The verification report should form part of the Health and Safety file in accordance with the Construction Design and Management (CDM) Regulations 2015 and the development operations & maintenance (O&M) manual or maintenance plan. This is to allow the owner/occupant to address any residual ground contamination risks associated with future operations and maintenance.

References

[1] Arup (2018), 1 Triton Square, St Anne's Contamination Desk Study and Programme of Investigation, February 2018.

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[4] Landmark (2015) Envirocheck Report, Order No 76872908_1_1, Dec 2015

[5] CIRIA (2001), Contaminated Land Risk Assessment – A Guide to Good Practice (C552).

[6] CLR 11 (2004), Model Procedures for the Management of Land Contamination, Department for Environment, Food and Rural Affairs.

[7] Defra, 2012. Environmental Protection Act 1990: Part 2A. Contaminated Land Statutory Guidance.

[8] BSI (2015), Specification for topsoil, BS3882:2015.

[9] Environment Agency (Aug 2009) Hazardous Waste – August 2009 Update, Technical Guidance WM2 and Changes to Chemical Legislation.

[10] Environment Agency (2018), Waste Classification, Guidance on the classification and assessment of waste (1st Edition v1.1), Technical guidance WM3.

[11] The Hazardous Waste (England and Wales) Regulations 2005.

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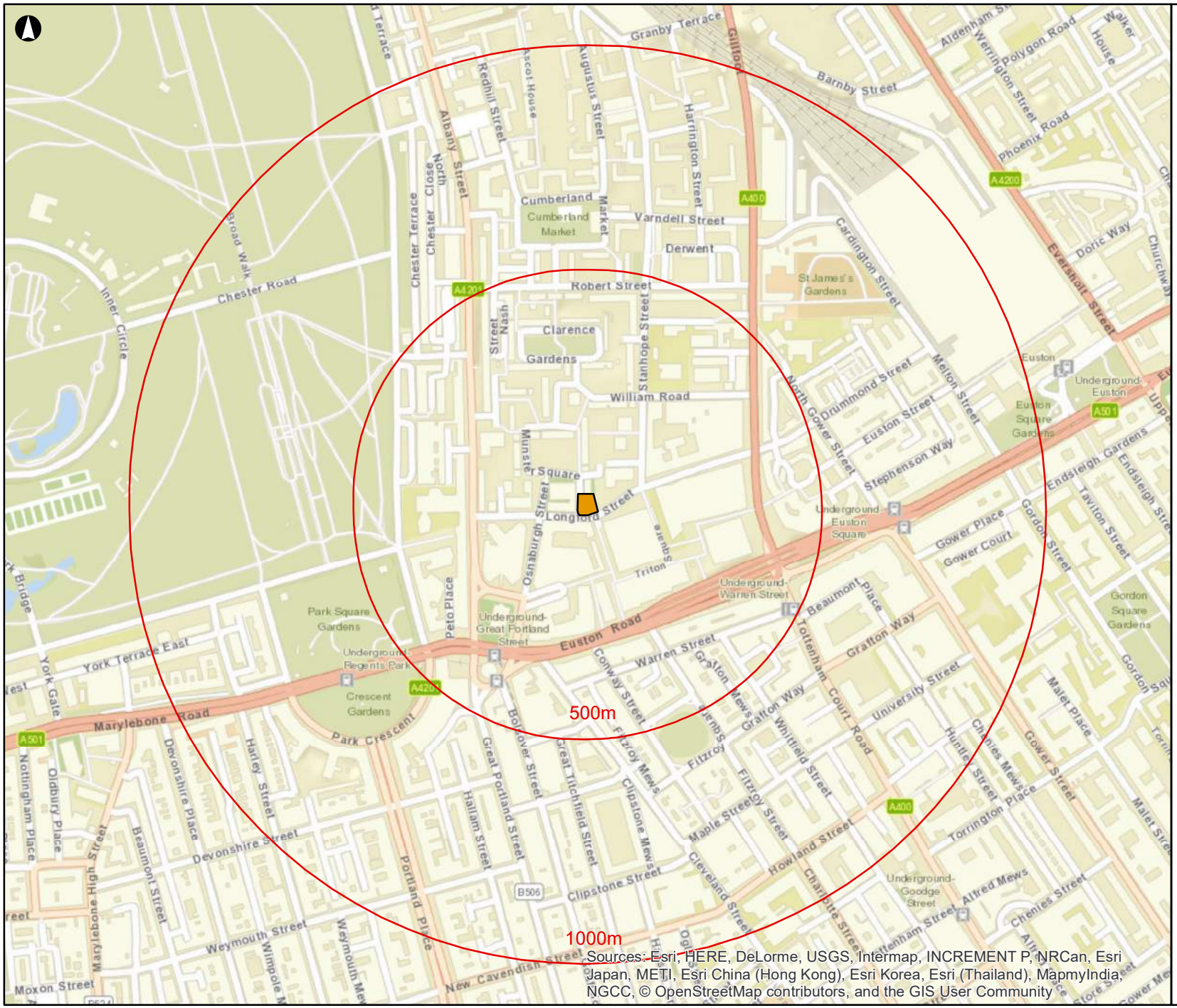
[13] HSE (2012) The Control of Asbestos Regulations (CAR).

[14] CAR-SOIL™ (CLAIRE & JIWG) (2016) Control of Asbestos Regulations 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials, Industry Guidance.

[15] Environment Agency (March 2012), Good practice for decommissioning redundant boreholes and wells.

Figures

A4



Legend

St Anne's

Issue	Date	By	Chkd	Appd
F1	05-02-18	RC	TM	CB

Metres
0 145 290 580

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client
British Land Ltd

Job Title
St Anne's Church

Site location plan

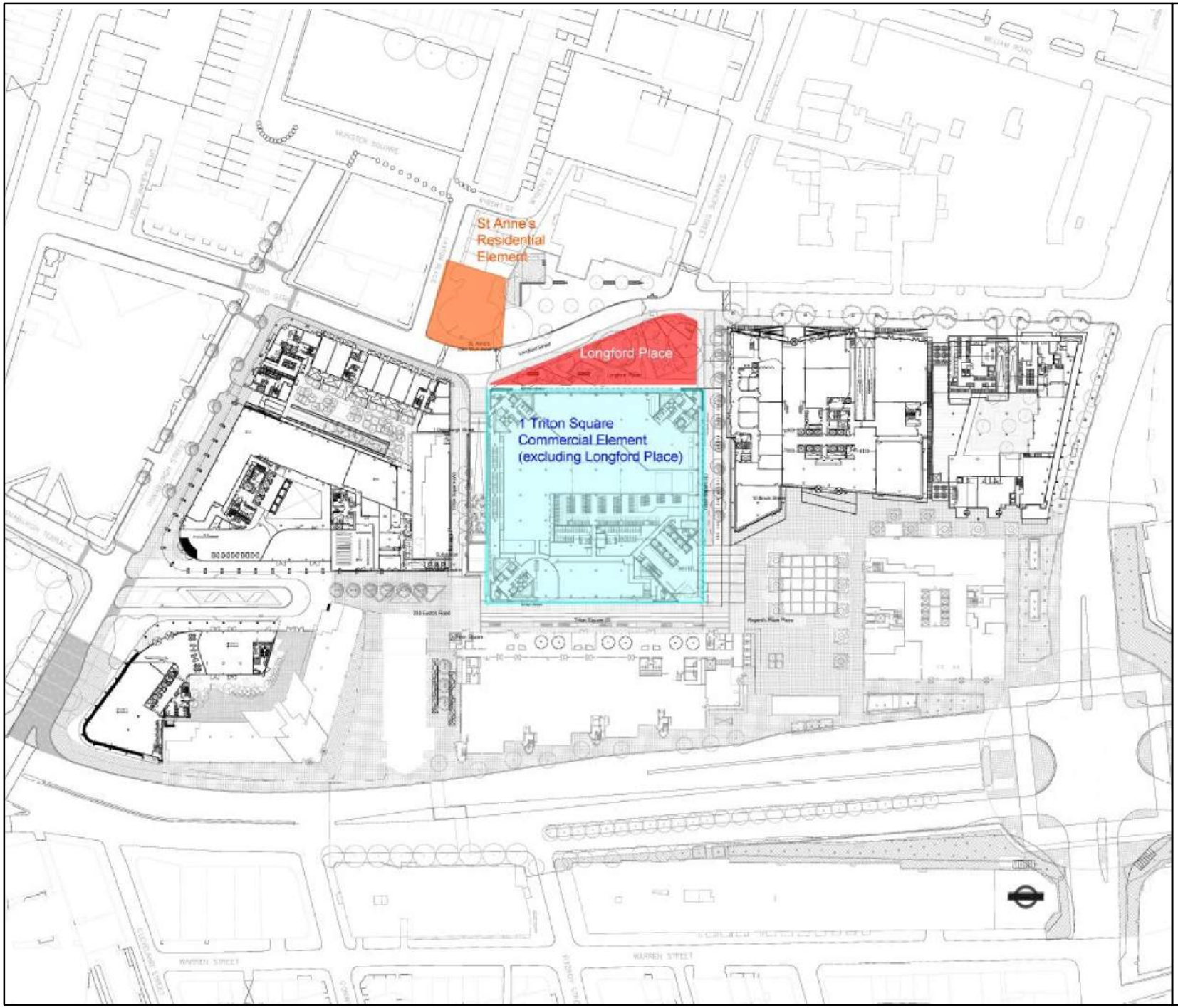
Scale at A4
1:12,000

Job No	Drawing Status
246868	**Final**

Figure	Issue
01	**F1**

MXD Location

A4



Issue	Date	By	Chkd	Appd
F1	05-02-18	RC	TM	CB

Metres
0 95 190 380

ARUP

13 Fitzroy Street
London W1T 4BQ
Tel +44 20 7636 1531 Fax +44 20 7580 3924
www.arup.com

Client
British Land Ltd

Job Title
St Anne's Church

Site layout plan

Job No	Drawing Status
246868	**Final**

Figure	Issue
02	**F1**

MXD Location

Appendix A

Concept 2018 factual report

SITE INVESTIGATION REPORT

1 Triton Square – St Anne's

ISSUE 01

SITE INVESTIGATION REPORT

1 Triton Square – St Anne's

Prepared for: British Land

Concept: 18/3106 - FR 01 17/07/2018

Unit 8, Warple Mews,
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: si@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Unit 8 Warple Mews, Warple Way, London W3 0RF
Tel: 0208 811 2880, Fax: 0208 811 2881
Email: si@conceptconsultants.co.uk

DOCUMENT ISSUE REGISTER			
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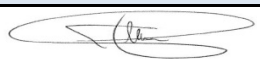
Project Number:	18/3106		
Document Reference:	18/3106 - FR 01	**Current Issue**	Issue 01
Document Type:	Site Investigation Report		

Development		**Name**	**Signature**	**Date**
Prepared by:		F Elliston		17/07/2018
Checked by:		O Savvidou		17/07/2018
Approved by:		I Penchev		17/07/2018

Issued to:	Arup

Date	Issue	Amendment Details/ Reason for issue	Issued to
27/06/2018	Issue 00	DRAFT	Arup
17/07/2018	Issue 01	FINAL - Updated with monitoring & chemical test results	Arup

Notes:

CONTENTS

1. PROJECT PARTICULARS

Site Location:	1 Laxton Place, London NW1 3PT
Client:	British Land
Investigation Supervisor:	Ove Arup & Partners
Fieldwork:	24/04/2018 – 04/05/2018
Laboratory Work:	03/05/2017 – Ongoing
Postfield Work:	18/05/2017 – 27/06/2018

2. PURPOSE AND SCOPE OF WORKS

The purpose of the investigation was to provide information on the geometry and condition of the existing substructure, the contamination status of the site in relation to ground conditions, ground gas and groundwater regime and confirm geotechnical parameters for the design of new foundations.

The site at the time of the investigation was occupied by the main church hall adjoined to a two storey building containing bathrooms, a kitchen, an office and storage rooms. An existing single storey building extension was also present to the north-east of site.

The proposed works involve the demolition of the existing buildings on site and construction of a new part 6 storey, part 9 storey above ground building.

The scope of the works comprised the following:

- 2 No. Cable Percussion Boreholes to a maximum depth of 30.00m.
- 11 Hand Excavated Pits to a maximum depth of 1.50m;
- Logging and Photographing;
- Instrumentation Monitoring and Sampling;
- Geotechnical & Chemical Testing.

Table 1 – Exploratory Hole List

Hole ID	Hole Type	Depth (m)	Easting	Northing	Level (mOD)
BH01	CP	30.00	528988.26	182406.28	28.04
BH02	IP	1.20	529002.71	182398.02	28.71
BH02A	IP	1.20	529004.91	182403.27	28.71
BH02B	CP	30.00	529005.25	182401.93	28.71
HP01	TP	0.80	529002.06	182413.08	28.58
HP02	TP	1.20	529002.48	182410.66	28.60
HP03	TP	1.20	529005.10	182413.53	28.55
HP04	TP	1.20	529005.23	182410.79	28.59
HP05	TP	0.40	529005.31	182416.20	28.52

Hole ID	Hole Type	Depth (m)	Easting	Northing	Level (mOD)
HP06	TP	0.65	529009.25	182399.47	28.35
TP01	TP	1.50	528988.60	182416.89	28.63
TP02	TP	0.40	528998.90	182417.20	28.66
TP03	TP	1.30	529004.34	182418.13	28.55
TP04	TP	1.40	529007.92	182400.64	28.40
TP05	TP	1.40	529001.32	182416.73	28.55

Key
CP – Cable Percussion Borehole
TP – Hand Excavated Trial Pit
IP – Inspection Pit

3. DESCRIPTION OF WORKS

The works were carried out in accordance with the Arup "1 Triton Square – St Anne's" Ground Investigation Specification document, Draft 1 dated 5 March 2018 and Concept's Method Statement (St Annes MS).

The site was bounded by 1 Laxton Place to the north, a small park to the east, Longford Street to the south and Laxton Place to the west.
The approximate centre of the site was located at National Grid Reference 528997E, 182419N.

The locations of all exploratory holes are shown in the Exploratory Hole Location Plan presented in Section 7 of this report.

4. INVESTIGATION METHODS

4.1 Inspection Pits

Inspection pits were hand excavated to a maximum depth of 1.20m at all borehole locations. BH02 and BH02A locations were aborted at 1.20m depth due to strong CAT signal. Position moved to location BH02B.

4.2 Cable Percussion Drilling

2 No. Cable Percussion Boreholes (BH01 and BH02B) were drilled to a maximum depth of 30.00m depth using a standard cable percussion rig (Dando 1000) with 200mm and 150mm diameter casing as appropriate.

4.2.1 Sampling and Testing during Cable Percussion Drilling

Bulk samples were taken at regular intervals in the Made Ground or as instructed by the Investigation Supervisor. Undisturbed Thin Walled samples (UT) were taken in accordance with EC7 using a down-hole sliding hammer in cohesive material at regular intervals or as instructed by the Investigation Supervisor.

Standard Penetration Tests (SPT) were carried out at specified intervals or as otherwise instructed by the Investigation Supervisor. The resulting SPT "N" blowcount values are

presented in the relevant borehole records. Where an SPT using a split spoon sampler was not possible, due to the granular nature of the material, a solid cone was used.

Small, disturbed samples were retrieved from the cutting shoe of the UT100 sampler, the SPT split spoon sampler and at intervals specified by the Investigation Supervisor.

Environmental samples (tubs, jars and vials) were taken for chemical analysis in the Made Ground or at each change of strata and where visual or olfactory evidence of contamination was noted or as instructed by the Investigation Supervisor. Headspace readings for volatile organic compound (VOC) content were taken in all the samples using a Phocheck Tiger photoionization detector.

The borehole logs are presented in Section 8 of this report.

4.3 Hand Excavated Trial Pits

11 No. Hand Excavated Pits were carried out to a maximum depth of 1.50m.

HP01 - HP06 were carried out for environmental testing purposes. Bulk samples were also taken for geological testing. HP05 and HP06 were aborted at 0.40m and 0.65m respectively due to presence of asbestos and no logging or sampling was carried out.

TP01 - TP05 were carried out to expose the width and depth of the existing boundary foundations and to assess the shallow ground conditions. TP02 was aborted at 0.60m depth and was not sketched or logged due to presence of asbestos. Specialist subcontractor 4-Rail was called on site and a sample was taken for testing. Asbestos was encountered also in TP03 and TP04.

Environmental samples (tubs, jars and vials) were taken for chemical analysis in the Made Ground or at each change of strata and where visual or olfactory evidence of contamination was noted or as instructed by the Investigation Supervisor. Headspace readings for volatile organic compound (VOC) content were taken in all the samples using a Phocheck Tiger photoionization detector. Bulk samples were also taken for soils analysis.

All pits were logged and photographed. Trial pits (TP01-TP05) were also sketched. The logs and sketches of the pits are presented in Section 9 of this report and the photographs are presented in Section 13 of this report.

4.4 Standpipe Installations

Monitoring wells were installed in the boreholes as follows:

Table 2 – Monitoring Installation Details

Hole ID	Base of Borehole (m bgl)	Diameter of Installation (mm)	Type of Installation	Base (m bgl)	Top RZ (m bgl)	Bottom RZ (m bgl)
BH01	30.00	50	SPG/GW	3.50	2.00	3.50
		50	SPGW	7.90	5.00	7.90
BH02B	30.00	50	SPG/GW	5.50	2.00	5.50

		50	SPGW	8.30	6.50	8.30

KEY
SPG/GW – Gas and groundwater Standpipe
SPGW – Goundwater Standpipe
RZ – Response Zone

The boreholes were backfilled with bentonite pellets with gas/groundwater response zones backfilled with a 10mm pea shingle filter with a geosoc surround. All installations were finished with bentonite pellets to the surface with concrete and a lockable stopcock cover flush with the ground.

4.5 Instrumentation Monitoring

Gas and groundwater monitoring and sampling was carried out by Concept subsequent to completion of the boreholes on 6 monitoring visits between the 18/05/2018 and 27/06/2018. All boreholes were developed prior to monitoring commencing.

Groundwater in the standpipes was monitored using an In-Situ Rugged interface and the gas concentrations were recorded using a Gas data GFM436 gas monitor. The accuracy of the instrument is summarised in Section 10 where the gas monitoring reports and groundwater results are presented.

4.6 Logging / Laboratory Testing

Logging of all soil samples was carried out in accordance with BS 5930:2015.

Geotechnical testing was performed at Concept Site Investigations laboratory in accordance with BS1377:1990 unless otherwise stated in the report. Concept is accredited by UKAS for tests where the UKAS logo is appended to the individual test report or summary. Approved signatories for laboratory testing are as follows:

- LG – Lynn Griffin (Quality Manager)
- KM – Kasia Mazerant (Laboratory Manager)

Where subcontracted analysis has been carried out, the details of the laboratory (and accreditation where applicable) are shown in the individual test report or summary.

The results are presented in tabular format in Section 11 of this report.

All chemical testing was specified and scheduled by Arup and carried out by i2 Analytical Ltd in accordance with the requirements of UKAS ISO17025 and MCERTS. The results are presented in tabular format in Section 12 of this report.

4.7 Setting Out

The locations of all exploratory holes were agreed with the Investigation Supervisor and set out prior to commencement of the site works.

Following completion of the ground works the locations and elevations of the boreholes and pits were established by Concept's specialist subcontractor JPP Surveying Ltd using total survey equipment with an accuracy between +/- 2mm and 5mm and GPS equipment with an accuracy between +/- 10mm and 20mm.

The co-ordinates and levels of the as-built locations of the boreholes and pits are shown in the Exploratory Hole Location Plan presented in Section 7 of this report.

5. GEOLOGICAL GROUND PROFILE

The geological strata encountered during the investigation are summarised in the table below. The Top and Bottom of the strata noted in the table indicates the highest and lowest boundaries encountered in all exploratory holes.

Table 3 - Geological Ground Profile

STRATUM	TOP (mOD)	BASE (mOD)	DESCRIPTION
MADE GROUND	28.71	22.21	Soft to firm, brown to yellowish brown gravelly very sandy CLAY. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and chalk fragments. Loose, dark brown to dark grey gravelly fine to coarse SAND with high brick and concrete cobble content. Gravel comprises angular to rounded fine to coarse flint, brick and concrete fragments. Light grey sandy GRAVEL with low brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete, ceramic fragments.
RIVER TERRACE DEPOSITS	24.14	20.71	Medium dense, yellowish brown slightly sandy angular to rounded fine to medium flint GRAVEL. Sand is fine to coarse.
LONDON CLAY	20.94	-1.76	Stiff, dark grey slightly sandy CLAY with rare pockets of silty fine sand.
LAMBETH GROUP	-1.76	Extent not proven	Very stiff, reddish brown mottled bluish grey CLAY.

REFERENCES

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British Standards Institution, (2011) Investigation of potentially contaminated sites, British Standard BS10175: 2011, BSI, London.

UK Specification for Ground Investigation, (2011) Site Investigation Steering Group, Thomas Telford, London

British Geological Survey (1996) London and the Thames Valley 4th Edition, London HMSO.

British Standards Institution BS EN ISO 22475-1, (2006) Geotechnical Investigation and Testing – Sampling Methods and Groundwater Measurements – Part 1: Technical Principles for Execution

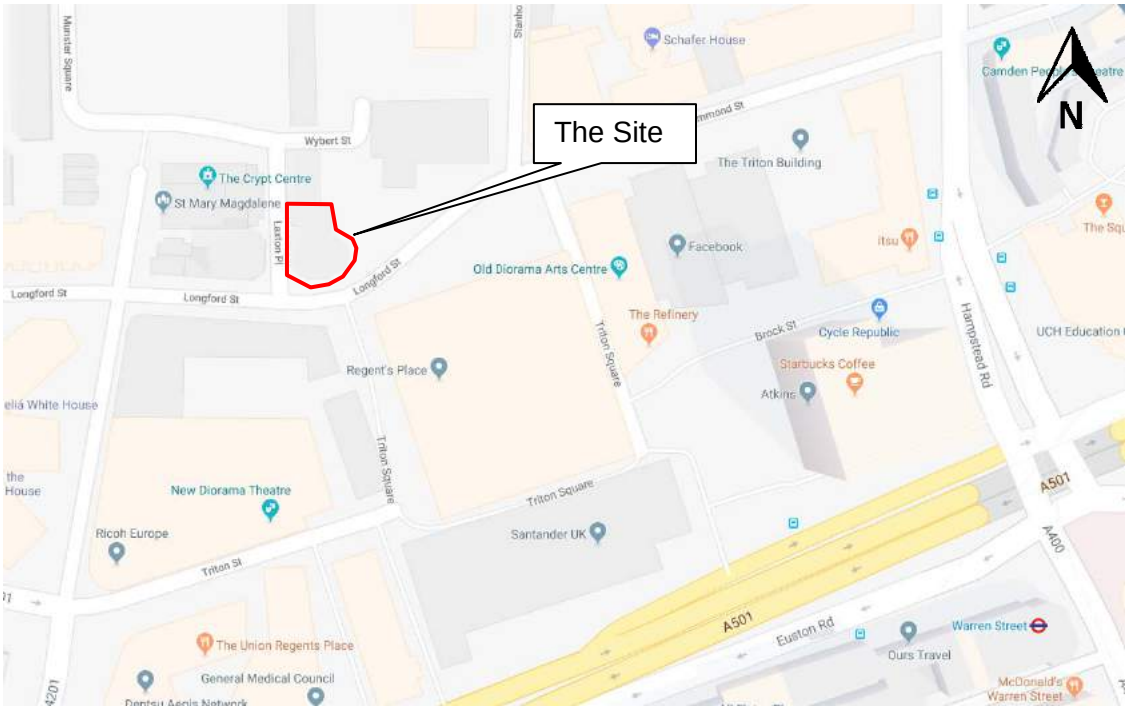
British Standards Institution BS EN 1997:1 (2004) EuroCode 7 - Geotechnical Design. Part 1 – General Rules.

British Standards Institution BS EN 1997:2 (2007) EuroCode 7 - Geotechnical Design. Part 2 - Ground Investigation and Testing.

King C. (1981) The stratigraphy of the London Basin and associated deposits. Tertiary Research Special Paper, Vol. 6, Backhuys, Rotterdam, p158.

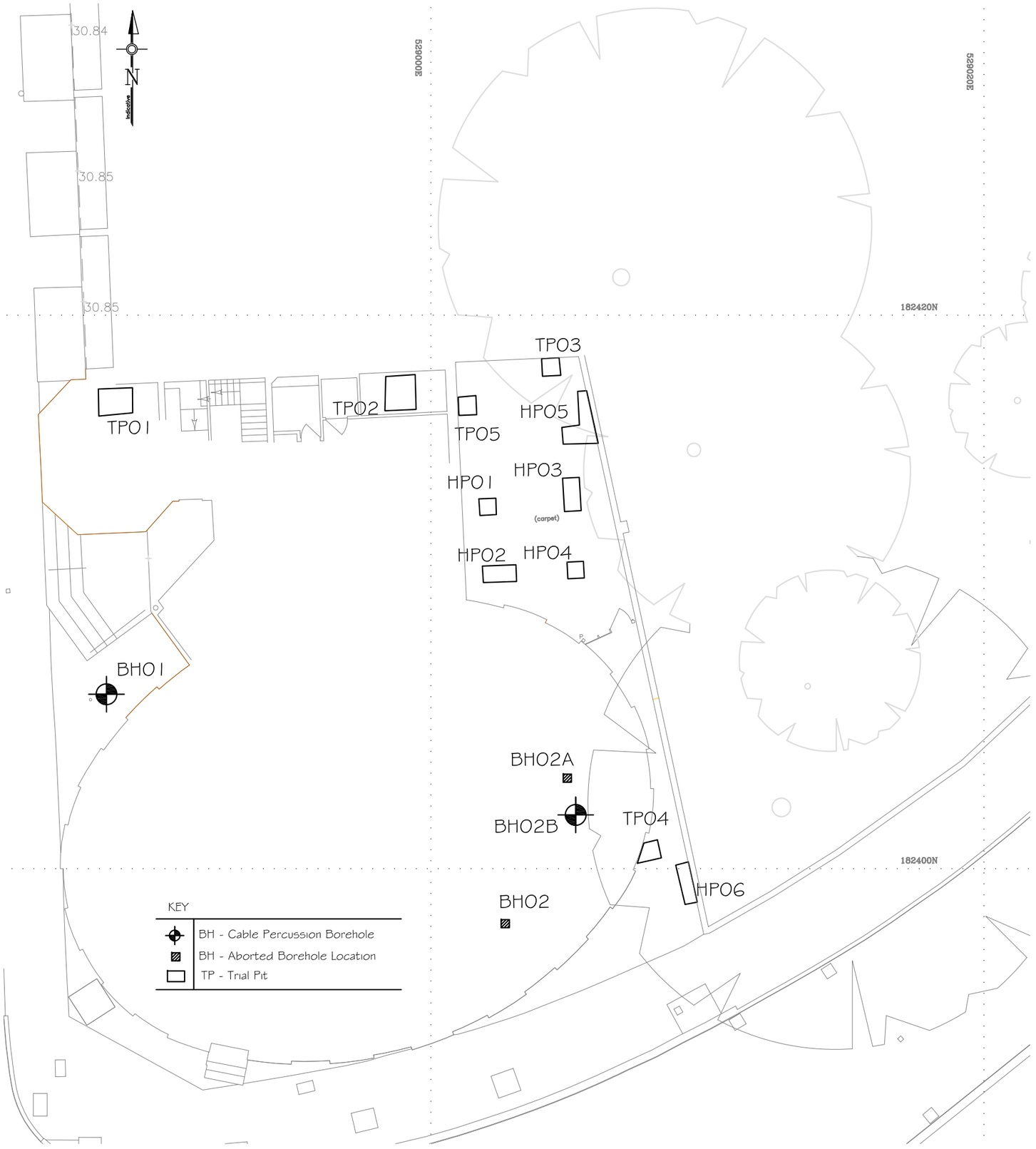
Entwisle N D C, Hobbs, P R N, Northmore, K J, Skipper, J, Raines, M R, Self, S J, Ellison, R A & Jones L D (2013) Investigation Supervisor ing Geology of British Rocks and Soils - Lambeth Group. British Geological Survey Open Report, OR/13/006. 316pp.

6. SITE LOCATION PLAN



Not to Scale © Crown Copyright reserved

7. EXPLORATORY HOLE LOCATION PLAN



Point ID	Easting	Northing	Level (mOD)
BH01	528988.26	182406.28	28.04
BH02	529002.71	182398.02	28.71
BH02A	529004.91	182403.27	28.71
BH02B	529005.25	182401.93	28.71
HP01	529001.74	182413.37	28.58
	529001.77	182412.76	28.58
	529002.37	182412.80	28.57
	529002.35	182413.39	28.57
HP02	529001.90	182410.34	28.61
	529001.86	182410.94	28.60
	529003.08	182410.98	28.60
	529003.10	182410.38	28.60
HP03	529004.83	182412.91	28.55
	529004.76	182414.11	28.55
	529005.36	182414.14	28.53
	529005.43	182412.94	28.55
HP04	529004.92	182411.08	28.58
	529004.95	182410.48	28.60
	529005.55	182410.51	28.59
	529005.51	182411.11	28.58
HP05	529005.63	182417.27	28.52
	529005.31	182417.25	28.53
	529005.37	182416.03	28.53
	529004.73	182415.95	28.52
	529004.79	182415.34	28.52
	529006.05	182415.37	28.51
HP06	529008.86	182400.12	28.37
	529009.19	182398.71	28.33
	529009.63	182398.79	28.32
	529009.31	182400.25	28.37
TP01	528989.21	182417.38	28.65
	528987.97	182417.33	28.60
	528987.99	182416.36	28.65
	528989.22	182416.47	28.64
TP02	528998.37	182417.79	28.66
	528999.43	182417.86	28.67
	528999.47	182416.60	28.66
	528998.34	182416.55	28.66
TP03	529004.64	182418.46	28.56
	529004.00	182418.43	28.56
	529004.04	182417.80	28.53
	529004.70	182417.83	28.53
TP04	529008.34	182400.39	28.39
	529007.47	182400.19	28.40
	529007.71	182400.93	28.41
	529008.19	182401.04	28.41
TP05	529000.99	182417.04	28.55
	529001.63	182417.10	28.54
	529001.66	182416.41	28.56
	529001.01	182416.38	28.56

NOTES

1. This drawing should not be scaled.

No	Revision	Drawn	Checked	Passed	Date

CONCEPT SITE INVESTIGATIONS
Unit 8, Warple Mews
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client:	British Land
Project:	1 Triton Square - St Anne's
Title:	Exploratory Hole Location Plan
Dwg. No:	183106/01
Status:	Issue
Scale:	NTS

Drawn	Checked	Passed	Date
OS	IP	IP	June 2018

8. CABLE PERCUSSION BOREHOLE LOGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	01/05/18	28.04	E 528988.3 N 182406.3	30.00m
	Date Completed 04/05/18			

Client

British Land

BOREHOLE SUMMARY

Top (m)	Base (m)	Type	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	1.20	IP	01/05/2018	01/05/2018	GM	SB			Hand Excavated	
1.20	30.00	CP	02/05/2018	03/05/2018	GM	SB			Dando 1000	WW1

WATER STRIKES

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)

WATER ADDED

From (m)	To (m)
2.00	7.00

CHISELLING / SLOW DRILLING

From (m)	To (m)	Duration (hr)	Remarks

HOLE

Depth (m)	Diameter (mm)
0.00	200
7.30	200
30.00	150

CASING

Depth (m)	Diameter (mm)
0.00	200
7.30	200
7.50	150

ROTARY RECOVERY

From (m)	To (m)	Blows	Recovery (%)

ROTARY FLUSH DETAIL

From (m)	To (m)	Flush Type	Flush Return (%)	Flush Colour

INSTALLATION DETAILS

Type	Diameter (mm)	Depth of Installation (m)	Top of Response Zone (m)	Bottom of Response Zone (m)	Date of Installation
SPG/GW	50	3.50	2.00	3.50	04/05/2018
SPGW	50	7.90	5.00	7.90	04/05/2018

BACKFILL DETAILS

Top (m)	Bottom (m)	Material	Backfill Date
0.00	0.30	Concrete / Flush Cover	04/05/2018
0.30	2.00	Bentonite Pellets	
2.00	3.50	Pea Shingle	
3.50	5.00	Bentonite Pellets	
5.00	7.90	Pea Shingle	
7.90	30.00	Bentonite Pellets	

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:43	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	01/05/18	28.04	E 528988.3 N 182406.3	30.00m
	Date Completed 04/05/18			

Client

British Land

PROGRESS

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks
01/05/18	0.00		Dry	
01/05/18	1.20		Dry	
02/05/18	1.20		Dry	
02/05/18	2.00	2.00	2.00	... Water Added
02/05/18	7.10	6.50	Dry	
02/05/18	7.50	7.50	Dry	
03/05/18	7.50	7.50	7.40	... see Remark 1
03/05/18	7.95	7.50	Dry	
03/05/18	30.00	7.50	Dry	

SPT DETAILS

Type	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
C	1.20	N8	3, 1 / 2, 2, 2, 2		Dry
C	2.00	N9	2, 1 / 3, 2, 2, 2	2.00	Dry
C	3.00	N7	4, 1 / 2, 1, 2, 2	3.00	3.00
C	4.00	N36	1, 1 / 4, 8, 11, 13	4.00	4.00
C	5.00	N15	1, 1 / 2, 3, 4, 6	5.00	5.00
C	6.50	N13	2, 2 / 4, 3, 3, 3	6.50	6.50
S	9.00	N19	2, 2 / 3, 4, 5, 7	7.50	Dry
S	12.00	N23	2, 4 / 5, 5, 6, 7	7.50	Dry
S	15.00	N27	3, 4 / 5, 6, 6, 10	7.50	Dry
S	18.00	N33	3, 4 / 6, 7, 9, 11	7.50	Dry
S	21.00	N42	4, 6 / 8, 10, 10, 14	7.50	Dry
S	24.00	N45	4, 8 / 10, 10, 11, 14	7.50	Dry
S	27.00	N46	4, 6 / 10, 10, 11, 15	7.50	Dry
S	29.50	N50/0.235	4, 8 / 9, 14, 21, 6	7.50	Dry

GENERAL REMARKS

1. Water entering the borehole between 02/05/2018 and 03/05/2018.

KEY

SAMPLES

ES - Environmental Sample (Tub, Vial, Jar)
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample, LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

INSTALLATION DETAILS

SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM - Inclinometer

HOLE TYPES

IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling /Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

TESTS S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer, MP-Mackintosh Probe, VOC-Volatile Organic Compounds

Note: All depths are in metres, all diameters in millimetres, water strike rise time in minutes. For details of abbreviations see Key

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:43	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	01/05/18	28.04	E 528988.3 N 182406.3	30.00m
	Date Completed 04/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	1 of 3

PROGRESS			STRATA				SAMPLES & TESTS				
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result	Field Records	Instrument/ Backfill
01/05/18		Dry	27.84		0.20	Brown ceramic tiles (0.02m) over	0.20-0.25	ES01		... VOC 0.1ppm	
			27.69		0.35	CONCRETE.	0.20-0.25	B02			
						Light grey sandy GRAVEL with low brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and ceramic fragments. (MADE GROUND)	0.50-0.60	ES03		... VOC 0.1ppm	
							0.50-0.60	B04			
							1.10-1.20	ES05		... VOC 0.1ppm	
01/05/18		Dry					1.20		N8	3, 1 / 2, 2, 2, 2	
02/05/18		Dry				Loose, dark brown gravelly silty SAND with high brick cobble content. Gravel comprises angular to subrounded fine to coarse flint, concrete and ceramic fragments. (MADE GROUND)	1.20-1.65	B06			
							1.90-2.00	ES07		... VOC 0.0ppm	
02/05/18	2.00	2.00					2.00		N9	2, 1 / 3, 2, 2, 2	
					(3.45)		2.00-2.45	B08			
							2.70	D09			
							3.00		N7	4, 1 / 2, 1, 2, 2	
							3.00-3.10	ES10		... VOC 0.1ppm	
							3.00-3.45	B11			
							3.70	D12			
			24.24		3.80						
			24.14		3.90	Firm, brown slightly sandy gravelly CLAY. Gravel comprises angular to subrounded fine to coarse flint, brick and concrete fragments. (MADE GROUND)	4.00		N36	1, 1 / 4, 8, 11, 13	
							4.00-4.10	ES13		... VOC 0.0ppm	
							4.00-4.45	B14			
						Medium dense, yellowish brown sandy angular to rounded fine to coarse flint GRAVEL. Sand is fine to coarse. (RIVER TERRACE DEPOSITS - LYNCH HILL GRAVEL)	4.70	D15			
							5.00		N15	1, 1 / 2, 3, 4, 6	
							5.00-5.10	ES16		... VOC 0.9ppm	
						5.00 ... becoming slightly silty and very sandy	5.00-5.45	B17			
					(3.20)						
							6.00-6.10	ES18		... VOC 0.5ppm	
							6.00	D19			
							6.50		N13	2, 2 / 4, 3, 3, 3	
						6.50 ... with no silt	6.50-6.95	B20			
02/05/18	6.50	Dry	20.94		7.10		7.10-7.20	ES21		... VOC 0.1ppm	
							7.10-7.50	B22			
						Firm to stiff, light brown silty CLAY with occasional selenite crystals. (THAMES GROUP: WEATHERED LONDON CLAY FORMATION)					
02/05/18	7.50	Dry			(0.50)		7.50-7.95	UT23	35 blows	100% Recovery	
			20.44		7.60						
						7.50 ... becoming very closely fissured and dark brown					
03/05/18	7.50	Dry					7.95	D24			
						Stiff, extremely closely fissured grey CLAY with frequent selenite crystals (<1mm) and rare pockets of grey fine sand and silt (<35mm). Fissures are of multiple orientation, planar, rough occasionally smooth. (THAMES GROUP: LONDON CLAY FORMATION - A3ii)	8.50	D25			
							9.00		N19	2, 2 / 3, 4, 5, 7	
							9.00-9.10	ES26		... VOC 0.0ppm	
						7.95 ... becoming dark brown	9.00-9.45	D27			
							9.50	B28			
							10.00-10.10	ES29		... VOC 0.1ppm	
							10.00	D30			
							10.50-10.95	UT31	55 blows	100% Recovery	
					(5.90)	10.50 ... becoming very closely fissured with a parting of yellowish brown silty fine sand					
						10.60 - 10.69 ... with a claystone fragment	10.95	D32			

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:44	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	01/05/18	28.04	E 528988.3 N 182406.3	30.00m
	Date Completed 04/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	2 of 3

PROGRESS			STRATA				SAMPLES & TESTS				Instrument/ Backfill
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result	Field Records	
						10.75 - 10.77 ... with a pyrite nodule					
							11.50	D33			
							11.70	B34			
							12.00		N23	2, 4 / 5, 5, 6, 7	
							12.00-12.10	ES35		... VOC 0.1ppm	
							12.00-12.45	D36			
							13.00-13.10	ES37		... VOC 0.1ppm	
							13.00	D38			
							13.20	B39			
			14.54		13.50		13.50-13.95	UT40	65 blows	100% Recovery	
						Stiff, extremely closely to very closely fissured brownish grey CLAY with rare pockets of grey fine sand (<30mm) and bioturbation. Fissures are of multiple orientation, planar, rough occasionally smooth. (THAMES GROUP: LONDON CLAY FORMATION - A3i)	13.95	D41			
							14.50	D42			
						13.65 ... with a pyrite nodule	14.70	B43			
						13.90 ... with a band of claystone					
						14.50 ... becoming dark brown	15.00		N27	3, 4 / 5, 6, 6, 10	
					(2.95)		15.00-15.10	ES44		... VOC 0.1ppm	
							15.00-15.45	D45			
							16.00	D46			
							16.20	B47			
			11.59		16.45		16.50-16.95	UT48	100 blows	78% Recovery	
						Very stiff, dark grey slightly sandy CLAY with rare pockets of silty fine sand. (THAMES GROUP: LONDON CLAY FORMATION - A2)	16.85	D49			
							17.00-17.10	ES50		... VOC 0.1ppm	
						16.80 - 16.90 ... with a band of claystone					
						16.85 ... becoming brownish grey and slightly sandy with rare claystone fragments	17.50	D51			
							17.70	B52			
							18.00		N33	3, 4 / 6, 7, 9, 11	
							18.00-18.45	D53			
							19.00-19.10	ES54		... VOC 0.1ppm	
							19.00	D55			
						19.00 ... with occasional foraminifera	19.20	B56			
							19.50-19.95	UT57	100 blows	100% Recovery	
						19.50 ... becoming silty	19.95	D58			
							20.50	D59			
							20.70	B60			
							21.00		N42	4, 6 / 8, 10, 10, 14	
							21.00-21.10	ES61		... VOC 0.4ppm	
							21.00-21.45	D62			
							22.00	D63			

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:44	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	01/05/18	28.04	E 528988.3 N 182406.3	30.00m
	Date Completed 04/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	3 of 3

PROGRESS			STRATA				SAMPLES & TESTS			Field Records	Instrument/ Backfill
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result		
							22.20	B64			
							22.50-22.95	UT65	100 blows	89% Recovery	
						22.50 ... becoming slightly micaceous with rare pockets of grey fine sand (<10mm)	22.90	D66			
					(13.05)	23.00 - 25.00 ... with dark grey to black organic material	23.00-23.10	ES67		... VOC 0.9ppm	
							23.50	D68			
							23.70	B69			
							24.00		N45	4, 8 / 10, 10, 11, 14	
							24.00-24.45	D70			
							25.00-25.10	ES71		... VOC 0.6ppm	
							25.00	D72			
						25.00 - 29.60 ... with partings of silty fine sand	25.20	B73			
							25.50-25.95	UT74	100 blows	100% Recovery	
						25.50 ... with occasional pockets of light brown fine sand					
						25.68 ... with frequent pockets of grey fine sand, rare pockets of yellowish brown fine sand (<10mm) and foraminifera	25.95	D75			
							26.50	D76			
							26.70	B77			
							27.00		N46	4, 6 / 10, 10, 11, 15	
							27.00-27.10	ES78		... VOC 0.4ppm	
							27.00-27.45	D79			
							28.00	D80			
							28.20	B81			
							28.50-29.95	UT82	100 blows	89% Recovery	
							28.90	D83			
			-1.46		29.50		29.50		N50/ 235 mm	4, 8 / 9, 14, 21, 6	
					(0.50)	Very stiff, reddish brown and reddish grey mottled bluish grey CLAY. (LAMBETH GROUP: READING FORMATION: Upper Mottled Beds)	29.50-29.95	D84			
03/05/18	7.50	Dry	-1.96		30.00		29.90-30.00	ES85		... VOC 0.2ppm	
						End of Borehole	30.00	B86			

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:44	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

BH02

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	24/04/18	28.71	E 529002.7 N 182398.0	1.20m
	Date Completed 24/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
				STRATA	**SAMPLES & TESTS**			
			(0.35)	Reinforced CONCRETE. 0.20 - 0.35 ... with Ø8mm rebar				
	28.36		0.35					
			(0.85)	Loose, orangish brown to dark brown slightly silty gravelly medium to coarse SAND with high brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse flint, brick and chalk fragments. (MADE GROUND) 0.80 ... becoming clayey	0.40-0.45 0.40-0.50 0.80-0.90 0.80-0.90 1.10-1.20 1.10-1.20	ES01 B02 ES03 B04 ES05 B06		... VOC 0.1ppm ... VOC 0.0ppm ... VOC 0.0ppm
	27.51		1.20					
				End of Trial Pit				... Pit aborted at 1.20m depth (see Remarks)

GENERAL REMARKS

1. Pit aborted at 1.20m depth due to strong CAT signal at the base of the pit. Location moved to position BH02A.

Issue No: 01	Drilled By: GM	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:46

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

BH02A

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	24/04/18	28.71	E 529004.9 N 182403.3	1.20m
	Date Completed 24/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
				STRATA	**SAMPLES & TESTS**			
			(0.35)	Reinforced CONCRETE. 0.20 - 0.35 ... with Ø8mm rebar				
	28.36		0.35					
			(0.70)	Loose, orangish brown and dark brown slightly clayey gravelly fine to coarse SAND with high brick and concrete cobble content. (MADE GROUND) 0.60 - 0.90 ... with 1No limestone boulder (north-east of pit)	0.40-0.50 0.40-0.50 0.70-0.80 0.70-0.80	ES01 B02 ES03 B04		... VOC 0.0ppm ... VOC 0.0ppm
	27.66		1.05					
			(0.15)	Soft, brown to yellowish brown gravelly very sandy CLAY with low brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and chalk fragments. (MADE GROUND)	1.10-1.20 1.10-1.20	ES05 B06		... VOC 0.0ppm
	27.51		1.20	End of Trial Pit				... Pit aborted at 1.20m depth (see Remarks)

GENERAL REMARKS

1. Pit aborted at 1.20m depth due to strong CAT signal at 1.10m depth. Location moved to position BH02B.

Issue No: 01	Drilled By: GM	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:47

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH02B

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.71	E 529005.3 N 182401.9	30.00m
	Date Completed 01/05/18			

Client

British Land

BOREHOLE SUMMARY

Top (m)	Base (m)	Type	Date Started	Date Ended	Crew	Logged By	Core Barrel (mm)	Core Bit	Plant Used/ Method	SPT Hammer Reference
0.00	1.20	IP	26/04/2018	26/04/2018	GM	SB			Hand Excavated	
1.20	30.00	CP	26/04/2018	01/05/2018	GM	SB			Dando 1000	WW1

WATER STRIKES

Strike at (m)	Rise to (m)	Time to Rise (min)	Casing Depth (m)	Sealed (m)

WATER ADDED

From (m)	To (m)
1.65	8.00

CHISELLING / SLOW DRILLING

From (m)	To (m)	Duration (hr)	Remarks

HOLE

Depth (m)	Diameter (mm)
0.00	200
8.30	200
30.00	150

CASING

Depth (m)	Diameter (mm)
0.00	200
8.30	200
8.50	150

ROTARY RECOVERY

From (m)	To (m)	Blows	Recovery (%)

ROTARY FLUSH DETAIL

From (m)	To (m)	Flush Type	Flush Return (%)	Flush Colour

INSTALLATION DETAILS

Type	Diameter (mm)	Depth of Installation (m)	Top of Response Zone (m)	Bottom of Response Zone (m)	Date of Installation
SPG/GW	50	5.50	2.00	5.50	01/05/2018
SPGW	50	8.30	6.50	8.30	01/05/2018

BACKFILL DETAILS

Top (m)	Bottom (m)	Material	Backfill Date
0.00	0.30	Concrete / Flush Cover	01/05/2018
0.30	2.00	Bentonite Pellets	
2.00	5.50	Pea Shingle	
5.50	6.50	Bentonite Pellets	
6.50	8.30	Pea Shingle	
8.30	30.00	Bentonite Pellets	

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:47	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH02B

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.71	E 529005.3 N 182401.9	30.00m
	Date Completed 01/05/18			

Client

British Land

PROGRESS

Date	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	Remarks
26/04/18	0.00		Dry	
26/04/18	1.20	1.20	Dry	
26/04/18	1.65	1.60	Dry	
27/04/18	1.65	1.60	1.65	... Water Added
27/04/18	6.00	6.00	5.10	
30/04/18	6.00	6.00	Dry	
30/04/18	6.50	6.50	6.50	... Water Added
30/04/18	8.20	8.20	Dry	
30/04/18	16.00	8.50	Dry	
01/05/18	16.00	8.50	Dry	
01/05/18	30.00	8.50	Dry	

SPT DETAILS

Type	Depth (m)	N Value	Blow Count / 75mm	Casing Depth (m)	Water Depth (m)
S	1.20	N36	7, 7 / 9, 10, 10, 7	1.20	Dry
C	2.00	N16	2, 3 / 3, 4, 4, 5	2.00	2.00
C	3.00	N17	2, 3 / 4, 4, 3, 6	3.00	3.00
C	4.00	N15	1, 4 / 3, 3, 4, 5	4.00	4.00
S	5.00	N22	2, 8 / 4, 5, 6, 7	5.00	5.00
C	6.50	N14	2, 2 / 3, 3, 4, 4	6.50	6.50
S	9.50	N21	2, 3 / 4, 5, 6, 6	8.50	Dry
S	12.50	N25	2, 4 / 5, 6, 6, 8	8.50	Dry
S	15.50	N47	3, 4 / 6, 8, 9, 24	8.50	Dry
S	18.50	N31	3, 5 / 7, 7, 8, 9	8.50	Dry
S	21.50	N33	3, 5 / 7, 8, 8, 10	8.50	Dry
S	24.50	N39	4, 7 / 8, 9, 11, 11	8.50	Dry
S	27.50	N43	4, 6 / 9, 9, 10, 15	8.50	Dry

GENERAL REMARKS

KEY

SAMPLES

ES - Environmental Sample (Tub, Vial, Jar)
U - 100mm Diameter Undisturbed Sample
UT - 100mm Diameter Thin Wall Undisturbed Sample
U38 - 38mm Diameter Undisturbed Sample
D - Disturbed Sample, B-Bulk Sample, LB- Large Bulk Sample, BLK-Block Sample
C - Core Sample, W-Water Sample, R-Root Sample

INSTALLATION DETAILS

SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer
ICM - Inclinometer

HOLE TYPES

IP -Inspection Pit, TP-Trial Pit TT - Trial Trench
CP -Cable Percussion, RC-Rotary Coring, R/S-Rotary/Sonic
DS -Dynamic Sampling, DS/R-Dynamic Sampling /Rotary
DC -Diamond Coring, CP/R-Cable Percussion Rotary follow on

TESTS S/C-SPT / CPT, V-Shear Vane, PP-Pocket Penetrometer, MP-Mackintosh Probe, VOC-Volatile Organic Compounds

Note: All depths are in metres, all diameters in millimetres, water strike rise time in minutes. For details of abbreviations see Key

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:48	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH02B

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.71	E 529005.3 N 182401.9	30.00m
	Date Completed 01/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	1 of 3

PROGRESS			STRATA				SAMPLES & TESTS				
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result	Field Records	Instrument/ Backfill
26/04/18		Dry	28.36		0.35	Reinforced CONCRETE.	0.40-0.45	ES01		... VOC 0.0ppm	
						0.20 ... with Ø8mm rebar mesh	0.40-0.45	B02			
						Loose, dark brown slightly silty gravelly SAND with high brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and slate fragments. (MADE GROUND)	0.60-0.70	ES03		... VOC 0.0ppm	
							0.60-0.70	B04			
					(1.25)		1.10-1.20	ES05		... VOC 0.0ppm	
26/04/18	1.20	Dry					1.10-1.20	B06			
							1.20		N36	7, 7 / 9, 10, 10, 7	
						0.75 ... becoming slightly clayey	1.20-1.65	D07			
26/04/18	1.60	Dry	27.11		1.60		1.20-1.65	B08			
27/04/18	1.60	1.65				Firm, yellowish brown gravelly sandy CLAY. Gravel comprises angular to subrounded fine to coarse flint, brick and concrete fragments. (MADE GROUND)	1.90-2.00	ES09		... VOC 0.0ppm	
							2.00		N16	2, 3 / 3, 4, 4, 5	
							2.00-2.45	B10			
							2.70	D11			
							2.90-3.00	ES12		... VOC 0.0ppm	
							3.00		N17	2, 3 / 4, 4, 3, 6	
					(2.90)		3.00-3.45	B13			
							3.70	D15			
							3.90-4.00	ES14		... VOC 0.0ppm	
							4.00		N15	1, 4 / 3, 3, 4, 5	
							4.00-4.45	B16			
			24.21		4.50						
						Medium dense, dark brown gravelly coarse SAND with frequent pockets of sandy clay. Gravel comprises angular to rounded fine to coarse brick, concrete and ceramic fragments. (MADE GROUND)	4.70	D17			
							4.90-5.00	ES18		... VOC 0.0ppm	
							5.00		N22	2, 8 / 4, 5, 6, 7	
							5.00-5.45	D19			
					(1.50)		5.00-5.45	B20			
							5.90-6.00	ES21		... VOC 0.1ppm	
27/04/18	6.00	5.10	22.71		6.00		6.00	D22			
						Medium dense, yellowish brown slightly sandy angular to rounded fine to coarse flint GRAVEL. Sand is medium to coarse. (RIVER TERRACE DEPOSITS)	6.50		N14	2, 2 / 3, 3, 4, 4	
30/04/18	6.50	6.50					6.50-6.95	B23			
							6.90-7.00	ES24		... VOC 0.0ppm	
					(2.00)		7.50	D25			
							7.90-8.00	ES26		... VOC 0.0ppm	
			20.71		8.00		8.00-8.20	B27			
30/04/18	8.20	Dry				Firm, light brown gravelly silty CLAY with frequent selenite crystals (<1mm). Gravel is angular to rounded fine to coarse flint. (THAMES GROUP: WEATHERED LONDON CLAY FORMATION)	8.20-8.65	UT28	35 blows	100% Recovery	
					(0.50)						
			20.21		8.50		8.65	D29			
						8.20 ... becoming extremely closely fissured and brownish grey	8.90-9.00	ES30		... VOC 0.0ppm	
							9.00	D31			
						Stiff, extremely closely fissured grey CLAY with rare pockets of grey silt (<40mm) and occasional selenite crystals. Fissures are of multiple orientation, planar, rough. (THAMES GROUP: LONDON CLAY FORMATION - A3ii)	9.50		N21	2, 3 / 4, 5, 6, 6	
							9.50-9.95	D32			
						8.56 - 8.63 ... with rare partings and pockets of yellowish brown fine sand (<15mm) and bioturbation					
						9.00 ... becoming brownish grey	10.50	D33			
							10.90-11.00	ES34		... VOC 0.0ppm	
							11.00-11.45	UT35	70 blows	89% Recovery	

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:48	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH02B

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.71	E 529005.3 N 182401.9	30.00m
	Date Completed 01/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	2 of 3

PROGRESS			STRATA				SAMPLES & TESTS			Field Records	Instrument/ Backfill
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result		
					(5.50)	11.00 ... becoming silty with a parting and rare pockets of yellowish brown fine sand (<15mm) and rare bioturbation	11.40	D36			
						11.00 - 11.35 ... with a band of claystone					
							12.00	D37			
						12.00 - 14.00 ... with frequent pockets of silt					
							12.50		N25	2, 4 / 5, 6, 6, 8	
							12.50-12.95	D38			
							12.90-13.00	ES39		... VOC 0.5ppm	
							13.50	D40			
			14.71		14.00		14.00-14.45	UT41	80 blows	100% Recovery	
						Stiff, extremely closely to very closely fissured grey CLAY with rare pockets of light brown fine sand (<25mm) and rare bioturbation. Fissures are of multiple orientation, planar, rough. (THAMES GROUP: LONDON CLAY FORMATION - A3i)	14.45	D42			
							14.90-15.00	ES43		... VOC 0.0ppm	
							15.00	D44			
							15.50		N47	3, 4 / 6, 8, 9, 24	
							15.50-15.95	D45			
30/04/18	8.50	Dry			(3.90)	15.80 - 16.00 ... with a band of claystone					
01/05/18	8.50	Dry					16.50	D46			
							16.90-17.00	ES47		... VOC 0.1ppm	
							17.00-17.45	UT48	90 blows	100% Recovery	
						17.00 ... becoming extremely closely fissured	17.45	D49			
			10.81		17.90		18.00	D50			
						Very stiff, dark grey slightly sandy CLAY with rare pockets of silty fine sand. (THAMES GROUP: LONDON CLAY FORMATION - A2)	18.50		N31	3, 5 / 7, 7, 8, 9	
							18.50-18.95	D51			
							18.90-19.00	ES52		... VOC 0.0ppm	
							19.50	D53			
							20.00-20.45	UT54	90 blows	100% Recovery	
						20.00 ... becoming extremely closely fissured, brownish grey and silty with occasional pockets of grey and brownish grey fine sand (<15mm), rare bioturbation and foraminifera	20.45	D55			
						20.50 ... with occasional foraminifera	20.90-21.00	ES56		... VOC 0.0ppm	
							21.00	D57			
							21.50		N33	3, 5 / 7, 8, 8, 10	
							21.50-21.95	D58			

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:48	AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 8811 2880_Fax: 020 8811 2881
E-mail: si@conceptconsultants.co.uk

Borehole No

BH02B

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.71	E 529005.3 N 182401.9	30.00m
	Date Completed 01/05/18			

Client	Method/ Plant Used	Sheet
British Land	Cable Percussion	3 of 3

PROGRESS			STRATA				SAMPLES & TESTS			Field Records	Instrument/ Backfill
Date	Casing	Water	Level (mOD)	Legend	Depth (Thickness)	Strata Description	Depth (m)	Type No	Test Result		
						22.00 - 26.00 ... with occasional pockets of black organic material	22.50	D59			
							22.90-23.00	ES60		... VOC 0.1ppm	
							23.00-23.45	UT61	100 blows	100% Recovery	
						23.00 ... with rare pockets of light grey fine sand (<5mm)	23.45	D62			
					(12.10)		24.00	D63			
							24.50		N39	4, 7 / 8, 9, 11, 11	
							24.50-24.95	D64			
							24.90-25.00	ES65		... VOC 0.0ppm	
							25.50	D66			
							26.00-26.45	UT67	100 blows	89% Recovery	
							26.40	D68			
							26.90-27.00	ES69		... VOC 0.1ppm	
							27.00	D70			
							27.50		N43	4, 6 / 9, 9, 10, 15	
							27.50-27.95	D71			
						28.00 ... with occasional partings of fine sand	28.50	D72			
							28.90-29.00	ES73		... VOC 0.1ppm	
							29.50-29.95	UT74	100 blows	78% Recovery	
						29.50 ... with frequent pockets of grey fine sand (<15mm)	29.85	D75			
01/05/18	8.50	Dry	-1.29		30.00		29.90-30.00	ES76		... VOC 0.1ppm	
						End of Borehole					

Issue No: 01	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 12:48	AGS

Southern Testing
Environmental & Geotechnical

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

Southern Testing Laboratories
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

SPT Hammer Ref:	WW1
Test Date:	11/09/2017
Report Date:	11/09/2017
File Name:	WW1.spt
Test Operator:	NPB

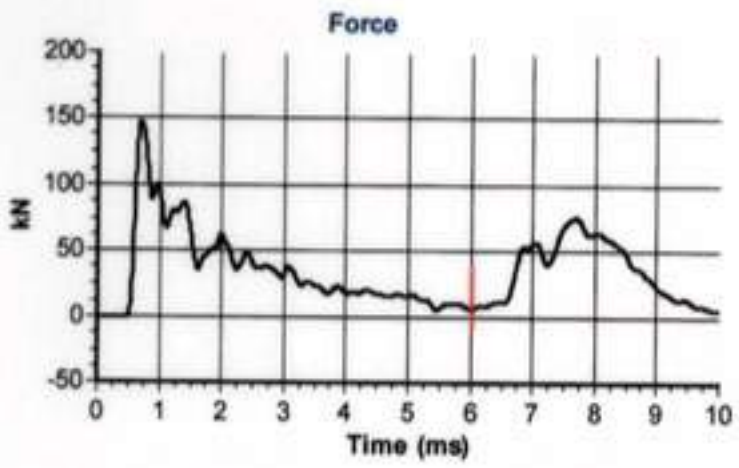
Instrumented Rod Data

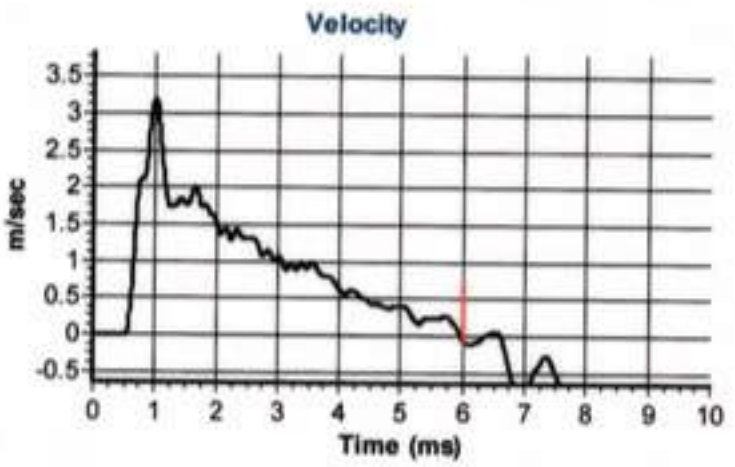
Diameter d_r (mm):	54
Wall Thickness t_r (mm):	6.0
Assumed Modulus E_a (GPa):	200
Accelerometer No.1:	6458
Accelerometer No.2:	9607

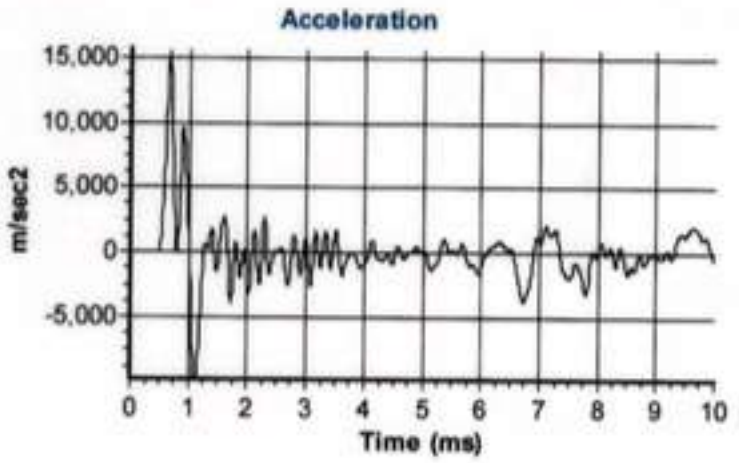
SPT Hammer Information

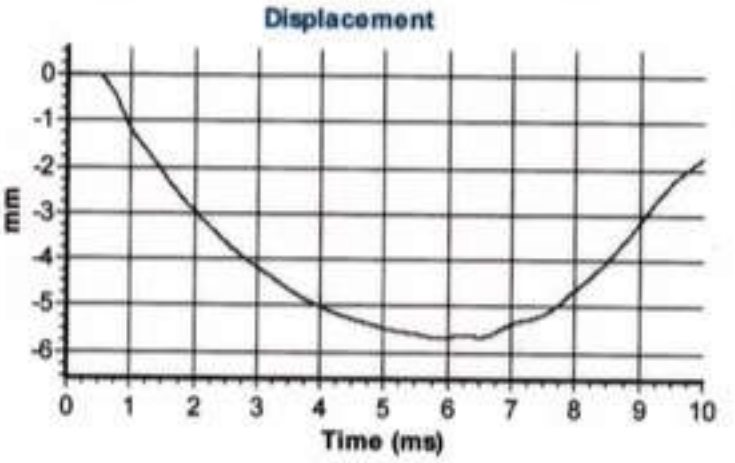
Hammer Mass m (kg):	63.5
Falling Height h (mm):	760
SPT String Length L (m):	14.5

Comments / Location
CHARLWOODS









Calculations

Area of Rod A (mm2):	905
Theoretical Energy E_{theor} (J):	473
Measured Energy E_{meas} (J):	301

Energy Ratio E_r (%): **64**

N P Burrows

Signed: Neil Burrows
Title: Field Operations Manager

The recommended calibration interval is 12 months

9. TRIAL PIT LOGS AND SKETCHES

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	27/04/18	28.58	E 529002.1 N 182413.1	0.80m
	Date Completed 27/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
	28.53		0.05	CONCRETE paving.				
	28.48		0.10	CONCRETE.				
			(0.70)	Loose, dark brown to grey slightly gravelly silty fine to medium SAND with high brick, concrete and cement cobble and boulder content, rare glass fragments and metal bolts (100mm). Gravel comprises angular to subangular fine to coarse brick, concrete, cement, ceramic and slate fragments. (MADE GROUND)	0.20-0.30 0.20-0.30	ES01 B02		... VOC 0.0ppm
					0.70-0.80 0.70-0.80	ES03 B04		... VOC 0.0ppm ... Ø50mm damaged copper pipe encountered at 0.75m depth
	27.78		0.80	End of Trial Pit				

GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.35m x 0.35m x 0.80m depth.
4. Pit backfilled with soil arisings and made up good upon completion.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:34

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP02

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	27/04/18	28.60	E 529002.5 N 182410.7	1.20m
	Date Completed 27/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
	28.55		0.05	CONCRETE paving.				
	28.50		0.10	CONCRETE.				
				Loose, light brown to grey gravelly silty fine to coarse SAND with high brick and concrete cobble and boulder content. Gravel comprises angular to rounded fine to coarse flint, brick and concrete fragments. (MADE GROUND)	0.20-0.30 0.20-0.30	ES01 B02		... VOC 0.1ppm
				0.30 ... with slight hydrocarbon odour				
				0.40 - 0.70 ... with 1No concrete boulder				
			(1.10)		0.70-0.80 0.70-0.80	ES03 B04		... VOC 0.3ppm
					1.00-1.10 1.00-1.10	ES05 B06		... VOC 0.3ppm
	27.40		1.20					
				End of Trial Pit				

GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.35m x 0.35m x 1.20m depth.
4. Pit backfilled with soil arisings and made up good upon completion.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:34

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP03

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	27/04/18	28.55	E 529005.1 N 182413.5	1.20m
	Date Completed 27/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
				STRATA	**SAMPLES & TESTS**			
	28.50		0.05	CONCRETE paving.				
	28.45		0.10	Reinforced CONCRETE.				
			(0.35)	Loose, dark brown to dark grey gravelly fine to coarse SAND. Gravel comprises angular to rounded fine to coarse flint, brick and concrete fragments. (MADE GROUND) 0.30 - 0.35 ... with occasional roots and rootlets	0.20-0.30 0.20-0.30	ES01 B02		... VOC 1.8ppm
	28.10		0.45					
			(0.75)	Loose, yellowish brown gravelly fine to coarse SAND. Gravel comprises angular to rounded fine to coarse brick and concrete fragments. (MADE GROUND)	0.70-0.80 0.70-0.80	ES03 B04		... VOC 0.1ppm
					1.10-1.20 1.10-1.20	ES05 B06		... VOC 0.1ppm
	27.35		1.20					
				End of Trial Pit				

GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.35m x 0.35m x 1.20m depth.
4. Pit backfilled with soil arisings and made up good upon completion.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:34

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP04

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	27/04/18	28.59	E 529005.2 N 182410.8	1.20m
	Date Completed 27/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
	28.54		0.05	CONCRETE paving.				
	28.49		0.10	Reinforced CONCRETE.				
			(0.35)	Loose, brown slightly gravelly medium to coarse SAND. Gravel comprises angular to rounded fine to coarse flint and concrete fragments. (MADE GROUND)	0.20-0.30 0.20-0.30	ES01 B02		... VOC 0.1ppm
	28.14		0.45					
			(0.75)	Loose, brown slightly silty gravelly medium SAND with high concrete cobble content. Gravel comprises angular to subrounded fine to coarse brick and concrete fragments. (MADE GROUND) 0.50 ... with 1No metal paint bucket	0.70-0.80 0.70-0.80	ES03 B04		... VOC 0.1ppm
					1.00-1.10 1.00-1.10	ES05 B06		... VOC 0.2ppm
	27.39		1.20					
				End of Trial Pit				

GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.35m x 0.35m x 1.20m depth.
4. Pit backfilled with soil arisings and made up good upon completion.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:34

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP05

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	03/05/18	28.52	E 529005.3 N 182416.2	0.40m
	Date Completed 03/05/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
				STRATA	**SAMPLES & TESTS**			
			(0.40)	(MADE GROUND)				
	28.12		0.40	End of Trial Pit				... Pit aborted at 0.40m depth (see Remarks)

GENERAL REMARKS

1. Pit aborted at 0.40m depth due to presence of asbestos.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

HP06

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	03/05/18	28.35	E 529009.3 N 182399.5	0.65m
	Date Completed 03/05/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

STRATA					SAMPLES & TESTS			
Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
			(0.65)	(MADE GROUND)				
	27.70		0.65	End of Trial Pit				... Pit aborted at 0.65m depth (see Remarks)

GENERAL REMARKS

1. Pit aborted at 0.65m depth due to presence of asbestos.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

TP01

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.63	E 528988.6 N 182416.9	1.50m
	Date Completed 26/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
			(0.35)	Reinforced CONCRETE. (Ømm mesh re-bar)				
	28.28		0.35					
			(1.15)	Loose, dark brown gravelly silty medium to coarse SAND with high brick, concrete and limestone cobble and boulder content. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete, limestone and slate fragments. (MADE GROUND)	0.40-0.45 0.40-0.45	ES01 B02		... VOC 0.0ppm
					0.60-0.70 0.60-0.70	ES03 B04		... VOC 0.0ppm
					1.20-1.30 1.20-1.30	ES05 B06		... VOC 0.0ppm
	27.13		1.50					
				End of Trial Pit				

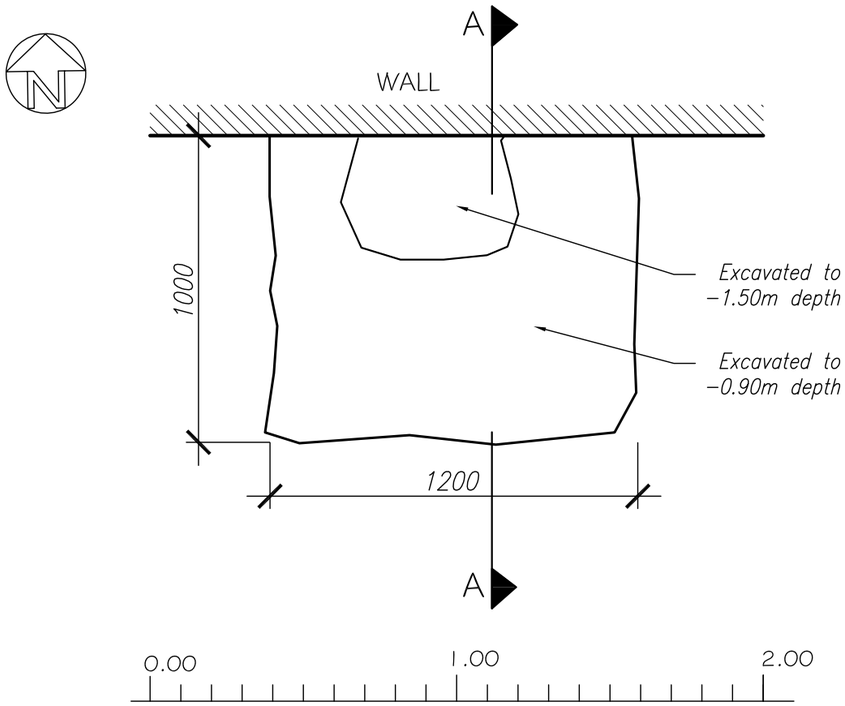
GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 1.00m x 1.20m x 1.50m depth.
4. Pit backfilled with soil arisings and made up good upon completion.
5. Also refer to TP01 sketch.

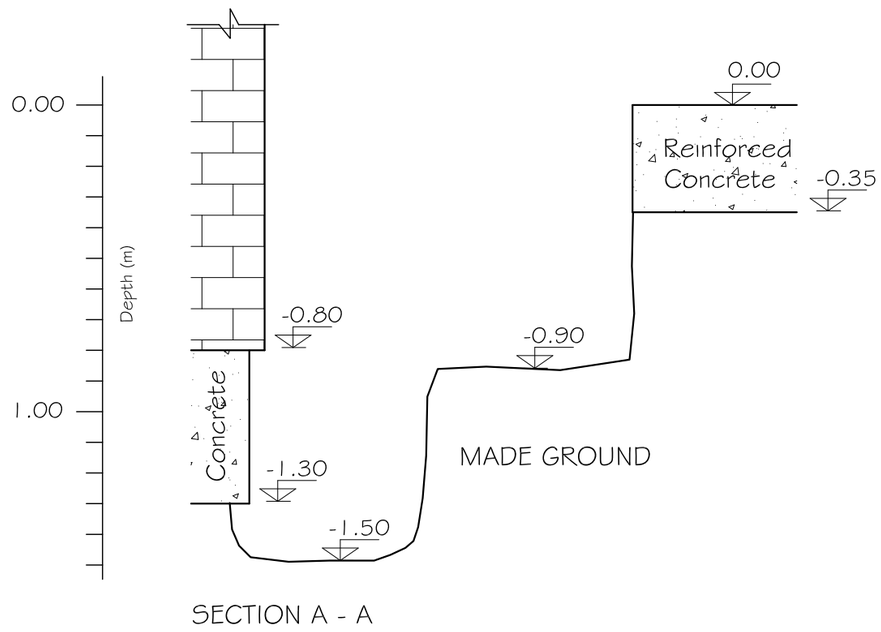
Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

NOTES

1. This drawing should not be scaled, only use annotated dimensions.



PLAN TP01



SECTION A - A

No	Revision	Drawn	Checked	Passed	Date

CONCEPT SITE INVESTIGATIONS

Unit 8, Warple Mews
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client:	British Land
Project:	1 Triton Square - St Anne's
Title:	TP01 Plan and Section A-A
Dwg. No:	183106/02
Status:	Issue
Scale:	1:20

Drawn	Checked	Passed	Date
OS	IP	IP	May 2018

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

TP02

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	26/04/18	28.66	E 528998.9 N 182417.2	0.60m
	Date Completed 26/04/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
			(0.35)	CONCRETE.				
	28.31		0.35					
			(0.25)	Loose, dark brown slightly silty gravelly medium to coarse SAND with high brick and concrete cobble content. Gravel comprises angular to subrounded fine to coarse brick and concrete fragments. (MADE GROUND)	0.40	D01		
	28.06		0.60					
				End of Trial Pit				... Pit aborted at 0.60m depth (see Remarks)

STRATA | **SAMPLES & TESTS**

GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit aborted at 0.60m depth due to presence of asbestos.
4. Pit dimensions: 1.00m x 1.20m x 0.60m depth.
5. Pit backfilled with soil arisings and made up good upon completion.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

AGS

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

TP03

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	03/05/18	28.55	E 529004.3 N 182418.1	1.30m
	Date Completed 03/05/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
	28.50		0.05	CONCRETE paving.				
	28.45		0.10	CONCRETE.				
				Light grey gravelly silty fine to medium SAND with high brick and concrete cobble and boulder content and occasional metal and glass fragments. Gravel comprises angular to rounded fine to coarse flint, brick, concrete, clinker and ceramic fragments. (MADE GROUND)	0.20-0.30 0.20-0.30	ES01 B02		... VOC 0.0ppm
				0.10 - 0.70 ... with frequent roots (<15mm) and rootlets (<2mm)				
				0.50 ... with 1No metal paint can	0.50-0.60 0.50-0.60	ES03 B04		... VOC 0.1ppm
				0.55 ... with a black plastic membrane				
			(1.20)					
					1.10-1.20 1.10-1.20	ES05 B06		... VOC 0.0ppm
	27.25		1.30					
				End of Trial Pit				

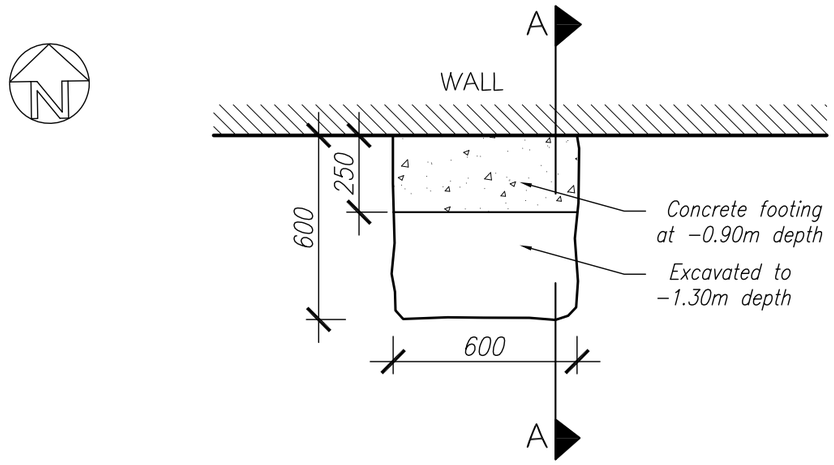
GENERAL REMARKS

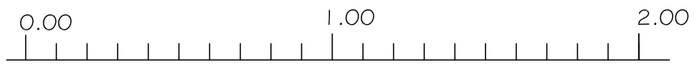
1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.60m x 0.60m x 1.30m depth.
4. Asbestos-containing material found in the pit during excavation.
4. Pit backfilled with soil arisings and made up good upon completion.
5. Also refer to TP03 sketch.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

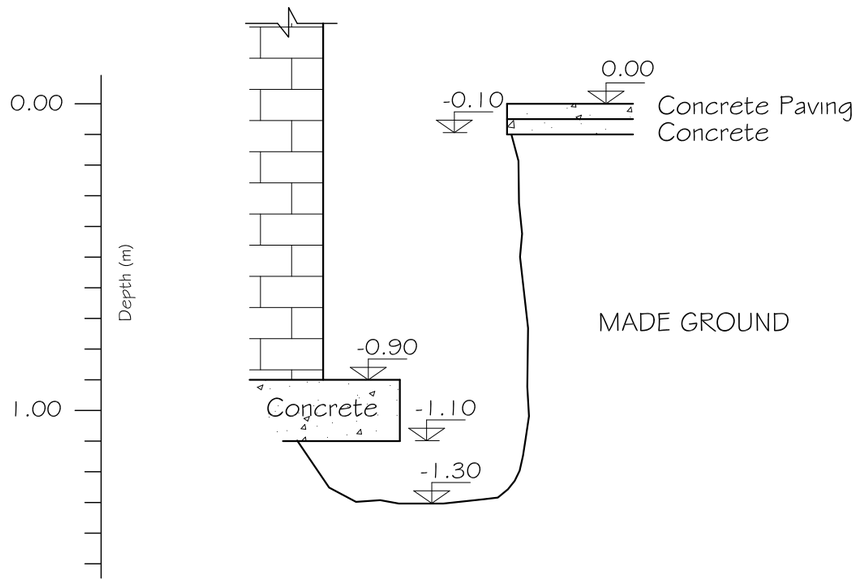
NOTES

1. This drawing should not be scaled, only use annotated dimensions.





PLAN TP03



SECTION A - A

No	Revision	Drawn	Checked	Passed	Date

CONCEPT SITE INVESTIGATIONS

Unit 8, Warple Mews
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client:	British Land
Project:	1 Triton Square - St Anne's
Title:	TP03 Plan and Section A-A
Dwg. No:	183106/03
Status:	Issue
Scale:	1:20

Drawn	Checked	Passed	Date
OS	IP	IP	May 2018

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

TP04

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	03/05/18	28.40	E 529007.9 N 182400.6	1.40m
	Date Completed 03/05/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
				STRATA	**SAMPLES & TESTS**			
	28.15		(0.25) 0.25	Brown ceramic tiles (0.02m) over CONCRETE.	0.25-0.35 0.25-0.35	ES01 B02		... VOC 0.1ppm
	27.90		(0.25) 0.50	Dark grey to brown gravelly silty fine to coarse SAND with high brick and concrete cobble and boulder content, occasional roots (<6mm), rootlets (<2mm) and rare glass fragments. Gravel comprises angular to rounded fine to coarse flint, brick, concrete, ceramic and slag fragments. (MADE GROUND)				
			(0.90)	Brown slightly clayey gravelly fine to coarse SAND with high brick and concrete cobble content and glass fragments. Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and ceramic fragments. (MADE GROUND)	0.55-0.65 0.55-0.65	ES03 B04		... VOC 0.0ppm
					1.20-1.30 1.20-1.30	ES05 B06		... VOC 0.0ppm
	27.00		1.40	End of Trial Pit				

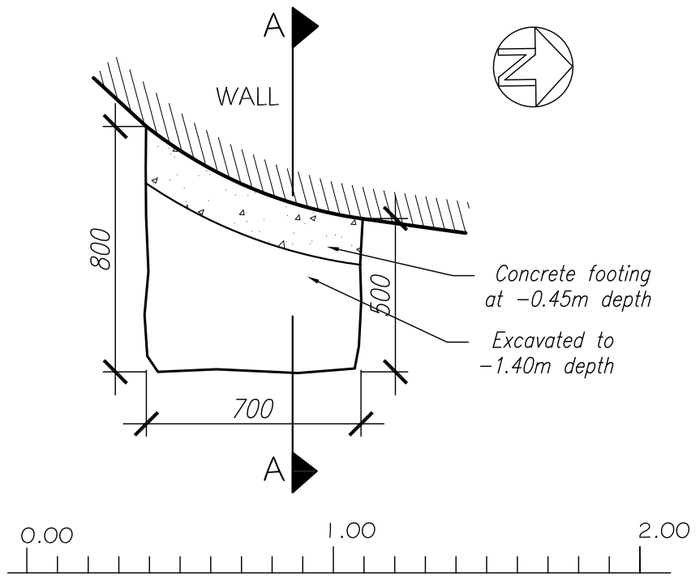
GENERAL REMARKS

1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.70m x 0.80m x 1.40m depth.
4. Asbestos found in spoil post-digging.
5. Pit backfilled with soil arisings and made up good upon completion.
6. Also refer to TP04 sketch.

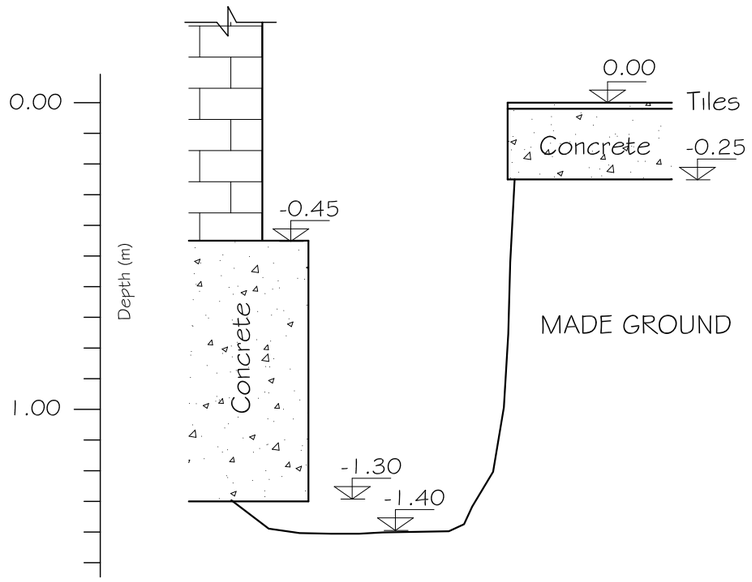
Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

NOTES

1. This drawing should not be scaled, only use annotated dimensions.



PLAN TP04



SECTION A - A

No	Revision	Drawn	Checked	Passed	Date

CONCEPT SITE INVESTIGATIONS

Unit 8, Warple Mews
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client:	British Land
Project:	1 Triton Square - St Anne's
Title:	TP05 Plan and Section A-A
Dwg. No:	183106/05
Status:	Issue
Scale:	1:20

Drawn	Checked	Passed	Date
OS	IP	IP	May 2018

CONCEPT
Unit 8, Warple Mews, Warple Way
W3 0RF
Telephone: 020 88 112 880_Fax: 020 88 112 881
E-mail: si@conceptconsultants.co.uk

Trial Pit No

TP05

Project

1 Triton Square - St Anne's

Job No	Date Started	Ground Level (mOD)	Co-Ordinates	Final Depth
18/3106	04/05/18	28.55	E 529001.3 N 182416.7	1.40m
	Date Completed 04/05/18			

Client	Method/ Plant Used	Sheet
British Land	Hand Excavated	1 of 1

Water	Level (mOD)	Legend	Depth (Thickness)	Stata Description	Depth	Type No	Test Result	Field Records
	28.50		0.05	Paving slabs. (MADE GROUND)				
	28.45		0.10	Reinforced CONCRETE.				
				Loose, light brown gravelly silty fine to medium SAND with high brick and concrete cobble content, occasional roots (<12mm) and rootlets (<2mm). Gravel comprises angular to subrounded fine to coarse flint, brick, concrete and ceramic fragments. (MADE GROUND)	0.20-0.30 0.20-0.30	ES01 B02		... VOC 0.1ppm
					0.50-0.60 0.50-0.60	ES03 B04		... VOC 0.1ppm
				0.60 - 1.40 ... with frequent pockets of brown clay				
			(1.30)					
					1.00-1.10 1.00-1.10	ES05 B06		... VOC 0.0ppm
	27.15		1.40					
				End of Trial Pit				

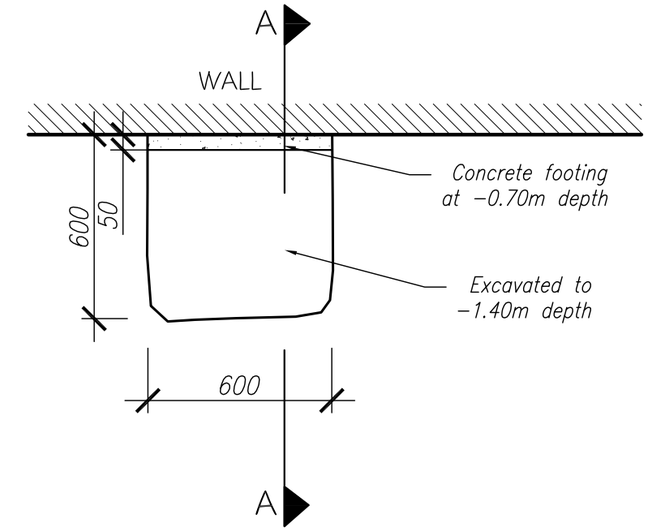
GENERAL REMARKS

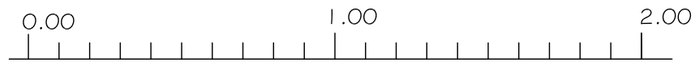
1. Weather was partially cloudy.
2. Pit was dry and stable.
3. Pit dimensions: 0.60m x 0.60m x 1.40m depth.
4. Pit backfilled with soil arisings and made up good upon completion.
5. Also refer to TP05 sketch.

Issue No: 01	Drilled By: ST	Logged By: SB	Checked By: AN	Approved By: OS	Log Print Date & Time: 18/06/2018 11:35

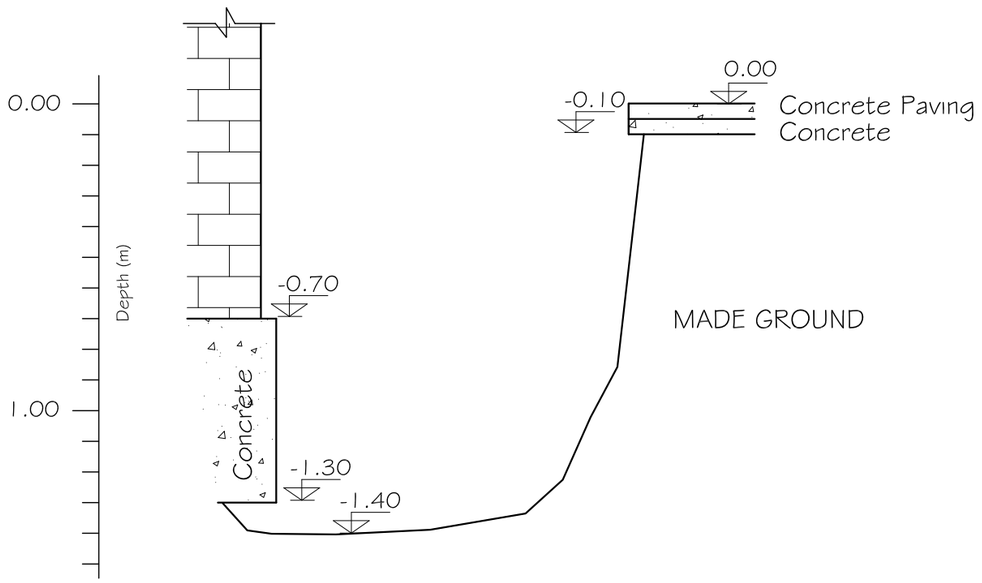
NOTES

1. This drawing should not be scaled, only use annotated dimensions.





PLAN TP05



SECTION A - A

No	Revision	Drawn	Checked	Passed	Date

CONCEPT SITE INVESTIGATIONS

Unit 8, Warple Mews
Warple Way
London W3 0RF
Tel: 020 8811 2880
Fax: 020 8811 2881
e-mail: concept@conceptconsultants.co.uk
www.conceptconsultants.co.uk

Client:	British Land
Project:	1 Triton Square - St Anne's
Title:	TP05 Plan and Section A-A
Dwg. No:	183106/05
Status:	Issue
Scale:	1:20

Drawn	Checked	Passed	Date
OS	IP	IP	May 2018

10. INSTRUMENTATION MONITORING RESULTS

Borehole	Depth of Installation (mbgl)	Date of Installation	Type	Top (mbgl)	Bottom (mbgl)	Date & Time	Water Level (mbgl)	Water Level (mOD)	Remarks
BH01	3.50	04/05/2018	SPG/GW	2.00	3.50	18/05/2018 10:00:00	3.42	24.62	
	3.50	04/05/2018	SPG/GW	2.00	3.50	29/05/2018 11:35:00	Dry		
	3.50	04/05/2018	SPG/GW	2.00	3.50	06/06/2018 14:20:00	Dry		
	3.50	04/05/2018	SPG/GW	2.00	3.50	13/06/2018 10:48:00	3.49	24.55	
	3.50	04/05/2018	SPG/GW	2.00	3.50	20/06/2018 11:40:00	Dry		
	3.50	04/05/2018	SPG/GW	2.00	3.50	27/06/2018 10:15:00	Dry		
	7.90	04/05/2018	SPGW	5.00	7.90	18/05/2018 10:00:00	6.02	22.02	
	7.90	04/05/2018	SPGW	5.00	7.90	29/05/2018 11:37:00	6.05	21.99	
	7.90	04/05/2018	SPGW	5.00	7.90	06/06/2018 14:20:00	6.06	21.98	
	7.90	04/05/2018	SPGW	5.00	7.90	13/06/2018 10:48:00	6.08	21.96	
	7.90	04/05/2018	SPGW	5.00	7.90	20/06/2018 11:40:00	6.11	21.93	
	7.90	04/05/2018	SPGW	5.00	7.90	27/06/2018 10:15:00	6.15	21.89	
BH02B	5.50	01/05/2018	SPG/GW	2.00	5.50	18/05/2018 09:25:00	Dry		
	5.50	01/05/2018	SPG/GW	2.00	5.50	29/05/2018 10:10:00	Dry		
	5.50	01/05/2018	SPG/GW	2.00	5.50	06/06/2018 14:00:00	Dry		
	5.50	01/05/2018	SPG/GW	2.00	5.50	13/06/2018 09:48:00	Dry		
	5.50	01/05/2018	SPG/GW	2.00	5.50	20/06/2018 11:45:00	Dry		
	5.50	01/05/2018	SPG/GW	2.00	5.50	27/06/2018 10:15:00	No Access		No permit
	5.50	01/05/2018	SPG/GW	2.00	5.50	02/07/2018 14:00:00	Dry		
	8.30	01/05/2018	SPGW	6.50	8.30	18/05/2018 09:25:00	6.52	22.19	
	8.30	01/05/2018	SPGW	6.50	8.30	29/05/2018 10:15:00	6.58	22.13	
	8.30	01/05/2018	SPGW	6.50	8.30	06/06/2018 14:20:00	6.58	22.13	
	8.30	01/05/2018	SPGW	6.50	8.30	13/06/2018 09:48:00	6.59	22.12	
	8.30	01/05/2018	SPGW	6.50	8.30	20/06/2018 11:45:00	6.62	22.09	
	8.30	01/05/2018	SPGW	6.50	8.30	27/06/2018 10:15:00	No Access		No permit
	8.30	01/05/2018	SPGW	6.50	8.30	02/07/2018 14:00:00	6.67	22.04	

KEY

SPIE - Standpipe Piezometer
SPGW - Groundwater Monitor Standpipe
SPG/GW - Gas / Groundwater Monitor Standpipe
VWP - Vibrating Wire Piezometer

CONCEPT

AGS

GROUNDWATER MONITORING

Job No: 18/3106

Project: 1 Triton Square - St Anne's

Client: British Land

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC
Date:	18/05/2018	**Job Number:**	18/3106	**Time:**	10:00

METEOROLOGICAL AND SITE INFORMATION											
State of ground:	X	Dry		Moist		Wet				**Delete As Required**	
Wind:		Calm	X	Light		Moderate		Strong		Ground Level	
Cloud cover:	X	None		Slight		Cloudy		Overcast			
Precipitation	X	None		Slight		Moderate		Heavy			
Barometric pressure (mb) Before:	1022	dP (Pa) initial:	0	aP (mb) After:	1022	Temperature (°C)	16				

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	3.42	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.8	18.9	0	0	2.1	**Short**
					30	0.0	0.0	0.0	20.7	0	0	2.0	
		0	0	0	**60**	0.0	0.0	0.0	20.7	0	0	2.2	
		30			**5**	0.0	0.0	0.1	20.9	0	0	4.4	**Long**
		60			**30**	0.0	0.0	0.3	20.1	0	0	2.2	
		90			**60**	0.0	0.0	0.4	20.1	0	0	1.6	
		120			**60**	0.0	0.0	0.0	20.7	0	0		
		150			**120**	0.0	0.0	0.0	20.7	0	0		
		180			**180**	0.0	0.0	0.0	20.7	0	0		
		210			**240**	0.0	0.0	0.0	20.7	0	0		Constant readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.0	20.6	0	0	2.6	**Short**
		600			**30**	0.0	0.0	0.0	20.7	0	0	3.8	
					60	0.0	0.0	0.0	20.6	0	0	4.2	
					5	0.0	0.0	0.0	20.4	0	0	2.9	**Long**
					30	0.0	0.0	0.0	20.4	0	0	2.8	
					60	0.0	0.0	0.0	20.3	0	0	2.4	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC
Date:	18/05/2018	**Job Number:**	18/3106	**Time:**	08:54

METEOROLOGICAL AND SITE INFORMATION										
State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1024	dP (Pa) initial:	0	aP (mb) After:	1024	Temperature (°C)	16			

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.8	19.2	0	0	3.3	**Short**
					30	0.0	0.0	0.6	19.0	0	0	7.9	
		0	0	0	**60**	0.0	0.0	0.6	19.0	0	0	9.1	
		30			**5**	0.0	0.0	1.4	17.1	0	0	7.4	**Long**
		60			**30**	0.0	0.0	4.2	13.5	0	0	3.5	
		90			**60**	0.0	0.0	4.2	13.4	0	0	1.9	
		120			**60**	0.0	0.0	0.6	19.0	0	0		
		150			**120**	0.0	0.0	0.6	19.0	0	0		
		180			**180**	0.0	0.0	0.6	19.0	0	0		
		210			**240**	0.0	0.0	0.6	19.0	0	0		Constant readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.6	19.0	0	0	3.6	**Short**
		600			**30**	0.0	0.0	0.6	19.2	0	0	7.3	
					60	0.0	0.0	0.6	19.2	0	0	7.6	
					5	0.0	0.0	1.9	16.2	0	0	5.6	**Long**
					30	0.0	0.0	4.0	13.7	0	0	4.0	
					60	0.0	0.0	4.1	13.6	0	0	2.8	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC and FG
Date:	29/05/2018	**Job Number:**	18/3106	**Time:**	11:00

METEOROLOGICAL AND SITE INFORMATION										
State of ground:		Dry		Moist	X	Wet				**Delete As Required**
Wind:		Calm	X	Light		Moderate		Strong		Ground Level
Cloud cover:		None	X	Slight		Cloudy		Overcast		
Precipitation		None		Slight	X	Moderate		Heavy		
Barometric pressure (mb) Before:	1013	dP (Pa) initial:	0	aP (mb) After:	1013	Temperature (°C)	18			

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.0	20.8	0	0	1.0	**Short**
					30	0.0	0.0	0.0	20.8	0	0	3.6	
		0	0	0	**60**	0.0	0.0	0.0	20.7	0	0	3.6	
		30			**5**	0.0	0.0	0.0	21.0	0	0	6.2	**Long**
		60			**30**	0.0	0.0	0.2	20.4	0	0	3.2	
		90			**60**	0.0	0.0	0.2	20.4	0	0	2.1	
		120			**60**	0.0	0.0	0.0	20.6	0	0		
		150			**120**	0.0	0.0	0.0	20.5	0	0		
		180			**180**	0.0	0.0	0.1	20.4	0	0		
		210			**240**	0.0	0.0	0.1	20.4	0	0		
		240			**300**	0.0	0.0	0.1	20.4	0	0		
		270			**360**	0.0	0.0	0.1	20.4	0	0		Constant readings
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.1	20.5	0.0	0.0	2.5	**Short**
		600			**30**	0.0	0.0	0.1	20.4	0.0	0.0	3.1	
					60	0.0	0.0	0.1	20.4	0	0	3.4	
					5	0.0	0.0	0.1	20.5	0.0	0.0	3.1	**Long**
					30	0.0	0.0	0.2	20.4	0.0	0.0	3.2	
					60	0.0	0.0	0.2	20.3	0	0	3	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC and FG
Date:	29/05/2018	**Job Number:**	18/3106	**Time:**	09:30

METEOROLOGICAL AND SITE INFORMATION										
State of ground:		Dry	X	Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:		None		Slight	X	Cloudy		Overcast		
Precipitation		None	X	Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1014	dP (Pa) initial:	0	aP (mb) After:	1014	Temperature (°C)	18			

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	6.58	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	2.1	17.8	0	0	4.0	**Short**
					30	0.0	0.0	2.1	17.7	0	0	8.8	
		0	0	0	**60**	0.0	0.0	2.1	17.7	0	0	10.3	
		30			**5**	0.0	0.0	2.1	18.1	0	0	1.0	**Long**
		60			**30**	0.0	0.0	2.2	17.4	0	0	6.1	
		90			**60**	0.0	0.0	2.3	17.4	0	0	2.0	
		120			**60**	0.0	0.0	2.6	17.0	0	0		
		150			**120**	0.0	0.0	2.0	16.7	0	0		
		180			**180**	0.0	0.0	2.4	16.9	0	0		
		210			**240**	0.0	0.0	2.3	17.2	0	0		
		240			**300**	0.0	0.0	2.1	17.5	0	0		
		270			**360**	0.0	0.0	2.2	17.4	0	0		
		300			**420**	0.0	0.0	2.2	17.6	0	0		
		360			**480**	0.0	0.0	2.1	17.4	0	0		
		420			**540**	0.0	0.0	2.1	17.7	0	0		
		480			**600**	0.0	0.0	2.0	17.8	0	0		
		540			**5**	0.0	0.0	0.0	17.4	0	0	2.2	**Short**
		600			**30**	0.0	0.0	0.0	17.6	0	0	4.7	
					60	0.0	0.0	0.0	17.6	0	0	5	
					5	0.0	0.0	0.0	17.4	0	0	0.7	**Long**
					30	0.0	0.0	0.0	17.6	0	0	0.5	
					60	0.0	0.0	0.0	17.6	0	0	0.4	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC
Date:	06/06/2018	**Job Number:**	18/3106	**Time:**	14:03

METEOROLOGICAL AND SITE INFORMATION										
State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1012	dP (Pa) initial:	0	aP (mb) After:	1012	Temperature (°C)	24			

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.7	18.8	0	0	0.9	**Short**
					30	0.0	0.0	0.2	20.2	0	0	3.5	
		0	0	0	**60**	0.0	0.0	0.2	20.2	0	0	3.0	
		30			**5**	0.0	0.0	0.2	20.4	0	0	5.8	**Long**
		60			**30**	0.0	0.0	0.3	20.2	0	0	4.2	
		90			**60**	0.0	0.0	0.3	20.2	0	0	3.0	
		120			**60**	0.0	0.0	0.2	20.2	0	0		
		150			**120**	0.0	0.0	0.2	20.2	0	0		
		180			**180**	0.0	0.0	0.2	20.2	0	0		
		210			**240**	0.0	0.0	0.2	20.2	0	0		Constant readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.2	20.5	0	0	1.8	**Short**
		600			**30**	0.0	0.0	0.2	20.2	0	0	3.5	
					60	0.0	0.0	0.2	20.2	0	0	3.4	
					5	0.0	0.0	0.2	20.4	0	0	3.4	**Long**
					30	0.0	0.0	0.2	20.2	0	0	2.9	
					60	0.0	0.0	0.2	20.2	0	0	2.6	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC
Date:	06/06/2018	**Job Number:**	18/3106	**Time:**	14:26

METEOROLOGICAL AND SITE INFORMATION										
State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1012		dP (Pa) initial:	0	aP (mb) After:	1012	Temperature (°C)	23		

INSTRUMENTATION USED			
		Tick if gas sample taken:	
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.7	18.6	0	0	3.1	**Short**
					30	0.0	0.0	0.7	18.6	0	0	6.2	
		0	0	0	**60**	0.0	0.0	0.7	18.6	0	0	8.1	
		30			**5**	0.0	0.0	0.8	18.0	0	0	2.0	**Long**
		60			**30**	0.0	0.0	3.2	15.7	0	0	3.5	
		90			**60**	0.0	0.0	3.1	15.8	0	0	1.4	
		120			**60**	0.0	0.0	0.7	18.5	0	0		
		150			**120**	0.0	0.0	0.7	18.5	0	0		
		180			**180**	0.0	0.0	0.7	18.5	0	0		
		210			**240**	0.0	0.0	0.7	18.5	0	0		Constant readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.7	18.6	0.0	0.0	1.8	**Short**
		600			**30**	0.0	0.0	0.7	18.4	0.0	0.0	4	
					60	0.0	0.0	0.7	18.4	0	0	4.3	
					5	0.0	0.0	0.5	17.6	0.0	0.0	1	**Long**
					30	0.0	0.0	0.0	17.5	0.0	0.0	0.4	
					60	0.0	0.0	0.0	17.5	0	0	0.5	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC+RP
Date:	13/06/2018	**Job Number:**	18/3106	**Time:**	10:48

METEOROLOGICAL AND SITE INFORMATION										
State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1015	dP (Pa) initial:	0	aP (mb) After:	1015	Temperature (°C)	21			

INSTRUMENTATION USED			
		Tick if gas sample taken:	X
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	3.49	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	1.2	18.1	0	0	9.3	**Short**
					30	0.0	0.0	0.5	19.7	0	0	2.2	
		0	0	0	**60**	0.0	0.0	0.5	19.6	0	0	1.3	
		30			**5**	0.0	0.0	0.4	20.2	0	0	4.3	**Long**
		60			**30**	0.0	0.0	0.2	20.0	0	0	5.5	
		90			**60**	0.0	0.0	0.2	20.0	0	0	5.9	
		120			**60**	0.0	0.0	0.4	19.6	0	0	**Circulation**	
		150			**120**	0.0	0.0	0.4	19.7	0	0		
		180			**180**	0.0	0.0	0.4	19.8	0	0		
		210			**240**	0.0	0.0	0.3	19.8	0	0		
		240			**300**	0.0	0.0	0.3	19.9	0	0		Constant readings
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.3	20.2	0.0	0.0	1	**Short**
		600			**30**	0.0	0.0	0.4	19.9	0.0	0.0	2.4	
					60	0.0	0.0	0.4	19.8	0	0	2.9	
					5	0.0	0.0	0.3	20.0	0.0	0.0	2.8	**Long**
					30	0.0	0.0	0.4	19.7	0.0	0.0	1.4	
					60	0.0	0.0	0.4	19.7	0	0	1.1	

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC+RP
Date:	13/06/2018	**Job Number:**	18/3106	**Time:**	09:48

METEOROLOGICAL AND SITE INFORMATION										
State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:		None	X	Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1016	dP (Pa) initial:	0	aP (mb) After:	1015	Temperature (°C)	21			

INSTRUMENTATION USED			
		Tick if gas sample taken:	X
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	Dry	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.4	20.4	0	0	3.0	**Short**
					30	0.0	0.0	0.8	18.6	0	0	7.7	
		0	0	0	**60**	0.0	0.0	0.8	18.5	0	0	8.8	
		30			**5**	0.0	0.0	1.8	18.4	0	0	2.8	**Long**
		60			**30**	0.0	0.0	3.8	14.8	0	0	5.8	
		90			**60**	0.0	0.0	3.8	14.8	0	0	2.7	
		120			**60**	0.0	0.0	0.8	18.5	0	0		
		150			**120**	0.0	0.0	0.8	18.5	0	0		
		180			**180**	0.0	0.0	0.8	18.5	0	0		
		210			**240**	0.0	0.0	0.8	18.5	0	0		Constant readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.9	19.0	0	0	3.2	**Short**
		600			**30**	0.0	0.0	0.7	19.0	0	0	4.6	
					60	0.0	0.0	0.7	19.0	0	0	4.5	
					5	0.0	0.0	0.8	19.0	0	0	5.1	**Long**
					30	0.0	0.0	2.4	16.4	0	0	3.9	
					60	0.0	0.0	2.4	16.4	0	0	2.8	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	R.P
Date:	20/06/2018	**Job Number:**	18/3106	**Time:**	11:40

METEOROLOGICAL AND SITE INFORMATION

State of ground:	X	Dry		Moist		Wet				**Delete As Required**	
Wind:	X	Calm		Light		Moderate		Strong		Ground Level	
Cloud cover:		None		Slight	X	Cloudy		Overcast			
Precipitation	X	None		Slight		Moderate		Heavy			
Barometric pressure (mb) Before:	1017	dP (Pa) initial:	0	aP (mb) After:	1017	Temperature (°C)	21				

INSTRUMENTATION USED

		Tick if gas sample taken:	X
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.6	17.8	0	0	3.5	**Short**
					30	0.0	0.0	0.2	20.2	0	0	6.1	
		0	0	0	**60**	0.0	0.0	0.2	20.3	0	0	6.7	
		30			**5**	0.0	0.0	0.2	20.5	0	0	14.5	**Long**
		60			**30**	0.0	0.0	0.5	20.0	0	0	2.5	
		90			**60**	0.0	0.0	0.5	20.0	0	0	1.6	
		120			**60**	0.0	0.0	0.2	20.3	0	0		
		150			**120**	0.0	0.0	0.2	20.3	0	0		
		180			**180**	0.0	0.0	0.2	20.3	0	0		Constant readings
		210			**240**								
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.2	20.3	0.0	0.0	2.4	**Short**
		600			**30**	0.0	0.0	0.2	20.3	0.0	0.0	1.8	
					60	0.0	0.0	0.2	20.3	0	0	1.6	
					5	0.0	0.0	0.5	20.2	0.0	0.0	3.7	**Long**
					30	0.0	0.0	0.5	20.1	0.0	0.0	4.2	
					60	0.0	0.0	0.4	20.1	0	0	4.4	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	R.P
Date:	20/06/2018	**Job Number:**	18/3106	**Time:**	10:45

METEOROLOGICAL AND SITE INFORMATION

State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:	X	Calm		Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		

Barometric pressure (mb) Before: 1018 dP (Pa) initial: 0 aP (mb) After: 1017 Temperature (°C) 21

INSTRUMENTATION USED Tick if gas sample taken: X

Gas concentration:		
	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±	
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X

Tick Instrument used

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	DRY	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	1.2	17.2	0	0	3.6	**Short**
					30	0.0	0.0	1.2	15.6	0	0	7.7	
		0	0	0	**60**	0.0	0.0	1.2	15.5	0	0	8.5	
		30			**5**	0.0	0.0	1.4	15.6	0	0	14.7	**Long**
		60			**30**	0.0	0.0	2.4	12.6	0	0	3.2	
		90			**60**	0.0	0.0	4.3	11.7	0	0	1.6	
		120			**60**	0.0	0.0	0.9	16.5	0	0		
		150			**120**	0.0	0.0	1.2	15.5	0	0		
		180			**180**	0.0	0.0	1.2	15.4	0	0		
		210			**240**	0.0	0.0	1.2	15.3	0	0		
		240			**300**	0.0	0.0	1.3	15.3	0	0		
		270			**360**	0.0	0.0	1.3	15.3	0	0		Constant readings
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	3.3	12.4	0	0	1.9	**Short**
		600			**30**	0.0	0.0	1.7	15.0	0	0	2.6	
					60	0.0	0.0	1.7	15.0	0	0	2.5	
					5	0.0	0.0	1.4	16.6	0	0	4.1	**Long**
					30	0.0	0.0	4.1	12.0	0	0	1.4	
					60	0.0	0.0	4.2	11.9	0	0	1.2	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	R.P
Date:	27/06/2018	**Job Number:**	18/3106	**Time:**	10:15

METEOROLOGICAL AND SITE INFORMATION

State of ground:	X	Dry		Moist		Wet				**Delete As Required**
Wind:		Calm	X	Light		Moderate		Strong		Ground Level
Cloud cover:	X	None		Slight		Cloudy		Overcast		
Precipitation	X	None		Slight		Moderate		Heavy		
Barometric pressure (mb) Before:	1024	dP (Pa) initial:	0	aP (mb) After:	1024	Temperature (°C)	19			

INSTRUMENTATION USED

		Tick if gas sample taken:	X
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH01	Dry	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.1	19.9	0	0	2.2	**Short**
					30	0.0	0.0	0.2	19.7	0	0	4.5	
		0	0	0	**60**	0.0	0.0	0.2	19.6	0	0	5.1	
		30			**5**	0.0	0.0	0.2	19.7	0	0	12.4	**Long**
		60			**30**	0.0	0.0	0.4	19.5	0	0	2.2	
		90			**60**	0.0	0.0	0.3	19.5	0	0	1.4	
		120			**60**	0.0	0.0	0.2	19.6	0	0		
		150			**120**	0.0	0.0	0.2	19.6	0	0		
		180			**180**	0.0	0.0	0.2	19.6	0	0		
		210			**240**	0.0	0.0	0.2	19.6	0	0		Constant Readings
		240			**300**								
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.2	19.9	0.0	0.0	1.2	**Short**
		600			**30**	0.0	0.0	0.3	19.7	0.0	0.0	2.3	
					60	0.0	0.0	0.3	19.7	0	0	2.5	
					5	0.0	0.0	0.2	19.7	0.0	0.0	2.7	**Long**
					30	0.0	0.0	0.3	19.5	0.0	0.0	2.5	
					60	0.0	0.0	0.3	19.5	0	0	2.2	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

Gas Monitoring Results

JOB DETAILS					
Location:	St Annes			**Engineer:**	VC
Date:	02/07/2018	**Job Number:**	18/3106	**Time:**	14:00

METEOROLOGICAL AND SITE INFORMATION											
State of ground:	X	Dry		Moist		Wet				**Delete As Required**	
Wind:	X	Calm		Light		Moderate		Strong		Ground Level	
Cloud cover:	X	None		Slight		Cloudy		Overcast			
Precipitation	X	None		Slight		Moderate		Heavy			
Barometric pressure (mb) Before:	1011		dP (Pa) initial:	0	aP (mb) After:	1011	Temperature (°C)	28			

INSTRUMENTATION USED			
		Tick if gas sample taken:	X
Gas concentration:	Gas Data LMSxi G3.18, Accuaracy: CH_4 ±0.2% (0 to 5%), ±1.0% (at 30%), ±3.0% (at 100%); CO_2 ±0.1% (0 to 10%), ±3.0% (at 40%); O_2 ±		Tick Instrument used
	Gas Data GFM 436, Accuracy: CH4 ±0.3% (0 to 5%), ±3.0% (at 30%), ±3.0% (at 100%); CO2 ±0.3% (0 to 5%), ±3.0% (at 40%); O2 ±0.2%;	X	

BH (No.)	Depth to GW (m)	Flow Measurements			Time (s)	CH_4 (%)	LEL (%)	CO_2 (%)	O_2 (%)	H_2S (ppm)	CO (ppm)	PID (ppm)	Comments
BH02B	Dry	**Time (s)**	**dP (mb)**	**Flow (l/h)**	**5**	0.0	0.0	0.0	20.1	0	0	4.1	**Short**
					30	0.0	0.0	0.0	20.2	0	0	8.2	
		0	0	0	**60**	0.0	0.0	0.0	20.1	0	0	8.0	
		30			**5**	0.0	0.0	0.5	16.2	0	0	1.0	**Long**
		60			**30**	0.0	0.0	2.4	16.0	0	0	4.9	
		90			**60**	0.0	0.0	2.3	16.4	0	0	5.0	
		120			**60**	0.0	0.0	0.0	20.1	0	0		
		150			**120**	0.0	0.0	0.0	20.0	0	0		
		180			**180**	0.0	0.0	0.2	19.6	0	0		
		210			**240**	0.0	0.0	0.2	19.6	0	0		
		240			**300**	0.0	0.0	0.2	19.6	0	0		Constant readings
		270			**360**								
		300			**420**								
		360			**480**								
		420			**540**								
		480			**600**								
		540			**5**	0.0	0.0	0.9	18.3	0	0	3	**Short**
		600			**30**	0.0	0.0	0.9	18.0	0	0	3.6	
					60	0.0	0.0	0.9	18.0	0	0	3.8	
					5	0.0	0.0	0.8	18.8	0	0	4.9	**Long**
					30	0.0	0.0	1.8	17.2	0	0	4.1	
					60	0.0	0.0	2.0	16.9	0	0	4.3	

Circulation

KEY
aP: Atmospheric Pressure NR: Not Recorded
dP: Differential Pressure OR: Out of Range

CONCEPT

GROUNDWATER - IN SITU ANALYSIS & SAMPLING

Site:	**St Annes Church**
Job No.:	**18/3106**
Date:	**29/05/2018**
Technician:	**VC + FG**
Sampling method:	*Peristactic pump*

BH No.	Base of well (mbgl)	Top of slotted (mbgl)	Depth to GW (mbgl)
BH01	7.96	5.00	6.05

Purge Volume (L)	Time	Temp (°C)	DO (mg/L)	SPC (mS/cm)	pH	Redox Potential (mV)	Sample Detail (Colour/Odour/Turbidity)
2	11:48	14.5	2.22	1.54	6.87	73.5	Brown
3	11:50	14.4	1.83	1.48	6.86	71.7	Brown
4	11:52	14.4	1.45	1.45	6.84	69.9	Brown
5	11:54	14.4	1.07	1.43	6.83	68.0	Brown
6	11:56	14.4	0.86	1.42	6.82	66.5	Brown
7	11:58	14.4	0.69	1.42	6.82	64.6	Brown
8	12:00	14.4	0.61	1.41	6.82	63.1	Brown

CONCEPT

GROUNDWATER - IN SITU ANALYSIS & SAMPLING

Site:	**St Annes Church**
Job No.:	**18/3106**
Date:	**29/05/2018**
Technician:	**VC + FG**
Sampling method:	*Peristactic pump*

	BH No.	Base of well (mbgl)	Top of slotted (mbgl)	Depth to GW (mbgl)	
	BH02B	8.45	6.50	6.58	

Purge Volume (L)	Time	Temp (°C)	DO (mg/L)	SPC (mS/cm)	pH	Redox Potential (mV)	Sample Detail (Colour/Odour/Turbidity)
2	10:24	14.4	1.24	1.42	6.75	72.4	Turbid Clear
3	10:26	14.4	1.10	1.42	6.75	73.0	Turbid Clear
4	10:28	14.4	0.89	1.42	6.75	73.9	Turbid Clear
5	10:31	14.4	0.71	1.42	6.77	71.0	Turbid Clear
6	10:33	14.4	0.65	1.42	6.77	69.6	Turbid Clear
7	10:36	14.4	0.57	1.42	6.78	68.0	Turbid Clear
8	10:39	14.4	0.50	1.42	6.78	66.9	Turbid Clear
9	10:42	14.4	0.48	1.42	6.78	65.7	Turbid Clear

CONCEPT

GROUNDWATER - IN SITU ANALYSIS & SAMPLING

Site:	**St Annes Church**
Job No.:	**18/3106**
Date:	**13/06/2018**
Technician:	**VC+RP**
Sampling method:	*Peristactic pump*

BH No.	Base of well (mbgl)	Top of slotted (mbgl)	Depth to GW (mbgl)
BH01	7.90	5.00	6.08

Purge Volume (L)	Time	Temp (°C)	DO (mg/L)	SPC (mS/cm)	pH	Redox Potential (mV)	Sample Detail (Colour/Odour/Turbidity)
1	11:20	14.4	1.51	1.43	6.79	126.1	Brown
2.2	11:22	14.3	1.01	1.42	6.76	122.8	Brown
3.6	11:24	14.3	0.76	1.42	6.76	119.3	Brown
5	11:26	14.3	0.63	1.42	6.77	116.9	Brown
6	11:28	14.3	0.54	1.42	6.77	114.2	Brown
7	11:30	14.3	0.48	1.42	6.77	111.2	Brown
8	11:32	14.3	0.44	1.42	6.77	108.5	Brown
9	11:34	14.3	0.41	1.41	6.77	105.5	Brown
10	11:36	14.3	0.41	1.42	6.77	103.2	Brown
11	11:38	14.3	0.39	1.42	6.78	100.8	Brown
12	11:40	14.3	0.38	1.42	6.78	99.3	Brown

CONCEPT

GROUNDWATER - IN SITU ANALYSIS & SAMPLING

Site:	**St Annes Church**
Job No.:	**18/3106**
Date:	**13/06/2018**
Technician:	**VC+RP**
Sampling method:	*Peristactic pump*

	BH No.	Base of well (mbgl)	Top of slotted (mbgl)	Depth to GW (mbgl)	
	BH02B	8.30	6.50	6.59	

Purge Volume (L)	Time	Temp (°C)	DO (mg/L)	SPC (mS/cm)	pH	Redox Potential (mV)	Sample Detail (Colour/Odour/Turbidity)
1	10:19	14.3	1.73	1.35	6.72	139.0	Brown
2	10:20	14.3	0.87	1.35	6.72	124.6	Brown
3	10:22	14.3	0.69	1.35	6.72	118.3	Brown
4	10:24	14.2	0.54	1.35	6.73	110.2	Brown
5	10:26	14.2	0.47	1.35	6.73	105.1	Brown
6	10:28	14.2	0.41	1.36	6.74	99.3	Brown
7	10:30	14.2	0.37	1.36	6.74	94.7	Brown
8	10:32	14.2	0.34	1.36	6.75	91.6	Brown
9	10:34	14.2	0.33	1.36	6.75	89.8	Brown
10	10:36	14.2	0.32	1.36	6.75	90.7	Brown
11	10:38	14.2	0.3	1.36	6.75	91.9	Brown
12	10:40	14.2	0.3	1.36	6.75	92.2	Brown

TEST DATE AND CONDITIONS	
Date	15·11·17
Atmospheric Pressure	1007 mB
Ambient Temp	22·1 °C
Environics Serial No.	5089

GAS DATA LTD
Unit 4, Fairfield Court
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LJ
Tel 02476303311 Fax 02476307711

GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS			
SO Number	Instrument Type	Instrument Serial Number + SW Version	Job Number(s)
318481	GFM436	12224 G436-00-0027/0011	119730

Calibration Technician ..... **Date** 15·11·17

Inspection Technician ..... **Date** 16.11.17

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable (NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All Keys)	P	Leather Case		✗
	Backlight	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		✗
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		✗
	Overall Leak Test (30mB)	N/A	AC Battery Charger (AUS)		✗
	Battery Charge Test	P	Gas Sample Pipe		✓
	Service Date set to?	15·11·18	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot		✓
	Verify CH4/LEL/Hexane/PID	P	Allen Key		✗
	Verify CO2	P	Flow Sample Pipe		✓
	Verify O2	P	Temperature Probe		✗
	Verify H2S	P	Vane Anemometer		✗
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory stick		✗
	Verify 1st Option Gas	N/A	SM V5 Software	Ver	
	Verify Atmospheric pressure	P	Internal Filter Pack	Qty 6-05	✗
	Verify differential pressure	P	External Filter Pack	Qty	✗
	Verify flow	P	Field Guide		✗
	Verify temperature probe input	P	Extra Items:		
	Verify vane anemometer input	P	'T' Piece adaptor		
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	N/A			
Label Checks	No. of Calibration label fitted	GDC 08270	Comments:		
	MCERTS label displayed	P			
	Warranty label fitted	N/A			
H2S Range	H2S Range from Sales Order	5000 ppm			
	H2S Range from Cal Cert	5000 ppm			
	Over-range value correct?	P			

Date	15/11/17	
Atmospheric Pressure	1007	mB
Ambient Temperature	22.1	°C
Environics Serial No.	5089	

GFM436 Final Inspection & Calibration Check Certificate

GAS DATA LTD

Unit 4, Fairfield Court

Seven Stars Estate

Wheler Rd

Coventry

CV3 4LJ

Tel 02476303311 Fax 02476307711

Customer	Concept Site Investigations
Certificate Number	119730
Order Number	318481

Serial Number	12224
Software Version	G436-00.0027/0011

15/11/18

Instrument Checks					
Keyboard	✓		Display Contrast	✓	
Pump Flow In	400	*Accept > 200 cc/min*	Pump Flow @ -200mB	300	*Accept > 200 cc/min*
Clock Set / Running	✓		Labels Fitted	✓	

Gas Checks						
	CH_4		CO_2		O_2	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
Sensor	60	*60*	40	*40*	20.9	*20.9*
	Accept ±3.0		*Accept ±3.0*		*Accept ±0.5*	
	4.9	*5*	4.9	*5*	6	*6*
	Accept ±0.3		*Accept ±0.3*		*Accept ±0.3*	
Zero Reading 100% N2	0	*0*	0	*0*	0	*0*
	Accept ±0.0		*Accept ±0.0*		*Accept ±0.1*	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings *(ppm)*			
Gas Type	Range *(ppm)*		Zero Reading		Instrument Gas Reading	
H2S	5000	*1500*	0	*Accept ±0.0*	1500	*Accept ±5.0*
CO	2000	*1000*	0	*Accept ±0.0*	1000	*Accept ±5.0*
Hexane	*2.0%*	2.0%	0	*Accept ±0.0*	1.99	*Accept ±10.0*

Cross Gas Effects

Applied Gas *(ppm)*		Instrument Readings *(ppm)*							
Gas Type	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:	HEX		
H2S	*1500*	1500		0		0			
CO	*1000*	60		1000		0			
Hexane	*2.0%*	0		0		1.99			

Pressure Checks

Atmospheric Pressure [AP] *(mB)*			
Current Atmospheric Pressure (mB)		Instrument Atmospheric Pressure Reading (mB)	
AP Open Ports		1007	*Accept ±2.0*
AP Port (Internal)	*+800 mB*	800	*Accept ±5.0*
	+1200mb	1200	*Accept ±5.0*

Flow Checks

Borehole Flow			Differential Pressure		
Applied Reading *(l/h)*	Instrument Reading *(l/h)*		Applied Pressure *(Pa)*	Instrument Reading *(Pa)*	
-30	-30.4	*Accept ±3.0*	-263	-267	*Accept ±50*
-3	-3	*Accept ±1.0*	-13	-13	*Accept ±6.0*
0	0	*Accept ±0.0*	0	0	*Accept ±0.5*
3	3	*Accept ±0.5*	13	13	*Accept ±3.0*
30	30.1	*Accept ±3.0*	273	276	*Accept ±50*
60	60	*Accept ±6.0*	818	820	*Accept ±130*
90	88.4	*Accept ±9.0*	1597	1560	*Accept ±250*

Temperature Checks

Calibration Temperature Applied Temperature °C	Instrument Temperature Reading °C	
-10	-10	*Accept ±2.0*
0	0	*Accept ±1.0*
30	30	*Accept ±1.0*
60	60	*Accept ±1.0*
100	100	*Accept ±1.0*

Technician:	Date Tested:
Jack Rutland	*16/11/17*

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015. Certificate NQA 8374. Valid until 22/03/2019

Test Conditions		
Date	05/12/17	
Atmospheric Pressure	1016	mB
Ambient Temperature	22.9	°C
Environics Serial No:	XXXX	

GAS DATA LTD
Unit 4, Fairfield Court
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LJ
Tel 02476303311 Fax 02476307711

LMSxi Final Inspection & Calibration Check Certificate

Customer	Concept Consultants
Certificate Number	119772
Order Number	317832

Serial Number	5037
Software Version	G3.18v-LTBX

Next Calibration Due
05/12/18

Gas Checks						
	CH_4		CO_2		O_2	
	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %	Instrument Gas Readings %	True Gas Value %
Sensor	56	56	40	42.3	20.7	20.9
	Accept ±3.0		*Accept ±3.0*		*Accept ±0.5*	
	5.7	5.8	4	4.2		
	Accept ±0.3		*Accept ±0.3*			
Zero Reading 100% N2	0	0	0	0	0.1	0
	Accept ±0.0		*Accept ±0.0*		*Accept ±0.1*	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings *(ppm)*			
Toxic Gas	Range *(ppm)*		Zero Reading		Instrument Gas Reading	
H2S	200	*200*	0	*Accept ±0.0*	200	*Accept ±5.0*
CO	1000	*430*	0	*Accept ±0.0*	433	*Accept ±5.0*
				Accept ±0.0		*Accept ±5.0*
				Accept ±0.0		*Accept ±5.0*

Cross Gas Effects									
Applied Gas *(ppm)*		Instrument Readings *(ppm)*							
Toxic Gas	Concentration	Toxic 1:	H2S	Toxic 2:	CO	Toxic 3:			
H2S	*200*	200		0					
CO	*430*	3.3		433					

Pressure Checks					
Atmospheric Pressure [AP] *(mbar)*			Differential Pressure [DP] *(mbar)*		
Atmospheric Pressure *(mbar)*		Instrument AP Pressure Reading	Applied Pressure	Instrument Pressure	
Current AP value	1016	*Accept ±2.0*	*0.0 mbar*		*Accept ±0.0*
Current AP value + 50 mbar	1066	*Accept ±2.0*	*+30 mbar*	n/a	*Accept ±1.0*
Current AP value - 50 mbar	966	*Accept ±2.0*	*-30 mbar*		*Accept ±1.0*

Flow Checks					
Applied Flow Reading *(l/h)*	Instrument Flow Reading *(l/h)*		Applied DP Pressure *(Pa)*	Differential Pressure	
				Instrument DP Reading *(Pa)*	
-5	*-5*	*Accept ±0.5*	*-13*	*-13*	*Accept ±5.0*
0	*0*	*Accept ±0.0*	*0*	*0*	*Accept ±0.0*
5	*5.1*	*Accept ±0.5*	*13*	*13*	*Accept ±5.0*
10	*10*	*Accept ±0.7*	*30*	*30*	*Accept ±10.0*
20	*20*	*Accept ±3.0*	*76*	*76*	*Accept ±20.0*

Temperature Checks		
Applied Temperature °C	Instrument Reading °C	
0	0	*Accept ±1.0*
25	25	*Accept ±1.0*
40	40.2	*Accept ±1.0*

Technician:	Date Tested:
Les Treece	*05/12/17*

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

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SERVICE / INSPECTION SHEET

JOB NUMBER: 61331
INSTRUMENT: Phocheck Tiger

Instrument House
91-92 Shrivenham Hundred Business Park
Watchfield
Oxfordshire
SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

SERIAL NUMBER: T-108843
DATE RECEIVED: 29/06/2017

FIRMWARE: V.4.33
UPGRADED TO: V7.05

CUSTOMER: Concept Engineering Consultants

ITEMS RECEIVED	CONDITION	RTN?
Instrument	YES	
Rubber Boot	YES	
Battery Charger	YES	
Charging Cradle	YES	
Operation Manual	NO	
Quick Start Guide	NO	
Spares Kit	YES	
Comms Cable	NO	
Probe FLEXI	NO	
Peli Case	YES	
Tubing	NO	
Regulator	NO	
Software (Memory Stick)	NO	
	SIGNED:	

TESTS	AS REC'D	AFTER REPAIR
Charging Test	Ok	Ok
Battery Test	Ok	Ok
Lamp Test	Ok	Ok
Air Flow Test	Ok	Ok
Switch Test	Ok	Ok
Moisture Sensitivity	Failed	Ok
Sensor Test	Ok	Ok
Alarm Test	Ok	Ok
PC Comms Test	Ok	Ok
Datalog Test	Ok	Ok
Display Test	Ok	Ok
Physical Inspection	Ok	Ok
PAT Test	Ok	Ok
Firmware Upgrade	Completed	Ok
Software Upgrade (usb)	Ok	Ok
Function Test	Ok	Ok

New probe kit fitted.
Sensor stack has been replaced.
Contaminated filter has been replaced
Sensor seal has been replaced.
Lamp cleaned with aluminium oxide.
Firmware has been upgraded to the latest version.
Instrument has been cleaned, serviced and calibrated.
Operationally tested to manufacturer's standards.

TECHNICIAN: Matthew Jordison DATE: 30.06.17

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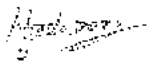
CERTIFICATE OF CALIBRATION
Phocheck Tiger

CALIBRATION CERTIFICATE NO: 61331

ISSUED BY: SHAWCITY LIMITED
DATE: 30.06.17

APPROVED SIGNATORY: 

NAME: Matthew Jordison

CUSTOMER: Concept Engineering Consultants
INSTRUMENT: Phocheck Tiger
SERIAL NUMBER: T-108843

CALIBRATION METHOD: CM03
AMBIENT CONDITIONS: 20°C ± 2°C and 50% (± 20%) RH

Prior to calibration the instrument was allowed to stabilise in the laboratory for at least 30 minutes.
The instrument was calibrated by exposing the sensor to known values of gas concentrations.
All gases were sampled through the complete probe and in line filter, where applicable.
The reference value is that generated by the certified source and the indicated value is that measured by the instrument.

CALIBRATION RESULTS

GAS	LOT No	REF. VALUE	INDICATED VALUE
Isobutylene	163183	100 ppm	100 ppm
Isobutylene	106389	1000 ppm	1000 ppm

COMMENTS:
The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$.
This provides a level of confidence of uncertainty of approximately 95%.
The uncertainty of measurement is ±2 %
The results indicate that the instrument conforms to the applicable parts of the published specification.

Tel: 01793 780622
www.shawcity.co.uk
Instrument House, 91-92 Shrivenham Hundred Business Park
Watchfield, Oxfordshire, SN6 8TY
Fax: 01793 784466
service@shawcity.co.uk

VAN WALT

OUTWARDS CHECKLIST

YSI & Cable Serial Numbers: 12C102679 / 16L100082

	Reading	Target	Acceptable	Pass	Lot No:
Temp	24.7	Ref: 24.9	± 1°C	✓	N/A
pH7mv	-29.5	0.0	0 ± 50	✓	18A1
pH4mv	147.6	177	177 ± 50	✓	18B1
pH Slope	177.1	177	162 - 180	✓	N/A
Cond. Cell Constant	4.9	5	4.6 - 5.4	✓	18A1
Redox Offset	33.2	0.0	±50.0	✓	17L1
DO Gain	Pass or fail determined by the meter			✓	N/A

All parameters were within acceptable range on the day of despatch; however we do recommend that the instrument is calibrated daily to ensure accurate readings.

* Calibrated to manufacturers standards

Signed: TM

Date: 2/7/18

Name: Tom Baggett

Cross checked contents initials: JR

11. GEOTECHNICAL LABORATORY TEST RESULTS

CONCEPT SITE INVESTIGATIONS

Site Name:	1 Triton Square - St Anne's	**Job No.:**	18/3106
Client:	British Land	**Date Reported:**	13/06/2018

Summary Test Report

Determination of Moisture Content and Liquid and Plastic Limits

Borehole No.	Sample Type	Sample No.	Depth m	Description	Natural Moisture Content %	[1] Passing 425 µm sieve %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Remarks
BH01	D	24	7.95	Dark brown CLAY	25	100	63	25	38	
BH01	B	28	9.50	Dark brown CLAY	32	100	67	26	41	
BH01	B	34	11.70	Dark brown CLAY	25	100	71	24	47	
BH01	B	39	13.20	Dark brown CLAY	26	100	71	25	46	
BH01	D	42	14.50	Dark brown CLAY	26	100	75	29	46	
BH01	D	49	16.85	Brownish grey slightly sandy CLAY with rare claystone fragments	18	98	77	30	47	
BH01	D	63	22.00	Brownish grey slightly sandy CLAY	25	100	75	27	48	
BH01	D	76	26.50	Brownish grey slightly sandy CLAY	24	100	69	26	43	
BH01	B	81	28.20	Brownish grey slightly sandy CLAY	17	100	48	19	29	

BS 1377: Part 2: Clause 4.3 & 4.4: 1990 Determination of the liquid limit by the cone penetrometer method

BS 1377: Part 2: Clause 5: 1990 Determination of the plastic limit and plasticity index

BS 1377: Part 2: Clause 3.2: 1990 Determination of the moisture content by the oven drying method

AGS ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS

UKAS TESTING 4503

Date - samples received:	07/05/2018	Checked by:	KM
Date - samples tested:	08/06/2018	Date:	11/06/2018
Approved Signatories:	L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)		

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553 Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

Site Name:	1 Triton Square - St Anne's	**Job No.:**	18/3106
Client:	British Land	**Date Reported:**	13/06/2018

Summary Test Report

Determination of Moisture Content and Liquid and Plastic Limits

Borehole No.	Sample Type	Sample No.	Depth m	Description	Natural Moisture Content %	[1.] Passing 425 µm sieve %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Remarks
BH01	D	84	29.50	Reddish grey mottled bluish grey CLAY	23	100	61	24	37	

BS 1377: Part 2: Clause 4.3 & 4.4: 1990 Determination of the liquid limit by the cone penetrometer method

BS 1377: Part 2: Clause 5: 1990 Determination of the plastic limit and plasticity index

BS 1377: Part 2: Clause 3.2: 1990 Determination of the moisture content by the oven drying method

4503

Date - samples received:	07/05/2018	Checked by:	KM
Date - samples tested:	08/06/2018	Date:	11/06/2018
Approved Signatories:	L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)		

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553 Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

Site Name:	1 Triton Square - St Anne's	**Job No.:**	18/3106
Client:	British Land	**Date Reported:**	13/06/2018

Summary Test Report

Determination of Moisture Content and Liquid and Plastic Limits

Borehole No.	Sample Type	Sample No.	Depth m	Description	Natural Moisture Content %	[1.] Passing 425 µm sieve %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Remarks
BH02B	D	31	9.00	Brownish grey CLAY	27	100	69	27	42	
BH02B	D	37	12.00	Brownish grey CLAY	22	100	69	28	41	
BH02B	D	46	16.50	Brownish grey CLAY	28	100	75	29	46	
BH02B	D	51	18.50	Dark grey slightly sandy CLAY	31	100	73	28	45	
BH02B	D	55	20.45	Brownish grey slightly sandy CLAY	28	100	80	31	49	
BH02B	D	59	22.50	Brownish grey slightly sandy CLAY	22	100	55	23	32	
BH02B	D	63	24.00	Brownish grey slightly sandy CLAY	25	100	76	26	50	
BH02B	D	68	26.40	Brownish grey slightly sandy CLAY	26	100	73	28	45	
BH02B	D	72	28.50	Brownish grey slightly sandy CLAY	19	100	51	19	32	

BS 1377: Part 2: Clause 4.3 & 4.4: 1990 Determination of the liquid limit by the cone penetrometer method

BS 1377: Part 2: Clause 5: 1990 Determination of the plastic limit and plasticity index

BS 1377: Part 2: Clause 3.2: 1990 Determination of the moisture content by the oven drying method

AGS ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS

UKAS TESTING 4503

Date - samples received:	03/05/2018	Checked by:	KM
Date - samples tested:	08/06/2018	Date:	11/06/2018
Approved Signatories:	L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)		

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553 Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

Site Name:	1 Triton Square - St Anne's	**Job No.:**	18/3106
Client:	British Land	**Date Reported:**	13/06/2018

Summary Test Report

Determination of Moisture Content and Liquid and Plastic Limits

Borehole No.	Sample Type	Sample No.	Depth m	Description	Natural Moisture Content %	[1] Passing 425 µm sieve %	Liquid Limit %	Plastic Limit %	Plasticity Index %	Remarks
BH02B	D	75	29.85	Dark grey slightly sandy CLAY	19	100	50	20	30	

BS 1377: Part 2: Clause 4.3 & 4.4: 1990 Determination of the liquid limit by the cone penetrometer method

BS 1377: Part 2: Clause 5: 1990 Determination of the plastic limit and plasticity index

BS 1377: Part 2: Clause 3.2: 1990 Determination of the moisture content by the oven drying method

AGS Association of Geotechnical & Geoenvironmental Specialists

UKAS TESTING
4503

Date - samples received:	03/05/2018	Checked by:	
Date - samples tested:	08/06/2018	Date:	
Approved Signatories:	L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)		

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553 Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

PARTICLE SIZE DISTRIBUTION

TEST REPORT

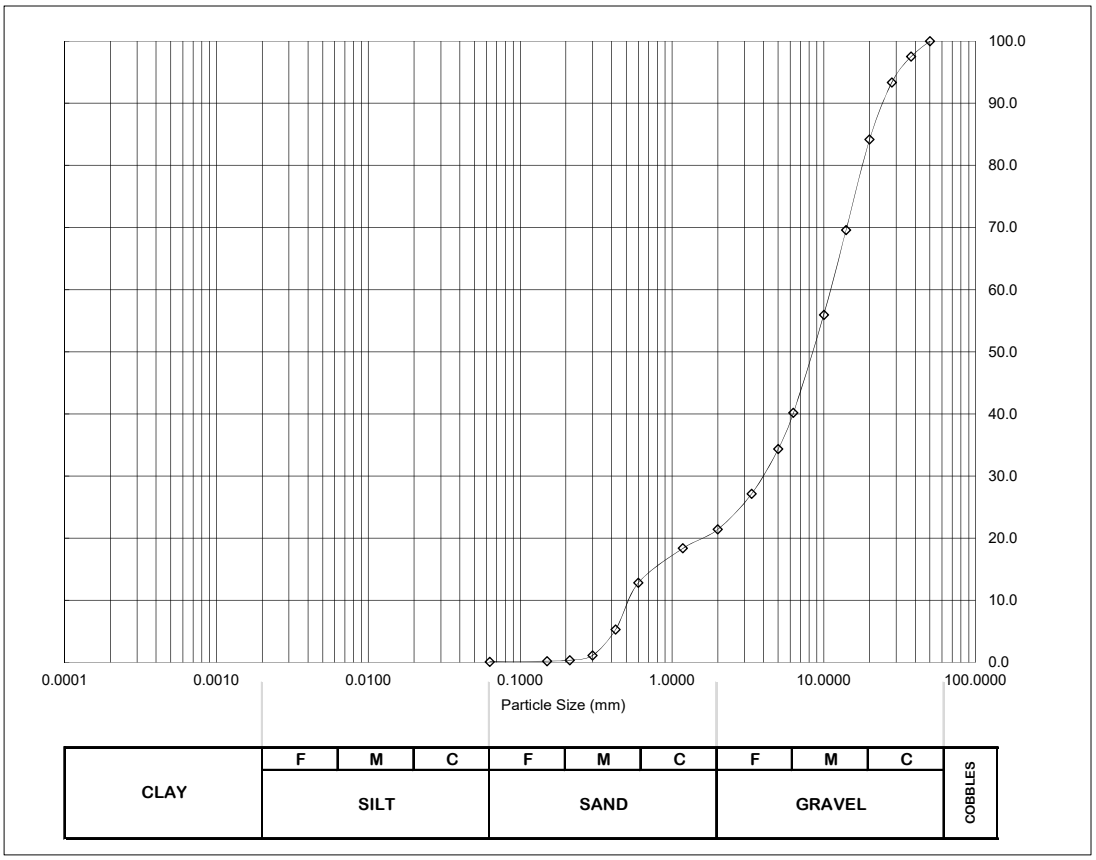
Site Name:	**1 Triton Square - St Anne's**					**Job Number:**	**18/3106**
Client:	**British Land**					**Date Reported:**	**13/06/2018**
Borehole No:	**BH01**	**Sample Type/No.**	**B**	**14**	**Top Depth:** **4.00 m**	**Bottom Depth:**	**4.45 m**

Soil Description:

Yellowish brown very sandy fine to coarse flint GRAVEL

BS Test Sieves	
Size (mm)	% Passing
75.000	100
63.000	100
50.000	100
37.500	98
28.000	93
20.000	84
14.000	70
10.000	56
6.300	40
5.000	34
3.350	27
2.000	21
1.180	18
0.600	13
0.425	5
0.300	1
0.212	0
0.150	0
0.063	0

Sedimentation (*if applicable)	
Size (mm)	% Passing
0.020	
0.006	
0.002	



Method/type:	Dry Sieving

BS 1377: Part 2: Clause 9.3: 1990 Determination of particle size distribution - dry sieving method.

Particle Proportions %	
Cobbles	
Gravel	78.6
Sand	21.3
Silt and Clay	0.1

4503

Remarks:

Date - samples received:	07/05/2018	Checked by: KM	
Date - samples tested:	07/06/2018	Date: 11/06/2018	

Approved Signatories: L Griffin LG (Quality Mngr) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

PARTICLE SIZE DISTRIBUTION

TEST REPORT

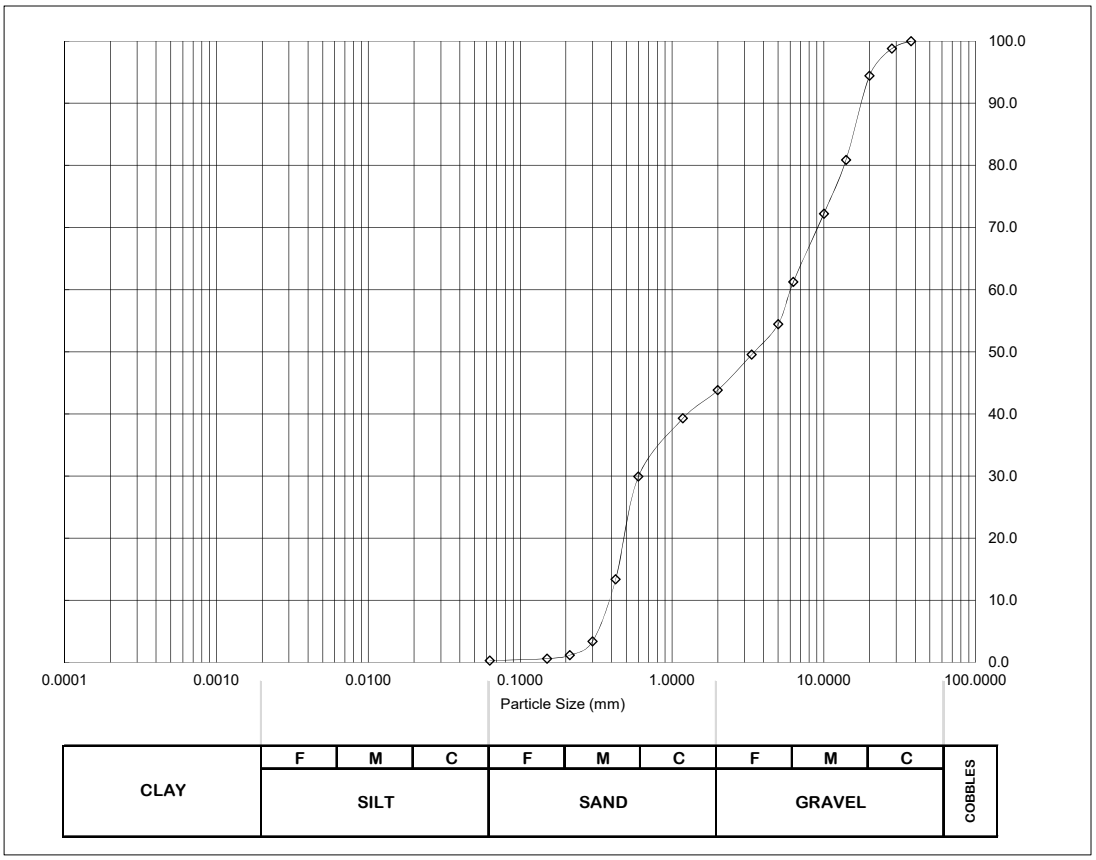
Site Name:	**1 Triton Square - St Anne's**					**Job Number:**	**18/3106**
Client:	**British Land**					**Date Reported:**	**13/06/2018**
Borehole No:	**BH01**	**Sample Type/No.**	**B**	**17**	**Top Depth:** **5.00 m**	**Bottom Depth:**	**5.45 m**

Soil Description:

Yellowish brown slightly silty very sandy fine to coarse flint GRAVEL

BS Test Sieves	
Size (mm)	% Passing
75.000	100
63.000	100
50.000	100
37.500	100
28.000	99
20.000	94
14.000	81
10.000	72
6.300	61
5.000	54
3.350	50
2.000	44
1.180	39
0.600	30
0.425	13
0.300	3
0.212	1
0.150	1
0.063	0

Sedimentation (*if applicable)	
Size (mm)	% Passing
0.020	
0.006	
0.002	



Method/type:	Dry Sieving

BS 1377: Part 2: Clause 9.3: 1990 Determination of particle size distribution - dry sieving method.

Particle Proportions %	
Cobbles	
Gravel	56.2
Sand	43.5
Silt and Clay	0.3

4503

Remarks:

Date - samples received:	07/05/2018	Checked by:	KM
Date - samples tested:	07/06/2018	Date:	11/06/2018

Approved Signatories: L Griffin LG (Quality Mngr) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

PARTICLE SIZE DISTRIBUTION

TEST REPORT

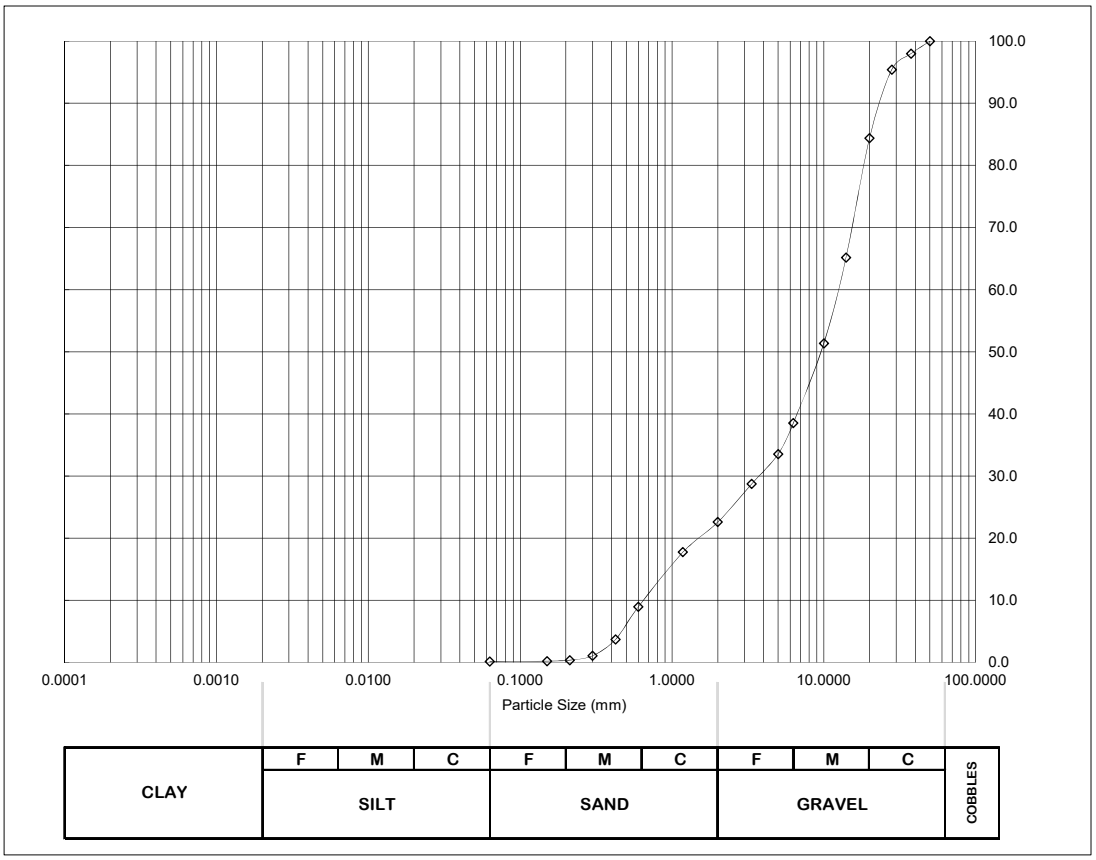
Site Name:	**1 Triton Square - St Anne's**					**Job Number:**	**18/3106**
Client:	**British Land**					**Date Reported:**	**13/06/2018**
Borehole No:	**BH01**	**Sample Type/No.**	**B**	**20**	**Top Depth:** **6.50 m**	**Bottom Depth:**	**6.95 m**

Soil Description:

Yellowish brown very sandy fine to coarse flint GRAVEL

BS Test Sieves	
Size (mm)	% Passing
75.000	100
63.000	100
50.000	100
37.500	98
28.000	95
20.000	84
14.000	65
10.000	51
6.300	39
5.000	34
3.350	29
2.000	23
1.180	18
0.600	9
0.425	4
0.300	1
0.212	0
0.150	0
0.063	0

Sedimentation (*if applicable)	
Size (mm)	% Passing
0.020	
0.006	
0.002	



Method/type:	Dry Sieving

BS 1377: Part 2: Clause 9.3: 1990 Determination of particle size distribution - dry sieving method.

Particle Proportions %	
Cobbles	
Gravel	77.4
Sand	22.5
Silt and Clay	0.1

4503

Remarks:

Date - samples received:	07/05/2018	Checked by: KM	
Date - samples tested:	07/06/2018	Date: 11/06/2018	

Approved Signatories: L Griffin LG (Quality Mngr) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: lab@conceptconsultants.co.uk

CONCEPT SITE INVESTIGATIONS

PARTICLE SIZE DISTRIBUTION

TEST REPORT

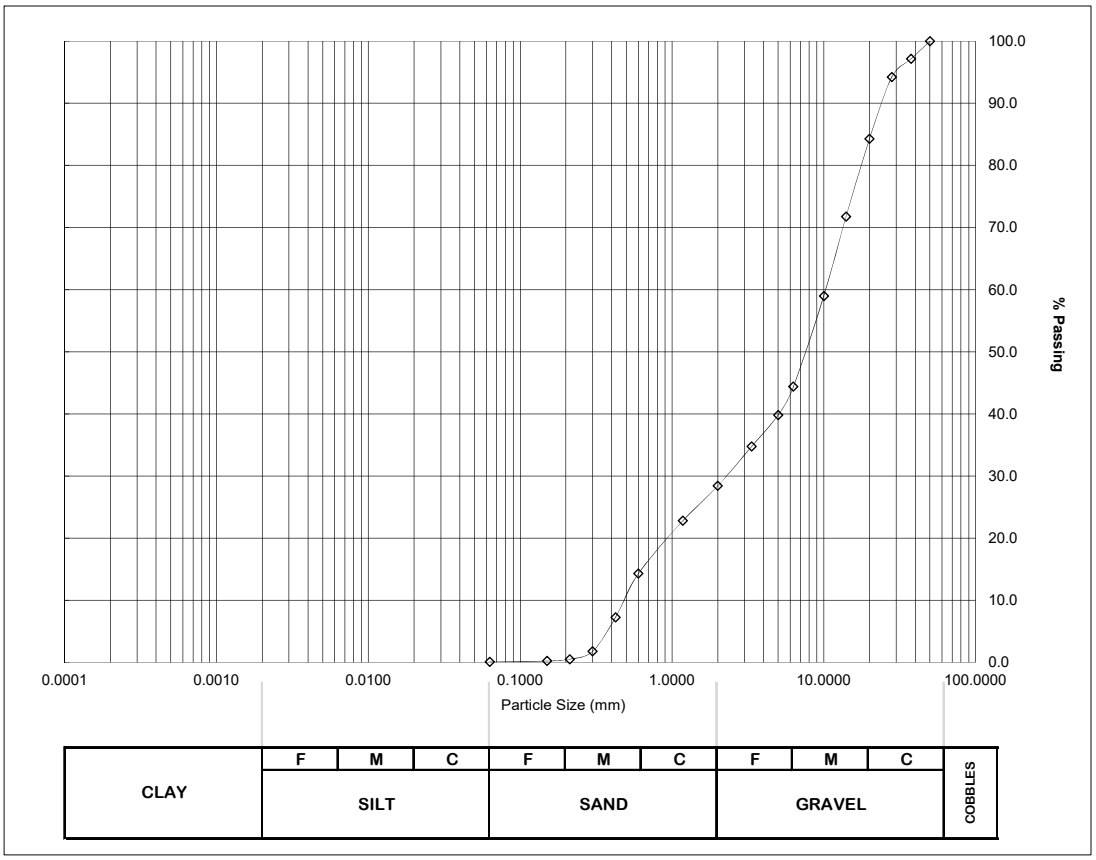
Site Name:	**1 Triton Square - St Anne's**					**Job Number:**	**18/3106**
Client:	**British Land**					**Date Reported:**	**13/06/2018**
Borehole No:	**BH02B**	**Sample Type/No.**	**B**	**23**	**Top Depth:** **6.50 m**	**Bottom Depth:**	**6.95 m**

Soil Description:

Brown very sandy fine to coarse flint GRAVEL

BS Test Sieves	
Size (mm)	% Passing
75.000	100
63.000	100
50.000	100
37.500	97
28.000	94
20.000	84
14.000	72
10.000	59
6.300	44
5.000	40
3.350	35
2.000	28
1.180	23
0.600	14
0.425	7
0.300	2
0.212	1
0.150	0
0.063	0

Sedimentation (*if applicable)	
Size (mm)	% Passing
0.020	
0.006	
0.002	



Method/type:	Dry Sieving

BS 1377: Part 2: Clause 9.3: 1990 Determination of particle size distribution - dry sieving method.

Particle Proportions %	
Cobbles	
Gravel	71.6
Sand	28.3
Silt and Clay	0.1

4503

Remarks:

Date - samples received:	03/05/2018	Checked by: KM	**CONCEPT** 47-49 Brunel Road, London W3 7XR Tel: 02087401553 Email: lab@conceptconsultants.co.uk
Date - samples tested:	07/06/2018	Date: 11/06/2018	

Approved Signatories: L Griffin LG (Quality Mngr) – K Mazerant KM (Lab Mngr)

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618
Facsimile: (01424) 729911
info@elab-uk.co.uk

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	18-17732
Issue:	1
Date of Issue:	30/05/2018
Contact:	Kasia Mazerant
Customer Details:	Concept Engineering Consultants Ltd Unit 8, Warple Mews Warple Way London W3 0RF
Quotation No:	Q15-00395
Order No:	L1767
Customer Reference:	18/3106
Date Received:	24/05/2018
Date Approved:	30/05/2018
Details:	1 Triton Square - St Annes
Approved by:	

Mike Varley, Technical Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)

Sample Summary

Report No.: 18-17732

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
137337	BH01 D25 8.50	23/05/2018	24/05/2018	Clay	
137338	BH01 D59 20.50	23/05/2018	24/05/2018	Clay	
137339	BH01 B86 30.00	23/05/2018	24/05/2018	Clay	
137340	BH02B B10 2.00 - 2.45	23/05/2018	24/05/2018	Sandy loam	
137341	BH02B D36 11.40	23/05/2018	24/05/2018	Clay	
137342	BH02B D45 15.50 - 15.95	23/05/2018	24/05/2018	Clay	

Results Summary

Report No.: 18-17732

	ELAB Reference	137337	137338	137339	137340	137341	137342
	Customer Reference	D25	D59	B86	B10	D36	D45
	Sample ID						
	Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Sample Location	BH01	BH01	BH01	BH02B	BH02B	BH02B
	Sample Depth (m)	8.50	20.50	30.00	2.00 - 2.45	11.40	15.50 - 15.95
	Sampling Date	23/05/2018	23/05/2018	23/05/2018	23/05/2018	23/05/2018	23/05/2018
Determinand	**Codes** / **Units** / **LOD**						
Anions							
Water Soluble Chloride	M / mg/l / 20	< 20	< 20	20	< 20	< 20	< 20
Water Soluble Sulphate	M / mg/l / 20	276	513	249	1310	257	578
Inorganics							
Total Sulphide	N / mg/kg / 2	3	< 2	< 2	< 2	< 2	< 2
Acid Soluble Sulphate (SO4)	U / % / 0.02	0.15	0.17	0.12	0.36	0.16	0.20
Miscellaneous							
pH	M / pH units / 0.1	7.9	8.1	8.9	9.1	8.1	7.8

Tests marked N are not UKAS accredited.

2683

Method Summary

Report No.: 18-17732

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	30/05/2018	109	Colorimetry
pH	M	Air dried sample	30/05/2018	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	30/05/2018	115	Ion Chromatography
Water soluble anions	M	Air dried sample	29/05/2018	172	Ion Chromatography

Tests marked N are not UKAS accredited

Report Information

Report No.: 18-17732

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
NS	Subcontracted to approved laboratory. UKAS accreditation is not applicable.
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis (dried at < 30°C)
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

CONCEPT SITE INVESTIGATIONS

Summary Test Report - Undrained Triaxial Compression (Single-Stage)

BS 1377 : Part 7: 1990 Clause 8

Date Reported: 13/06/2018

Job No.: 18/3106

Site Location: 1 Triton Square - St Anne's

Client: British Land

BH No.	Sample Type	Sample No	Depth top (m)	Description	Cell pressure kN/m2	Strain at failure %	Bulk Density Mg/m3	Dry Density Mg/m3	NMC %	Max Dev. Stress kPa	Shear Strength kPa	Mode of failure/Comments
BH01	UT	23	7.50	Stiff, very closely fissured dark brown CLAY with rare partings of yellowish brown fine sand, occasional pockets of yellowish brown fine sand (<30mm) and yellowish brown discolouration	150	10.7	2.045	1.642	25	261	131	Brittle
BH01	UT	31	10.50	Stiff, very closely fissured dark brown CLAY with a parting of yellowish brown silty fine sand, rare pockets of yellowish brown silty fine sand, a claystone fragment between 10.60m and 10.69m and a pyrite nodule between 10.75m and 10.77m.								Insufficient testable sample (due to presence of claystone fragment)
BH01	UT	40	13.50	Very stiff, extremely closely to very closely fissured brownish grey silty CLAY with rare pockets of grey fine sand (<30mm) rare bioturbation and a pyrite nodule at 13.65m	270	5.7	2.025	1.617	25	426	213	Brittle
BH01	UT	48	16.50	Very stiff, extremely closely to very closely fissured brownish grey CLAY with rare white flecks	330	2.7	1.937	1.526	27	199	100	Brittle
BH01	UT	57	19.50	Very stiff, brownish grey slightly sandy silty CLAY with frequent pockets of grey fine sand (<15mm), rare foraminifera and bioturbation	390	3.6	2.007	1.622	24	352	176	Brittle
BH01	UT	65	22.50	Very stiff, brownish grey slightly sandy slightly micaceous silty CLAY with rare pockets of grey fine sand (<10mm), bioturbation and foraminifera	450	6.0	2.033	1.631	25	690	345	Brittle

Date - samples received: 07/05/2018

Date - samples tested: 31/05/2018/

Checked by: KM Date: 11/06/2018

Approved Signatories: L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: Lab@conceptconsultants.co.uk

AGS ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS

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CONCEPT SITE INVESTIGATIONS

Summary Test Report - Undrained Triaxial Compression (Single-Stage)

BS 1377 : Part 7: 1990 Clause 8

Date Reported: 13/06/2018

Job No.: 18/3106

Site Location: 1 Triton Square - St Anne's

Client: British Land

BH No.	Sample Type	Sample No	Depth top (m)	Description	Cell pressure kN/m2	Strain at failure %	Bulk Density Mg/m3	Dry Density Mg/m3	NMC %	Max Dev. Stress kPa	Shear Strength kPa	Mode of failure/Comments
BH01	UT	74	25.50	Very stiff, brownish grey silty CLAY with occasional pockets of light brown fine sand, rare pyrite nodules at 26.68 (<10mm) and bioturbation	510	10.7	2.074	1.731	20	571	286	Britlle
BH01	UT	82	28.50	Very stiff, brownish grey slightly sandy silty CLAY with frequent pockets of grey fine sand and rare yellowish brown fine sand (<10mm) and foraminifera	510	4.6	2.068	1.653	25	552	276	Britlle

Date - samples received: 07/05/2018

Date - samples tested: 10/06/2018

Checked by: KM Date: 11/06/2018

Approved Signatories: L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)

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Tel: 02087401553
Email: Lab@conceptconsultants.co.uk

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CONCEPT SITE INVESTIGATIONS

Summary Test Report - Undrained Triaxial Compression (Single-Stage)

BS 1377 : Part 7: 1990 Clause 8

Date Reported: 13/06/2018

Job No.: 18/3106

Site Location: 1 Triton Square - St Anne's

Client: British Land

BH No.	Sample Type	Sample No	Depth top (m)	Description	Cell pressure kN/m2	Strain at failure %	Bulk Density Mg/m3	Dry Density Mg/m3	NMC %	Max Dev. Stress kPa	Shear Strength kPa	Mode of failure/Comments
BH02B	UT	28	8.20	Stiff, extremely closely fissured brownish grey CLAY with rare partings of yellowish brown fine sand between 8.56m and 8.63m, rare pockets of grey fine sand and yellowish brown fine sand and bioturbation	175	8.0	2.012	1.607	25	228	114	Brittle
BH02B	UT	35	11.00	Very stiff, extremely closely fissured brownish grey silty CLAY with one parting of yellowish brown fine sand, rare pockets of yellowish brown fine sand (<15mm) and rare bioturbation	220	5.5	2.024	1.620	25	341	171	Brittle
BH02B	UT	41	14.00	Very stiff, extremely closely to very closely fissured brownish grey CLAY with rare pockets of light brown fine sand (<25mm) and bioturbation	280	4.5	2.000	1.589	26	371	186	Brittle
BH02B	UT	48	17.00	Very stiff, extremely closely fissured brownish grey CLAY with rare bioturbation	340	5.2	1.968	1.544	27	464	232	Brittle
BH02B	UT	54	20.00	Very stiff, extremely closely fissured brownish grey slightly sandy silty CLAY with occasional pockets of grey fine sand (<10mm) and brownish grey fine sand (<15mm), rare bioturbation and foraminifera	400	3.3	2.026	1.623	25	324	162	Brittle
BH02B	UT	61	23.00	Very stiff, brownish grey slightly sandy silty CLAY with rare pockets of light grey fine sand (<5mm) and rare bioturbation	460	5.4	2.008	1.604	25	618	309	Brittle

Date - samples received: 03/05/2018

Date - samples tested: 04/06/2018

Checked by: KM Date: 11/06/2018

Approved Signatories: L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: Lab@conceptconsultants.co.uk

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CONCEPT SITE INVESTIGATIONS

Summary Test Report - Undrained Triaxial Compression (Single-Stage)

BS 1377 : Part 7: 1990 Clause 8

Date Reported: 13/06/2018

Job No.: 18/3106

Site Location: 1 Triton Square - St Anne's

Client: British Land

BH No.	Sample Type	Sample No	Depth top (m)	Description	Cell pressure kN/m2	Strain at failure %	Bulk Density Mg/m3	Dry Density Mg/m3	NMC %	Max Dev. Stress kPa	Shear Strength kPa	Mode of failure/Comments
BH02B	UT	67	26.00	Very stiff, extremely closely fissured brownish grey CLAY with rare pockets of grey fine sand (<15mm) and foraminifera	520	2.1	2.012	1.614	25	369	185	Brittle
BH02B	UT	74	29.50	Very stiff, brownish grey slightly sandy silty CLAY with frequent pockets of grey fine sand (<15mm), occasional foraminifera and rare bioturbation	590	7.9	2.093	1.737	21	727	364	Brittle

Date - samples received: 03/05/2018

Date - samples tested: 04/06/2018

Checked by: KM Date: 11/06/2018

Approved Signatories: L Griffin LG (Quality Manager) – K Mazerant KM (Lab Mngr)

CONCEPT
47-49 Brunel Road, London W3 7XR
Tel: 02087401553
Email: Lab@conceptconsultants.co.uk

AGS ASSOCIATION OF GEOTECHNICAL & GEOENVIRONMENTAL SPECIALISTS

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12. CHEMICAL LABORATORY TEST RESULTS

Evangelos Kafantaris
Concept Site Investigations
Unit 8
Warple Mews
Warple Way
London
W3 0RF

t: 02087401553

e: Concept Group

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

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

Analytical Report Number : 18-83584

Project / Site name:	St. Annes	**Samples received on:**	26/04/2018
Your job number:	18-3106	**Samples instructed on:**	26/04/2018
Your order number:	CL1397	**Analysis completed by:**	03/05/2018
Report Issue Number:	1	**Report issued on:**	03/05/2018
Samples Analysed:	2 soil samples		

Signed:

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

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

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

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

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

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

Analytical Report Number: 18-83584

Project / Site name: St. Annes
Your Order No: CL1397

Lab Sample Number				951073	951074			
Sample Reference				BH2B	TP01			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.40-0.45	0.60-0.70			
Date Sampled				25/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	9.0	11			
Total mass of sample received	kg	0.001	NONE	1.3	1.4			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile & Amosite	-			
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	-			
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	-			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.8	10.0			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	0.8			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	0.78			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.16			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.8			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	1.6			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	1.1			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.90			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	1.4			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.72			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	1.2			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.62			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.14			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.74			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80	11.2			
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.9	7.5			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	20			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.64	1.2			
Boron (water soluble)	mg/kg	0.2	MCERTS	2.6	3.0			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	31			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	130			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	580	1200			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.0			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	24			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	37	51			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	300	350			

Analytical Report Number: 18-83584

Project / Site name: St. Annes
Your Order No: CL1397

Lab Sample Number				951073	951074			
Sample Reference				BH2B	TP01			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.40-0.45	0.60-0.70			
Date Sampled				25/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.8			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	33			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	20			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	44			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	< 10	65			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	5.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	20			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	25	98			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	61			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	29	120			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	29	180			
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	< 0.001			
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	< 0.001			
Total PCBs	mg/kg	0.012	NONE	< 0.012	< 0.012			

Analytical Report Number: 18-83584
Project / Site name: St. Annes
Your Order No: CL1397

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
951073	BH2B	0.40-0.45	152	Loose Fibrous Debris	**Chrysotile & Amosite**	0.002	**0.002**

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

Analytical Report Number : 18-83584

Project / Site name: St. Annes

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
951073	BH2B	None Supplied	0.40-0.45	Brown sandy loam with gravel.
951074	TP01	None Supplied	0.60-0.70	Brown sandy loam with gravel and rubble.

Analytical Report Number : 18-83584

Project / Site name: St. Annes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
PCBs WHO 12 in soil	Determination of PCBs (WHO-12 Congeners) by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS

Analytical Report Number : 18-83584

Project / Site name: St. Annes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
TPH in (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method, TPH with carbon banding.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

Evangelos Kafantaris
Concept Site Investigations
Unit 8
Warple Mews
Warple Way
London
W3 0RF

t: 02087401553

e: Concept Group

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

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

Analytical Report Number : 18-83587

Project / Site name:	St. Annes	**Samples received on:**	26/04/2018
Your job number:	18-3106	**Samples instructed on:**	26/04/2018
Your order number:	CL1397	**Analysis completed by:**	03/05/2018
Report Issue Number:	1	**Report issued on:**	03/05/2018
Samples Analysed:	2 leachate samples		

Signed:

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

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

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

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

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

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Analytical Report Number: 18-83587

Project / Site name: St. Annes

Your Order No: CL1397

Lab Sample Number				951083	951084			
Sample Reference				BH2B	TP01			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.40-0.45	0.60-0.70			
Date Sampled				25/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
10:1 WAC Leachate								
Arsenic	mg/l	0.0011	ISO 17025	< 0.0011	0.0020			
Barium	mg/l	0.00005	ISO 17025	0.0427	0.0121			
Cadmium	mg/l	0.00008	ISO 17025	< 0.0001	< 0.0001			
Chromium	mg/l	0.0004	ISO 17025	0.032	0.0096			
Copper	mg/l	0.0007	ISO 17025	0.012	0.0040			
Mercury	mg/l	0.0005	ISO 17025	< 0.0005	< 0.0005			
Molybdenum	mg/l	0.0004	ISO 17025	0.0096	0.0102			
Nickel	mg/l	0.0003	ISO 17025	0.0007	< 0.0003			
Lead	mg/l	0.001	ISO 17025	0.011	< 0.0010			
Antimony	mg/l	0.0017	ISO 17025	0.010	< 0.0017			
Selenium	mg/l	0.004	ISO 17025	< 0.0040	< 0.0040			
Zinc	mg/l	0.0004	ISO 17025	0.0024	0.0015			
Chloride	mg/l	0.15	ISO 17025	4.1	4.9			
Fluoride	mg/l	0.05	ISO 17025	0.25	0.22			
Sulphate	mg/l	0.1	ISO 17025	520	150			
Total dissolved solids	mg/l	4	ISO 17025	510	240			
Total monohydric phenols	mg/l	0.01	ISO 17025	< 0.010	< 0.010			
Dissolved organic carbon	mg/l	0.1	NONE	4.88	5.16			
10:1 WAC Leachate								
Arsenic	mg/kg	0.011	NONE	< 0.0110	0.0151			
Barium	mg/kg	0.0005	NONE	0.360	0.0913			
Cadmium	mg/kg	0.0008	NONE	< 0.0008	< 0.0008			
Chromium	mg/kg	0.004	NONE	0.27	0.073			
Copper	mg/kg	0.007	NONE	0.10	0.030			
Mercury	mg/kg	0.005	NONE	< 0.0050	< 0.0050			
Molybdenum	mg/kg	0.004	NONE	0.0811	0.0769			
Nickel	mg/kg	0.003	NONE	0.0061	< 0.0030			
Lead	mg/kg	0.01	NONE	0.094	< 0.010			
Antimony	mg/kg	0.017	NONE	0.087	< 0.017			
Selenium	mg/kg	0.04	NONE	< 0.040	< 0.040			
Zinc	mg/kg	0.004	NONE	0.021	0.011			
Chloride	mg/kg	1.5	NONE	34	37			
Fluoride	mg/kg	0.5	NONE	2.1	1.6			
Sulphate	mg/kg	1	NONE	4300	1100			
Total dissolved solids	mg/kg	40	NONE	4300	1800			
Total monohydric phenols	mg/kg	0.1	NONE	< 0.10	< 0.10			
Dissolved organic carbon	mg/kg	1	NONE	41.1	39.0			

Analytical Report Number : 18-83587

Project / Site name: St. Annes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	ISO 17025

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For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
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Evangelos Kafantaris
Concept Site Investigations
Unit 8
Warple Mews
Warple Way
London
W3 0RF

t: 02087401553

e: Concept Group

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

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

Analytical Report Number : 18-84041

Project / Site name:	St Annes	**Samples received on:**	01/05/2018
Your job number:	18-3106	**Samples instructed on:**	02/05/2018
Your order number:	CL1403	**Analysis completed by:**	09/05/2018
Report Issue Number:	1	**Report issued on:**	09/05/2018
Samples Analysed:	7 soil samples		

Signed:

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

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

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

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

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Analytical Report Number: 18-84041

Project / Site name: St Annes
Your Order No: CL1403

Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	21	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	13	6.5	9.5	12
Total mass of sample received	kg	0.001	NONE	1.1	1.6	1.4	1.2	1.3
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	0.002	-	-	-	< 0.001
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	11.7	9.1	11.1	8.5	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Organic Carbon (TOC)	%	0.1	MCERTS	0.3	0.5	0.8	0.8	1.8
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Phenanthrene	mg/kg	0.05	MCERTS	0.21	0.36	1.4	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.25	-	-
Fluoranthene	mg/kg	0.05	MCERTS	0.37	0.82	3.5	-	-
Pyrene	mg/kg	0.05	MCERTS	0.28	0.69	2.8	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	-	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	-	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.64	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.2	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.61	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.70	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	0.86	1.87	15.1	-	-

Analytical Report Number: 18-84041

Project / Site name: St Annes
Your Order No: CL1403

Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	1.7	2.7	4.1	2.7
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	30	14	14	26	15
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.53	0.97	0.76	0.74	0.77
Boron (water soluble)	mg/kg	0.2	MCERTS	1.0	0.9	1.7	1.0	1.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	< 0.2	0.4
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	21	24	22	22	23
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	34	38	66	44
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	110	400	850	280
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.5	0.6	5.3	0.5
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	25	15	14	19
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.2	2.3	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	39	38	34	41
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	160	63	120	130	160
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Analytical Report Number: 18-84041

Project / Site name: St Annes
Your Order No: CL1403

Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.3	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	3.2	< 2.0	5.9	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	19	41	9.1	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	72	110	44	19	22
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	9.9	< 8.4	24	< 8.4	< 8.4
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	95	150	61	26	25
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	100	150	85	26	25
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	4.5
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	16	16	20	19	16
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	53	55	60	46	49
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	11	12	31	8.9	26
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	70	73	80	66	71
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	81	85	110	75	97

Analytical Report Number: 18-84041

Project / Site name: St Annes
Your Order No: CL1403

Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
VOCs								
Chloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chloroethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Bromomethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Vinyl Chloride	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Trichlorofluoromethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1-Dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
2,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-Dichloropropene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tetrachloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dichloropropane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Trichloroethene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Dibromomethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromodichloromethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-Dichloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Dibromochloromethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Tetrachloroethene	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
1,2-Dibromoethane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
Chlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Styrene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tribromomethane	µg/kg	1	NONE	-	-	-	< 1.0	< 1.0
o-Xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Isopropylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Bromobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
n-Propylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
2-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
4-Chlorotoluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
tert-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
sec-Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,3-Dichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
p-Isopropyltoluene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,4-Dichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Butylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Hexachlorobutadiene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,2,3-Trichlorobenzene	µg/kg	1	ISO 17025	-	-	-	< 1.0	< 1.0

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Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.05	MCERTS	-	-	-	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	-	-	-	0.19	< 0.05
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Fluorene	mg/kg	0.05	MCERTS	-	-	-	0.14	< 0.05
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.05	MCERTS	-	-	-	2.7	0.93
Anthracene	mg/kg	0.05	MCERTS	-	-	-	0.28	0.22
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.05	MCERTS	-	-	-	4.1	2.3
Pyrene	mg/kg	0.05	MCERTS	-	-	-	3.0	1.9
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.05	MCERTS	-	-	-	1.8	1.4
Chrysene	mg/kg	0.05	MCERTS	-	-	-	1.4	1.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	1.8	1.8
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	-	-	-	0.80	0.82
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	1.3	1.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	-	-	-	0.63	0.83
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	-	-	-	0.18	0.23
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	-	0.70	0.95

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Lab Sample Number				953445	953446	953447	953448	953449
Sample Reference				BH2B	BH2B	HP01	HP02	HP03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.00	4.90-5.00	0.7-0.80	0.20-0.30	0.20-0.30
Date Sampled				27/04/2018	27/04/2018	26/04/2018	26/04/2018	26/04/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
PCBs								
PCB Congener 077	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 081	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 105	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 114	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 118	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 123	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 126	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 156	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 157	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 167	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 169	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
PCB Congener 189	mg/kg	0.001	NONE	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Total PCBs	mg/kg	0.012	NONE	< 0.012	< 0.012	< 0.012	< 0.012	< 0.012

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Lab Sample Number				953450	953451			
Sample Reference				HP03	HP04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00-1.10	0.70-0.80			
Date Sampled				26/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	5.3	11			
Total mass of sample received	kg	0.001	NONE	1.4	1.4			
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Amosite			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.001			
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.001			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	8.1	9.3			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Organic Carbon (TOC)	%	0.1	MCERTS	1.0	0.8			
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	1.8	0.27			
Anthracene	mg/kg	0.05	MCERTS	0.32	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	3.3	0.54			
Pyrene	mg/kg	0.05	MCERTS	2.6	0.48			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.5	0.30			
Chrysene	mg/kg	0.05	MCERTS	1.2	0.27			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.8	0.36			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.77	0.22			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.3	0.30			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.85	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.99	< 0.05			
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	16.4	2.74			

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Lab Sample Number				953450	953451			
Sample Reference				HP03	HP04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00-1.10	0.70-0.80			
Date Sampled				26/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	2.5	4.0			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	13			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.65	0.48			
Boron (water soluble)	mg/kg	0.2	MCERTS	0.8	0.8			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	1.0			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	20	19			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	42	42			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	320	400			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	0.9			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	18	15			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.6	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	31			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	230			

Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0			

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Project / Site name: St Annes
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Lab Sample Number				953450	953451			
Sample Reference				HP03	HP04			
Sample Number				None Supplied	None Supplied			
Depth (m)				1.00-1.10	0.70-0.80			
Date Sampled				26/04/2018	26/04/2018			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.8			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	10			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	9.0	34			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	36	75			
TPH-CWG - Aliphatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	28			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	45	120			
TPH-CWG - Aliphatic (EC5 - EC44)	mg/kg	10	NONE	45	150			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	3.6			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	11	15			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	36	34			
TPH-CWG - Aromatic > EC35 - EC44	mg/kg	8.4	NONE	< 8.4	< 8.4			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	47	53			
TPH-CWG - Aromatic (EC5 - EC44)	mg/kg	10	NONE	47	53			