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ENERGY AND CLIMATE CHANGE ENVIRONMENT AND SUSTAINABILITY INFRASTRUCTURE AND UTILITIES LAND AND PROPERTY MINING, QUARRYING AND MINERAL ESTATES WASTE RESOURCE MANAGEMENT



KEYLAND DEVELOPMENTS LTD

FORMER NORTH BIERLEY WWTW

PHASE II GEO-ENVIRONMENTAL ASSESSMENT

NOVEMBER 2017



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KEYLAND DEVELOPMENTS LTD

FORMER NORTH BIERLEY WWTW PHASE II GEO-ENVIRONMENTAL ASSESSMENT

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ENERGY AND CLIMATE CHANGE ENVIRONMENT AND SUSTAINABILITY INFRASTRUCTURE AND UTILITIES LAND AND PROPERTY MINING AND MINERAL PROCESSING MINERAL ESTATES AND QUARRYING WASTE RESOURCE MANAGEMENT



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DRAWINGS

| Drawing No | Title | Scale |
|-------------|-------------------------------|----------|
| SH10534-001 | Site Location Plan | 1:50,000 |
| SH10534-008 | Site Investigation Plan | 1:2,500 |
| SH10534-009 | Revised Conceptual Site Model | NTS |



1 INTRODUCTION

1.1 Instruction

1.1.1 This report is prepared in accordance with instruction from Mr M Naylor of KeyLand Developments Ltd dated 13 May 2015 and in accordance with our standard terms and conditions as attached at Appendix I. This follows a proposal dated 12 May 2015 by Wardell Armstrong LLP.

1.2 Site Location

1.2.1 The site is North Bierley WWTW, and is located as shown on the site location plan, Drawing No. SH10534-001 (1:50,000 scale), and more detailed site plan SH10534-008 (1:2,500 scale). The site is located approximately 6km south of Bradford city centre, adjacent to the junction of the M606 and M62 motorways and comprises approximately 22ha of a disused wastewater treatment works and fields. The site is bounded by the M606 motorway to the west, Hunsworth Beck to the east, the M62 motorway to the south and fields to the north.

1.3 Purpose and Basis of Report

1.3.1 The purpose of this report is to present the findings of an intrusive site investigation that was carried out to further identify and examine the potential contamination issues identified in a previous environmental assessment, carried out by URS Corporation Ltd (report ref. 44320048, November 2006), that may arise in connection with present use or proposed use of the site and to determine geotechnical information of relevance to the proposed use of the site.

1.4 Proposed Site Use

1.4.1 It is proposed that the site is redeveloped for mixed residential and commercial land uses.



2 PREVIOUS INVESTIGATIONS

2.1 Introduction

- 2.1.1 A Phase I Environmental Site Assessment was carried out by URS Corporation Ltd in November 2006 (report ref. 44320048). At the time of the report the site was an operational WWTW. Historical plans show that a sewage works was present on part of the site in 1893. The Valley Pit Coal and Ironstone workings were also present in the west of the site at this time along with an Old Coal pit in the south. A tramway is reported extending across the western part of the site. By 1908 the pits were reported to be closed and the sewage works had expanded. Subsequent maps show further expansion and changes to the layout up until 2004.
- 2.1.2 The site is situated on Lower Coal Measures which are considered a minor aquifer. Alluvium drift deposits are indicated as likely to be present along the eastern boundary associated with the Hunsworth Beck. It is also likely that made ground of an unknown nature and thickness will be present on the site associated with the collieries and former layouts.
- 2.1.3 The Hunsworth Beck is located adjacent to the eastern site boundary. This was given a quality grading of Grade E (poor) in 2000. The report indicates that eastern parts of the site lie within an area at risk of extreme flooding (Flood Zone 3).
- 2.1.4 The conceptual model identifies sources of contamination from former on-site operations (contamination resulting from settlement tanks, sludge beds, organic matter, fuels), nearby off-site operations (chemical works, rope works, cotton mill, mills, garages, coal pits etc) and made ground.

2.2 Preliminary Conceptual Site Model

2.2.1 A preliminary conceptual site model was presented in the Phase I Environmental Site Assessment. The conceptual model identifies sources of contamination from former on-site operations (contamination resulting from settlement tanks, sludge beds, organic matter, fuels), nearby off-site operations (chemical works, rope works, cotton mill, mills, garages, coal pits etc) and made ground.



- 2.2.2 The report concludes that there are likely to be pollutant linkages present at the site. However the report allocates a low to moderate risk of significant harm based on a continued land use. The report indicates that should the use of the site change a higher risk may be applicable.
- 2.2.3 The updated conceptual model is in Section 9.



3 GEOLOGICAL AND HYDROGEOLOGICAL SETTING

3.1 Geology

3.1.1 The assessment of the geology of the site is based on the published geological mapping sheet (Sheets Yorkshire 231NE and 232NW (Solid and Drift Editions), 1:10,560 scale) supplemented by the geological memoir, topographical plans and site visit. A typical summary section is provided in Table I below along with other geological data.

| TABLE I – Geological Summary | | | |
|------------------------------|--|--|--|
| Strata Description | | | |
| Made ground. | Made ground of an unknown nature and thickness associated with past site uses is likely to be present | | |
| Natural superficials. | across the site. An unknown thickness of alluvium may be present to the east of the site adjacent to Hunsworth Beck. | | |
| Solid strata. | Sandstones, mudstones and shales of the Lower Coal Measures. | | |
| Dip and dip direction. | Sub-horizontal. | | |
| Evidence of faulting. | Two faults trending NE-SW are located to the north of the site; the north is the downthrow side. | | |

3.2 Hydrogeology

- 3.2.1 Hydrogeological information from the Environment Agency changed in April 2010 in order to comply with the Water Framework Directive. Where possible, this report considers both the old and new information obtained from:
 - Groundwater Protection Policy and Groundwater Vulnerability maps published by the Environment Agency;
 - Hydrogeological maps published by the British Geological Survey; and
 - Groundwater Protection: Policy and Practice (Environment Agency, 2006).
- 3.2.2 This information indicates the site to be underlain by sandstones, mudstones and shales of the Lower Coal Measures which are classified as a Secondary A Aquifer.



- 3.2.3 Secondary A aquifers are generally fractured or potentially fractured formations and do not have a high primary permeability. Although not producing large quantities of water for abstraction, they are important for local supplies and may supply base flow to rivers.
- 3.2.4 The site does not lie within a source protection zone.

3.3 Hydrology

Surface Water Features

3.3.1 The nearest graded surface watercourse is Hunsworth Beck, which forms the eastern boundary of the site. The Environment Agency has given Hunsworth Beck a General Quality Assessment (Chemistry) rating of E (Poor).

Flooding

3.3.2 The Environment Agency maintains national flood maps based on ground levels, predicted flood levels, information on flood defences and local knowledge. The flood maps show the predicted likelihood of flooding in an area in the context of current and also the proposed land use considered in development planning.

Flooding – Existing Use

- 3.3.3 For existing land use purposes, the likelihood of flooding is classed as very low, low, medium or high based on the Environment Agency map entitled Risk of Flooding from Rivers and Sea. Where applicable, these flood risk categories take into account the effect of any flood defences that may be in the area.
- 3.3.4 The majority of the site is within a very Low risk area. The chance of flooding each year is less than 1 in 1,000 (0.1%).
- 3.3.5 An area to the east of the site towards the Hunsworth Beck is within a Low risk area where the chance of flooding is between 1 in 1000 (0.1%) and 1 in 100 (1%) and is within a Medium risk area where the chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%).

Flooding – Planning Purposes

3.3.6 For planning purposes, the likelihood of flooding is classed as low, medium or high based on flood zones identified in National Planning Policy Guidance (2014) attached to the National Planning Policy Framework (2012) and the EA map



entitled Flood Map for Planning (Rivers and Sea). The Flood Map for Planning would only apply if the site was intended for redevelopment.

- 3.3.7 The majority of the site is within Zone 1 and has a low probability of flooding. The chance of flooding each year is less than 0.1% (1 in 1,000).
- 3.3.8 An area to the east of the site towards the Hunsworth Beck is within Zone 2 and has a moderate probability of flooding. The chance of flooding each year is between 1.0% (1 in 100) and 0.1% (1 in 1,000).
- 3.3.9 A thin strip along the Hunsworth Beck is within Zone 3 and has a high probability of flooding. The chance of flooding each year is 1.0% (1 in 100) or greater.

3.4 Mining

General

3.4.1 Research of the mining setting is based on examination of the published topographical and geological information as described in Section 2 and 4 of this report along with other mining archive information. A Coal Authority report for the site has been obtained, dated 23 November 2010 and is attached at Appendix II, a visit was also made to the Coal Authority abandoned mine records office at Mansfield on 25 November 2010.

Surface Workings

3.4.2 Research of topographical, geological and other archive mining records has indicated no evidence of surface workings within the vicinity of the site..

Shallow Underground Workings

3.4.3 From the enquiries made and examination of the geological information there is evidence of shallow underground mining activity beneath the site. Reference to the abandonment plans indicate that these shallow workings are likely to be in the Shertcliffe Bed.

Potential Surface Instability

3.4.4 Most of the ancient and frequently unrecorded mining activity of the nineteenth and earlier centuries was carried out by the room and pillar system. The problems of potential surface instability over such old mine workings arises when the process of upward collapse under gravity penetrates through the solid strata,



either to the surface sub-soil, to superficial deposits and/or tipped material above.

- 3.4.5 The height above the working to which the collapse process can take place before total choke-filling occurs, is generally governed by the volume of the original tunnel or roadway, and by the change in volume of the collapsed material. The greater the volume of the tunnel or void (ie, the greater its height and width), or the smaller the change in volume of the collapsed material, the higher the process of collapse is likely to take place. The change in volume of the collapsed materials may be as little as 10% and as much as 50%. Therefore, the ultimate height of collapse through solid strata is not likely to be less than twice or more than ten times the thickness of the seam mined.
- 3.4.6 The above leads directly to a definition of "shallow" old mine workings and to the delineation of problem areas. Research of existing records, an appreciation of the caving or collapse, and the characteristics of the solid strata overlying such old workings, allows the evaluation of problems and appropriate action.

Deep Mining

- 3.4.7 The Coal Authority report indicates evidence of deep underground mining activity beneath the site in the Blocking and Better Bed Coal seams.
- 3.4.8 Deep mining is generally defined as that mining undertaken at depths greater than about 30m below rockhead.
- 3.4.9 Whilst ground movements would have occurred due to the mining of any deeper seams, surface subsidence effects should have been largely contemporaneous with the mining. The site is considered stable in respect of any past deep mining.
- 3.4.10 There are no current mining activities affecting the site and the site does not lie within influencing distance of any presently known planned future workings.

Mine Entries

3.4.11 The Coal Authority report has indicated that there are ten recorded mine entries on or within influencing distance of the site. Only one of the mine entries is noted to have had any treatment; entry 417427-005 (to the north west of the site) was treated on behalf of the Coal Authority with mass concrete following its collapse in 1997.



Mine Shafts

- 3.4.12 In old abandoned mining areas, it was common practice to backfill the abandoned shafts either completely or, to a staging built at some level above the shaft bottom with loose colliery refuse. In many cases such old mine shafts have subsequently been covered over and have become overgrown and visually indistinguishable. Where no special plugging precautions were taken to seal off the shaft fill material from old workings or, where a shaft was filled on to staging in the shaft, the fill material can run into the old workings or into the empty shaft space beneath the staging. In both cases, the result is the sudden appearance of a collapse hole in the ground the diameter of which may be considerably greater than that of the original shaft.
- 3.4.13 In addition to the recorded mine entries at or near the site, the possibility of there being additional unrecorded mine entries cannot be entirely discounted. During development a careful watch should be maintained for any feature which may represent an unrecorded mine entry, such as circular brickwork or anomalous areas of fill/timber. Should any such feature be identified it should be reported, investigated and acted upon as necessary.

Coal Mine Gas

3.4.14 Examination of the mining and geological information indicates that it is possible that gases migrating from now abandoned coal mine workings may affect the site.



4 SITE INVESTIGATION

4.1 Introduction

- 4.1.1 The current investigation was designed around the preliminary conceptual site model that identified all potential sources, pathways and receptors. This allowed a targeted sampling approach to be undertaken and provide general coverage of the site. Results of the investigation are used to revise the conceptual site model, establish whether linkages identified are plausible and establish the level of risk associated with the site.
- 4.1.2 The site investigation was also carried out to assess the geotechnical nature of the ground. The site investigation comprised of seven cable percussion boreholes, three of which had rotary follow-on, ten window sample boreholes and nineteen trial pits across the site area. Locations were positioned to provide complete coverage of the whole site. Site investigation locations are shown on Drawing SH10534-008 (1:2,500 scale).
- 4.1.3 The investigation including sampling techniques was carried out in accordance with BS10175:2001 Investigation of potentially contaminated sites – code of practice.

4.2 Scope

4.2.1 The investigation was designed as a series of tasks that are summarised below in Table II.

| TABLE II – Summary of Tasks | | | |
|-----------------------------|--|-----------------------|--|
| Task Summary Date(s | | | |
| Preparatory | Setting up site investigation contract, including services | November | |
| Work | enquiries, contractor health & safety document and site | 2010- May | |
| | meeting with contractor/client. | 2011 | |
| Intrusive site | 7 Cable percussion boreholes to a nominal depth of 10m | 16 th May- | |
| investigation | with rotary open-hole follow-on in 3 boreholes to 30mbgl. | 20 th May | |
| | 10 window sample boreholes to a nominal depth of 5m and | 2011 | |
| | 19 trial pits to a nominal depth of 4m. Installation of | | |
| | monitoring wells for groundwater and gas. | | |



| TABLE II – Summary of Tasks | | | |
|-----------------------------|--|------------------------|--|
| Task | Task Summary | | |
| Laboratory | Chemical / geotechnical testing in accredited laboratory – | 20 th May – | |
| analysis | 34 soil and 5 groundwater samples. 24 th June | | |
| | | 2011 | |
| Monitoring | Gas and water level monitoring. | 19 th May | |
| | | 2011- 17 th | |
| | | May 2012 | |

4.2.2 The investigation was completed in accordance with Construction (Design and Management) (CDM) Regulations 2007 and a site specific Health & Safety plan. Contractors used during this project include; JB Site Investigations (cable percussion and rotary drillers), Exploration Ltd (window sample borehole drillers), Pudsey Plant Hire (trial pits), ALcontrol Laboratories (geochemical analysis) and Professional Soils Laboratory (geotechnical analysis). Drilling was completed using a variety of methods and these are discussed in more detail below.

4.3 Cable Percussion Boreholes

- 4.3.1 Cable percussion drilling was completed under the part-time supervision of a Wardell Armstrong engineer. Seven cable percussion boreholes (BH1-BH7) were drilled to a maximum depth of 10.7m below ground level (bgl). Locations (see Drawing No. SH10534-008) were positioned provide widespread coverage of the site.
- 4.3.2 Cable percussion borehole logs are attached at Appendix III.

4.4 Rotary Open-Hole Boreholes

- 4.4.1 Rotary open-hole drilling was completed under the part-time supervision of a Wardell Armstrong engineer. Three rotary open-hole boreholes (BH4-BH6) were drilled from the base of the cable percussion boreholes to depths of either 16.7m bgl (BH6) or 30m bgl (BH4 and BH5). Locations (see Drawing No. SH10534-008) were positioned to the south of the site in the area of suspected shallow mine workings.
- 4.4.2 Rotary open-hole drilling borehole logs are attached at Appendix III.



4.5 Window Sample Boreholes

- 4.5.1 Window sample boreholes were completed under the full-time supervision of a Wardell Armstrong engineer. Ten window sample boreholes (WS101-WS110) were drilled to depths of between 2m bgl and 5m bgl. Drilling beyond these depths was not possible due to shallow rockhead or underground obstructions. Locations (see Drawing No. SH10534-008) were positioned to provide widespread coverage of the site.
- 4.5.2 Window sample borehole logs are attached at Appendix IV.

4.6 Trial Pit Excavations

- 4.6.1 Trial pit excavations were completed under the full-time supervision of a Wardell Armstrong engineer. Nineteen trial pits (TP101-TP119) were excavated to depths of between 1.4m and 3.6m bgl using a JCB 3CX Sitemaster hydraulic excavator. Excavations beyond these depths were not possible due to difficult excavation conditions brought about by stiff clay and/or boulders or to carry out soakaway tests. Locations (see Drawing No. SH10534-008) were positioned to provide widespread coverage of the site.
- 4.6.2 Trial pit logs are included at Appendix V.

4.7 Ground Gas and Groundwater Monitoring Standpipes

- 4.7.1 Nine gas and groundwater monitoring standpipes were installed by the cable percussion, rotary open-hole or window sampling drilling contractor at locations BH1, BH5, BH6, BH7, WS102, WS104, WS105, WS107 and WS110.
- 4.7.2 The standpipes were completed with 50mm diameter screen and casing between 4m and 10m bgl, with the screened section extended from the base to 1.00m bgl in boreholes BH1, BH7, WS102, WS104, WS105, WS107 and WS110 and from 9m to 1m bgl in boreholes BH5 and BH6 as 1m of plain standpipe was installed from the base to 9m bgl in these boreholes to provide a sump for groundwater monitoring purposes. A filter pack of 4-6mm washed gravel was placed in each well annulus to just above the screened section. Thereafter the annulus was sealed to the surface with bentonite. Installations were completed with concreted headworks to protect the inner casing and gas valves. All installations were supervised by a Wardell Armstrong engineer on a part-time basis.



- 4.7.3 After installation, all water-monitoring wells were developed using a submersible pump or bailer. Development was continued to until the pH, temperature and electrical conductivity of the purged water had stabilised (i.e. until any two successive reading are within 10% of each other), the water in the wells was visibly clean or until five well volumes of water had been removed.
- 4.7.4 Newly installed monitoring boreholes were left for 24 hours to allow gas levels to equilibrate. Data for methane, carbon dioxide, oxygen and flow rate was collected using a portable infrared gas analyser. Atmospheric pressure was recorded at the time of monitoring. Soil gases were analysed and assessed following guidance from:
 - NHBC Report No. 4, Guidance on evaluation of development proposals on sites where methane and carbon dioxide are present (March, 2007);
 - BS 8485, Code of practice for the characterization and remediation of ground gas in brownfield developments (October 2007); and
 - CIRIA C665, Assessing Risks Posed by Hazardous Ground Gases to Buildings (2007).

4.8 Sampling and Testing

Sampling and Chemical Analysis of Soils

- 4.8.1 Thirty four disturbed samples of material from beneath the site were collected for laboratory analysis. Samples were taken at regular depths, changes in strata and any discrete horizons with a high potential to retain contaminants and logged in general accordance with BS ISO 14688:2002 and BS ISO 10381:2002. Samples were obtained using a fresh pair of nitrile gloves.
- 4.8.2 Samples scheduled for analysis of organic contaminants were placed in amber bottles with a minimum of headspace. The bottles were immediately sealed with polytetrafluoroethylene (PTFE) lined caps and labelled. The remaining small disturbed samples were placed in polypropylene tubs with a minimum of headspace, sealed with airtight polypropylene 'snap-on' lids and labelled. The labels detailed individual sample number, location, depth and sampler identity.
- 4.8.3 Collected samples were stored away from sunlight in temperature controlled conditions and transported by courier to ALcontrol Laboratories. Chain of custody forms were completed for all samples sent to the laboratory. The forms



detailed individual bottle identification number and sample location. The forms were signed on release by the Wardell Armstrong field engineer and upon receipt by the laboratory.

4.8.4 The laboratory analyses scheduled were selected to establish the type, level and distribution of the possible harmful contaminants that may be present on the site given its past and current uses. In order to provide cost effective analysis, solid samples were analysed for a number of substances depending on depth, matrix and a visual assessment of ground conditions. The analysis scheduled is presented in Table III.

| TABLE III – Summary of Sample Analysis | | | |
|--|---------------------|-------------------------------|----------------------------|
| Substance | No. Soil Samples | No. Groundwater Samples | No. Leachate Samples |
| A standard suite of industrial pollutants including common metals (arsenic, water-soluble boron, cadmium, chromium, chromium ^{VI} , copper, lead, mercury, nickel, selenium, and zinc), pH, sulphate, sulphide, sulphur, thiocyanate, total cyanide and phenols. | 30 | 4 | 6 |
| Petroleum hydrocarbons ($C_5 - C_{40}$ with aliphatic/aromatic class separation and carbon banding), BTEX, MTBE. | 10 | 5 | 3 |
| Polycyclic Aromatic Hydrocarbons (PAH). | 12 | 4 | 6 |
| Volatile Organic Compounds (VOCs). | 10 | 4 | - |
| Semi-Volatile Organic Compounds (SVOCs). | 18 | 5 | - |
| Poly-chlorinated Biphenyl (PCBs). | 4 | - | - |
| Soluble Sulphate (2:1). | 23 | - | - |
| Total Organic Carbon (TOC). | 12 | - | - |
| Asbestos. | 13 | - | - |
| Hardness. | - | 4 | - |

4.8.5 The results of the chemical analyses are attached at Appendix VI.

Sampling and Chemical Analysis of Groundwater

4.8.6 Five groundwater samples were collected for laboratory analysis from groundwater monitoring installations using procedures that ensured the collection and preservation of sample quality.



- 4.8.7 Prior to sampling, each well was purged until three well volumes of water had been removed or the well became dry.
- 4.8.8 All water samples were taken using disposable bailers or disposable peristaltic pump tubing, to avoid cross-contamination, with a bottom pour tap, to minimise the loss of more volatile components. Samples were placed in laboratory prepared amber bottles with a minimum of headspace. The bottles were immediately sealed with polytetrafluoroethylene (PTFE) lined caps and labelled. The labels detailed individual sample number, location, depth and sampler identity. The analysis scheduled is presented in Table III.
- 4.8.9 The results of the chemical analyses are attached at Appendix V.

4.9 Quality Assurance and Quality Control

4.9.1 The soil and groundwater samples were collected, transferred to the laboratory under chain of custody and analysed to ensure traceability and reliability of analytical results. Based on the laboratory QA data the analytical results are considered acceptable for interpretative use.

4.10 Limitations of Site Investigation

4.10.1 It should be noted that the interpretation of the results of the physical site investigation is based on a limited number of investigation points. The locations and numbers of the investigation locations were governed by the physical state of the site and the location of known services at the time of the investigation. Although reasonable inferences have been made during the interpretation, it is possible that variances in the thickness, distribution and physical/chemical characteristics of the strata present will exist.



5 RESULTS OF SITE INVESTIGATION

5.1 Ground Conditions

Made Ground

- 5.1.1 Made Ground was present in the majority of borehole, window sample and trial pit locations on site; exceptions to this were borehole locations BH1 and BH3, window sample location WS110, and trial pit locations TP108, TP112, TP113, TP114 and TP116. The made ground on site comprised four horizons and varied in thickness from 0.15m in trial pit TP115 to 8.3m in borehole BH6.
- 5.1.2 The first horizon of made ground was a soft to firm, orange to black, locally cobbly, sandy, gravelly clay. The second horizon of made ground consisted of a loose to dense, grey or brown, locally clayey or cobbly, sandy gravel or gravelly sand. The gravel fraction in these two horizons consisted of a number of constituents including sandstone, mudstone, shale, coal fragments, brick, typical aggregate, concrete, tarmac and wood fragments. The third horizon of made ground consisted of a loose to medium dense, grey to black, locally slightly clayey, sandy gravel of shale. The fourth horizon consisted of a loose, black, locally slightly clayey, sandy gravel of sandstone, mudstone, shale, coal fragments, brick, typical aggregate, concrete, tarmac and ash. This horizon consisted in this horizon consisted of sandstone, mudstone, shale, coal fragments, brick, typical aggregate, concrete, tarmac and ash. This horizon was observed in window sample borehole WS108 and trial pits TP110, TP111 and TP115. Ash was also observed in the made ground in borehole BH7 and trial pit TP105.
- 5.1.3 The thickness of the made ground was unproven in window sample borehole WS109 due to drilling refusals caused by obstructions and in trial pits TP101, TP102, TP103, TP106 and TP107 due to the extent of the made ground and limitations of the excavator.

Natural Strata

5.1.4 The natural materials encountered during the intrusive investigation comprised a 3.5m thickness of predominantly soft to stiff, orange-brown mottled grey, locally cobbly with rare boulders, sandy, gravelly clay. The gravel fraction consisted of angular to subrounded, fine to medium grained sandstone, shale, mudstone and coal fragments. Cobbles and boulders were typically subangular to subrounded, fine to medium grained sandstone.



- 5.1.5 Rockhead was encountered at all borehole locations and at window sample borehole locations WS102 and WS105 during the intrusive investigation and consisted of sandstone and mudstone. The rock was proven to 30m bgl by rotary open-hole drilling. All natural strata were interpreted as the weathering profile of the underlying Middle Coal Measures geology.
- 5.1.6 A summary of the strata beneath the site is shown in Table IV.

| | Table IV – Summary of strata beneath the site | | | |
|-----------------------------------|---|-------------------|---------------------|------------------|
| Depth to base of strata (mbgl) | | Mean Thickness | Typical Description | |
| Max. | Min. | Mean | (m) | |
| 0.5 | 0.1 | 0.21 | 0.21 | Topsoil |
| 8.4* | 0.4* | 2.55* | 2.42* | Made Ground |
| 1.4* | 10.5* | 7.27* | 3.47* | Natural Material |
| * | * | * | * | Rockhead |
| * Base of | * Base of strata not always proven. | | | |

5.2 Groundwater

- 5.2.1 Groundwater was encountered during the intrusive investigation works in boreholes BH5 and BH6 and in window sample boreholes WS102, WS105 and WS110. During development and purging the water was initially cloudy but became increasingly clear until visibly clean with the increasing volume removed. Recharge was observed to be moderate in all monitoring wells. No visual or olfactory evidence of contamination was observed in the water extracted from the wells.
- 5.2.2 Water levels were measured on six occasions using a product/water interface probe. No free phase product was detected. Water elevations measured relative to a site datum (ground level) are shown in Table V.



| Table V | | | | | | | | |
|----------------|---------------------------------|--------|---------|--------|---------|---------|--|--|
| Borehole | Date and Depth to Water (m bgl) | | | | | | | |
| Identification | 19/5/11 | 1/6/11 | 22/7/11 | 3/4/12 | 20/4/12 | 17/5/12 | | |
| BH1 | DRY | DRY | DRY | DRY | DRY | DRY | | |
| BH5 | - | 8.42 | 8.94 | 7.73 | 7.49 | 7.41 | | |
| BH6 | - | 9.56 | 9.60 | 9.07 | 8.50 | 8.70 | | |
| BH7 | - | DRY | DRY | DRY | 5.13 | 5.37 | | |
| WS102 | 4.58 | 4.90 | 4.80 | DRY | 2.04 | DRY | | |
| WS104 | DRY | DRY | DRY | DRY | DRY | DRY | | |
| WS105 | 2.17 | 2.24 | 2.10 | 1.61 | DRY | 1.481 | | |
| WS107 | DRY | DRY | DRY | DRY | 3.50 | DRY | | |
| WS110 | 3.01 | 4.50 | 3.21 | - | - | - | | |

5.2.3 Analysis of the reduced groundwater levels is inconclusive and it is assumed that the overall groundwater flow is to the south east.

5.3 Soakaway Tests

- 5.3.1 Five soakaway tests were carried out on site in trial pits TP101 and TP103 (to the east of the site), TP105 (to the south of the site), TP108 (to the north of the site) and TP113 (to the west of the site). The results indicate that soil in the vicinity of:
 - TP101 has an approximate infiltration rate of 2.708 x 10⁻⁴m/s; and
 - TP103 has an approximate infiltration rate of 2.197×10^{-4} m/s.
- 5.3.2 However, no infiltration was observed in the soakaway tests in trial pits TP105, TP108 and TP113.
- 5.3.3 These infiltration rates indicate that the made ground beneath the former wastewater treatment works area of the site is likely to be suitable for the construction of soakaways but the natural materials observed to the west and north of the site are not suitable for the construction of soakaways.
- 5.3.4 The results of the soakaway tests are attached at Appendix IX.



5.4 Ground Gas

- 5.4.1 There are several regulatory authorities that require the assessment of ground gas on potentially contaminated sites. The main stakeholders are Building Control, Local Authority Planning and Environmental Health (Contaminated Land Officers). CIRIA have published guidance (C665, 2007) on risk assessment for new buildings and existing structures on ground with potentially hazardous gassing regimes. This guidance indicates that a semi-quantitative risk assessment for ground gas can be completed using Gas Screening Values (GSV) and consideration of the conceptual site model.
- 5.4.2 Six gas monitoring rounds were completed over a 12 month period. Three sets of readings were recorded at low and falling atmospheric pressure. Gas monitoring results are attached at Appendix X.

5.5 Observations of contamination

- 5.5.1 Observations of soil contamination noted during the site investigation are presented on the borehole, window sample borehole and trial pit logs (Appendices III, IV and V). These can be summarised as follows:
 - Ash was observed in made ground in borehole BH7, window sample borehole WS108 and trial pits TP105, TP110, TP111 and TP115 at ground level to depths of up to 4.3mbgl.

5.6 Shallow mining

- 5.6.1 No intact coal seams were encountered during the rotary drilling in the south of the site. However, there was evidence of broken/soft ground accompanied by loss of flush in BH6 which may indicate the presence of workings. The broken ground was observed at depths of between 11.3m and 16.7m bgl. The borehole collapsed at 16.7m bgl and drilling was terminated at that depth.
- 5.6.2 Boreholes BH4 and BH5 were drilled to a depth of 30m bgl with no evidence of shallow mining.



6 GUIDANCE ON CONTAMINATION RISK ASSESSMENT

6.1 Introduction

- 6.1.1 The following section aims to assess the magnitude and significance of potential risks to human health, surface water, groundwater, ecosystems and buildings from contaminated soil and groundwater. The assessment provides information that is fit for purpose given the regulatory context and completed in accordance with UK best practice. A summary of the risk assessment process is presented below. More detailed information on risk assessments is contained in various reports published by the Environment Agency and DEFRA including:
 - Contaminated Land Science Reports (SR2 to 4); and
 - Model Procedures for the Management of Land Contamination (CLR 11).

6.2 General Soil Contamination Guidance

- 6.2.1 The Environment Agency (EA) has a statutory duty to ensure the protection of the environment and the remediation of contaminated land and groundwater. In order to achieve this, the EA employs the principle of risk assessment the risk of a contaminant source causing harm or pollution via a given pathway to an identified receptor. If one of the source-pathway-receptor linkages is not considered to be present then there is deemed to be no risk. However, if a contaminant source is present and there is a pathway for that contaminant to reach a receptor then there is a potential risk of significant harm to the receptor. Therefore, if the source-pathway-receptor linkages are complete, there is a requirement to undertake a risk assessment related to the receptor of concern, be it human health, surface water, groundwater, buildings or other property or ecological issues.
- 6.2.2 The first stage in the assessment of a site is development of a conceptual model. This includes consideration of all possible sources of contamination on the site, the potential receptors and whether there is a plausible pathway between the two. This allows evaluation of whether further more complicated risk assessment for an identified receptor is necessary. A site-specific conceptual model is presented in previous reports and is revised here in Section 9 based on the findings of the site investigations.



Generic Assessment Criteria

- 6.2.3 In March 2002 the Environment Agency and the Department of Environment, Food and Rural Affairs (DEFRA) released a package of guidance to assess the health risks posed by contaminated land as part of the statutory framework for contaminated land. The Contaminated Land Exposure Assessment (CLEA) model is a framework for estimating the likely exposure to contaminants in soil as part of the wider approach of the UK's assessment of risk and suitability for use. The methodology adopted for CLEA builds upon the source-pathway-receptor model for the assessment of risk. Following the CLEA model, generic Soil Guideline Values (SGVs) were developed to act as triggers for intervention in a number of end-use scenarios. The Environment Agency commenced a programme looking at 55 contaminants. The CLEA methodology has been updated and the SGVs were withdrawn from use in August 2008. New SGVs have been published by the EA since March 2009 onwards.
- 6.2.4 The CLEA SGVs are derived using specific parameters, which may not be relevant to each site. The CLEA software allows parameters to be changed and site specific assessment criteria (SSAC) can be developed. The CLEA methodology also uses a statistical evaluation of all the data collected in order to give an overall impression of the site and therefore the exposure to a modelled receptor rather then using individual contaminant values, which may vary dramatically across the site. The statistical tests calculate a normalised upper bound value for the site as a whole and also give an indication of whether a particular data value is a statistical outlier (potential hotspot) or whether it is part of the whole population of samples.
- 6.2.5 The Soil Guideline Values derived from the CLEA model are intended for use in assessing the risk to long term human users of the site. There is also a requirement to consider the potential for harm from short-term exposure to contaminants at the site, e.g. to construction workers who may be exposed to risk via inhalation of dust or dermal contact with the contaminated material.
- 6.2.6 In the absence of SGVs published under the new CLEA methodology, Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) published their third edition of generic assessment criteria (GAC) for 82 inorganic and organic substances in January 2015 which are termed Suitable 4 Use Levels or S4UL's. In addition, GAC values for 30 separate organic compounds were



published in December 2009 by the Environmental Industries Commission (EIC), the Association of Geotechnical and Geoenvironmental Specialists (AGS) and CL:AIRE. These GAC values have been derived in the same vein as SGVs and are intended to be used in the same manner. Additionally, the GAC values have been produced for varying soil organic matter content (i.e. 1%, 2.5% and 6%).

Category 4 Screening Levels (C4SLs)

- 6.2.7 Revised Statutory Guidance to support Part 2A of the Environmental Protection Act 1990 was published in April 2012 by DEFRA. This Guidance introduced a new four-category system for classifying land under Part 2A for cases of a Significant Possibility of Significant Harm to human health:
 - Category 1 includes land where the level of risk is clearly unacceptable;
 - Category 2/3 border defines the point at which land is determined under the legislation;
 - Category 3 would include sites that regulators conclude should not be designated as contaminated under Part 2A; and
 - Category 4 includes land where the level of risk posed is acceptably low.
- 6.2.8 Land is determined as 'contaminated land' under Part 2A if it falls within Categories 1 or 2.
- 6.2.9 In March 2014, DEFRA published C4SLs for four generic land-uses comprising residential, commercial, allotments and public open space for six substances – arsenic, benzene, benzo(a)pyrene, cadmium, chromium (VI) and lead.
- 6.2.10 The C4SLs have been derived in support of Defra's revised Statutory Guidance for Part 2A of the Environmental Protection Act 1990 but it was anticipated that they could be used under the planning regime as generic screening criteria within a GQRA, albeit describing a higher level of risk than the currently or previously available SGVs.
- 6.2.11 In the case of lead where the SGV was removed in 2008 and was not replaced, the C4SL for lead is considered a suitable generic screening value.

6.3 Statistical analysis

6.3.1 Statistical analysis has been completed to identify if the data set for each substance tested contains outliers, has as normal or non-normal distribution and if there is significant evidence that the mean concentration, as defined by the



95% upper confidence level (UCL), is less than the adopted screening value. This process follows the CL:AIRE/CIEH Guidance on Comparing Soil Contamination Data with a Critical Concentration, May 2008. Results from this statistical testing can be used to inform decisions on whether land is suitable for use under the land use planning system without mitigation to break identified pollutant linkages.

6.4 General Water Contamination Guidance

- 6.4.1 Concentrations of contaminants detected in groundwater have been compared to the UK Drinking Water Standards (UKDWS) encompassing the Water Supply (Water Quality) Regulations 1989 and Water Supply (Water Quality) Regulations 2000 where drinking water is the receptor. Where surface water is the receptor the Environment Agency Environmental Quality Standards (EQS) have also been used.
- 6.4.2 Where the UKDWS and EQS do not encompass contaminants of concern to human health, reference is made to other appropriate guidance. This includes the European Union Council Directives 98/83/EC and 75/440/EEC on the quality of water intended for human consumption and the quality required of surface water intended for the abstraction of drinking water respectively. Additional screening values are derived from the World Health Organisation (WHO) Guidelines for Drinking-water Quality (1984) and the Dutch Target and Intervention Values for Soil Remediation.



7 GENERIC QUANTITATIVE RISK ASSESSMENT

7.1 Soil Results

- 7.1.1 Soil samples taken from the site have been tested for potential chemicals of concern appropriate to the former land uses. Results from the chemical testing have been evaluated with reference to each of the plausible receptors identified in the conceptual model. The results are evaluated differently for each receptor.
- 7.1.2 The proposed redevelopment is for commercial/industrial use. Therefore, the results have been assessed for commercial assessment criteria.

7.2 Human Health - occupiers

- 7.2.1 As the receptor is human health, the most relevant risk assessment model is the CLEA model. The model estimates child and adult exposures to soil contaminants for those potentially living, working and/or playing on contaminated sites over long time periods and has been used to produce the SGVs for the United Kingdom.
- 7.2.2 The principal pathways of concern for human health are dermal contact, ingestion, and inhalation. Generally, in the assessment of risk to site users, only samples taken in the top 1m are considered as contact with deeper samples is unlikely.
- 7.2.3 The geometric mean soil organic matter content at the site is 3.67%. Therefore, GAC values derived using 2.5% SOM have been selected in this assessment. The pH of the soil ranged from 6.29 in TP111-0.7m to 8.67 in WS103-0.3m.

Metals

- 7.2.4 The mean concentration (95% UCL) for arsenic, boron, cadmium, chromium (III and VI), copper, lead, mercury, nickel, selenium and zinc were below their respective SGV or GAC. Therefore, it may be considered that the concentrations of these substances in soil on site do not present a significant risk to long-term human health.
- 7.2.5 Statistical analysis of the laboratory results is attached at Appendix VII.



Total Petroleum Hydrocarbons

- 7.2.6 Most samples recorded low concentrations of all petroleum hydrocarbon fractions (TPH) and no visual or olfactory evidence of petroleum hydrocarbons was observed during the intrusive investigation.
- 7.2.7 The maximum recorded concentrations for all TPH fractions are significantly less than the adopted GAC, as is shown in Table VI below. Therefore, TPH contamination is considered unlikely to present a significant risk to long term human health at the site.

| Table VI – TPH Summary | | | | | | | |
|------------------------|-----------------------------|------------|---|--|--|--|--|
| TPH Fraction | Max. Recorded (mg/kg) | Location | Generic Assessment Criteria (mg/kg) | | | | |
| GRO (C4-C12) | 0.828 | WS105-0.3m | - | | | | |
| Aliphatics C5-C6 | 0.0123 | WS105-0.3m | 5,900 (558)s | | | | |
| Aliphatics >C6-C8 | 0.0526 | WS105-0.3m | 17,000 (322)s | | | | |
| Aliphatics >C8-C10 | 0.113 | WS105-0.3m | 4,800 (190)v | | | | |
| Aliphatics >C10-C12 | 0.328 | WS105-0.3m | 23,000 (118)v | | | | |
| Aliphatics >C12-C16 | 79.3 | TP104-05m | 82,000 (59)s | | | | |
| Aliphatics >C16-C35 | 288.6 | TP105-0.3m | 1,700,000 | | | | |
| Aliphatics >C35-C44 | 36.3 | TP105-0.3m | 1,700,000 | | | | |
| Aromatics C6-C7 | <0.01 | - | 690 | | | | |
| Aromatics >C7-C8 | 0.0135 | WS108-0.4m | 1,800 | | | | |
| Aromatics >EC8-EC10 | 0.0963 | WS105-0.3m | 110 | | | | |
| Aromatics >EC10-EC12 | 0.218 | WS105-0.3m | 590 | | | | |
| Aromatics >EC12-EC16 | 58 | WS108-0.4m | 2,300 (419)s | | | | |
| Aromatics >EC16-EC21 | 247 | WS108-0.4m | 1,900 | | | | |
| Aromatics >EC21-EC35 | 517 | WS108-0.4m | 1,900 | | | | |
| Aromatics >EC35-EC44 | 125 | WS108-0.4m | 1,900 | | | | |

NB – calculation of GAC values assumes that no free phase product is present.

Semi-Volatile Organic Compounds and Polycyclic Aromatic Hydrocarbons

7.2.8 The majority of the samples tested contained concentrations of Semi-Volatile Organic Compounds (SVOC) below the Limit of Detection (LOD). However, minor concentrations of dibenzofuran, carbazole and 2-methylnaphthalene were detected above the LOD but below their respective screening criteria. Therefore, these compounds are unlikely to present a significant risk to long term human health.



- 7.2.9 The mean concentrations (95% UCL) of all Polycyclic Aromatic Hydrocarbons (PAH) compounds analysed (naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(123cd)pyrene, dibenz(ah)anthracene and benzo(ghi)perylene) were below their respective GAC. Therefore, these PAHs are unlikely to present a significant risk to long term human health.
- 7.2.10 Statistical analysis of the laboratory results is attached at Appendix VII.

| Table VII – PAH Soil Exceedances | | | | | | | | |
|----------------------------------|---|---|---|--|--|--|--|--|
| Substance | Number of Individual Sample Exceedences | Mean Concentration (95% Confidence Level) (mg/kg) | Generic Assessment Criteria (mg/kg) | | | | | |
| Acenaphthene | 0 | 1.85 | 97,000 | | | | | |
| Acenaphthylene | 0 | 0.26 | 97,000 | | | | | |
| Anthracene | 0 | 2.67 | 540,000 | | | | | |
| Benzo(a)anthracene | 0 | 5.53 | 170 | | | | | |
| Benzo(a)pyrene | 0 | 5.44 | 35 | | | | | |
| Benzo(b)fluoranthene | 0 | 4.67 | 44 | | | | | |
| Benzo(ghi)perylene | 0 | 3.02 | 4000 | | | | | |
| Benzo(k)fluoranthene | 0 | 3.44 | 1200 | | | | | |
| Chrysene | 0 | 5.27 | 350 | | | | | |
| Dibenzo(ah)anthracene | 0 | 0.73 | 3.6 | | | | | |
| Fluoranthene | 0 | 12.29 | 23,000 | | | | | |
| Fluorene | 0 | 1.39 | 68,000 | | | | | |
| Indeno(123cd)pyrene | 0 | 2.74 | 510 | | | | | |
| Naphthalene | 0 | 1.97 | 460 | | | | | |
| Phenanthrene | 0 | 11.56 | 22,000 | | | | | |
| Pyrene | 0 | 10.31 | 54,000 | | | | | |



Volatile Organic Compounds

7.2.11 The recorded concentrations of Volatile Organic Compounds (VOC) were all recorded at their respective limits of detection (LOD) or below their respective SGV or GAC. Therefore, these compounds are unlikely to present a significant risk to long term human health.

Polychlorinated Biphenyls

7.2.12 Concentrations of Polychlorinated Biphenyls (PCB - ICES 7) have been compared to their respective screening values. None of the samples tested contained concentrations of PCB above their limit of detection or screening value. Therefore, these compounds are unlikely to present a significant risk to long term human health.

Other Substances

- 7.2.13 Statistical analysis for monohydric phenol, total cyanide and sulphide was carried out to identify the 95% confidence limits of the measured mean and to compare the upper 95th percentile with the respective screening criteria.
- 7.2.14 The upper bound values (US95) for phenol, cyanide and sulphide were below their respective screening values. Therefore, it may be considered that the concentrations of these substances in soil on site do not present a significant risk to long-term human health.
- 7.2.15 Statistical analysis of the laboratory results is attached at Appendix VII.

Asbestos

- 7.2.16 Guidance on the need for asbestos surveys and the method of carrying them out are given in HSE Publication HSG264.
- 7.2.17 Thirteen samples were screened for asbestos and no fibres were detected. In addition, no visual evidence of asbestos was recorded during site investigation works. Therefore, asbestos contamination is unlikely to pose a risk to future site occupiers.

7.3 Human Health – Construction Workers

7.3.1 The CLEA Soil Guideline Values only apply to the protection of health for long term chronic exposure. Construction workers are more likely to be at risk from a



high single exposure, i.e. an acute dose, which can result in contaminant poisoning. Suggested values for acute lethal doses of arsenic, cadmium, chromium, inorganic mercury, nickel and selenium is outlined in the Environment Agency R&D SGV reports from 2002.

7.3.2 None of the samples contained concentrations of cadmium, chromium, inorganic mercury, nickel or selenium that are elevated with respects to an acute lethal dose. No acute lethal dose value is given for lead.

7.4 Ecology – Future Landscaped Areas

- 7.4.1 Ecological Soil Screening Levels (Eco-SSL) have been published by the USEPA for a range of metals. The Eco-SSLs present indicative values for assessing potential risk to plants and other ecological receptors. As no relevant UK guidance exists for assessing risk to ecology, the recorded metal concentrations have been compared on an individual basis to Eco-SSLs.
- 7.4.2 The mean concentrations (95% UCL) for cadmium and nickel were below the Eco-SSLs for plants. Therefore, it may be considered that the concentrations of cadmium and nickel in soil on site do not present a risk to sensitive plants.
- 7.4.3 The mean concentrations (95% UCL) for arsenic, copper, lead and zinc were above the Eco-SSLs for plants. Therefore, it may be considered that the concentrations of these elements may pose a risk to sensitive plant growth in future garden or landscaped areas.

7.5 Groundwater Results

- 7.5.1 Groundwater samples taken from the site have been tested for potential chemicals of concern appropriate to the former land uses. As a number of the installed wells were dry our assessment of the risk to controlled waters is guided by the analysis of groundwater samples and soil samples submitted for leachate preparation. While leachate preparation is considered to be more aggressive than natural processes in the unsaturated zone, the results give broadly representative estimate of the leachability of contaminants.
- 7.5.2 Due to the proximity of the Hunsworth Beck, concentrations of contaminants detected in groundwater have been compared to EQS as surface water is the most sensitive fate of the groundwater beneath the site. The hardness of the



water ranged from 399mg/l to 1,220mg/l and the maximum hardness dependent EQS have been selected.

7.5.3 The main pathway by which contaminants are likely to reach the groundwater is through infiltration of rainwater causing vertical movement through the ground. At present the majority of the site is covered by hardstanding in the form of tarmac and/or a substantial thickness reinforced concrete, surfaced in places by a vinyl screed which should prevent the downward passage of any contaminants.

Metals, Semi-metals and Non-metals

- 7.5.4 The majority of metal concentrations were below their respective LOD or screening value and are considered unlikely to pose a significant risk to controlled waters. However, elevated concentrations of several metals in some samples were recorded as discussed below.
- 7.5.5 The recorded concentration of total chromium ranged from 6.14μg/l to 29.1μg/l which are elevated with respect to the EQS of 4.7μg/l but are below the chromium UKDWS of 50μg/l.
- 7.5.6 The concentration of chromium VI ranged from <LOD to 54µg/l which are elevated with respect to the EQS of 3.4µg/l. The analytical method for total chromium is more sensitive with a lower limit of detection compared with the method for chromium VI and is considered more representative of the chromium concentrations in the samples.
- 7.5.7 The recorded concentration of cadmium ranged from <LOD to 0.346µg/l which are elevated with respect to the EQS of 0.08µg/l but below the UKDWS of 5µg/l.
- 7.5.8 The recorded concentration of nickel in BH6, with a concentration of 50.2µg/l, was elevated with respect to the hardness dependent EQS of 20µg/l. The recorded concentrations of nickel in boreholes downstream of BH6 were below the EQS.
- 7.5.9 Therefore, these metals are not considered to represent a significant risk to controlled waters at the site based on the majority of groundwater samples recording very low to low concentrations with several samples with minor exceedences of EQS with no significant exceedance of UKDWS.



Total Petroleum Hydrocarbons

- 7.5.10 There is no EQS value for TPH, so reference is made to the UK Drinking Water Standards (UKDWS) which provides a value for the maximum tolerable concentration of dissolved/emulsified hydrocarbons allowed in drinking water at the tap (0.01mg/l). There are also limits for dissolved or emulsified hydrocarbons given in the Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 of 0.05mg/l, 0.2mg/l or 1mg/l dependent on the degree of treatment required.
- 7.5.11 A conservative approach of comparing each speciated TPHCWG fraction with the UKDWS of 0.01mg/l has been performed. In the majority of the samples analysed, the concentration of aromatic and aliphatic petroleum hydrocarbon fractions between C6 and C35 were below the Limit of Detection (LOD).
- 7.5.12 Slightly elevated concentrations of long chain-length aliphatic hydrocarbons (C21-C35) from BH5 and WS110 were recorded at 0.216mg/l and 0.017mg/l respectively. These concentrations exceed the UKDWS of 0.01mg/l but are below the DWS surface water abstraction limit of 1mg/l.
- 7.5.13 Elevated concentrations of medium to long chain-length aliphatic and aromatic hydrocarbons (C16-C35) were detected in borehole BH6. The maximum concentration was recorded in the aliphatic fraction C21-C35, 3.39mg/l, which exceeds the UKDWS of 0.01mg/l and the DWS surface water abstraction limit of 1mg/l.
- 7.5.14 Although elevated TPH groundwater concentrations were identified in BH6, negligible or low levels of TPH were recorded up gradient of this area and it is considered to represent an isolated hotspot. Given the localised occurrence and lack of obvious source or presence of free product, this is not considered significant and is not considered further.

Volatile Organic Compounds (VOC)

7.5.15 The recorded concentrations of VOC were all recorded at or below the respective LOD, with the exception of toluene in sample WS110 which recorded a minor concentration of 1.44µg/l. Therefore, these compounds are unlikely to present a significant risk to controlled waters at the site.



Semi-Volatile Organic Compounds and Polycyclic Aromatic Hydrocarbons

- 7.5.16 The recorded concentrations of SVOC were all at or below the respective LOD, with the exception of bis(2-ethylhexyl)pthalate in samples BH5 and BH6 which recorded minor concentrations of 8.11µg/l and 3.92µg/l respectively. Therefore, these compounds are unlikely to present a significant risk to controlled waters at the site.
- 7.5.17 For the purposes of this risk assessment, benzo(a)pyrene and dibenz(a,h)anthracene are considered to be the most carcinogenic PAH compound and naphthalene is considered to be the most mobile PAH. These compounds have been used as surrogates to assess the degree of risk posed by PAH compounds in groundwater and surface water.
- 7.5.18 The recorded concentrations of naphthalene ranged from <0.1µg/l to 1.22µg/l which are below the annual average EQS of 2.4µg/l.
- 7.5.19 The recorded concentrations of benzo(a)pyrene ranged from <0.009 μ g/l to 2.55 μ g/l in BH5 which is above the maximum allowable EQS of 0.1 μ g/l.
- 7.5.20 The recorded concentrations of dibenzo(a,h)anthracene ranged from <0.016μg/l to 0.369μg/l in BH5 which is above the maximum allowable EQS of 0.1μg/l for benzo(a)pyrene.
- 7.5.21 Boreholes downstream of BH5 recorded concentrations of benzo(a)pyrene and dibenzo(a,h)anthracene below the maximum allowable EQS which may indicate an off-site source of benzo(a)pyrene and dibenzo(a,h)anthracene in groundwater around BH5. As boreholes closer to the Hunsworth Beck have recorded concentrations of benzo(a)pyrene and dibenzo(a,h)anthracene are below the maximum allowable EQS and it is considered unlikely to present a significant risk to controlled waters at the site.

7.6 Leachate Results

Metals, Semi-metals and Non-metals

7.6.1 The majority of leachable metal concentrations were below their respective LOD or screening value and are considered unlikely to pose a significant risk to controlled waters. In contrast to this, the recorded concentration of leachable copper ranged from 1.34µg/l to 4.65µg/l in most samples. An elevated



concentration in WS108-0.4m was recorded at 60.9μ g/l compared to its EQS of 28μ g/l but was below the UKDWS of $2,000\mu$ g/l. These values are not considered to pose a significant risk to controlled waters.

Total Petroleum Hydrocarbons

7.6.2 The concentration of leachable aromatic and aliphatic petroleum hydrocarbon fractions were below the LOD and are not considered to pose a significant risk to controlled waters.

Polycyclic Aromatic Hydrocarbons

- 7.6.3 The recorded concentrations of benzo(a)pyrene ranged from <0.009µg/l to 0.00926µg/l which is below the maximum allowable EQS of 0.1µg/l.</p>
- 7.6.4 The recorded concentrations of dibenzo(a,h)anthracene was less than the LOD of <0.016µg/l and the maximum allowable EQS of 0.1µg/l for benzo(a)pyrene.
- 7.6.5 The recorded concentrations of naphthalene was less than the LOD of $<0.1\mu g/l$ and below the annual average EQS of $2.4\mu g/l$.
- 7.6.6 Based on these results, the soils on site are not considered to pose a significant risk to controlled waters from PAH compounds.

7.7 Ground Gas

7.7.1 The potential for elevated ground gas concentrations at the site has been identified in the desk study report and subsequent research into the mining setting of the site.

Ground Gas Assessment

- 7.7.2 The ground gas assessment has been carried out in consultation with the following guidance:
 - Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings (BS 8485:2015);
 - Assessing Risks Posed by Hazardous Ground Gases to Buildings, CIRIA C665, 2007.
- 7.7.3 The ground gas assessment has been undertaken using the Wilson and Card classification adopted by BS 8485: 2015 to derive a Characteristic Situation.



Development Area

- 7.7.4 The monitoring wells within the development area are characterised by low concentrations of methane (max 1.6%) and moderate concentrations of carbon dioxide (max 3.7%) (Table I overleaf). Flow rates for the boreholes were typically 0.1l/hr with a peak reading of 0.4l/hr and barometric pressures ranging from 978mb to 1014mb.
- 7.7.5 Using the Wilson and Card classification system and based on the monitoring results, a GSV of 0.015I/hr has been calculated. This corresponds to Characteristic Situation 1 (green or very low risk) classification.

Outside of Development Area – BH5

- 7.7.6 An exception to the general site trend was borehole BH5 to the south of the site (outside of the proposed development layout) which recorded very high concentrations of methane (max 34.6%) and moderate concentrations of carbon dioxide (max 3.0%). Flow rates for BH5 ranged from 0.0-0.2l/hr.
- 7.7.7 Using the Wilson and Card classification system and based on the monitoring results for BH5, a GSV of 0.07l/hr has been calculated. This corresponds to Characteristic Situation 2 for area around BH5. If the area around BH5 is developed in the future then consideration of ground gas protection measures appropriate to Characteristic Situation 2 and/or further monitoring will be required.

| | TABLE I: SUMMARY OF GROUND GAS MONITORING DATA | | | | | |
|----------|--|-----------|----------|---------|-------------|------------------------------|
| Borehole | Response Zone/Strata | No. Tests | CH₄ (%) | CO2 (%) | Flow (l/hr) | Atmospheric Pressure (mb) |
| BH1 | 1m-6.4m/ Natural | 6 | 0.0 | 0.0-3.4 | 0.0-0.2 | 980-1014 |
| BH5 | 1m-10m/MG, Natural | 5 | 0.0-34.6 | 0.2-3.0 | 0.0-0.2 | 981-1014 |
| BH6 | 1m-10m/MG, Natural | 5 | 0.0 | 0.3-3.4 | 0.0-0.1 | 981-1014 |
| BH7 | 1m-7.8m/MG, Natural | 5 | 0.0-1.6 | 0.0-1.4 | 0.0-0.3 | 978-1013 |



| | TABLE I: SUMMARY OF GROUND GAS MONITORING DATA | | | | | |
|----------|--|-----------|---------|---------|-------------|------------------------------|
| Borehole | Response Zone/Strata | No. Tests | CH₄ (%) | CO2 (%) | Flow (l/hr) | Atmospheric Pressure (mb) |
| WS102 | 1m-5m/ Natural | 6 | 0.0 | 0.1-1.4 | 0.0-0.1 | 980-1014 |
| WS104 | 1m-5m/MG, Natural | 6 | 0.0 | 0.0-3.7 | 0.0-0.4 | 981-1014 |
| WS105 | 1m-6.4m/MG, Natural | 6 | 0.0 | 0.0-2.4 | 0.0-0.1 | 981-1014 |
| WS107 | 1m-6.4m/MG, Natural | 6 | 0.0 | 0.0-2.0 | 0.0-0.3 | 980-1014 |
| WS110 | 1m-6.4m/MG, Natural | 3 | 0.0 | 0.0-1.3 | 0.0-0.1 | 1005-1014 |

Ground Gas Protection Measures

- 7.7.8 CIRIA Report C735, entitled 'Good Practice and verification of protection systems for buildings against hazardous ground gases' presents guidance on the approach for verification of gas protection systems and describes how it should be reported.
- 7.7.9 The calculation of the GSV using the ground gas data from the monitoring wells at the site indicates a classification of Characteristic Situation 1 and no special ground gas protection measures are required for the development area.
- 7.7.10 Although outside of the development area, the monitoring results from BH5 indicates a classification of Characteristic Situation 2. If the area around BH5 is developed in the future then consideration of ground gas protection measures appropriate to Characteristic Situation 2 and/or further monitoring will be required.

7.8 Radon Gas

7.8.1 An initial assessment for radon gas has been carried out. The determination follows the two-stage procedure outlined in *BR211 Radon: Guidance on protective measures for new dwellings (2015)*. The assessment confirms that no specific radon protection measures are required at the site



7.9 Building Materials

Concrete

- 7.9.1 Concentrations of total sulphate were measured in order to indicate the potential for concrete attack. Concentrations on site ranged between 0.005% and 0.456% indicating that there is potential for concrete attack on site.
- 7.9.2 Results from sulphate (2:1 extract) for materials on site ranged between 0.008g/l and 0.204g/l. These results indicate that a worst case design sulphate class of DS-2 and Aggressive Chemical for Concrete (ACEC) class of AC-2 may be appropriate for the site. Relevant guidelines are given in BRE Special Digest 1: Concrete in Aggressive Ground.

Water Supply Pipes

- 7.9.3 Permeation and accelerated deterioration of pipe material can occur due to chemical reactions between the pipe and contaminants in the ground in which it is laid. This can lead to premature failures resulting in leakage and loss of water quality.
- 7.9.4 The Water Supply (Water Quality) Regulations in England and Wales, the Byelaws in Scotland and the Northern Ireland Water Regulations include a requirement to use only suitable materials when laying water pipes and the laying of unprotected water supply pipes through contaminated land is not permitted.
- 7.9.5 A table of threshold values for various contaminants has been produced by UKWIR in their report Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (ref: 10/WM/03/21). These threshold values allow an assessor to select an appropriate pipe material where the contaminant concentrations are below the threshold values.
- 7.9.6 The selection of an appropriate pipe material based on the worst case (maximum) contaminant concentrations at the site is presented below in Table XI. Based on the available chemical test results, it is recommended that either wrapped ductile iron or barrier pipe is used for water supply to the site. Further information regarding the selection of materials for water supply pipes is given in the UKWIR Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites.



| TABL | TABLE XI – UKWIR Pipe Material and Threshold Value (mg/kg) | | | | | | |
|--|--|------|-------|----------------------------|------------------|-------------------------|--------|
| Contaminant | Max / Range Concentration | PE | PVC | Barrier Pipe (PE-AL-PE) | Wrapped Steel | Wrapped Ductile Iron | Copper |
| VOC's | 0.754mg/kg | 0.5 | 0.125 | Pass | Pass | Pass | Pass |
| BTEX +MTBE | <0.029mg/kg | 0.1 | 0.03 | Pass | Pass | Pass | Pass |
| SVOC's including aliphatic and aromatic fraction C5-C10) | 290.75mg/kg | 2 | 1.4 | Pass | Pass | Pass | Pass |
| Phenols | <0.1mg/kg | 2 | 0.4 | Pass | Pass | Pass | Pass |
| Mineral Oil C11-C20 | 328.35mg/kg | 10 | Pass | Pass | Pass | Pass | Pass |
| Mineral Oil C21-C40 | 782.3mg/kg | 500 | Pass | Pass | Pass | Pass | Pass |
| Corrosive (conductivity, redox and pH) | 6.29-8.67 pH range | Pass | Pass | Pass | Fail | Pass | Fail |
| Nitrobenzene | <0.1 | 0.5 | 0.4 | Pass | Pass | Pass | Pass |
| Preferred Pipe Type | | - | - | ~ | - | ~ | - |



8 GEOTECHNICAL RESULTS

8.1 Introduction

- 8.1.1 Site investigation works have identified significant thicknesses of made ground across the majority of the site. This is underlain by natural deposits of sandy, gravelly clay.
- 8.1.2 In total fifty five samples of made ground and natural material were collected from various depths and tested for range of geotechnical parameters including:
 - Moisture content;
 - Particle Size Distribution;
 - Atterberg Limits;
 - 2.5kg Rammer Compaction;
 - One Dimensional Consolidation;
 - Undrained Shear Strength in Triaxial Compression; and
 - Hand Shear Vane Tests.

All tests were performed in accredited geotechnical laboratory and in accordance with the appropriate British Standard.

8.2 Made Ground

8.2.1 Twenty five samples of made ground were sent to the laboratory for analysis. The made ground was described as brown, locally silty to very silty, sandy to very sandy, gravelly to very gravelly clay. The gravel fraction in this horizon consisted of sandstone, mudstone, shale, coal fragments, brick, typical aggregate, concrete, tarmac and ash.

Particle Size Distribution Test

8.2.2 Particle Size Distribution tests were performed on six samples from the made ground. The range in quantities of each soil fraction is shown in Table XII.



| Table XII: PSD Made Ground | | |
|----------------------------|------------------|--|
| Soil Fraction | Total Percentage | |
| Cobbles | 0 | |
| Gravel | 12-47 | |
| Sand | 6-28 | |
| Silt/Clay | 36-77 | |

Moisture Content

8.2.3 Fourteen samples of made ground were tested for natural moisture content and the results varied between 11% and 36%.

Atterberg Limits

8.2.4 Eight samples from the made ground were tested for determination of Atterberg limits. The majority of the results determined intermediate plasticity material with a plasticity index (PI) ranging between 14% (BH4-2.4m) and 24% (BH7-6.0m). One sample was described as high plasticity material with PI of 30% (BH4-7.0m).

2.5kg Rammer Compaction

8.2.5 Four compaction tests were carried out on made ground samples taken at various depths from boreholes BH4, BH5 and BH6. The results for maximum dry density ranged between 1.82Mg/m³ (BH4, 1.2-2.4mbgl) and 1.87Mg/m³ (BH5, 0.5-2.7mbgl) with optimum moisture contents ranging from 13% (BH6) to 15% (BH4).

One Dimensional Consolidation

8.2.6 Two samples from the made ground were subjected to one dimensional consolidation testing. The results are presented in Table XIII.



| Table XIII: ODC Made Ground | | | | |
|-----------------------------|----------------------|----------------------|--|--|
| INITIAL CONDITIONS | BH4 4.5m-4.95mbgl | BH7 1.2-1.65m bgl | | |
| Bulk density (g/cm3) | 2.04 | 1.98 | | |
| Dry density (g/cm3) | 1.68 | 1.63 | | |
| Moisture content (%) | 21 | 22 | | |
| Degree of saturation | 97.9 | 90.9 | | |
| Void ratio | 0.5771 | 0.6306 | | |

| Table XIII: ODC Made Ground | | | | | | |
|-----------------------------|---------------|--------------|----------------------|------------|--|--|
| | BI 4.5m-4 | 14 95mbgl | BH7 1.2-1.65m bgl | | | |
| | COEFFICIENTS | | COEFFICIENTS | | | |
| PRESSURE RANGE (KPa) | Mv (m2/MN) | Cv (m2/yr) | Mv (m2/MN) | Cv (m2/yr) | | |
| 0 – 50 | 0.235 | 6.514 | 0.261 | 4.547 | | |
| 50 – 100 | 0.215 | 6.368 | 0.217 | 6.387 | | |
| 100 - 200 | 0.147 | 14.339 | 0.152 | 11.887 | | |
| 200 – 400 | 0.105 | 9.612 | 0.108 | 13.848 | | |
| 400 - 50 | 0.024 | 8.668 | 0.020 | 7.990 | | |

Undrained Shear Strength in Triaxial Compression

8.2.7 Three samples representing the made ground were subjected to undrained triaxial compression tests. The results are presented in Table XIV.



| TABLE XIV: UTS Made Ground | | | |
|----------------------------|----|------------------------------|--|
| Depth of Sample, mbgl | ВН | Undrained Shear strength, Cu | |
| 2.5-2.95 | 4 | 70 | |
| 5.5-5.85 | 7 | 66 | |
| 7.0-7.45 | 6 | 57 | |

Hand Shear Vane Tests

8.2.8 Hand Shear Vane tests were performed on two samples representing the made ground. Shear Strength values ranged from 84kPa (BH4, 6.5-6.95m) to 92kPa (BH7, 2.2-2.65m).

8.3 Natural Materials - Clay

8.3.1 Twenty six samples representing the natural clay were sent to the geotechnical laboratory. The natural clay was described as, predominantly firm to very stiff, brown, slightly gravelly to very gravelly, sandy to very sandy clay.

Particle Size Distribution Test

8.3.2 Particle Size Distribution tests were performed on five samples from the natural clay. The range in quantities of each soil fraction is shown in Table XV.

| Table XV: PSD Natural Materials - Clay | | |
|--|------------------|--|
| Soil Fraction | Total Percentage | |
| Cobbles | 0 | |
| Gravel | 5-36 | |
| Sand | 23-31 | |
| Silt/Clay | 37-69 | |



Moisture content

8.3.3 Thirteen samples of the natural clay were tested for natural moisture content and the results varied between 9.4% and 32%.

Atterberg Limits

8.3.4 Thirteen samples from the natural clay were tested for determination of Atterberg limits. The majority of the results determined low to intermediate plasticity material with a plasticity index (PI) ranging between 9% (BH1-2.5m) and 25% (TP108-0.9m).

2.5kg Rammer Compaction

8.3.5 Two compaction tests were carried out on natural clay samples taken at various depths from trial pits TP111 and TP118. The results for maximum dry density ranged between 2.65Mg/m³ (TP111-2.2mbgl) and 2.68Mg/m³ (TP118-1.4mbgl) with optimum moisture contents ranging from 19% (TP111) to 20% (TP118).

One Dimensional Consolidation

8.3.6 One sample from the natural clay was subjected to one dimensional consolidation testing. The results are presented in Table XVI.

| Table XVI: ODC Natural Materials - Clay | | |
|---|---------------|--|
| INITIAL CONDITIONS | BH3 | |
| | 1.2m-1.65mbgl | |
| Bulk density (g/cm3) | 2.05 | |
| Dry density (g/cm3) | 1.66 | |
| Moisture content (%) | 24 | |
| Degree of saturation | 104.2 | |
| Void ratio | 0.6008 | |





| Table XVI: ODC Natural Materials - Clay | | | |
|---|---------------|------------|--|
| | BH3 | | |
| | 1.2m-1.65mbgl | | |
| | COEFFI | CIENTS | |
| PRESSURE RANGE (KPa) | Mv (m2/MN) | Cv (m2/yr) | |
| 0 – 50 | 0.259 | 5.057 | |
| 50 – 100 | 0.236 | 4.932 | |
| 100 - 200 | 0.162 | 7.248 | |
| 200 – 400 | 0.114 | 15.148 | |
| 400 - 50 | 0.065 | 6.916 | |

Undrained Shear Strength in Triaxial Compression

8.3.7 Seven samples representing the natural clay were subjected to undrained triaxial compression tests. The results are presented in Table XVII.

| TABLE XVII: UTS Natural Materials - Clay | | | |
|--|----|------------------------------|--|
| Depth of Sample, mbgl | ВН | Undrained Shear strength, Cu | |
| 1.2-1.65 | 3 | 112 | |
| 2.0-2.45 | 1 | 161 | |
| 2.3-2.7 | 3 | 183 | |
| 3.5-3.95 | 1 | 127 | |
| 5.7-6.15 | 5 | 32 | |
| 6.7-7.15 | 5 | 48 | |
| 8.5-9.15 | 6 | 101 | |



Hand Shear Vane Tests

8.3.8 A Hand Shear Vane test was performed on one sample representing the natural materials. A Shear Strength value of 57kPa was recorded for the sample from BH6, 9.5-9.85mbgl.

8.4 Natural Materials - Gravel

8.4.1 Four samples representing the natural gravel were sent to the geotechnical laboratory. The natural gravel was described as, predominantly, brown, sandy to very sandy, slightly clayey to very clayey, gravel.

Particle Size Distribution Test

8.4.2 Particle Size Distribution tests were performed on two samples from the natural gravel. The range in quantities of each soil fraction is shown in Table XVIII.

| Table XVIII: PSD Natural Materials - Gravel | | |
|---|------------------|--|
| Soil Fraction | Total Percentage | |
| Cobbles | 0 | |
| Gravel | 32-58 | |
| Sand | 22-36 | |
| Silt/Clay | 20-32 | |

Moisture content

8.4.3 Two samples of the natural gravel were tested for natural moisture content and the results varied between 7.4% and 9.4%.

Atterberg Limits

8.4.4 One sample from the natural gravel was tested for determination of Atterberg limits. The sample (BH1-6.1m) was described as non-plastic material.



8.5 Standard/Cone Penetration Testing

8.5.1 In addition to laboratory geotechnical testing, in situ standard/cone penetration tests were carried out during the site investigation and the results are summarised in Table XIX.

| | | | ТА | BLE XIX: | RESULTS | FOR STA | NDARD | CONE PI | ENETRAT | ION TEST | rs | | | |
|-----------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|
| Depth BH1 | | ВІ | H2 | В | BH3 | | BH4 | | BH5 | | BH6 | | H7 | |
| (m bgl) | N- value | Geol Unit |
| 1.00 | | | 13 | MG | | | 45 | MG | 25 | MG | 18 | MG | | |
| 1.50 | | | | | | | | | | | | | | |
| 2.00 | | | REF | MG | | | | | 13 | MG | REF | MG | | |
| 2.50 | | | | | | | | | | | | | | |
| 3.00 | | | | | | | | | | | | | | |
| 3.50 | | | 18 | MG | | | 12 | MG | | | | | | |
| 4.00 | | | | | | | | | 8 | MG | 23 | MG | | |
| 4.50 | REF | Nat. | | | | | | | | | | | | |
| 5.00 | REF | Nat. | | | 20 | Nat. | | | 10 | MG | 15 | MG | | |
| 5.50 | | | | | | | 12 | MG | | | | | | |
| 6.00 | REF | СМ | | | 24 | Nat. | | | | | 15 | MG | | |
| 6.50 | | | 30 | Nat. | | | | | | | | | | |
| 7.00 | | | | | REF | Nat. | | | | | | | | |
| 7.50 | | | REF | Nat. | REF | СМ | | | | | | | REF | СМ |
| 8.00 | | | | | | | | | | | 19 | MG | | |
| 8.50 | | | REF | СМ | | | | | 41 | Nat. | | | | |
| 9.00 | | | | | | | REF | СМ | | | | | Ī | |
| 9.50 | | | | | | | | | REF | СМ | | | Ī | |
| 10.00 | | | | | | | | | | | | | 1 | |
| 10.50 | | | | | | | | | | | REF | СМ | | |

Key: MG = Made Ground, Nat. = Natural Materials, CM = Coal Measures, REF = Refusal

At depths where no Standard/Cone Penetration Test results are shown a U100 sample was taken.



- 8.5.2 The table shows that N-values within the made ground range between 8 and Refusal (>50). The N-values in the made ground suggest that the material is highly variable between loose/soft and very dense/very stiff.
- 8.5.3 N-values obtained within underlying natural materials are also highly variable, ranging between 20 and Refusal (>50). There is typically an increase in N value with depth.
- 8.5.4 N-values obtained within the coal measures all show Refusal (>50).



9 REVISED CONCEPTUAL SITE MODEL

9.1 Introduction

9.1.1 In line with current Environment Agency guidance, plausible source, pathway and receptor linkages have been identified for the site. The plausible linkages are indicated in the conceptual site model outlined and discussed below. This conceptual site model is based on the findings of the intrusive site investigation works and associated geochemical testing and is illustrated in Drawing SH10534-009.

9.2 Contamination Sources

- 9.2.1 No significantly elevated contaminant concentrations were identified in soil on site.
- 9.2.2 There are minor elevated concentrations of petroleum hydrocarbons in groundwater at the site.

9.3 Pathways

Human Health

9.3.1 In terms of human health the main pathways are considered to be dermal contact, ingestion and inhalation. Future occupiers and construction workers are likely to be at risk from all three potential pathways whilst working on the site.

Groundwater

- 9.3.2 The main pathway by which contaminants are likely to reach the saturated zone beneath the site is through infiltration of rainwater causing vertical movement through the unsaturated zone.
- 9.3.3 The site investigation has identified and sampled groundwater from the coal measures strata.

9.4 Receptors

9.4.1 A number of sensitive receptors have been identified in close proximity to the site. These receptors are:



- Future human receptors (site occupiers and construction workers);
- Shallow groundwater;
- Surface water in the Hunsworth Beck.

9.5 Summary

- 9.5.1 Based on the land use history and identified sources of contamination, a conceptual site model has been developed. This is shown in Table XX and details the potential sources, pathways and receptors and the inter-relationship of these factors.
- 9.5.2 It is considered that the risks to the proposed development for residential use without any mitigation are as follows.

| | TABLE XX | | |
|---|--|---|--------------------|
| Source | Pathway | Receptor | Risk |
| Ground gases (carbon dioxide, methane) | Lateral and vertical migration of gases and inhalation | Construction workers and future occupiers | Low to Moderate |
| Minor petroleum hydrocarbons in groundwater | Infiltration, advection, diffusion and dispersion | Groundwater and Surface water | Low to Moderate |



10 CONCLUSIONS

10.1 General

- 10.1.1 The site history indicates that a sewage works was present on part of the site in 1893. The Valley Pit Coal and Ironstone workings were also present in the west of the site at this time along with an Old Coal pit in the south. A tramway is reported extending across the western part of the site. By 1908 the pits were reported to be closed and the sewage works had expanded. Subsequent maps show further expansion and changes to the layout up until 2004.
- 10.1.2 A total of seven cable percussion boreholes (to a maximum depth of 10.7mbgl), three of which had rotary follow-on (to a maximum depth of 30mbgl), ten window sample boreholes (2.0m to 5.0mbgl) and nineteen trial pits (1.4m-3.6mbgl) were completed as part of this Phase II investigation. Observations from the intrusive work have confirmed the presence of 0.15m and 8.3m thick over the majority of the site, underlain by soft to stiff, orange-brown mottled grey, locally cobbly with rare boulders, sandy, gravelly clay and mudstone bedrock of the Middle Coal Measures geology.
- 10.1.3 Thirty soil and six groundwater samples from across the site were tested for a suite of potential chemicals of concern comprising: volatile and semi-volatile organic compounds; aliphatic, aromatic and polyaromatic hydrocarbons; metals and other inorganic elements.

10.2 Human Health

- 10.2.1 Analytical results were analysed using CLEA methodology to assess the risk to human health in both a residential and a commercial/industrial scenario.
- 10.2.2 The mean concentrations of all determinands across the site are below screening criteria and should not pose a risk to human health for a commercial/ industrial end use.

10.3 Surface Water and Groundwater

10.3.1 The risk to surface water and groundwater is considered to be low to moderate. The recorded concentrations of medium to long chain petroleum hydrocarbons



are elevated with respect to the UKDWS in the southern part of the site, particularly BH6. However, concentrations of petroleum hydrocarbons in groundwater across the site are generally below the LOD and/or UKDWS, therefore the risk to surface water and groundwater can be considered more towards low than moderate.

10.4 Buildings and Property

10.4.1 Results from sulphate (2:1 extract) testing indicate that a worst case design sulphate class of DS-2 and Aggressive Chemical for Concrete (ACEC) class of AC-2 may be appropriate for the site.

Ground Gas

Development Area

10.4.2 The monitoring wells within the development area are characterised by low concentrations of methane (max 1.6%) and moderate concentrations of carbon dioxide (max 3.7%). Using the Wilson and Card classification system and based on the monitoring results, a GSV of 0.015l/hr has been calculated. This corresponds to Characteristic Situation 1 (green or very low risk) classification.

Outside of Development Area – BH5

10.4.3 An exception to the general site trend was borehole BH5 to the south of the site (outside of the proposed development layout) which recorded very high concentrations of methane (max 34.6%) and moderate concentrations of carbon dioxide (max 3.0%). Using the Wilson and Card classification system and based on the monitoring results for BH5, a GSV of 0.071/hr has been calculated. This corresponds to Characteristic Situation 2 for area around BH5. If the area around BH5 is developed in the future then consideration of ground gas protection measures appropriate to Characteristic Situation 2 and/or further monitoring will be required.

10.4.4

10.4.5 Low concentrations of methane, up to 1.6%, and low concentrations of carbon dioxide, up to 1.4% have been reported in one borehole in this area.



- 10.4.6 For a CIRIA Situation A development type, a gassing regime of Characteristic Situation 1 (CS1) can be attributed to this area and no special ground gas protection measures are required.
- 10.4.7 For a CIRIA Situation B development type, a gassing regime of Amber 1 can be attributed to this area which requires low-level gas protection measures, comprising a membrane and ventilated sub-floor void to create a permeability contrast to limit the ingress of gas into buildings. Gas protection measures should be as prescribed in BRE Report 414 (Johnson, 2001). Ventilation of the sub-floor void should facilitate a minimum of one complete volume change per 24 hours.

Ground Gas - Commercial

10.4.8 High concentrations of methane, up to 34.6%, have been reported in one borehole, BH5, and moderate concentrations of carbon dioxide, up to 3.7%, have been reported across the remainder of the site. Through reference to CIRIA C665 a gassing regime of Characteristic Situation 1 (CS1) can be attributed to the commercial area due to low flow rates. However, given the high levels of methane recorded in the south of the site, we would recommend increasing the classification in this area (BH's 4, 5 and 6) to Characteristic Situation 2 (CS2) as a precaution.

Ground Gas Protection Measures

- 10.4.9 The calculation of the GSV using the ground gas data from the monitoring wells at the site indicates a classification of Characteristic Situation 1 and no special ground gas protection measures are required for the development area.
- 10.4.10 Although outside of the development area, the monitoring results from BH5 indicates a classification of Characteristic Situation 2. If the area around BH5 is developed in the future then consideration of ground gas protection measures appropriate to Characteristic Situation 2 and/or further monitoring will be required.

Radon

10.4.11 An initial assessment for radon gas has been carried out. The determination follows the two-stage procedure outlined in *BR211 Radon: Guidance on protective measures for new dwellings (2015)*. The assessment indicates that no specific radon protection measures are required.



10.5 Ecology

10.5.1 The phytotoxic metals arsenic, copper, lead and zinc were analysed against the ECO-SSL threshold values for risk to plants. The results displayed numerous samples to have elevated metals considered likely to hinder plant growth in planned areas of landscaping. These samples were widespread across the site.

10.6 Coal Mining

10.6.1 A Coal Authority report for the site has been obtained, dated 23 November 2010 and is attached at Appendix II, a visit was also made to the Coal Authority abandoned mine records office at Mansfield on 25 November 2010.

Shallow Underground Workings

- 10.6.2 From the enquiries made, examination of the geological information and site investigation observations there is evidence of shallow underground mining activity beneath the south of the site. Reference to the abandonment plans indicate that these shallow workings are likely to be in the Shertcliffe Bed.
- 10.6.3 No intact coal seams were encountered during the investigation. However, there was evidence of broken/soft ground accompanied by loss of flush which may indicate the presence of workings. This broken/soft ground was observed at depths of between 11.3m and 16.7mbgl in borehole BH6. Due to collapse of the borehole, drilling was terminated at 16.7mbgl. Further investigation and stabilisation of the underground conditions with respect to mining is likely to be necessary in this area of the site.

Mine Entries

- 10.6.4 The Coal Authority report has indicated that there are ten recorded mine entries on or within influencing distance of the site. Only one of the mine entries is noted to have had any treatment; entry 417427-005 (to the north west of the site) was treated on behalf of the Coal Authority with mass concrete following its collapse in 1997. Prior to development the mine entries will require location, investigation and stabilisation.
- 10.6.5 Mining constraints on development are indicated on drawing SH10534-008.



10.7 Geotechnical and foundation design

- 10.7.1 The geology of the site is relatively homogenous and comprises made ground (up to 8.4m bgl to the south of the site) underlain by sandy, gravelly clay with occasional layers of very sandy, very clayey gravel of weathered Coal Measures which is in turn underlain by weak to moderate strong mudstone and sandstone of the Coal Measures.
- 10.7.2 As the site is proposed for commercial redevelopment it has been assumed that the commercial units constructed on the site will be steel framed structures with clad walls. These structures typically apply pressure to the ground at the end points of the steel columns and the foundations should be constructed to minimise the effect of applying localised pressure to the ground. Provided that some degree of settlement can be accommodated within the structure, pad or raft foundations should be satisfactory for structures on site founded on the weathered coal measures or on the made ground after ground improvement. Ground bearing floor slabs should be constructed to allow for some differential movement of the ground where pad foundations are employed.
- 10.7.3 Standard Penetration Tests (SPTs) were carried out in all borehole locations at 1m centres. The results obtained from the made ground are highly variable due to the impact that large particles can have on the test results. The tests indicate that the made ground would be unsuitable as a founding medium in its current condition due to this variability and the loose nature of some of the fill materials. Therefore some form of ground improvement would be required, either by excavation and recompaction or dynamic compaction, where foundations cannot be placed on the solid Coal Measures.
- 10.7.4 The weathered Coal Measures are described as firm to very stiff with undrained shear strength values in the range 32kPa to 161kPa and SPT n-values ranging from 30 to Refusal (>50). The tests indicate that the weathered Coal Measures across the majority of the site would be suitable as a founding medium in their current condition.
- 10.7.5 The shear strength of the weathered Coal Measures suggests C_u values for firm to very stiff clay which may be suitable for allowable bearing pressures up to 125kPa-250kPa. The results of consolidation testing suggest that these materials demonstrate low to medium compressibility and that, at the allowable bearing



pressure above, settlement should be restricted to less than 25mm. Detailed analysis of foundations should be carried out to ensure that the design loads for a particular building can be accommodated and that both total and differential settlements at design loads can be tolerated by the proposed structure.

- 10.7.6 Monitoring of boreholes on site indicates that groundwater is approximately 2m to 9m below ground level. Based on the site topography the groundwater level is fairly consistent across the site and is considered to be the natural groundwater level in the weathered Coal Measures. Caution may be required where foundations are constructed close to the water table.
- 10.7.7 As an alternative, piled foundations might be suitable to the south of the site where made ground thicknesses are up to 8.3m but consideration should be given to ground settlement around the structures if no other ground treatment was carried out. There would also likely be negative skin friction loads on piles caused by this settlement and these should be considered in any design.



11 **RECOMMENDATIONS**

11.1 Contamination

11.1.1 No elevated concentrations of contaminants were identified on site and, therefore, there is unlikely to be a significant risk to long term human health given a commercial land use.

11.2 Mining

- 11.2.1 Further investigation of the mining setting of the site is recommended. This is likely to take the form of further rotary open-hole drilling to the south of the site and exploratory excavation of areas around potential mine shaft locations. Drawing SH10534-008 shows the location of shafts and likely shallow mining.
- 11.2.2 There are a number of constraints to development as shown on Drawing SH10534-008, of which the mining position and existing structures represent the most significant elements from a construction viewpoint. Once broad architectural layouts are available, it would be useful to compare with existing site constraints in order to determine remedial options and costs.

11.3 Ground Gas

11.3.1 Gas protection measures are recommended as a precaution in the southern area of the site (CS2) to address high levels of methane recorded in this area. No gas protection is required over the remainder of the site.



APPENDIX I

Standard Terms and Conditions and Limitations to Reports



STANDARD TERMS AND CONDITIONS AND LIMITATIONS TO REPORTS

This report is provided for the stated purpose and for the sole use of the client. It is confidential to the client and his professional advisors and cannot be shown to any other party without prior written consent. Wardell Armstrong LLP accepts no responsibility whatsoever to any person other than the client.

The findings of this report are based upon information relating to the property supplied by the client or their agents. The information has been accepted and used in good faith and unless otherwise stated, no attempt has been made to verify the information supplied. Should any of these factors or information change then the conclusions of the report may need to be amended.

The findings and recommendations are considered to be valid and appropriate at the time of preparation and for the specific purpose or purposes intended. Wardell Armstrong LLP will not be liable if any findings are used by third parties, without the written agreement of the company, or if an interpretation is made and action taken without further consultation.



APPENDIX II

Coal Authority Report



Issued by:

The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG ON-Line Service: www.groundstability.com - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

| Person dealing with this matter: | Darren Moody |
|----------------------------------|---|
| Our reference: | 00052445-10 |
| Your reference: | 33198658 |
| Electronic Ref: | EME_00014987250003_005 |
| RRUID: | 005.00014987250003 |
| Date of your enquiry: | 23 November 2010 |
| Date we received your enquiry: | 23 November 2010 |
| Date of issue: | 24 November 2010 |
| | Our reference: Your reference: Electronic Ref: RRUID: Date of your enquiry: Date we received your enquiry: |

This report is for the property described in the address below and the attached plan.

Non-Residential Coal and Brine Report

Site At, North Bierley Works, Bradford Road, Oakenshaw, Bradford, West Yorkshire

This report is based on and limited to the records held by, the Coal Authority, and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

| Coal mining | Yes |
|-----------------------------|-----|
| Brine Compensation District | No |

Information from the Coal Authority

Underground Coal Mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at shallow to 120m depth, and last worked in 1929.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

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© The Coal Authority CON29M Non-Residential 00052445-10 The property is not in an area that is likely to be affected at the surface from any planned future workings.

However reserves of coal exist in the local area which could be worked at some time in the future.

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

Within, or within 20 metres of, the boundary of the property there are 10 mine entries, the approximate positions of which are shown on the attached plan.

Coal Authority records disclose the following information:

418427-005. No treatment details.

417427-001. No treatment details.

417427-002. No treatment details.

417427-015. No treatment details.

417427-005. after collapsing in 1997 was plugged with mass concrete by IMC Ltd. on behalf of the Coal Authority in September 1997 $\,$.

418427-011. No treatment details.

417427-004. No treatment details.

417427-003. No treatment details.

417427-014. No treatment details.

417427-016. No treatment details.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

The Authority is not aware of any evidence of damage arising due to geological faults or other lines of weakness that have been affected by coal mining.

Opencast Coal Mining

Past

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

Present

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 1 January 1984. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

Hazards related to coal mining

The property has been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

Withdrawal of Support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not in an area for which an Order has been made under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

Payments to Owners of Former Copyhold Land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/ former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

The attached plan shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan. Property owners have the benefit of statutory protection (under the Coal Mining Subsidence act 1991*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848 or online at www.coal.gov.uk/services/subsidence. If you wish to discuss the relevance of any of the information contained in this report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source

plans from which the information has been taken these are normally available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637233. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

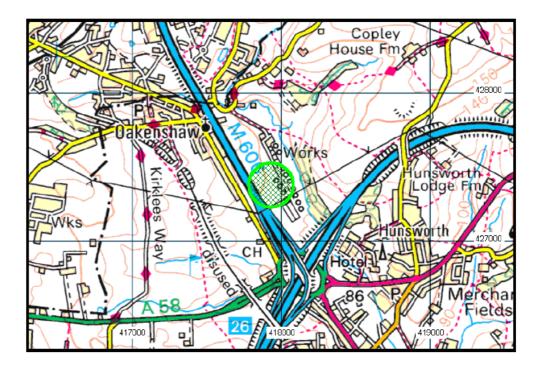
This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

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Location map



Approximate position of property



Enquiry boundary

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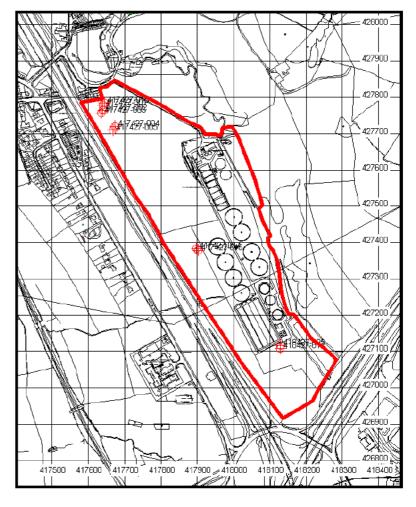


Approximate position of enquiry boundary shown



Disused Adit or Mineshaft

⇒ ⊕





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Printed: 24 Nov 2010

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APPENDIX III

Borehole Logs

| *** } | wardell armstrong | | | | | | Site North Bierley WWTW | | Nu | orehole umber BH1 |
|---|-------------------------------|-------------------------------------|-----------------------|-----------------|---------------------|-----------------------------|--|--|---------------|-------------------------|
| Boring Meth Cable Percu | | Casing | Diamete | r | Ground | Level (mOD) | Client KeyLand Developments | | | ob umber 110534 |
| | | Location See Drawing SH10534-002 | | | Dates 16/05/2011 | | Engineer M Kelly | | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| | | | | | | (0.15) 0.15 | Loose dark brown slightly clayey SAND (TOPSOIL). | | | · · · · · · |
| 0.20 0.30-0.80 | D1 B2 | | | | | (0.65) | Firm dark brown sandy gravelly CLAY. Gravel of angular-subrounded sandstone and coal fragments. | | | |
| 0.80 0.85-1.20 | D3 B4 | | | | | | Firm orange brown sandy CLAY. | | | |
| 1.20-1.65 | U5 | | | 68 blows | | (1.10) | | | | |
| 1.70 1.90 | D6 D7 | | | | | L 1.90 | | | | |
| 2.00-2.45 | U8 | | | 83 blows | | | Firm-Stiff brown sandy gravelly CLAY. Gravel of angular-subrounded sandstone and shale. | | 0 11 10 1 1 1 | |
| 2.50 2.50-3.00 | D9 B10 | | | | | | | ************************************** | 2 2 11 12 E | |
| 3.00-3.20 3.00-3.20 | B11 U | | | 100 blows | | | | | | |
| 3.50-3.95 | U12 | | | 100 blows | | (3.20) | | | | |
| 4.00 | D10 | | | | | E_ | | | | |
| 4.00 | D13 | | | | | | | | | |
| 4.50-4.95 4.50-4.95 4.50-5.00 | SPT N=53 S14 B15 | | | 5,8/9,11,14,19 | | | | | | |
| 5.10 5.20-5.65 5.20-5.65 5.20-6.10 | D16 SPT N=52 S18 B17 | | | 4,9/10,12,14,16 | | 5.10 | Dense grey sandy GRAVEL of weatehred sandstone, mudstone and shale. | | | |
| | | | | | | | | , | | |
| 6.10 6.20-6.65 6.20-6.40 | D19 SPT N=50 S20 | | | 16,9/31,19 | | 6.10 (0.30) 6.40 | Strong orange brown grey SANDSTONE. | | | |
| | | | | | | | Complete at 6.40m | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| Remarks | | | | | | | | Scale (approx) | Lo | ogged |
| | | | | | | | | 1:50 | | , Kelly |
| | | | | | | | | Figure N SH10 | | BH1 |

| Boring Method Cable Percussion Depth (m) Sample / Tests 0.20 D1 0.50-1.00 B2 1.20-1.65 SPT(C) N=13 C C SPT(C) N=13 C C SPT(C) N=13 C C SPT(C) N=50 C SPT(C) N=50 C SPT(C) N=50 C SPT(C) N=50 C SPT(C) N=50 SPT N=18 S50-3.95 SPT N=18 S9 S0-4.90 | Casing Diamete Location See Drawir Casing Depth (m) Water Depth (m) | r Ig SH10534-002 Field Records 1,2/3,3,3,4 4,7/11,18,21 | Dates | Level (mOD) | KeyLand Developments Engineer M Kelly Description Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Soft brown sandy gravelly CLAY. Gravel of sandstone aggregate, sandstone and brick. | Job Number SH1053 Sheet 1/1 Legend |
|---|---|---|----------------|--|---|---|
| (m) Sample / Tests 0.20 D1 0.50-1.00 B2 1.20-1.65 SPT(C) N=13 C B3 1.20-1.65 C 1.20-1.65 SPT(C) N=50 C B5 2.00-2.45 SPT(C) N=50 C B5 2.00-2.60 B5 2.60 D6 B7 3.40 B8 3.50-3.95 3.50-3.95 SPT N=18 S9 | See Drawir | Field Records | 16 17 | 7/05/2011 Depth (m) (Thickness) | M Kelly Description Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Soft brown sandy gravelly CLAY. Gravel of sandstone aggregate, sandstone and brick. | 1/1 |
| (m) Sample / Tests 0.20 D1 0.50-1.00 B2 1.20-1.65 SPT(C) N=13 C B3 1.20-1.65 C 1.20-1.65 SPT(C) N=50 C B5 2.00-2.45 SPT(C) N=50 C B5 2.00-2.60 B5 2.60 D6 B7 3.40 B8 3.50-3.95 3.50-3.95 SPT N=18 S9 | Casing Depth Depth (m) | 1,2/3,3,3,4 | Level (mOD) | (ṁ) (Thickness) | Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Soft brown sandy gravelly CLAY. Gravel of sandstone aggregate, sandstone and brick. | Legend |
| 0.50-1.00 B2 1.20-1.65 SPT(C) N=13 1.20-1.65 C 1.20-1.70 B3 1.70 D4 2.00-2.45 SPT(C) N=50 2.00 C 2.00-2.60 B5 2.60 D6 2.60-3.40 B7 3.40 D8 3.50-3.95 SPT N=18 3.50-3.95 S9 | | | | (0.15) 0.15 (1.55) | MADE GROUND: Soft brown sandy gravelly CLAY. Gravel of sandstone aggregate, sandstone and brick. | |
| 4.50-4.90 U11 4.90 D12 5.20-5.65 U13 5.70 D14 5.70 D14 5.20-5.65 U13 5.70 D14 5.20-5.65 U13 5.70 D14 5.20-6.40 U 5.40-6.50 D15 5.60-7.05 SPT N=30 5.60-7.10 S16 B17 S16 7.60-8.00 S18 7.60-8.10 B19 3.40 D20 3.50-8.95 SPT N=50 3.50-8.80 B21 | | 2,3/4,4,5,5 100 blows 78 blows 5,7/8,6,8,8 3,9/9,11,12,18 17,8/38,12 | | (0.15) 0.15 0.15 (1.55) 1.70 (0.90) 1.70 (0.90) 1.70 (0.90) 1.70 (0.80) 1.40 (1.40) (1.40) (1.40) (1.90) (1.90) (1.90) (1.90) (0.40) 8.40 (0.40) 8.80 | MADE GROUND: Dense grey brown slightly clayey sandy gravel of sandstone, mudstone, coal fragments and rare brick with cobbles and boulders of sandstone and mudstone. MADE GROUND: Concrete. MADE GROUND: Medium Dense grey sandy gravel of shale. Firm-Stiff orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Stiff orange brown mottled grey slightly cobbly gravelly very sandy CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Stiff orange brown mottled grey slightly cobbly gravelly very sandy CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Stiff orange brown mottled grey slightly cobbly gravelly very sandy CLAY with rare boulders. Storng orange brown weathered SANDSTONE. Complete at 8.80m | |
| Remarks | | | | | Scale (approx) | Logged By |
| | | | | | 1:50 Figure | M Kelly |

W20

| | wardell armstrong | | | | | | Site North Bierley WWTW | Borehole Number BH3 | |
|---|--|------------------------|-------------------------------------|--|---------------------|--|--|----------------------------|--|
| Boring Meth Cable Percu | | Casing | Diamete | r | Ground | Level (mOD) | Client KeyLand Developments | Job Number SH10534 | |
| | | | Location See Drawing SH10534-002 | | Dates 17/05/2011 | | Engineer M Kelly | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Kegend Sate | |
| 0.20 0.50-1.00 1.10 1.10-1.70 1.20-1.65 1.70 2.10-2.30 2.30-2.70 2.70 3.30-3.75 3.80 4.30-4.40 4.30-4.40 4.30-4.70 4.70-5.15 4.70-5.15 4.70-5.15 5.70-6.15 5.70-6.15 5.70-6.15 5.70-6.20 6.70-7.15 6.70-7.00 6.70-7.05 7.60-8.05 7.60-7.75 | D1 B2 D3 B6 U4 D5 D7 U8 D9 U10 D11 U B12 SPT N=20 S13 B14 SPT N=20 S13 B14 SPT N=20 S13 B14 SPT N=20 S13 B14 SPT N=50 B18 S17 D19 SPT N=50 S21 | | | 54 blows 100 blows 95 blows 2,3/5,4,5,6 3,4/4,6,6,8 3,6/8,9,33 20,5/50 | | (0.20) 0.20 (0.90) 1.10 (6.50) 7.75 | Loose dark brown slightly clayey SAND (TOPSOIL). Firm orange brown mottled grey slightly cobbly gravelly very sandy CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Firm-Stiff orange brown mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Very sandy with increasing gravel and cobbles from 3.5m. Strong brown SANDSTONE. Complete at 7.75m | | |
| Remarks | | | | | | | Scale (approx | | |
| | | | | | | | 1:50 Figure SH1 | M Kelly No. 0534.BH3 | |

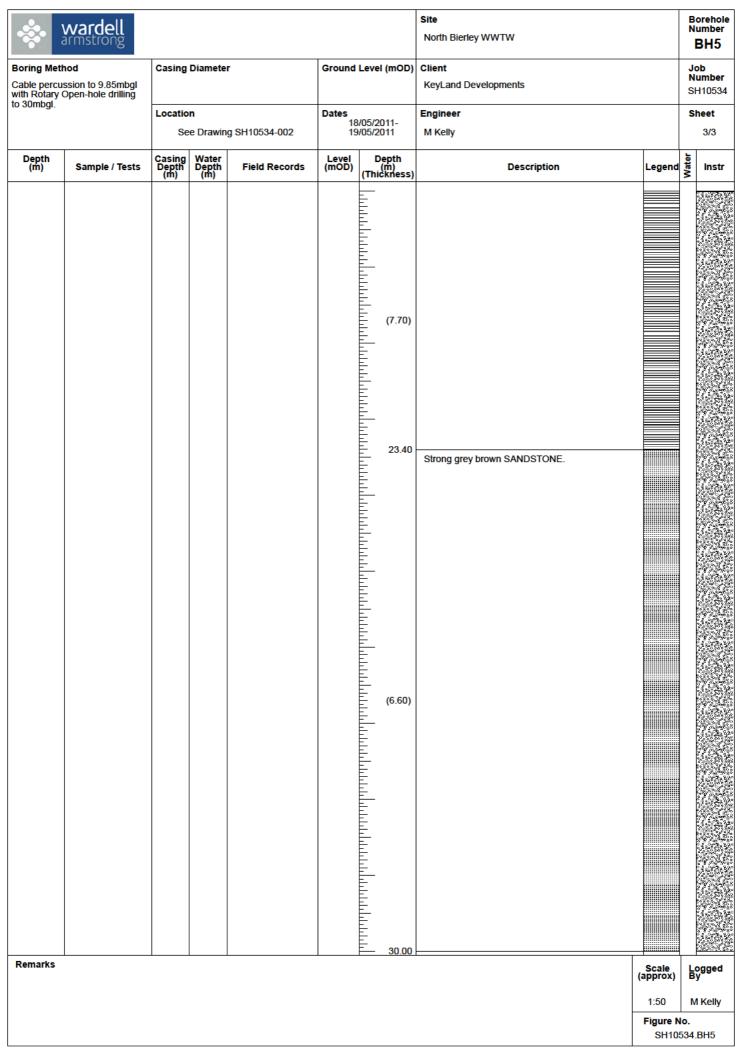
| | wardell | | | | | | Site North Bierley WWTW | Boreh Numb BH | ber |
|------------------------|--------------------------------------|-------------------------|-----------------------|---------------|---------------------------|--|---|---------------------|-------|
| Boring Meth | od | Casing | Diamete | r | Ground | Level (mOD) | Client | Job Numb | per |
| vith Rotary C | ssion to 9mbgl Open-hole drilling | | | | | | KeyLand Developments | SH10 | |
| o 30mbgl. | | Locatio | n | | Dates | 7/05/0044 | Engineer | Sheet | t |
| Depth Oracle (Teste | | See Drawing SH10534-002 | | | 17/05/2011- 19/05/2011 | | M Kelly | | 3 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | d |
| | | | | | | (0.15) | Loose dark brown slightly clayey SAND (TOPSOIL). | | 5 |
| .20 | D1 | | | | | 0.15 | MADE GROUND: Firm orange brown sandy gravelly clay. Gravel of sandstone, mudstone, coal fragments, shale and | | ŝ |
| 0.50 | B2 | | | | | (0.15) 0.15 | brick. | | XXXXX |
| | | | | | | | | | XXXXX |
| .20-1.65 | SPT(C) N=45 | | | 4,6/9,9,11,16 | | | | | XXXX |
| .20 .20-1.00 | B3 C | | | | | (2.85) | | | XXXX |
| | | | | | | | | | XXXX |
| 2.00-2.40 | B4 | | | | | | | | XXXX |
| 2.40 | D5 | | | 00 blave | | | | | XXXX |
| 2.50-2.95 | U6 | | | 80 blows | | | | | XXXX |
| .00 | D7 | | | | | 3.00 | MADE GROUND: Soft-Firm grey orange brown sandy | | XXEX |
| | | | | | | | gravely clay. Gravel of sandstone, mudstone, coal fragments and rare | | |
| .50-3.95 .50-3.95 | SPT(C) N=12 C | | | 1,2/3,2,3,4 | | | brick with organic debris observed at 6.3m. | | XXXX |
| .50-4.00 | B8 | | | | | | | | 222 |
| | | | | | | | | | 22 |
| .50-4.95 | U9 | | | 62 blows | | | | | XXXX |
| 1.30-4.95 | 09 | | | 62 DIOWS | | | | | XXXX |
| 5.00 | D10 | | | | | (4.20) | | | XXXX |
| | | | | | | F | | | |
| 5.50-5.95 5.50-5.95 | SPT(C) N=12 C | | | 2,2/2,3,3,4 | | | | | XXXX |
| 5.50-6.00 | B11 | | | | | | | | XXXX |
| | | | | | | | | | XXXX |
| .50-6.95 | U12 | | | 85 blows | | | | | |
| | | | | | | | | | |
| .00 | D13 | | | | | - - - 7.20 | | | XXXX |
| 7.20 7.20-7.60 | D14 B15 | | | | | | Firm-Stiff orange brown mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. | · · · · · · | |
| .30-7.75 | U16 | | | 80 blows | | (0.90) | Gravel, cobbles and boulders of angular-subrounded sandstone. | | - |
| 7.80 | D17 | | | | | | | | |
| 3.10 3.20-8.40 | D18 U | | | 100 blows | | 8.10 | Stiff orange brown mottled grey sandy gravelly CLAY. Gravel of angular-subrounded mudstone and shale. | <u>.</u> | |
| 3.20-8.70 | B19 | | | | | (0.60) | | <u> </u> | |
| 3.70-9.15 3.70 | SPT N=50 D20 | | | 7,11/22,28 | | 8.70 | Weak grey MUDSTONE. | | |
| 3.70-9.00 | S21 | | | | | | | | |
| | | | | | | | | | |
| | | | | | | T. 7.20 | | | |
| | | | | | | F | | | |
| Remarks | | | | | | | Scale (approx) | Logge By | ad |
| | | | | | | | 1:50 | M Kel | lly |
| | | | | | | | Figure | No. | |

| Independencies of single statistication of singl | *** \ | wardell Irmstrong | | | | | | Site North Bierley WWTW | | Borehole Number BH4 |
|---|-------------------------------|----------------------|------------------------|-----------------------|---------------|----------------|-----------------------------|----------------------------|-----------------|---------------------------|
| Some of the second se | Cable percus vith Rotary C | | Casing | Diamete | r | Ground | Level (mOD) | | | Job Number SH10534 |
| Remarks Image: Strong grey MUDSTONE with satisfune bands. Image: Strong grey MUDSTONE with satisfune bands. Image: Strong grey MUDSTONE with satisfune bands. | o 30mbgl. | | | | g SH10534-002 | 17 | 7/05/2011- 9/05/2011 | | | |
| Remarks | Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | | Legend |
| (approx) By 950 1:50 M Kelly | | | | | | | | | S. | |
| | Remarks | | | | | | | (ar | Scale pprox) | Logged By |
| | | | | | | | | | | M Kelly |

| | wardell rmstrong | | | | | | Site North Bierley WWTW | | Borehol Number BH4 |
|---|--|------------------------|-----------------------|---------------|-------------------|-----------------------------|--------------------------------|-------------------|--------------------------|
| oring Metho able percuss ith Rotary O | od sion to 9mbgl pen-hole drilling | Casing | Diameter | r | Ground | Level (mOD) | Client KeyLand Developments | | Job Number SH1053 |
| 30mbgl. | | Location Se | | g SH10534-002 | Dates 17 19 | 7/05/2011- 9/05/2011 | Engineer M Kelly | | Sheet 3/3 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | | Legend |
| Remarks | | | | | | | Strong grey brown SANDSTONE. | Scale | |
| lemarks | | | | | | | | Scale (approx) | Logged By |
| | | | | | | | | 1:50 | M Kelly |
| | | | | | | | | Figure N | lo. 534.BH4 |

| | wardell armstrong | | | | | | Site North Bierley WWTW | | Ν | orehole umber BH5 |
|---|--|------------------------|-----------------------|---------------|----------------|-----------------------------|---|--------------------------|-------|--|
| with Rotary (| nod ssion to 9.85mbgl Open-hole drilling | Casing | Diamete | r | Ground | l Level (mOD) | Client KeyLand Developments | | Ν | ob umber H10534 |
| to 30mbgl. | | Locatio Se | | g SH10534-002 | | 8/05/2011- 9/05/2011 | Engineer M Kelly | | S | heet 1/3 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 0.20 0.50-1.00 | D1 B2 | | | | | (0.10) 0.10 | Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Medium Dense brown slightly clayey gravelly cobbly sand. | | | * 0 • • • • • • |
| 1.20-1.65 1.20-1.65 1.20-1.70 | SPT(C) N=25 C B3 | | | 4,5/7,7,5,6 | | | Gravel and cobbles of brick, concrete, mudstone and sandstone. | | | |
| 2.20-2.65 2.20-2.65 2.20-2.70 | SPT(C) N=13 C B4 | | | 1,3/2,3,3,5 | | (5.10) | | | | |
| 2.95 3.20-3.50 3.20-3.50 | W6 B5 U | | | 100 blows | | | | | | |
| 4.00-4.45 4.00-4.45 4.00-4.50 | SPT(C) N=8 C B7 | | | 2,1/2,1,2,3 | | | | | | |
| 5.00-5.45 5.00-5.45 5.00-5.50 5.30 | SPT(C) N=10 C B8 D9 | | | 1,1/2,2,3,3 | | 5.20 | MADE GROUND: Soft dark grey clayey silt with a little organic debris. | | | |
| 5.70-6.15 5.80-6.50 | U10 B12 | | | 58 blows | | 5.80 | Firm-Stiff orange brown mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | | | |
| 6.20 6.70-7.15 | D11 U13 | | | 87 blows | | (1.70) | | | | |
| 7.20 7.50 7.70-8.15 | D14 D15 U16 | | | 93 blows | | (0.50) 8.00 | Stiff brown mottled grey sandy gravelly CLAY. Gravel of angular-subrounded mudstone and shale. | | | |
| 8.20 8.50-8.95 8.50-8.95 8.50-9.00 | D17 SPT N=41 S18 B19 | | | 4,8/9,8,10,14 | | (0.60) | Stiff dark brown mottled grey sandy gravelly CLAY. Gravel of angular-subrounded sandstone. | | | |
| 9.50-9.95 9.50-9.85 | SPT N=50 S20 | | | 9,13/16,18,16 | | 9.40 | Weak grey brown MUDSTONE. | | | |
| Remarks | L | 1 | | I | 1 | <u> </u> | | Scale (approx) | L | ogged y |
| | | | | | | | | 1:50 Figure N SH10 | lo. | I Kelly .BH5 |

| Indee yoursetsion 10 3 65mg Indee yourset Review Engineer Review Image: Sec 10 and Sec 10 | ke wardel | ll g | | | | | | Site North Bierley WWTW | | Nu | orehole umber BH5 |
|---|--|---------|------------------------|-----------------------|---------------|-------------------|-----------------------------|---|--------|-------|-------------------------|
| Location Date: Instruction Description Serie (France) Operation Technology Technology <t< th=""><th>Boring Method Cable percussion to 9.85 with Rotary Open-hole dri o 30mbol</th><th>I</th><th>Casing I</th><th>Diameter</th><th>r</th><th>Ground</th><th>Level (mOD)</th><th></th><th></th><th>Nu</th><th>umber</th></t<> | Boring Method Cable percussion to 9.85 with Rotary Open-hole dri o 30mbol | I | Casing I | Diameter | r | Ground | Level (mOD) | | | Nu | umber |
| Remarks | o oombyi. | L | | | g SH10534-002 | Dates 18 19 | 8/05/2011- 9/05/2011 | | | Sł | |
| Remarks | Depth (m) Sample / ` | Tests I | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 1:50 M Kelly Figure No. | Remarks | | | | | | (6.30) | Medium Strong grey MUDSTONE with siltstone bands. | | | |
| Figure No. | Remarks | | | | | | | | | | |
| | | | | | | | | | | | Kelly |



| | wardell armstrong | | | | | | Site North Bierley WWTW | | Borehole Number BH6 |
|--|---|------------------------|-----------------------|-------------------------|----------------|----------------------------------|--|-------------------|---------------------------|
| with Rotary C | od ssion to 10.7mbgl Open-hole drilling | Casing | Diamete | r | Ground | Level (mOD) | Client KeyLand Developments | | Job Number SH10534 |
| to 30mbgl. | | Locatio Se | | g SH10534-002 | | 8/05/2011- 0/05/2011 | Engineer M Kelly | | Sheet 1/2 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Nate Instr |
| 0.25 0.50-1.00 | D1 B2 | | | | | (0.10) 0.10 | Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Medium Dense brown slightly clayey gravelly cobbly sand. Gravel and cobbles of brick, concrete, mudstone | | |
| 1.20-1.65 | SPT(C) N=18 | | | 244255 | | | Gravel and cobbles of brick, concrete, mudstone and sandstone. | | |
| 1.20-1.65 1.20-1.70 1.80 | C B3 D4 | | | 3,4/4,3,5,6 | | | | | |
| 2.20-2.65 2.20-2.52 2.20-2.90 | SPT(C) N=50 C B5 | | | 3,5/6,20,24 | | (4.90) | | | |
| 3.20-3.60 3.60 | U6 D7 | | | 100 blows | | | | | |
| 4.20-4.65 4.20-4.65 4.20-4.70 4.80 | SPT(C) N=23 C B8 D9 | | | 3,3/4,4,7,8 | | | | | |
| 5.20-5.65 5.20-5.65 5.20-5.70 | SPT(C) N=15 C B10 | | | 1,1/2,4,4,5 | | | MADE GROUND: Firm orange grey brown sandy gravelly CLAY. Gravel and cobbles of mudstone and sandstone. | | |
| 6.20-6.65 6.20-6.65 6.20-6.70 | SPT(C) N=15 C B11 | | | 3,2/4,3,4,4 | | | | | |
| 6.90 7.00-7.45 | D12 U13 | | | 61 blows | | 6.90 | MADE GROUND: Firm grey brown slightly gravelly sandy CLAY. Gravel of shale. | ' | |
| 7.50 | D14 | | | | | (1.50) | | | |
| 8.00-8.45 8.00-8.40 8.00-8.45 8.40 8.50-8.95 | SPT(C) N=19 B15 C D16 U17 | | | 2,3/3,4,6,6 90 blows | | 6.90 (1.50) 8.40 (2.10) | Stiff orange brown mottled grey sandy gravelly CLAY. | | |
| 9.00 9.00-9.50 | D18 B19 | | | | | | Gravel of angular-subrounded sandstone. | | |
| 9.50-9.85 9.85 | U20 D21 | | | 100 blows | | (2.10) | | | |
| Remarks | UZI | | | | 1 | F | 1 | | 2.5 J. 6. 6. |
| Nemains | | | | | | | | Scale (approx) | Logged By |
| | | | | | | | | 1:50 Figure N | M Kelly |
| | | | | | | | | - | 534.BH6 |

| | wardell rmstrong | | | | | | Site North Bierley WWTW | | Nu | orehole umber 3H6 |
|--|---|------------------------|-----------------------|---------------|-------------------|--|---|------------------|----------|-------------------------|
| Boring Mether Cable percus with Rotary O | od sion to 10.7mbgl pen-hole drilling | Casing | Diamete | r | Ground | Level (mOD) | Client KeyLand Developments | | | ob umber 110534 |
| to 30mbgl. | | Locatio Se | | g SH10534-002 | Dates 18 20 | 3/05/2011- 0/05/2011 | Engineer M Kelly | | Sh | 2/2 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 10.40-10.85 | SPT N=50 S22 | | | 10,14/25,25 | | (2.10) 10.50 (0.20) 10.70 (0.60) 11.30 (5.40) 16.70 | Medium Strong brown SANDSTONE. Weak brown grey weathered MUDSTONE. Soft ground; possible workings. Complete at 16.70m | | | |
| Remarks | | 1 | | | 1 | 1 | (4 | Scale approx) | Lo By | ogged / |
| | | | | | | | - | 1:50 Figure N | | Kelly |
| | | | | | | | | SH105 | | BH6 |

| -\$*• } | wardell armstrong | | | | | | Site North Bierley WWTW | | N | orehole umber BH7 |
|--|---|------------------------|-----------------------|--|----------------|--|--|-------------------|---------|-------------------------|
| Boring Meth Cable Percus | | Casing | Diamete | r | Ground | Level (mOD) | Client KeyLand Developments | | N | ob umber H10534 |
| | | Location See | | g SH10534-002 | Dates 19 | 9/05/2011 | Engineer M Kelly | | Sł | heet 1/1 |
| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 0.30 0.50-1.00 1.20-1.65 1.70 2.20-2.65 2.70 3.20-3.35 3.20-3.60 3.60-4.05 4.10 4.30 5.00 5.50-5.85 6.00 6.00-6.50 6.30-6.70 6.90 7.10-7.40 7.40-7.85 7.40 7.40-7.80 | D1 B2 U3 D4 D5 U6 D7 U8 U9 D10 D11 B12 U13 D14 U15 D16 B17 U18 D19 U20 SPT N=50 D21 S22 | | | 88 blows 77 blows 100 blows 100 blows 100 blows 100 blows 100 blows 6,8/10,12,15,13 | | (0.30) 0.30 (0.4.00) (4.00) (1.70) (1.40) 7.80 | Loose dark brown slightly clayey SAND (TOPSOIL). MADE GROUND: Firm-Stiff orange brown mottled grey sandy gravelly CLAY. Gravel of sandstone, mudstone, shale, ash and brick. MADE GROUND: Medium Dense dark grey slightly clayey sandy gravel of mudstone and shale. Stiff orange brown mottled grey sandy gravelly CLAY. Gravel of angular-subrounded sandstone and shale. Medium Strong brown grey weathered SANDSTONE. Complete at 7.80m | | | |
| Remarks | | | | | <u> </u> | <u>F</u> | 1 | Scale (approx) | Lc B | ogged y |
| | | | | | | | | 1:50 | | I Kelly |
| | | | | | | | | Figure N SH10 | | BH7 |



APPENDIX IV

Windowless Sample Logs

| *** } | wardell armstrong | | | | | Site North Bierley WWTW | Number WS101 |
|----------------------------|-----------------------|-----------------------|---------------------|----------------|-----------------------------|--|-----------------------------|
| Excavation Drive-in Win | Method dow Sampler | Dimensi | ons | Ground | Level (mOD) | Client KeyLand Developments | Job Number SH10534 |
| | | Location See | Drawing SH10534-002 | Dates 16 | 6/05/2011 | Engineer M Kelly | Sheet 1/1 |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend Safe |
| 0.40 | D | | | | | Loose brown slightly gravelly slightly clayey SAND (TOPSOIL). Gravel of sandstone aggregate, rare brick and concrete. MADE GROUND: Loose-Medium Dense light grey slightly sandy cobbly gravel of concrete. Firm brown slightly gravelly sandy CLAY. Gravel of angular-subrounded sandstone and mudstone. | |
| Remarks | | | | | | Scale (approx | |
| | | | | | | 1:40 Figure SH10 | M Kelly No. 534.WS101 |

| • | wardell armstrong | | | | | Site North Bierley WWTW | | | umber S102 |
|----------------------------|------------------------|-----------------------|---------------------|----------------|--|---|-------------------|----------|------------------------------|
| Excavation Drive-in Wir | Method ndow Sampler | Dimensi | ons | Ground | Level (mOD) | Client KeyLand Developments | | | b umber 110534 |
| | | Location See | Drawing SH10534-002 | Dates 16 | 6/05/2011 | Engineer M Kelly | | Sł | neet 1/1 |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 0.70 | D | | | | (0.10) 0.10 0.10 0.10 0.15 0.25 (0.15) 0.40 (0.20) 0.60 (0.40) 1.00 | Loose brown slightly clayey SAND (TOPSOIL). MADE GROUND: Loose grey slightly sandy grave of limestone aggregate. MADE GROUND: Dense red gravelly cobbles of brick. MADE GROUND: Medium strong orange fine grained sandstone. Firm dark grey slightly gravelly sandy CLAY. Gravel of coal fragments. Soft brown slightly sandy slightly gravelly CLAY. Gravel of angular-subrounded sandstone. Soft orange sandy gravelly CLAY. Gravel of angular-subrounded sandstone, mudstone and coal fragments. Soft-Firm orange mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone, mudstone and coal fragments. Stiff grey slightly sandy gravelly CLAY. Gravel of angular-subrounded mudstone. Weak grey MUDSTONE. Complete at 5.00m | | | |
| Remarks | 1 | I | | _1 | | | Scale (approx) | Lo By | ogged / |
| | | | | | | | 1:40 Figure N | | Kelly |
| | | | | | | | SH1053 | | S102 |

| | wardell rmstrong | | | | | Site North Bierley WWTW | Numbe | |
|-------------------------------|---------------------|-----------------------|---------------------|----------------|-----------------------------|--|------------------------|-------|
| Excavation M Drive-in Wind | | Dimensi | ons | Ground | Level (mOD) | Client KeyLand Developments | Job Numbe SH1053 | |
| | | Location See | Drawing SH10534-002 | Dates 16 | 6/05/2011 | Engineer M Kelly | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
| 0.30 | D | | | | (0.40) | MADE GROUND: Firm brown slightly sandy gravelly clay. Gravel of sandstone aggregate, brick, sandstone and concrete. Firm brown sandy gravelly CLAY. Gravel of angular-subrounded sandstone, mudstone and coal fragments. Increasing strength with depth. Decreasing sand with depth. | | |
| Remarks | | | | | | Scale (approx) | Logged By | đ |
| | | | | | | 1:40 | M Kelly | |
| | | | | | | Figure I | No. 34.WS103 | |

| Example De number de la construit de la constr | | wardell armstrong | | | | | Site North Bierley WWTW | | | ^{umber} S104 |
|--|--------------|----------------------|-----------------------|---------------|----------------|--|--|-------------------|-------|--------------------------|
| Note Note <th< th=""><th></th><th></th><th>Dimensi</th><th>ons</th><th>Ground</th><th>Level (mOD)</th><th></th><th></th><th>N</th><th>umber</th></th<> | | | Dimensi | ons | Ground | Level (mOD) | | | N | umber |
| 0.40 D 0.40 D MADE CACOUND. Firm thrown slightly sandy gravely classes, sandstone aggregate and gravely classes, sandstone and gravely classes, | | | | | Dates 16 | 6/05/2011 | | | SI | |
| 0.40 D D Image: Constraint of the constraint o | Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| (approx) By 1:40 M Kelly | 0.40 | D | | | | 0.75 (0.75) 1.50 (0.30) 1.80 (2.70) 4.50 (0.50) 5.00 | gravelly clay. Gravel of sandstone, sandstone aggregate and mudstone. MADE GROUND: Soft black slightly sandy gravelly clay. Gravel of angular-subangular mudstone. Soft-Firm dark grey slightly sandy gravelly CLAY. Gravel of angular-subangular mudstone. Firm orange mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. Firm orange mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. Firm grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. | | | |
| | Remarks | | | | | <u>F</u> | | Scale (approx) | Lo | ogged y |
| SH10534.WS104 | | | | | | | | Figure N | lo. | - |

| -\$* | wardell armstrong | | | | | Site North Bierley WWTW | | | ^{umber} S105 |
|----------------------------|-----------------------|-----------------------|---------------------|----------------|-----------------------------|--|-------------------|----------|--------------------------|
| Excavation Drive-in Win | Method dow Sampler | Dimensi | ons | Ground | Level (mOD) | Client KeyLand Developments | | N | ob umber 110534 |
| | | Location See | Drawing SH10534-002 | Dates 16 | 6/05/2011 | Engineer M Kelly | | SI | heet 1/1 |
| Depth (m) | Sample / Tests | Water Depth (M) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 0.30 | D | | | | | MADE GROUND: Soft grey slightly sandy gravelly clay. Gravel of sandstone, sandstone aggregate, wood fragments, mudstone and rare brick. Firm orange brown mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone and rare coal fragments. Soft-Firm grey slightly sandy gravelly CLAY. Gravel of angular-subangular mudstone. Weak light grey MUDSTONE. Complete at 4.00m | | | |
| Remarks | 1 | | | .1 | <u> </u> | | Scale (approx) | Lo Bj | ogged y |
| | | | | | | - | 1:40 Figure M | | l Kelly |
| | | | | | | | SH105 | | /S105 |

| | wardell armstrong | | | | | Site North Bierley WWTW | Numb WS1 | |
|-------------------------------|-----------------------|-----------------------|---------------------|----------------|----------------------------------|---|-------------------------|---|
| Excavation I Drive-in Wine | Method dow Sampler | Dimensio | ns | Ground | Level (mOD) | Client KeyLand Developments | Job Numb SH105 | |
| | | Location See | Drawing SH10534-002 | Dates 16 | 6/05/2011 | Engineer M Kelly | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
| 0.50 | D | | | | (1.40) | MADE GROUND: Loose brown slightly clayey sandy gravel of sandstone, sandstone aggregate, mudstone and rare brick. | | MAXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX |
| | | | | | 1.40 (0.10) 1.50 (0.80) | MADE GROUND: Loose dark grey black slightly clayey slightly sandy gravel of shale. | | 222022222222222222222222222222222222222 |
| | | | | | (1.30) | Firm orange brown mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone, mudstone and coal fragments. Very stiff grey slightly sandy gravelly CLAY. Gravel of angular-subangular mudstone. | | |
| | | | | | - (0.40) - 4.00 | Complete at 4.00m | | - |
| | | | | | | | | |
| Remarks | | | | | | Scale (approx) | Logge By | |
| | | | | | | 1:40 Figure I SH105 | M Kel No. 34.WS10 | - |

| | wardell armstrong | | | | | Site North Bierley WWTW | | | ^{umber} /S107 |
|----------------------------|------------------------|-----------------------|---------------------|----------------|--|--|-------------------|--------------|---------------------------|
| Excavation Drive-in Win | Method Idow Sampler | Dimensi | ons | Ground | Level (mOD) | Client KeyLand Developments | | N | ob umber H10534 |
| | | Location See | Drawing SH10534-002 | Dates 17 | 7/05/2011 | Engineer M Kelly | | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Water Depth (M) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
| 0.50 | D | | | | (0.15) 0.15 (1.85) (1.85) (1.70) (1.70) (1.10) (0.20) 5.00 | Loose brown slightly clayey slightly gravelly SAND (TOPSOIL). Gravel of sandstone, sandstone aggregate, mudstone and rare brick. MADE GROUND: Firm brown slightly sandy gravely CLAY. Gravel of shale, sandstone, mudstone and rare brick. MADE GROUND: Loose black slightly clayey slightly sandy gravel of shale. Soft-Firm orange brown mottled grey slightly sandy slightly gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. Medium Dense orange brown sandy GRAVEL of angular-subrounded fine grained sandstone. Complete at 5.00m | | | |
| Remarks | | | | | | | Scale (approx) | B | ogged y |
| | | | | | | - | 1:40 Figure I | | I Kelly |
| | | | | | | | SH105 | | /S107 |

| | wardell armstrong | | | | | Site North Bierley WWTW | Numb WS1 | |
|----------------------------|-----------------------|-----------------------|---------------------|----------------|-----------------------------|--|------------------------|-------|
| Excavation Drive-in Win | Method dow Sampler | Dimensio | ns | Ground | Level (mOD) | Client KeyLand Developments | Job Numb SH105 | |
| | | Location See [| Drawing SH10534-002 | Dates 17 | 7/05/2011 | Engineer M Kelly | Sheet 1/1 | |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
| 0.40 | D | | | | | MADE GROUND: Loose black slightly clayey gravelly sand. Gravel of sandstone aggregate, brick, tarmac and concrete. MADE GROUND: Firm orange brown slightly sandy gravelly CLAY. Gravel of shale, sandstone, mudstone and rare brick. | | |
| Remarks | <u> </u> | | | | <u> </u> | Scale (approx) | Logge By | ad |
| | | | | | | 1:40 | M Kel | ly |
| | | | | | | Figure SH105 | No. 534.WS10 | 38 |

| * | wardell armstrong | | | | | Site North Bierley WWTW | Numb WS1 | |
|----------------------------|-----------------------|-----------------------|---------------------|----------------|-----------------------------|--|--|-------|
| Excavation Drive-in Win | Method dow Sampler | Dimensio | ns | Ground | Level (mOD) | Client KeyLand Developments | Job Number SH10534 Sheet 1/1 | |
| | | Location See | Drawing SH10534-002 | Dates 17 | 7/05/2011 | Engineer M Kelly | | |
| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
| 0.70 | D | | | | | MADE GROUND: Medium Dense orange brown slightly clayey sandy gravel of sandstone aggregate, sandstone and tarmac. MADE GROUND: Soft brown sandy gravelly CLAY. Gravel of coal, mudstone, sandstone and very rare brick. MADE GROUND: Dense orange slightly clayey sandy cobbly gravel of sandstone. Complete at 2.00m | | |
| Remarks | | | | | <u> </u> | Scal (appro | e Logge x) By | ed |
| | | | | | | 1:40 | M Kel | |
| | | | | | | | e No. 0534.WS10 |)9 |

| wardell armstrong | | | | | Site North Bierley WWTW | | Num WS | | |
|--|-----------------------|---------------------|---|-----------------------------|---|-------------------|--------------------|------|--|
| Excavation Method Drive-in Window Sampler | Dimensio | ns | Ground Level (mOD) Client KeyLand Developments | | | | Job Num SH10 | | |
| | Location See | Drawing SH10534-002 | Dates 17 | 7/05/2011 | Engineer M Kelly | | Sheet 1/1 | | |
| Depth (m) Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | nstr | |
| 0.60 D | | | | | Soft black slightly sandy CLAY (TOPSOIL). Soft-Firm brown slightly sandy slightly gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. Firm orange mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. Complete at 4.50m | | | | |
| Remarks | · · · | | | | | Scale (approx) | Logg By | ged | |
| | | | | | | 1:40 Figure N | M Ke | elly | |

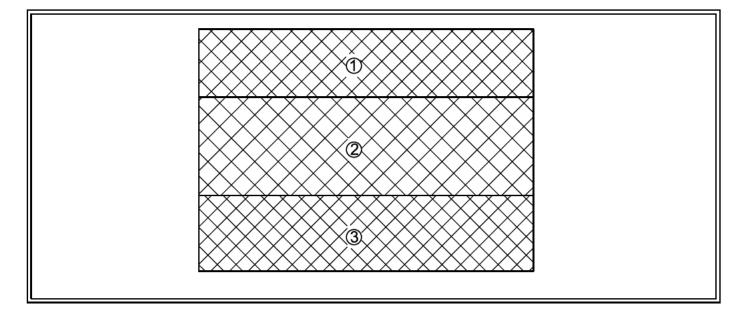


APPENDIX V

Trial Pit Logs



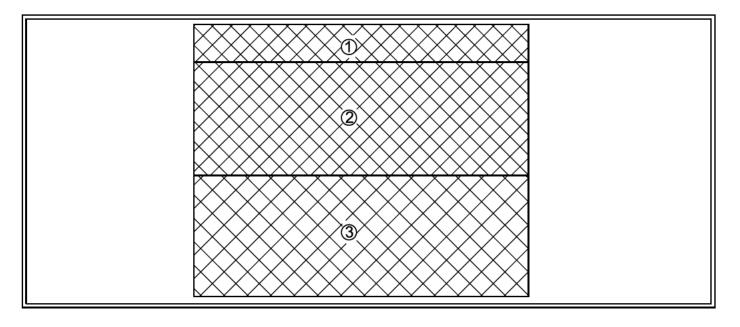
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|------------------------|--------------------------------|--------------------|--|--|
| Weather: Cool, windy w | Trial Pit: TP101 | | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | 17/05/2011 | | |



| | | : | STRATA | SAMPLES | | TESTS | |
|-----------|------------------|-----|--|--------------|------|--|--|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical | |
| 0.00-0.90 | 0.90 | 1 | MADE GROUND: Loose brown slightly clayey gravelly sand. Gravel of brick, mudstone, sandstone and concrete. | 0.6 | D | Soil MAXI SVOC, Soluble Sulphate (2:1), | |
| 0.90-2.20 | 1.30 | 2 | MADE GROUND: Soft brownish grey sandy gravelly clay. Gravel of brick, mudstone, shale, sandstone and concrete. | | | TOC. | |
| 2.20-3.20 | 1.00 | 3 | MADE GROUND: Loose black slightly clayey slightly sandy gravel of angular-subangular shale. | | | | |
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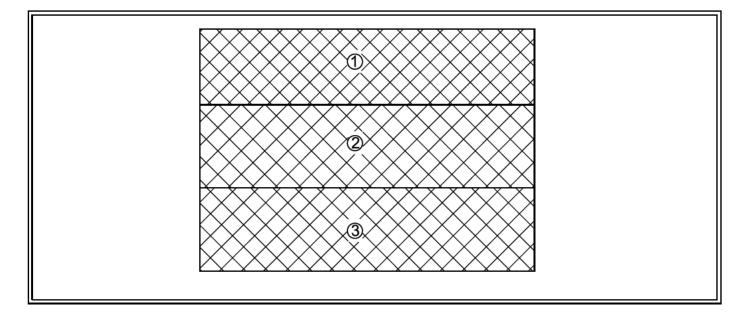
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|------------------------|------------------------------------|--------------------|--|--|
| Weather: Cool, windy w | Weather: Cool, windy with showers. | | | |
| Grld Ref: | Remarks: | TP102 | | |
| Logged By: M Kelly | | 17/05/2011 | | |



| | | : | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|--------|---------------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.50 | 0.50 | 1 | MADE GROUND: Loose brown slightly clayey gravelly sand. Gravel of brick, mudstone, sandstone and concrete. | | | |
| 0.50-2.00 | 1.50 | 2 | MADE GROUND: Soft brownish grey sandy gravelly clay. Gravel of mudstone, shale, sandstone and rare brick. | 0.8 1.2 | D B | Soil MIDI. Moisture Content, |
| 2.00-3.60 | 1.60 | 3 | MADE GROUND: Loose black slightly clayey slightly sandy gravel of angular-subangular shale. | | | Atterberg Limits, PSD. |
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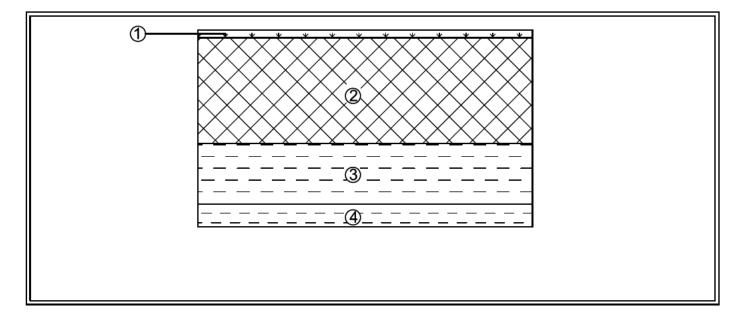
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|------------------------|------------------------------------|--------------------|--|--|
| Weather: Cool, windy w | Weather: Cool, windy with showers. | | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | 17/05/2011 | | |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|--|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-1.00 | 1.00 | 1 | MADE GROUND: Loose brown sandy gravel of brick, sandstone aggregate, mudstone, sandstone and concrete. | 0.4 | D | Soil MAXI SVOC, Soluble Sulphate (2:1), |
| 1.00-2.10 | 1.10 | 2 | MADE GROUND: Soft dark brown-black sandy gravelly clay. Gravel of mudstone, shale, sandstone and rare brick. | 1.2 | D | TOC. |
| 2.10-3.20 | 1.10 | 3 | MADE GROUND: Loose black slightly sandy clayey gravel of angular-subangular shale. | | | |
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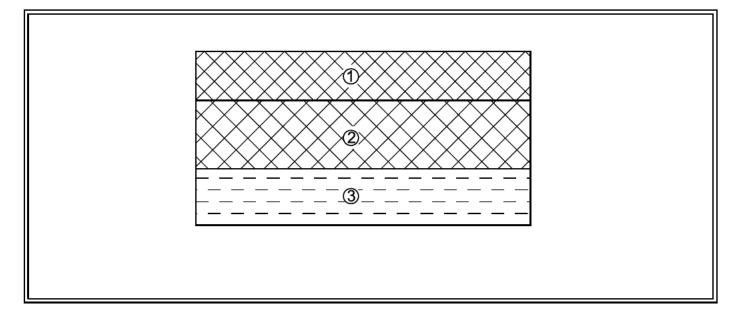
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|------------------------|------------------------------------|--------------------|--|--|
| Weather: Cool, windy w | Weather: Cool, windy with showers. | | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | 17/05/2011 | | |



| | | 1 | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|---|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.10 | 0.10 | 1 | Loose dark brown slightly clayey slightly gravelly SAND (TOPSOIL). Gravel of sandstone aggregate, shale, mudstone and rare brick. | 0.5 | D | Soil MAXI SVOC, UKCWG, VOC, Asbestos. |
| 0.10-1.50 | 1.40 | 2 | MADE GROUND: Loose black slightly sandy cobbly gravel of angular-subangular shale. | 1.0 | В | 2.5kg Compaction. |
| 1.50-2.30 | 0.80 | 3 | Soft-Firm orange brown sandy gravelly CLAY. Gravel of angular-subrounded sandstone, mudstone and coal fragments. | | | |
| 2.30-2.60 | 0.30 | 4 | Stiff brown mottled grey slightly sandy gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. | | | |



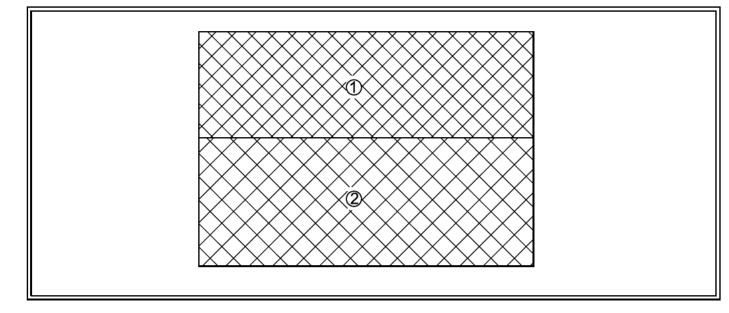
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|--------------------------|--------------------------------|---------------------|--|--|
| Weather: Light rain, bre | ezy. | Trial Pit: TP105 | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | 18/05/2011 | | |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|--------------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.65 | 0.65 | 1 | MADE GROUND: Loose brown sandy cobbly gravel of brick, concrete, clinker, sandstone aggregate, sandstone, tarmac and rare ash; cobbles of brick, sandstone, tarmac and concrete. | 0.3 | D | Soil MAXI SVOC, UKCWG, VOC. |
| 0.10-1.50 | 1.40 | 2 | MADE GROUND: Loose black slightly sandy cobbly gravel of angular-subangular shale. | 0.9 | D | Soil MIDI. |
| 1.55-2.30 | 0.75 | 3 | Soft grey slightly gravelly CLAY. Gravel of angular-subrounded sandstone and mudstone. | | | |



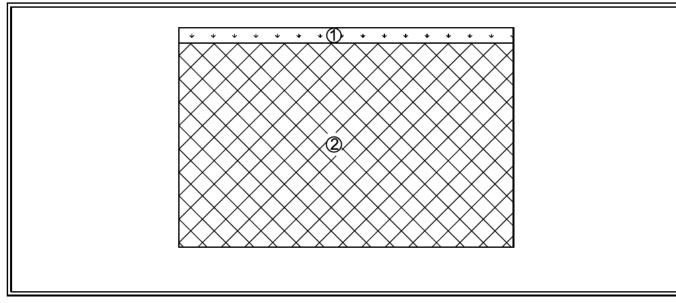
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 |
|--------------------------|--------------------------------|---------------------|
| Weather: Light rain, bre | ezy. | Trial Pit: TP106 |
| Grld Ref: | Remarks: | Date: |
| Logged By: M Kelly | | 18/05/2011 |



| | STRATA | | | | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|--|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-1.40 | 1.40 | 1 | MADE GROUND: Loose brown gravelly cobbly sand. Gravel of cobbles of brick, concrete, mudstone and sandstone. | 0.5 | D | Soil MAXI SVOC, Asbestos, Soluble Sulphate (2:1), TOC. |
| 1.40-3.10 | 1.70 | 2 | MADE GROUND: Soft grey sandy cobbly gravelly clay. Gravel and cobbles of mudstone, sandstone and rare brick. | | | |



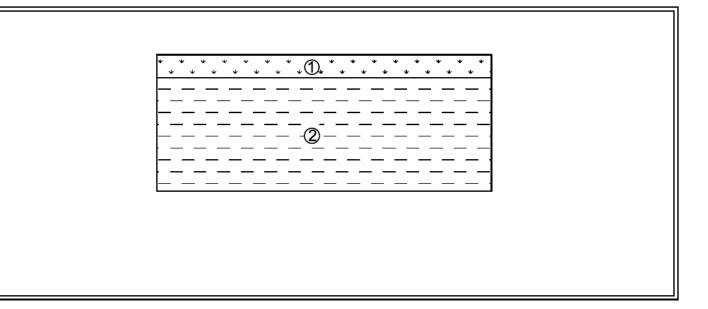
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: | SH10534 | |
|--------------------------|--------------------------------|------------|------------|--|
| Weather: Light rain, bre | ezy. | Trial Pit: | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | | 18/05/2011 | |



| | | 1 | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|---|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.20 | 0.20 | 1 | Loose dark brown clayey SAND (TOPSOIL). | | | |
| 0.20-2.90 | 2.70 | 2 | MADE GROUND: Soft brownish grey slightly cobbly sandy gravelly clay. Gravel and cobbles of brick, mudstone, sandstone, shale, concrete and tarmac. | 0.7 | D | Soil MAXI SVOC, UKCWG, VOC, Asbestos, |
| | | | | | | |



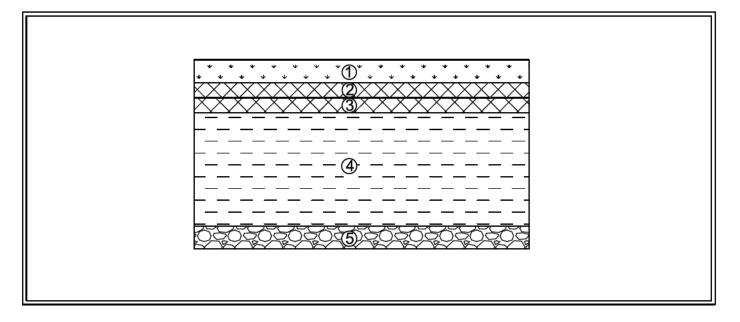
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 |
|--------------------------|--------------------------------|---------------------|
| Weather: Light rain, bre | ezy. | Trial Pit: TP108 |
| Grld Ref: | Remarks: | Date: |
| Logged By: M Kelly | | 18/05/2011 |



| | STRATA | | | | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|--|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.30 | 0.30 | 1 | Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone. | | | |
| 0.30-1.80 | 1.50 | 2 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of angular-subrounded sandstone. | 0.75 0.9 | D | Soil MAXI SVOC. Moisture Content, Atterberg Limits, PSD. |



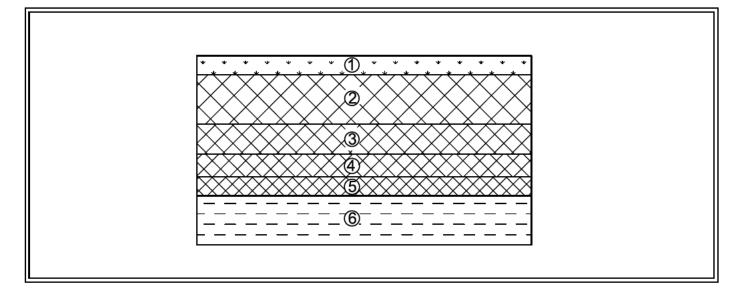
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: | SH10534 | |
|--------------------------|--------------------------------|---------------------|------------|--|
| Weather: Light rain, bre | ezy. | Trial Pit: TP109 | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | | 18/05/2011 | |



| STRATA | | | | PLES | TESTS |
|------------------|-------------------------------------|---|--|--|---|
| Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.30 | 1 | Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone. | | | |
| 0.20 | 2 | MADE GROUND: Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of sandstone, mudstone and rare brick. | 0.6 | D | Soil MIDI, Soluble Sulphate (2:1), TOC. |
| 0.20 | 3 | MADE GROUND: Soft black sandy gravelly clay. Gravel of sandstone, mudstone and rare brick. | | | |
| 1.50 | 4 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of angular-subrounded sandstone. | | | |
| 0.30 | 5 | Dense orange slightly clayey sandy GRAVEL of angular-subrounded sandstone. | | | |
| | (m) 0.30 0.20 0.20 1.50 | Thickness (m) No. 0.30 1 0.20 2 0.20 3 1.50 4 | Thickness (m)No.Description0.301Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone.0.202MADE GROUND: Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of sandstone, mudstone and rare brick.0.203MADE GROUND: Soft black sandy gravelly clay. Gravel of sandstone, mudstone and rare brick.1.504Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of angular-subrounded sandstone.0.305Dense orange slightly clayey sandy GRAVEL of angular-subrounded | Thickness (m)No.DescriptionDepth (m)0.301Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone.0.202MADE GROUND: Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of sandstone, mudstone and rare brick.0.60.203MADE GROUND: Soft black sandy gravelly clay. Gravel of sandstone, mudstone and rare brick.0.61.504Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of angular-subrounded sandstone.0.300.305Dense orange slightly clayey sandy GRAVEL of angular-subrounded | Thickness (m)No.DescriptionDepth (m)Type0.301Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone |



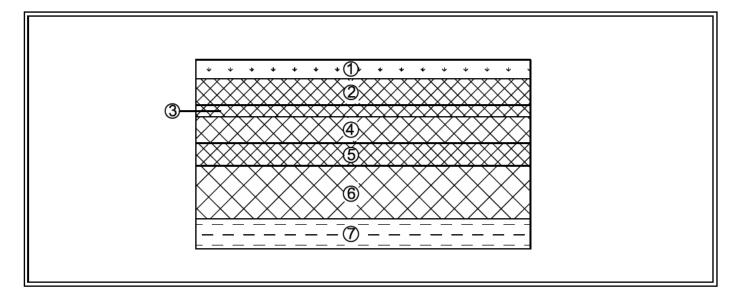
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|--------------------------|--------------------------------|---------------------|--------|--|
| Weather: Light rain, bre | ezy. | Trial Pit: TP110 | | |
| Grld Ref: | Remarks: | Date: | \neg | |
| Logged By: M Kelly | | 18/05/2011 | | |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|--------------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 | 0.25 | 1 | Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone. | | | |
| 0.25-0.90 | 0.65 | 2 | MADE GROUND: Firm orange mottled grey slightly cobbly sandy gravelly CLAY. Gravel and cobbles of sandstone, mudstone and rare brick. | | | |
| 0.90-1.30 | 0.40 | 3 | MADE GROUND: Soft black sandy gravelly clay. Gravel of sandstone, mudstone and rare brick. | 1.0 | D | Soil MAXI SVOC, UKCWG, VOC, |
| 1.30-1.60 | 0.30 | 4 | MADE GROUND: Loose black slightly clayey slightly sandy gravel of angular-subangular shale. | 1.4 | D | Asbestos. |
| 1.60-1.85 | 0.25 | 5 | MADE GROUND: Loose black gravelly sand, Gravel of ash, shale, coal fragments and brick. | | | |
| 1.85-2.50 | 0.65 | 6 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | | | |



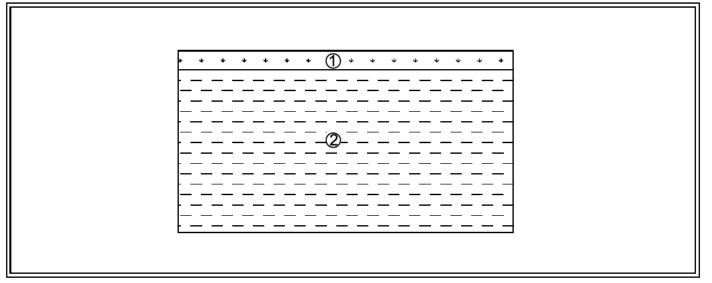
| Excavator: JCB 3CX Project: North Bierley WWTW | | Job No: | SH10534 |
|---|------------------------------|---------|------------|
| Weather: Light rain, bre | Weather: Light rain, breezy. | | |
| Grld Ref: Remarks: | | | TP111 |
| Logged By: M Kelly | | Date: | 18/05/2011 |



| | STRATA | | | | | TESTS |
|-----------|------------------|-----|---|--------------|------|---|
| Depth (m) | Thlckness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 | 0.25 | 1 | Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and mudstone. | | | |
| 0.25-0.60 | 0.35 | 2 | MADE GROUND: Loose brown sandy gravel sandstone, mudstone and rare brick. | | | |
| 0.60-0.75 | 0.15 | 3 | MADE GROUND: Loose black sandy gravel of ash, shale, mudstone and rare brick. | 0.7 | D | Soil MAXI SVOC, UKCWG, VOC, |
| 0.75-1.10 | 0.35 | 4 | MADE GROUND: Soft black sandy gravelly clay. Gravel of sandstone, mudstone and rare brick. | | | Asbestos, Soluble Sulphate (2:1), TOC. |
| 1.10-1.40 | 0.30 | 5 | MADE GROUND: Loose black sandy gravel of ash, shale, mudstone, sandstone and brick. | 1.2 | D | Soil MAXI SVOC, UKCWG, VOC. |
| 1.40-2.10 | 0.70 | 6 | MADE GROUND: Soft grey sandy gravelly clay. Gravel of mudstone, shale and brick. | | | |
| 2.10-2.50 | 0.40 | 7 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | 2.2 | В | 2.5kg Compaction. |



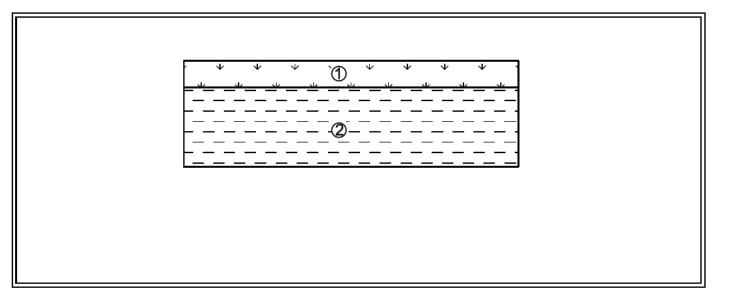
| Excavator: Project: JCB 3CX North Bierley WWTW | | Job No: | SH10534 |
|--|------------------------------|---------|------------|
| Weather: Light rain, bre | Weather: Light rain, breezy. | | |
| Grld Ref: | Grld Ref: Remarks: | | TP112 |
| Logged By: M Kelly | | Date: | 18/05/2011 |



| | STRATA | | | | TESTS |
|---------------|-----------------|---|--------------|------|----------------------------|
| | kness No. n) | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 0.2 | 25 1 | Loose dark brown slightly clayey SAND (TOPSOIL). | | | |
| 0.25-2.40 2.1 | 15 2 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | 0.5 | D | Soil MIDI. |



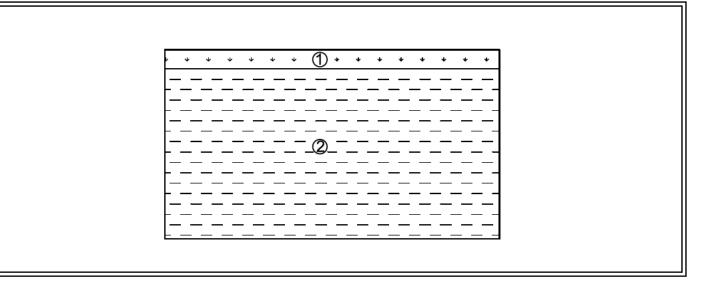
| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | | |
|-------------------------|--------------------------------|--------------------|--|--|
| Weather: Mild, sunny, b | Trial Pit: TP113 | | | |
| Grld Ref: | Remarks: | Date: | | |
| Logged By: M Kelly | | 19/05/2011 | | |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|--|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.35 | 0.35 | 1 | Loose dark brown slightly clayey slightly gravelly SAND (TOPSOIL). Gravel of sandstone. | | | |
| 0.35-1.40 | 1.05 | 2 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | 0.45 | D | Soil MAXI SVOC, Soluble Sulphate (2:1), TOC. |



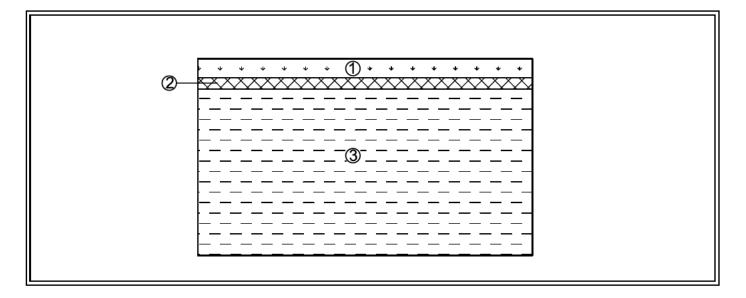
| Excavator: JCB 3CX Project: North Bierley WWTW | | Job No: SH10534 | |
|---|-------------------------------|--------------------|--|
| Weather: Mild, sunny, b | Weather: Mild, sunny, breezy. | | |
| Grld Ref: | Grld Ref: Remarks: | | |
| Logged By: M Kelly | | Date: 19/05/2011 | |



| | STRATA | | | | | TESTS |
|-----------|------------------|-----|---|--------------|------|---|
| Depth (m) | Thlckness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 | 0.25 | 1 | Loose dark brown slightly clayey slightly gravelly SAND (TOPSOIL). Gravel of sandstone. | | | |
| 0.25-2.50 | 2.25 | 2 | Firm-Stiff orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. Increasing gravel, cobbles and boulders with depth. | 0.8 | D | Soil MIDI, Soluble Sulphate (2:1), TOC. Moisture Content, Atterberg Limits, PSD. |



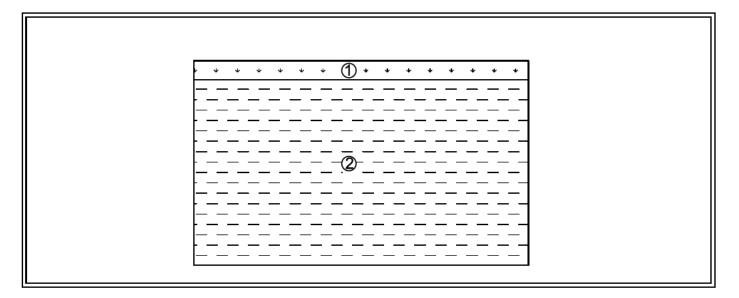
| Excavator: JCB 3CX Project: North Bierley WWTW | | Job No: | SH10534 |
|---|--|---------|------------|
| Weather: Mild, sunny, breezy. | | | TP115 |
| Grld Ref: Remarks: | | | |
| Logged By: M Kelly | | Date: | 19/05/2011 |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|--------------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 | 0.25 | 1 | Loose black slightly clayey gravelly SAND (TOPSOIL). Gravel of angular-subrounded sandstone and shale. | | | |
| 0.25-0.40 | 0.15 | 2 | MADE GROUND: Loose black sandy gravel of brick, sandstone aggregate, shale, mudstone, sandstone and rare brick. | 0.3 | D | Soil MAXI SVOC, UKCWG, VOC, |
| 0.40-2.60 | 2.20 | 3 | Firm-Stiff orange brown mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | | | Asbestos. |
| | | | | | | |
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| | | | | | | |



| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 | |
|-------------------------|--------------------------------|--------------------|--|
| Weather: Mild, sunny, b | Weather: Mild, sunny, breezy. | | |
| Grld Ref: Remarks: | | Date: | |
| Logged By: M Kelly | | 19/05/2011 | |

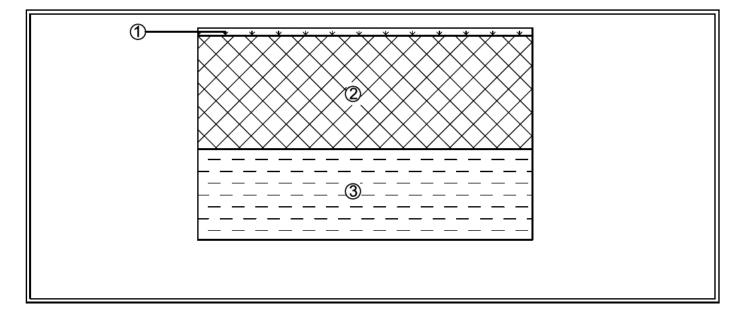


| STRATA | | | | SAMPLES | | TESTS |
|-----------|------------------|-----|---|--------------|------|----------------------------|
| Depth (m) | Thlckness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.25 | 0.25 | 1 | Loose dark brown slightly clayey slightly gravelly SAND (TOPSOIL). Gravel of sandstone. | | | |
| 0.25-2.70 | 2.45 | 2 | Firm orange brown mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | 0.6 | D | |
| | | | | | | |
| | | | | | | |



TRIAL PIT RECORD

| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: SH10534 |
|-------------------------|--------------------------------|---------------------|
| Weather: Mild, sunny, b | preezy. | Trial Pit: TP117 |
| Grld Ref: | Remarks: | Date: |
| Logged By: M Kelly | | 20/05/2011 |

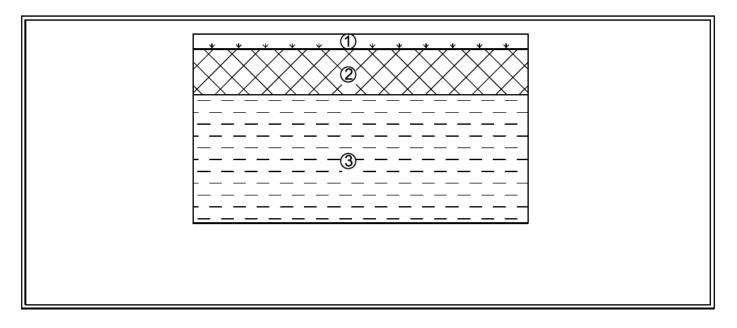


| | | : | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|--|--------------|------|----------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.10 | 0.10 | 1 | Loose dark brown clayey SAND (TOPSOIL). | | | |
| 0.10-1.60 | 1.50 | 2 | MADE GROUND: Loose dark grey slightly cobbly sandy gravel of shale and brick. | 0.4 | D | Soil MIDI. |
| 1.60-2.80 | 1.20 | 3 | Soft-Firm orange brown mottled grey slightly cobbly slightly gravelly sandy CLAY. Gravel and cobbles of angular-subrounded sandstone. | | | |



TRIAL PIT RECORD

| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: | SH10534 |
|-------------------------|--------------------------------|------------|------------|
| Weather: Mild, sunny, b | reezy. | Trial Pit: | TP118 |
| Grld Ref: | Remarks: | Date: | |
| Logged By: M Kelly | | | 20/05/2011 |

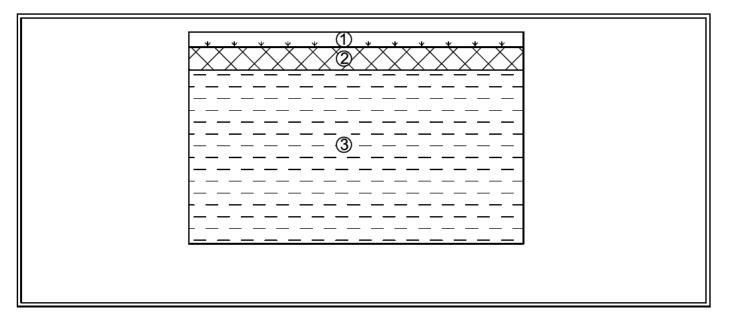


| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|------------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.20 | 0.20 | 1 | Loose dark brown clayey SAND (TOPSOIL). | | | |
| 0.20-0.80 | 0.60 | 2 | MADE GROUND: Loose brown slightly clayey gravelly sand. Gravel of sandstone, shale and rare brick. | 0.7 | D | Soil MAXI SVOC, Asbestos. |
| 0.80-2.50 | 1.70 | 3 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | 1.4 | В | 2.5kg Compaction. |



TRIAL PIT RECORD

| Excavator: JCB 3CX | Project: North Bierley WWTW | Job No: | SH10534 |
|-------------------------|--------------------------------|------------|------------|
| Weather: Mild, sunny, b | reezy. | Trial Pit: | TP119 |
| Grid Ref: | Remarks: | Date: | - |
| Logged By: M Kelly | | | 20/05/2011 |



| | | ; | STRATA | SAM | PLES | TESTS |
|-----------|------------------|-----|---|--------------|------|----------------------------|
| Depth (m) | Thickness (m) | No. | Description | Depth (m) | Туре | Chemical / Geotechnical |
| 0.00-0.20 | 0.20 | 1 | Loose dark brown clayey SAND (TOPSOIL). | | | |
| 0.20-0.50 | 0.30 | 2 | MADE GROUND: Loose brown slightly clayey gravelly sand. Gravel of sandstone, shale and rare brick. | 0.3 | D | Soil MIDI. |
| 0.50-2.80 | 2.30 | 3 | Firm orange mottled grey slightly cobbly sandy gravelly CLAY with rare boulders. Gravel, cobbles and boulders of angular-subrounded sandstone. | | | |



APPENDIX VI

Geochemical Laboratory Results



Wardell Armstrong LLP Unit 4 Newton Business Centre Thorncliffe Park Sheffield South Yorkshire S35 2PH

Attention: James Lymer

CERTIFICATE OF ANALYSIS

| Date: | 23 June 2011 |
|------------------------------|---------------|
| Customer: | H_WARDELL_SHF |
| Sample Delivery Group (SDG): | 110523-40 |
| Your Reference: | SH10534 |
| Location: | |
| Report No: | 135537 |
| | |

This report has been revised and directly supersedes 132894 in its entirety.

We received 34 samples on Saturday May 21, 2011 and 30 of these samples were scheduled for analysis which was completed on Thursday June 23, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan Operations Manager



Alcontrol Laboratories is a trading division of ALcontrol UK Limited Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

CERTIFICATE OF ANALYSIS

Validated

| SDG: | 110523-40 | Location: | | Order Number: | SH3068 |
|-------------------|------------------|---------------|----------------------|--------------------|--------|
| Job: | H_WARDELL_SHF-37 | Customer: Wa | ardell Armstrong LLP | Report Number: | 135537 |
| Client Reference: | SH10534 | Attention: Mi | ke Kelly | Superseded Report: | 132894 |

Received Sample Overview

| Lab Sample No(s) | Customer Sample Ref. | AGS Ref. | Depth (m) | Sampled Date |
|------------------|----------------------|----------|-----------|--------------|
| 3515843 | TP 101 | | 0.60 | 17/05/2011 |
| 3515844 | TP 102 | | 0.80 | 17/05/2011 |
| 3515847 | TP 103 | | 0.40 | 17/05/2011 |
| 3515848 | TP 103 | | 1.20 | 17/05/2011 |
| 3515852 | TP 104 | | 0.50 | 17/05/2011 |
| 3515853 | TP 105 | | 0.30 | 18/05/2011 |
| 3515854 | TP 105 | | 0.90 | 18/05/2011 |
| 3515856 | TP 106 | | 0.50 | 18/05/2011 |
| 3515860 | TP 107 | | 0.70 | 18/05/2011 |
| 3515861 | TP 108 | | 0.75 | 18/05/2011 |
| 3515862 | TP 109 | | 0.60 | 18/05/2011 |
| 3515863 | TP 110 | | 1.00 | 18/05/2011 |
| 3515864 | TP 110 | | 1.40 | 18/05/2011 |
| 3515866 | TP 111 | | 0.70 | 18/05/2011 |
| 3515870 | TP 112 | | 0.50 | 18/05/2011 |
| 3515872 | TP 113 | | 0.45 | 19/05/2011 |
| 3515876 | TP 114 | | 0.80 | 19/05/2011 |
| 3515881 | TP 116 | | 0.60 | 19/05/2011 |
| 3515882 | TP 117 | | 0.40 | 20/05/2011 |
| 3515883 | TP 118 | | 0.70 | 20/05/2011 |
| 3515886 | TP 119 | | 0.30 | 20/05/2011 |
| 3515887 | WS 101 | | 0.40 | 16/05/2011 |
| 3515888 | WS 102 | | 0.70 | 16/05/2011 |
| 3515891 | WS 103 | | 0.30 | 16/05/2011 |
| 3515892 | WS 103 | | 0.60 | 16/05/2011 |
| 3515894 | WS 104 | | 0.40 | 16/05/2011 |
| 3515895 | WS 105 | | 0.30 | 16/05/2011 |
| 3515897 | WS 106 | | 0.50 | 16/05/2011 |
| 3515899 | WS 107 | | 0.50 | 17/05/2011 |
| 3515902 | WS 109 | | 0.70 | 17/05/2011 |
| 3515903 | WS 110 | | 0.60 | 17/05/2011 |

Only received samples which have had analysis scheduled will be shown on the following pages.

| Test Image: Containing deference Image: Containing def | Job: | 110523-40 H_WARDEL SH10534 | L_SHF-37 | Location: Custome Attention | r: ' | Waro Mike | | | tron | g LLF | 5 | | | | | Rep | er Nu ort Ni ersed | umb | er: | ort: | 1 | 3553 3289 | 37 | | |
|--|---------------------------|----------------------------------|------------|-----------------------------------|---|---|--------------------|--|------------------|---|--|---|---|---------------------------------------|---|---|---|--|---------------------------------------|--------------------|---------------------------------------|---|---|---|---|
| Possible Customer Sample Reference I < | Results Legend | | Lab Sample | No(s) | 3515843 | 3515844 | 100100 | 3545847 | 3515852 | | 3515853 | 3515854 | 3515856 | 3515860 | 3515861 | 3515862 | | 3515863 | 3515866 | | 3515869 | 3515870 | 3515872 | 3515876 | 3515878 |
| Depth (m) No | | ion | | | TP 101 | TP 102 | | TD 103 | TP 104 | : | TP 105 | TP 105 | TP 106 | TP 107 | TP 108 | TP 109 | | TP 110 | TP 111 | 1 | TP 111 | TP 112 | TP 113 | TP 114 | TP 115 |
| Depth (m) N | | | AGS Refer | ence | | | | | | | | | | | | | | | | | | | | | |
| Arrings by Kone (soil) All Tests 21 Arring Server All NPP: 0 | | ions by Kone (soil) | Depth (r | | | | | 5 | 50 | 2 | 3 3 | | 50 | 70 | 75 | | | | 70 | | | 50 | 45 | 8 | |
| Aritors by Kone (soil) All Tests 20 A V < | | | Contain | er | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 250g Amber Jar (AL | 250g Amber Jar (AL 200g Tub (AL E214) | 60g VOC (ALE215) | 400g Tub (ALE214) 250g Amber Jar (AL | 250g Amber Jar (AL 60g VOC (ALE215) | 250g Amber Jar (AL 400g Tub (ALE214) | 250g Amber Jar (AL 400g Tub (ALE214) | 60g VOC (ALE215) 400g Tub (ALE214) | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 250g Amber Jar (AL 60g VOC (ALE215) | 60g VOC (ALE215) 400g Tub (ALE214) | 250g Amber Jar (AL | 60g VOC (ALE215) 400g Tub (ALE214) | 400g Tub (ALE214) 250g Amber Jar (AL |
| Addeestors Containing Material All NDPs:0 Image: Stress 10 Image: S | Anions by Kone (soil) | / | Aji | NDPs: 0 | | | | | | | | | | | | | | | | | | | | | |
| Screen Tests: 13 I < | Anions by Kone (w) | / | All | | | | | | | | | | | | | | | | | 2 | <mark>x</mark> | | | | x |
| Test: 1 Test: 1 X < | | al / | All | | | |) | K 2 | x | x | | | x | x | | | x | | x | | | | | | x |
| Tests: 12 X | Asbestos Identification | / | All | | | |) | ĸ | | | | | | | | | | | | | | | | | |
| Tests: 6 X< | | / | All | | | x | | | | | x | | | | | x | | | | | | x | | x | |
| Cómp/Free/Total/Thiocyanate Tests: 30 X | Ŭ | | | Tests: 6 | × | | | 2 | x | | | | | | | | | | | 2 | <mark>x</mark> | | | | × |
| Tests: 6 X< | Comp/Free/Total/Thiocyana | ite | | Tests: 30 | × | x | | K 2 | x | x | | × | x | x | × | x | x | | x | 2 | × | × | x | x | x |
| Tests: 12 X | | | | Tests: 6 | x | | | 3 | x | | | | | | | | | | | 2 | x | | | | x |
| (W) Tests: 3 EPH CWG (Aliphatic) GC (S) All NDPs: 0 Tests: 10 X X X X X X X X X X X X X X X X X X X X X X X X X X X <td></td> <td></td> <td></td> <td>Tests: 12</td> <td></td> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>×</td> <td></td> <td></td> <td></td> <td>x</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>×</td> <td></td> <td>x</td> <td></td> | | | | Tests: 12 | | x | | | | | | × | | | | x | | | | | | × | | x | |
| Tests: 10 X </td <td>(W)</td> <td></td> <td></td> <td>Tests: 3</td> <td></td> <td>2</td> <td>×</td> <td></td> <td></td> <td></td> <td>x</td> | (W) | | | Tests: 3 | | | | | | | | | | | | | | | | 2 | × | | | | x |
| EPH CWG (Aromatic) GC (S) All NDPs: 0 Tests: 10 X X X X X X GRO by GC-FID (S) All NDPs: 0 Tests: 10 NDPs: 0 Tests: 10 Image: Comparison of the test of the test of te | | | | Tests: 10 | | | | × | | × | | | × | | | | × | x | | x | | | | | x |
| X X X X X X X X X GRO by GC-FID (S) All NDPs: 0 Tests: 10 Image: Comparison of the second seco | (W) | | All | Tests: 3 NDPs: 0 | | | | | | | | | | | | | | | | | x | | | | x |
| | GRO by GC-FID (S) | / | All | Tests: 10 NDPs: 0 | | | | x | | × | | | X | | | | × | X | | x | | | | | x |
| GRO by GC-FID (W) All NDPs: 0 Image: Comparison of the second | GRO by GC-FID (W) | / | All | | | | | | x | | × | | | x | | | | x | × | | x | | | | |

| Job: H | 10523-40 H_WARDELL_SHF-37 SH10534 | Location: Customer Attention | r: | Ward Mike | | | ong LLF |) | | | | Repo | r Num ort Nur ersede | | 1 | SH30 13553 13289 | 37 | | |
|--|---|------------------------------------|---|---|--------------------|---|--|--|---------------------------------------|--|---------------------------------------|---------------------------------------|--|---|--|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| SOLID Results Legend X Test | Lab San | nple No(s) | 3515843 | 3515844 | 3010047 | | 3515852 | 3515853 | 3515856 | 3515860 | 3515861 | 3515862 | 3515863 | 3515866 | 3515869 | 3515870 | 3515872 | 3515876 | 3515878 |
| suits Legend X Test No Determination Possible kavalent Chromium (s) kavalent Chromium (w) rcury Dissolved tals by iCap-OES (Soil) | Cus | tomer Reference | TP 101 | TP 102 | UL AI | | TP 104 | TP 105 | TP 106 | TP 107 | TP 108 | TP 109 | TP 110 | TP 111 | TP 111 | TP 112 | TP 113 | TP 114 | TP 115 |
| | AGS R | eference | | | | | | | | | | | | | | | | | |
| lercury Dissolved | Dep | th (m) | 0.60 | | 0.40 | | | 0.30 | | | | 60 | 1.00 | | 1.20 | | | | |
| | Con | tainer | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (Al | 400g Tub (ALE214 250g Amber Jar (A 60g VOC (ALE215 | 400g Tub (ALE214 250g Amber Jar (A 60g VOC (ALE215 | 400g Tub (ALE214 250g Amber Jar (A | 60g VOC (ALE215 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE214 250g Amber Jar (A | 60g VOC (ALE215 400g Tub (ALE214 250g Amber Jar (A | 60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL | 60g VOC (ALE215 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE214 250g Amber Jar (A |
| | All | NDPs: 0 Tests: 30 | × | | | | x | × | | | r S | | x | x | x | x | | | |
| | All | NDPs: 0 Tests: 3 | | | | | | | | | | | | | x | | | | × |
| Mercury Dissolved | All | NDPs: 0 Tests: 6 | x | | | x | | | | | | | | | x | | | | x |
| Metals by iCap-OES (Soil) | Arsenic | NDPs: 0 Tests: 30 | x | x | x | x | x | × | x | × | x | x | x | x | x | × | x | x | x |
| lexavalent Chromium (w) A fercury Dissolved A fetals by iCap-OES (Soil) A fetals by iCap-OES (Soil) G G G G G G G G G G G G G G G G G G G | Cadmium | NDPs: 0 Tests: 30 | x | x | x | x | x | × | x | × | x | x | x | x | x | x | x | x | x |
| | Chromium | NDPs: 0 Tests: 30 | x | x | x | x | x | × | x | × | x | x | x | x | x | x | x | x | x |
| | Copper | NDPs: 0 Tests: 30 | x | x | x | x | x | × | x | × | x | x | x | x | x | x | x | x | x |
| | Lead | NDPs: 0 Tests: 30 | x | x | x | x | x | × | x | × | x | x | x | x | x | x | x | x | x |
| | Mercury | NDPs: 0 Tests: 30 | x | x | x | x | x | x | x | × | x | x | x | x | x | x | x | x | x |
| | Nickel | NDPs: 0 Tests: 30 | x | x | x | x | × | × | x | × | x | x | x | x | x | × | x | x | x |
| | Selenium | NDPs: 0 Tests: 30 | x | x | x | x | × | × | x | × | x | x | x | x | x | × | x | x | x |
| | Thallium | NDPs: 0 Tests: 1 | | | | | | | | | x | | | | | | | | |
| | Vanadium | NDPs: 0 Tests: 18 | x | | x | x | x | | x | x | × | | x | x | x | | x | | x |
| BAUL CONF | Zinc | NDPs: 0 Tests: 30 | x | x | x | x | x | x | x | x | x | x | x | × | x | x | x | x | x |
| PAH by GCMS | All | NDPs: 0 Tests: 12 | | x | | | | x | | | | x | | | | x | | x | |

| Job: H | 0523-40 _WARDEL 110534 | L_SHF-37 | Location: Customer Attention | r: ' | Waro Mike | dell | | istroi | ng L | LP | | | | | | Rep | ort | umi Num edec | nbe | r: | rt: | 1 | SH30 1355 1328 | 37 | | | |
|--------------------------------|------------------------------|-----------------------|------------------------------------|---------------------------------------|---------------------------------------|-------------------|---------------------------------------|-------------------------------------|---|-----------------|---------------------------------------|---------------------------------------|-------------------|-----------------|------------------|---------------------------------------|-------------------|--------------------|-------------------|-----------------|-------------------|-----------------|---------------------------------------|-------------------|-------------------|-------------------|-------------------|
| SOLID Results Legend | | Lab Sample | No(s) | 3515843 | 3515844 | 0010011 | 3515847 | 3515852 | | 3515853 | 3515854 | OCDCICS | 2000 | 3515860 | 3515861 | 3515862 | | 3515863 | | 3515866 | | 3515869 | 3515870 | 3010872 | | 0010070 | 3515878 |
| No Determination Possible | | Custom Sample Refe | | TP 101 | TP 102 | - | TP 103 | TP 104 | | TP 105 | TP 105 | UL LI | ; | TP 107 | TP 108 | TP 109 | | TP 110 | | TP 111 | | TP 111 | TP 112 | 1 113 | | | TD 115 |
| | | AGS Refer | ence | | | | | | | | | | | | | | | | | | | | | | | | |
| IH Spec MS - Aqueous (W) | | Depth (r | • | 0.60 | | | 0.40 | 0.50 | 3 | 0.30 | 0.90 | 2 | 5 | 0.70 | 0.75 | 0.60 | | 1.00 | | 0.70 | | 1.20 | | 5 | | | |
| PAH Spec MS - Aqueous (W) H | | Contain | er | 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE214 250g Amber Jar (A | 250g Amber Jar (A | 250g Amber Jar (A 400g Tub (ALE214 | 60g VOC (ALE215 400g Tub (ALE214 | 400g Tub (ALE214) 250g Amber Jar (AL | 60g VOC (ALE215 | 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE21- 250g Amber Jar (A | 250g Amber Jar (A | 60g VOC (ALE215 | 400g Tub (ALE214 | 400g Tub (ALE214 250a Amber Jar (A | 250g Amber Jar (A | 60g VOC (ALE215 | 250g Amber Jar (A | 60g VOC (ALE215 | 250g Amber Jar (A | 60g VOC (ALE215 | 400g Tub (ALE214 250g Amber Jar (A | 250g Amber Jar (A | 250g Amber Jar (A | 250g Amber Jar (A | A00~ Tub (A1 E214 |
| | | All | NDPs: 0 Tests: 6 | r ≎ x | | | 5 - | ss x | | | | | | | - 5 | | | | | | r :: X | | - 3 | | | | × |
| pH | 4 | All | NDPs: 0 Tests: 30 | x | x | | X | x | | <pre>c</pre> | X |) | () | (| x | × | | × | 2 | × | X | | x | | () | () | x |
| pH Value | 4 | All | NDPs: 0 Tests: 3 | | | | | | | | | | | | | | | | | | X | | | | | | x |
| Phenols by HPLC (S) | <i>,</i> | AII | NDPs: 0 Tests: 30 | x | x | | x | x | | c | x |) | () | (| x | × | | × | 2 | × | X | | x | | () | () | x |
| Phenols by HPLC (W) | F | All | NDPs: 0 Tests: 3 | | | | | | | | | | | | | | | | | | X | . | | | | | x |
| Sample description | , F | All | NDPs: 0 Tests: 30 | X | x | x | x | | x | | x | x | x | | x | x | x | | x | | X | | x | x | x | X | - |
| Semi Volatile Organic Compou | inds / | All . | NDPs: 0 Tests: 18 | x | | x | x | | x | | | x | x | | x | | x | | x | | x | | | x | | x | - |
| Sulphide | F | All . | NDPs: 0 Tests: 3 | | | | | | | | | | | | | | | | | | × | <u>د</u> | | | | | × |
| Total Organic Carbon | ŀ | All | NDPs: 0 Tests: 12 | x | | x | | | | | | x | | | | x | | | x | | | | | x | x | | |
| Total Sulphate | ļ | NI . | NDPs: 0 Tests: 30 | x | x | x | x | | x | | x | x | x | | x | x | x | | x | | x | | x | x | x | x | - |
| Total Sulphur | ŀ | All | NDPs: 0 Tests: 12 | | x | | | | | | x | | | | | x | | | | | | | x | | x | | - |
| TPH CWG (W) | ļ | All . | NDPs: 0 Tests: 3 | | | | | | | | | | | | | | | | | | × | c i | | Ħ | | 2 | x |
| TPH CWG GC (S) | ļ | All . | NDPs: 0 Tests: 10 | | | | x | | x | | | | x | | | | x | | x | | x | | | | | x | |
| VOC MS (S) | ļ | All | NDPs: 0 Tests: 10 | | | | | X | | x | | | | v | | | | x | | x | | x | | | | | |

| | 440505 15 | | | | | | | | NAL | | | | | | - | | | 01100000 |
|--------------------------------------|---------------------------------|-------------|------------------------------------|------------------|----------------|---|---|-----------------------|---|---|---|---|---|--|------------|-------------------|----------------|----------------------------|
| Job: | 110523-40 H_WARDE SH10534 | ELL_SHF-37 | Location: Customer Attention | r: \ | | lell Arm Kelly | nstror | ng LLP | | | | | Orde Repo Supe | ort N | lumi | ber: | ort: | SH3068 135537 132894 |
| SOLID | | | | | | | | | | | | | | | | | | |
| Results Legend | | Lab Sample | No(s) | 3515887 | 3515888 | 3515891 | 3515894 | 3515895 | 3515897 | 3515899 | 3515901 | 3515902 | 35159 | 3515878 | 3515882 | 3515883 | 3515886 | |
| X Test | | | | 387 | 88 | 391 | 94 | 395 | 397 | 999 | 901 | 02 | 03 | 378 | 382 | 383 | 86 | |
| No Determinati | on | | | | | | | | | | | | | | | | | |
| Possible | | Custom | or | | _ | | _ | _ | _ | _ | _ | _ | _ | | | | | |
| | | Sample Refe | | WS 101 | WS 102 | WS 103 | WS 104 | WS 105 | WS 106 | WS 107 | WS 108 | WS 109 | NS 11 | TP 115 | TP 117 | TP 118 | TP 119 | |
| | | - | | Ē | Ñ | ü | 4 | 5 | ത | 7 | õ | Ø | 0 | 5 | 7 | 8 | 9 | |
| | | | | | | | | | | | | | | | | | | |
| | | AGS Refer | ence | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | Depth (r | n) | 0.40 | 0.70 | 0.30 | 0.40 | 0.30 | 0.50 | 0.50 | 0.40 | 0.70 | 0.60 | 0.30 | 0.40 | 0.70 | 0.30 | |
| | | | | | | | | | | | | | | | | | | |
| | | | | 400g 250g | 400g 250g | 60g \ 400g 250g | 400g 250g | 60g \ 400g 250g | 400g 250g | 400g 250g | 60g \ 400g 250g | 400g 250g | 400g 250g | 250g 60g \ | 400g | 400g | 400g | |
| | | Contain | er | Tub (/ Ambe | Tub (/ Ambe | Ambe | Tub (/ | Ambe | Tub (/ Ambe | Tub (/ Ambe | OC (/ Tub (/ Ambe | Tub (/ Ambe | Tub (/ Ambe | Ambe OC (/ | Tub (/ | Tub (/ | Tub (/ Ambe | |
| | | | | LE21 | r Jar (/ | 60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | LE21 | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 400g Tub (ALE214) 250g Amber Jar (AL | 250g Amber Jar (AL 60g VOC (ALE215) | LE21 | 400g Tub (ALE214) | LE21 | |
| Anions by Kone (soil) | | All | NDPs: 0 | ₽₽ | ₽₽ | ₽£9 | ₽₽ | ₽ ₽ 5 | ₽₽ | ₽₽ | ₽₽5 | ₽₽ | ₽₽ | ຫ ₽ | 4 € | 2 € | ₽.₽ | |
| 2 | | | Tests: 23 | x | | x | x | x | | x | X | x | x | | | ĸ | | |
| Anions by Kone (w) | | All | NDPs: 0 | | | | | | | | | | | | | | | |
| | | | Tests: 3 | | | | | | | | x | | | | | | | |
| Asbestos Containing Materia | al | All | NDPs: 0 | | | | | | | | | | | | + | | + | |
| Screen | | | Tests: 13 | | | x | | x | | | x | | X | | | x | | |
| Boron Water Soluble | | All | NDPs: 0 | | | | | | | | | | | | | | | |
| | | | Tests: 12 | x | x | | x | | x | | | x | | x | | | x | |
| CEN Readings | | All | NDPs: 0 Tests: 6 | | | | | | | | | | | | | | | |
| | | | 10313.0 | | | | | | | | x | | | | | x | | |
| Cyanide Comp/Free/Total/Thiocyana | te | All | NDPs: 0 Tests: 30 | | | | | | | | | | | | | | | |
| | | | | X | X | X | X | x | X | X | x | X | X | | x | x | × | |
| Dissolved Metals by ICP-MS | 5 | All | NDPs: 0 Tests: 6 | | | | | | | | | | | | | | | |
| Easily Liberated Sulphide | | All | NDPs: 0 | | | | | | | | X | | | | | x | | |
| цаэлу цистакей эйірпійе | | rui | NDPs: 0 Tests: 12 | | | | | | - | | | - | | | ~ | | | |
| EPH CWG (Aliphatic) Aqueo | ous GC | All | NDPs: 0 | X | X | | X | | X | | | X | | | x | | X | |
| W) | | | Tests: 3 | | | | | | | | X | | | | | | | |
| EPH CWG (Aliphatic) GC (S | 5) | All | NDPs: 0 | $\left \right $ | | | | | | | | | | | | | + | |
| | | | Tests: 10 | | | x | | x | | | x | | | | | | + | |
| EPH CWG (Aromatic) Aque | ous GC | All | NDPs: 0 | $\left \right $ | | | | | \square | | | $\left \right $ | | \vdash | \square | | + | |
| W) | | | Tests: 3 | | | | | | | | x | | | | | | | |
| EPH CWG (Aromatic) GC (§ | 5) | All | NDPs: 0 | | | | | | | | | | | | + | | + | |
| | | | Tests: 10 | | | x | | x | | | x | | | | | | | |
| GRO by GC-FID (S) | | All | NDPs: 0 Tests: 10 | | | | | | | | | | | | \square | | + | |
| | | | Tests: 10 | | | × | | x | | | x | | | x | | | | |
| GRO by GC-FID (W) | | All | NDPs: 0 Tests: 3 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | x | | | | | | | |
| Hexavalent Chromium (s) | | All | NDPs: 0 Tests: 30 | | | | | | | | | | | | | | | |

| | 140500 40 | | | | | | | | | | | | - | | | | 01100.01 |
|---------------------------|--|-------------------------------------|----------------|----------------|-------------------------|----------------|--------------|----------------|------------------|--|--------------|-------------------|---------|---------|---------|-----------------|----------------------------|
| Job: | 110523-40 H_WARDELL_SHF-37 SH10534 | Location: Customer Attention: | r: \ | | ell Arm Kelly | stror | ng LLF | > | | | | Ord Rep Sup | ort | Num | ber: | oort: | SH3068 135537 132894 |
| SOLID | | | | | | | | | | | | | | | | | |
| Results Legend | Lab Sam | ple No(s) | 3515887 | 3515888 | 3515891 | 3515894 | | 3515895 | 0 1 1 0 | 3515901 | 3515902 | 35159 | 3515878 | 3515882 | 3515883 | 3515886 | |
| X Test | | | 387 | 388 | 391 | 394 | | 995 | 07 | 99 | 02 | 903 | 378 | 382 | 383 | 386 | |
| No Determinati | on | | | | | | | | | | | | | | | | |
| Possible | Cust | omer | < | < | < | < | | < < | | < < | < | < | | _ | _ | _ | |
| | Sample R | | WS 101 | WS 102 | WS 103 | WS 104 | | WS 105 | | WS 108 | WS 109 | VS 11 | TP 115 | TP 117 | TP 118 | TP 119 | |
| | | | _ | N | ω | 4 | ' | 5 0 | " · | 7 0 | 9 9 | 0 | | ~ | | Ű | |
| | | | | | | | | | +- | | | | + | | | | |
| | AGS Re | ference | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | - | | |
| | Dept | n (m) | 0.40 | 0.70 | 0.30 | 0.40 | | 0.30 | 5 | 0.50 | 0.70 | 0.60 | 0.30 | 0.40 | 0.70 | 0.30 | |
| | | | | | | | | | | | | | | | | | |
| | | | 400g 250g / | 400g 250g / | 60g V 400g 250g / | 400g 250g / | 400g 250g | 400g 250g / | 250g | 400g 250g 400g | 400g | 400g 250g / | 60g V | 400g | 400g | 400g 250g / | |
| | Cont | ainer | Ambei | Ambei | OC (A | Ambei | Ambei | | Ambei | Tub (A | Ambei | Ambei | 00 (/ | Tub (/ | Tub (/ | Tub (A Ambei | |
| | | | Jar (/ | LE21 | LE21: Jar (/ | Jar (/ | LE21 | LE21: | Jar (/ | 60g VOC (ALE215) 400g Tub (ALE214) 250g Amber Jar (AL 400g Tub (ALE214) | Jar (/ | Jar (/ | LE21 | LE21 | Jar (/ | LE21. Jar (/ | |
| Hexavalent Chromium (w) | All | NDPs: 0 | ₽₽ | ₽₽ | ₽£9 | ₽₽ | ₽₽ | 5 F 3 | > = : | 9 4 4 | • ₽ € | ₽₽ | 5 f | £ ⊻ | ₽₽ | ₽₽ | |
| | | Tests: 3 | | | | | | | | x | | | | | | | |
| Mercury Dissolved | All | NDPs: 0 | | | | | | | | | | | + | | _ | | |
| | | Tests: 6 | | | | | | | | x | | | | | X | | |
| Metals by iCap-OES (Soil) | Arsenic | NDPs: 0 | | | | | | | | | | | | | | | |
| | | Tests: 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Cadmium | NDPs: 0 Tests: 30 | | | | | | | | | | | | | | | |
| | | 16313. 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Chromium | NDPs: 0 Tests: 30 | | | | | | | | | | | | | | | |
| | | | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Copper | NDPs: 0 Tests: 30 | | | | | | | | | | | | | | | |
| | | | x | x | x | x | x | × | x | x | x | x | | × | x | × | |
| | Lead | NDPs: 0 Tests: 30 | | ~ | | | V | | | . | | | | | | | |
| | Mercury | NDDa: 0 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Wereary | NDPs: 0 Tests: 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Nickel | NDPs: 0 | ^ | ^ | ^ | ^ | ^ | ^ | ^ | ^ | ^ | ^ | l l | ^ | ^ | ^ | |
| | | Tests: 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Selenium | NDPs: 0 | | | | | | | | | | | H | | | | |
| | | Tests: 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| | Vanadium | NDPs: 0 | | | | | | | | | | | | | | | |
| | | Tests: 18 | | | x | | x | | x | x | | x | | | x | | |
| | Zinc | NDPs: 0 | \vdash | \square | | | | + | | | | | | | | | |
| | | Tests: 30 | x | x | x | x | x | x | x | x | x | x | | x | x | x | |
| PAH by GCMS | All | NDPs: 0 Tests: 12 | | | | | | | | | | | | | | | |
| | | Tests. 12 | x | x | | x | | x | | | x | | | × | | x | |
| PAH Spec MS - Aqueous (N | /) All | NDPs: 0 Tests: 6 | | | | | | | | | | | | | | | |
| | | | | | | | | | | x | | | | | x | | |
| PCBs by GCMS | All | NDPs: 0 | | | | | | | | | | | T | | | | |

| SDG: 110523 Job: H_WAR Client Reference: SH1053 | RDELL_SHF-37 | Location: Customer Attention: | | War Mike | | | stro | ng Ll | P | | | | | F | Repo | ort N | umb lum ded | ber: | port: | SH3068 135537 132894 | |
|---|-----------------------|-------------------------------------|---------------------------------------|-------------------|-------------------|-------------------------------------|---------------------------------------|-------------------|-----------------|------------------|---------------------------------------|---------------------------------------|-----------------|------------------|------------------|-----------------|-------------------|------------------|---|----------------------------|--|
| SOLID Results Legend X Test | Lab Sample | No(s) | 3515887 | 3010888 | 0 | 3515891 | 3515894 | | 3515895 | 3515897 | 3515899 | | 3515901 | 3515902 | 3515903 | 3515878 | 3515882 | 3515883 | 3515886 | | |
| No Determination Possible | Custom Sample Refe | | WS 101 | ZOL SAA | | WS 103 | WS 104 | | WS 105 | WS 106 | WS 107 | | WS 108 | WS 109 | WS 110 | TP 115 | TP 117 | TP 118 | TP 119 | | |
| | AGS Refer | ence | | | | | | | | | | | | | | | | | | | |
| | Depth (r | n) | 0.40 | 0.70 | 2 | 0.30 | 0.40 | | 0.30 | 0.50 | 0.50 | | 0.40 | 0.70 | 0.60 | 0.30 | 0.40 | 0.70 | 0.30 | | |
| | Contain | er | 400g Tub (ALE214 250g Amber Jar (A | 250g Amber Jar (A | 250g Amber Jar (A | 60g VOC (ALE215 400g Tub (ALE214 | 400g Tub (ALE214 250g Amber Jar (A | 250g Amber Jar (A | 60g VOC (ALE215 | 400g Tub (ALE214 | 400g Tub (ALE214 250g Amber Jar (A | 400g Tub (ALE214 250g Amber Jar (A | 60g VOC (ALE215 | 400g Tub (ALE214 | 400g Tub (ALE214 | 60g VOC (ALE215 | 400g Tub (ALE214 | 400g Tub (ALE214 | 400g Tub (ALE214) 250g Amber Jar (AL | | |
| pH | All | NDPs: 0 Tests: 30 | × | | | x | × | | | - 3 X | r ≎ x | | | ×. | - <u>-</u> x | | ×. | - <u>-</u> X | | | |
| pH Value | All | NDPs: 0 Tests: 3 | | | | | | | | | | X | | | | | | | | | |
| Phenols by HPLC (S) | All | NDPs: 0 Tests: 30 | x | | c | x | x | | <u>.</u> | X | x | X | | X | X | | X | X | x | | |
| Phenols by HPLC (W) | All | NDPs: 0 Tests: 3 | | | | | | | | | | x | | | | | | | | | |
| Sample description | All | NDPs: 0 Tests: 30 | x | x | x | | x | x | 2 | x | x | x | , , | () | x | , | () | x | x | | |
| Semi Volatile Organic Compounds | All | NDPs: 0 Tests: 18 | | | x | | | x | | | x | x | | | x | | | x | | | |
| Sulphide | All | NDPs: 0 Tests: 3 | | | | | | | | | | × | | | | | | | | | |
| Total Organic Carbon | All | NDPs: 0 Tests: 12 | x | | | | x | | | | x | |) | () | × | | | | | | |
| Total Sulphate | All | NDPs: 0 Tests: 30 | x | x | x | | x | x | | x | x | x |) | () | × | , | () | × | x | | |
| Total Sulphur | All | NDPs: 0 Tests: 12 | x | x | | | x | | 2 | x | | |) | C I | | × | C I | | x | | |
| TPH CWG (W) | All | NDPs: 0 Tests: 3 | | | | | | | | | | X | | | | | | | | | |
| TPH CWG GC (S) | All | NDPs: 0 Tests: 10 | | | x | | | x | | | | x | | | | | | | | | |
| VOC MS (S) | All | NDPs: 0 Tests: 10 | | | | x | | | x | | | | x | | | x | | | | | |

Grain Sizes

CERTIFICATE OF ANALYSIS

| SDG: | 110523-40 | Location: | | Order Number: | SH3068 |
|-------------------|------------------|------------|-----------------------|--------------------|--------|
| Job: | H_WARDELL_SHF-37 | Customer: | Wardell Armstrong LLP | Report Number: | 135537 |
| Client Reference: | SH10534 | Attention: | Mike Kelly | Superseded Report: | 132894 |
| | | | | | |

Sample Descriptions

| very fine | <0.063mm | fine | 0.063mm - 0.1mm | medium | 0.1mr | n - 2mm 🛛 🖸 | oarse | 2mm - 1 | Omm very co | oarse >10 |
|-----------------|-----------|--------------|-----------------|--------|---------|-----------------|-------|-------------|---------------|--------------|
| Lab Sample No(s | s) Custon | ner Sample R | ef. Depth (m) | C | olour | Description | (| Grain size | Inclusions | Inclusions 2 |
| 3515843 | | TP 101 | 0.60 | Darl | Brown | Top Soil | 0.0 | 63 - 0.1 mm | Stones | Vegetation |
| 3515844 | | TP 102 | 0.80 | Darl | Brown | Silty Clay | 0.0 | 63 - 0.1 mm | Stones | N/A |
| 3515847 | | TP 103 | 0.40 | Ligh | t Brown | Sandy Loam | 0 | .1 - 2 mm | Stones | None |
| 3515852 | | TP 104 | 0.50 | Ligh | t Brown | Clay | < | 0.063 mm | None | None |
| 3515853 | | TP 105 | 0.30 | Darl | Brown | Silty Sand | 0.0 | 63 - 0.1 mm | Crushed Brick | Vegetation |
| 3515854 | | TP 105 | 0.90 | Ligh | t Brown | Clay | < | 0.063 mm | None | None |
| 3515856 | | TP 106 | 0.50 | Ligh | t Brown | Silt Loam | 0.0 | 63 - 0.1 mm | Stones | None |
| 3515860 | | TP 107 | 0.70 | Ligh | t Brown | Silty Clay Loar | n 0.0 | 63 - 0.1 mm | Stones | None |
| 3515861 | | TP 108 | 0.75 | Ligh | t Brown | Silty Clay | 0.0 | 63 - 0.1 mm | Stones | None |
| 3515862 | | TP 109 | 0.60 | Darl | Brown | Silty Sand | 0.0 | 63 - 0.1 mm | Stones | None |
| 3515863 | | TP 110 | 1.00 | Darl | Brown | Sandy Loam | 0 | .1 - 2 mm | Stones | None |
| 3515866 | | TP 111 | 0.70 | Ligh | t Brown | Silt Loam | 0.0 | 63 - 0.1 mm | None | None |
| 3515869 | | TP 111 | 1.20 | Darl | Brown | Silty Clay Loan | n 0.0 | 63 - 0.1 mm | Crushed Brick | Stones |
| 3515870 | | TP 112 | 0.50 | Ligh | t Brown | Silty Clay Loar | n 0.0 | 63 - 0.1 mm | Stones | None |
| 3515872 | | TP 113 | 0.45 | Ligh | t Brown | Silt Loam | 0.0 | 63 - 0.1 mm | None | None |
| 3515876 | | TP 114 | 0.80 | Ligh | t Brown | Silt | 0.0 | 63 - 0.1 mm | Vegetation | Stones |
| 3515878 | | TP 115 | 0.30 | Darl | Brown | Sandy Loam | 0 | .1 - 2 mm | Stones | None |
| 3515882 | | TP 117 | 0.40 | (| Grey | Shale | 0.0 | 63 - 0.1 mm | Vegetation | None |
| 3515883 | | TP 118 | 0.70 | Ligh | t Brown | Silt Loam | 0.0 | 63 - 0.1 mm | Stones | None |
| 3515886 | | TP 119 | 0.30 | Ligh | t Brown | Clay Loam | < | 0.063 mm | Stones | None |
| 3515887 | | WS 101 | 0.40 | Darl | Brown | Silty Clay | 0.0 | 63 - 0.1 mm | Stones | Vegetation |
| 3515888 | | WS 102 | 0.70 | Darl | Brown | Silty Clay Loan | n 0.0 | 63 - 0.1 mm | Stones | None |
| 3515891 | | WS 103 | 0.30 | Ligh | t Brown | Silty Clay | 0.0 | 63 - 0.1 mm | Stones | None |
| 3515894 | | WS 104 | 0.40 | Ligh | t Brown | Clay | < | 0.063 mm | Stones | None |
| 3515895 | | WS 105 | 0.30 | Ligh | t Brown | Clay | < | 0.063 mm | Stones | None |
| 3515897 | | WS 106 | 0.50 | Darl | Brown | Silty Clay Loar | n 0.0 | 63 - 0.1 mm | Stones | None |
| 3515899 | | WS 107 | 0.50 | Darl | Brown | Clay | < | 0.063 mm | Stones | None |
| 3515901 | | WS 108 | 0.40 | Darl | Brown | Sandy Loam | 0 | .1 - 2 mm | Stones | None |
| 3515902 | | WS 109 | 0.70 | Darl | Brown | Clay Loam | < | 0.063 mm | Vegetation | None |
| 3515903 | | WS 110 | 0.60 | Darl | Brown | Silt Loam | 0.0 | 63 - 0.1 mm | Stones | None |

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

| Job: H_W | 523-40 /ARDELL_SHI 0534 | F-37 | Location: Customer: Attention: | | ardell Armstrong L ke Kelly | .LP | | | Order Number: Report Number: Superseded Repo | SH3068 135537 ort: 132894 | | | |
|--|-------------------------------|---|--|---|--|-----|--|-----|--|--|------|--|---|
| Results Legend # ISO17025 accredited. M mCERTS accredited. | Cus | tomer Sample R | TP 101 | | TP 102 | | TP 103 | | TP 104 | TP 105 | | TP 105 | |
| Non-conforming work. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * Swbcontracted test. * % recovery of the surrogate stant check the efficiency of the metho results of individual compounds i samples aren't corrected for the r (F) Trigger breach confirmed Component | d.The La | Depth (m) Sample Type Date Sampled Date Received SDG Ref ab Sample No.(s) AGS Reference Method | 0.60 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515843 | | 0.80 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515844 | | 0.40 Soii/Solid 17/05/2011 21/05/2011 110523-40 3515847 | | 0.50 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515852 | 0.30 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515853 | | 0.90 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515854 | |
| Moisture | % | PM114 | 13.7 | | | | | | 7.84 | | | | |
| Moisture content ratio | % | PM114 | 15.8 | | | - | | - | 8.51 | | | | |
| Dry matter content ratio | % | PM114 | 86.4 | | | - | | - | 92.2 | | | | |
| Asbestos Containing | - | TM001 | | | | - | Possible ACM E | Det | No ACM Detected | No ACM Dete | cted | | |
| Material Screen Phenol | <0.01 | TM062 (S) | | | <0.01 | | | | | | | <0.01 | |
| Phenols, Total Detected monohydric | mq/kq mg/kg | TM062 (S) | <0.1 | | <0.1 | | <0.1 | | <0.1 | <0.1 | | <0.1 | |
| Organic Carbon, Total | <0.2 % | TM132 | 1.87 | # | | | 3.27 | # | | | | | |
| Sulphur, Total | <0.02 % | TM132 | | π | 0.03 | # | | n. | | | | 0.03 | # |
| рН | 1 pH Units | TM133 | 8.13 | м | 7.85 | м | 8.16 | м | 7.9 M | 8.31 | м | 7.88 | м |
| Chromium, Hexavalent | <0.6 mg/kg | TM151 | <0.6 | # | <0.6 | # | <1.2 | # | <0.6 | <0.6 | # | <0.6 | # |
| Total Cyanide | <1 mg/kg | TM153 | | | 3.75 | м | | | | | | <1 | м |
| Free Cyanide | <1 mg/kg | TM153 | | | <1 | м | | | | | | <1 | м |
| Thiocyanate | <1 mg/kg | TM153 | | | <1 | м | | | | | | <1 | м |
| Cyanide, Free | <1 mg/kg | TM153 | <1 | м | | | <1 | м | <1 M | <1 | м | | |
| Sulphide, Easily liberated | <15 mg/kg | TM180 | | | <15 | # | | | | | | <15 | # |
| Arsenic | <0.6 mg/kg | TM181 | 18.2 | м | 25.6 | м | 41.2 | м | 12.8 M | 20.7 | м | 6.09 | м |
| Cadmium | <0.02 mg/kg | TM181 | 1.58 | м | 0.463 | м | <0.02 | м | 0.49 M | 0.502 | м | 0.447 | м |
| Chromium | <0.9 mg/kg | TM181 | 19.7 | м | 25.6 | м | 810 | м | 23.1 M | 166 | м | 28 | м |
| Copper | <1.4 mg/kg | TM181 | 84.6 | м | 115 | м | 85.1 | м | 45.1 M | 85.6 | м | 22.8 | м |
| Lead | <0.7 mg/kg | TM181 | 1680 | м | 1150 | м | 73.1 | м | 26.1 M | 95.8 | м | 21.5 | м |
| Mercury | <0.14 mg/kg | TM181 | 0.147 | м | 0.61 | м | <0.14 | м | <0.14 M | <0.14 | м | <0.14 | м |
| Nickel | <0.2 mg/kg | TM181 | 20.8 | М | 39.2 | м | 50.6 | м | 49.3 M | 34.7 | м | 31.9 | м |
| Selenium | <1 mg/kg | TM181 | <1 | # | <1 | # | 2.69 | # | <1 # | 1.06 | # | <1 | # |
| Vanadium | <0.2 mg/kg | TM181 | 38.8 | # | | | 107 | # | 16.4 # | 61.6 | # | | |
| Zinc | <1.9 mg/kg | TM181 | 1230 | М | 122 | м | 154 | м | 113 M | 208 | м | 76 | м |
| Sulphate, Total | <48 mg/kg | TM221 | 248 | м | 101 | м | 1340 | м | 217 M | 1410 | м | 173 | м |
| Boron, water soluble | <1 mg/kg | TM222 | | | <1 | м | | | | | | <1 | м |
| Water Soluble Sulphate as SO4 2:1 Extract | <0.008 q/l | TM243 | <0.008 | М | | | 0.0879 | м | 0.0393 M | 0.0582 | М | | |
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CERTIFICATE OF ANALYSIS

| Job: H_ | 0523-40 _WARDELL_SH 110534 | F-37 | Location: Customer: Attention: | | ardell Armstrong LLP ke Kelly | 5 | | | Order Number: Report Number: Superseded Repo | SH3068 135537 ort: 132894 | | | |
|---|----------------------------------|---|--|-----|--|----------|--|---|--|--|-----|--|---------|
| Results Legend # ISO17025 accredited. M mCERTS accredited. | Cu | stomer Sample R | TP 106 | | TP 107 | | TP 108 | | TP 109 | TP 110 | Т | TP 111 | |
| M mCERTs accredited. § Non-conforming work. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate st check the efficiency of the me results of individual compound samples aren't corrected for tt (F) Tigger breach confirmed Component | thod. The ds within L | Depth (m) Sample Type Date Sampled Date Received SDG Ref ab Sample No.(s) AGS Reference | 0.50 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515856 | | 0.70 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515860 | | 0.75 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515861 | | 0.60 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515862 | 1.00 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515863 | | 0.70 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515866 | |
| Asbestos Containing | - | TM001 | No ACM Detec | ted | No ACM Detected | | | _ | | No ACM Detecte | d N | o ACM Dete | cted |
| Material Screen Phenol | <0.01 | TM062 (S) | | | | | | | <0.01 | | + | | |
| Phenols, Total Detected monohydric | mq/kq mg/kg | TM062 (S) | <0.1 | _ | <0.1 | | <0.1 | | <0.1 | <0.1 | T | <0.1 | |
| Organic Carbon, Total | <0.2 % | TM132 | 1.43 | # | | | | | 3.29 # | | | 10.1 | # |
| Sulphur, Total | <0.02 % | TM132 | | | | | | | 0.07 # | | | | |
| рН | 1 pH Units | TM133 | 8.07 | М | 6.79 M | | 7.72 | м | 7.53 M | 7.12 | и | 6.29 | м |
| Chromium, Hexavalent | <0.6 mg/kg | TM151 | <0.6 | # | <0.6 # | | <0.6 | # | <1.2 | <0.6 | # | <1.2 | # |
| Total Cyanide | <1 mg/kg | TM153 | | | | | | | 1.47 M | | | | |
| Free Cyanide | <1 mg/kg | TM153 | | | | | | | <1 M | | | | |
| Thiocyanate | <1 mg/kg | TM153 | | | | | | | <1 M | | | | |
| Cyanide, Free | <1 mg/kg | TM153 | <1 | м | <1 M | | <1 | м | | <1 | и | <1 | м |
| Sulphide, Easily liberated | <15 mg/kg | TM180 | | | | | | | <15 # | | Т | | |
| Arsenic | <0.6 mg/kg | TM181 | 8.64 | м | 10 M | | 7.88 | м | 101 M | 28.1 | л | 45.9 | м |
| Cadmium | <0.02 mg/kg | TM181 | 0.511 | М | <0.02 M | | 1.08 | м | 1.21 M | 1.3 | и | <0.02 | м |
| Chromium | <0.9 mg/kg | TM181 | 24.1 | М | 24.6 M | | 24.3 | м | 98.8 M | 25.4 | и | 19.7 | м |
| Copper | <1.4 mg/kg | TM181 | 32.1 | м | 24 M | | 24.8 | м | 127 M | 85.4 | и | 37.9 | м |
| Lead | <0.7 mg/kg | TM181 | 21.2 | м | 21.7 M | | 21.7 | м | 160 M | 70.1 | и | 22.2 | м |
| Mercury | <0.14 mg/kg | TM181 | <0.14 | м | <0.14 M | | <0.14 | м | <0.14 M | <0.14 | и | <0.14 | м |
| Nickel | <0.2 mg/kg | TM181 | 34.3 | м | 36.1 M | | 10.6 | м | 29.6 M | 44.5 | и | 30.3 | м |
| Selenium | <1 mg/kg | TM181 | <1 | # | <1 # | | <10 | # | <10 # | 2.1 | # | <1 | # |
| Thallium | <0.7 mg/kg | TM181 | | | | | <7 | # | | | | | |
| Vanadium | <0.2 mg/kg | TM181 | 22.8 | # | 24.9 # | | 29 | # | | 43.6 | # | 25.6 | # |
| Zinc | <1.9 mg/kg | TM181 | 92 | м | 92.2 | | 51.1 | м | 219 M | 313 | и | 62.9 | ,, M |
| Sulphate, Total | <48 mg/kg | TM221 | 748 | м | 765 | | 161 | м | 505 M | 258 | л | 4560 | м |
| Boron, water soluble | <1 mg/kg | TM222 | | | | | | | <1 M | | | | |
| Water Soluble Sulphate as SO4 2:1 Extract | <0.008 g/l | TM243 | 0.0291 | м | 0.167 M | | 0.0226 | м | <0.016 M | 0.0414 | и | 0.204 | м |
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CERTIFICATE OF ANALYSIS

| SDG: Job: Clien | ŀ | 110523-40 H_WARDELL_ SH10534 | SHF-37 | Location: Customer: Attention: | Wa | ardell Armstrong LLF | | Order Number: Report Number: Superseded Repo | SH3068 135537 prt: 132894 | |
|---|---|------------------------------------|--|--|-----|--|--|--|--|--|
| | Results Legend | | Customer Sample R | TP 111 | | TP 112 | TP 113 | TP 114 | TP 115 | TP 117 |
| # M § diss.filt tot.unfilt * (F) Compo | ISO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Subcontracted test. % recovery of the surrogatic check the efficiency of the results of individual compo samples aren't corrected fo Trigger breach confirmed | method. The unds within | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | 1.20 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515869 | | 0.50 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515870 | 0.45 Soil/Solid 19/05/2011 21/05/2011 110523-40 3515872 | 0.80 Soil/Solid 19/05/2011 21/05/2011 110523-40 3515876 | 0.30 Soli/Solid 19/05/2011 21/05/2011 110523-40 3515878 | 0.40 Soli/Solid 20/05/2011 21/05/2011 1105/2011 3515882 |
| Moistu | | % | PM114 | 17.5 | | | | | 12.5 | |
| Moistu | re content ratio | % | PM114 | 21.2 | | | | | 14.3 | |
| Dry ma | atter content ratio | % | PM114 | 82.5 | | | | | 87.5 | |
| | tos Containing al Screen | - | TM001 | | | | | | No ACM Detected | |
| Pheno | | <0.0 ² mg/kg | | | | <0.01 | | <0.01 | | <0.01 |
| Pheno monoh | ls, Total Detected | mg/k | | <0.1 | | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| | ic Carbon, Total | <0.2 | % TM132 | | | | 0.46 # | 2.48 | | |
| Sulphu | ır, Total | <0.02 | % TM132 | | | 0.02 | | 0.02 | | 0.07 |
| рН | | 1 pH Units | | 7.76 | м | 7.27 M | 8.25 M | 8.36 | 7.94 M | 7.56 # |
| Chrom | ium, Hexavalent | <0.6 mg/kg | TM151 | <0.6 | # | <0.6 | <0.6 | <0.6 | <0.6 | <0.6 |
| Total C | Cyanide | <1 mg | | | | <1 M | | <1 # | | <1 # |
| Free C | yanide | <1 mg | /kg TM153 | | | <1 M | | <1 # | | <1 # |
| Thiocy | anate | <1 mg | /kg TM153 | | | <1 M | | <1 # | | <1 # |
| Cyanic | le, Free | <1 mg | /kg TM153 | <1 | м | | <1 M | | <1 M | |
| Sulphi | de, Easily liberated | l <15 mg/kg | | | | <15 # | | <15 # | | <15 # |
| Arseni | с | <0.6 mg/kg | TM181 | 52.3 | м | 9.61 M | 9.84 M | 19.4 | 56.8 M | 5.79 # |
| Cadmi | um | <0.02 mg/kg | 2 TM181 | <0.2 | м | 0.331 M | 0.35 M | 1.82 | <0.02 M | 0.307 # |
| Chrom | ium | <0.9 mg/kg | TM181 | 30.4 | м | 23.4 M | 23.3 M | 40 | 63.7 M | 26.6 # |
| Coppe | r | <1.4 mg/kg | TM181 | 51 | м | 24 M | 16.7 M | 40.1 | 64.3 M | 46.3 # |
| Lead | | <0.7 mg/kg | TM181 | 43.5 | м | 16.5 M | 17.8 M | 34.4 | 52.6 M | 16.9 # |
| Mercu | ry | <0.14 mg/kg | 4 TM181 | <0.14 | м | <0.14 M | <0.14 M | <0.14 | <0.14 M | <0.14 # |
| Nickel | | <0.2 mg/kg | TM181 | 36.7 | м | 26.6 M | 18.8 M | 33.3 | 33.1 M | 52.4 # |
| Seleni | um | <1 mg | | <10 | # | <1 # | <1 # | <10 | <1 # | <1 # |
| Vanad | ium | <0.2 mg/kg | | 45.5 | # | | 25.2 # | | 27.4 # | |
| Zinc | | <1.9 mg/kg | TM181 | 79.8 | м | 74.4 M | 59.8 M | 130 | 115 M | 105 # |
| Sulpha | ite, Total | <48 mg/kc | TM221 | 837 | M | 78.7 M | 153 M | 74.5 | 2040 M | 136 # |
| Boron, | water soluble | <1 mg/ | | | TVI | <1 M | IV. | | IVI | <1 # |
| | Soluble Sulphate a | as <0.00 g/l | 8 TM243 | 0.2 | м | IVI | <0.016 M | <0.008 | 0.123 M | # |
| 304.2 | . TEAUdU | q/I | | | IVI | | IV | # | IVI | |
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CERTIFICATE OF ANALYSIS

| Job: H | 0523-40 _WARDELL_SH 110534 | F-37 | Location: Customer: Attention: | | ardell Armstrong ke Kelly | LLP | | | Order Number: Report Number: Superseded Repo | SH3068 135537 ort: 132894 | | | |
|--|---|---|--------------------------------------|-----|--|-----|--|---|--|--|----|--|---|
| Results Legend | Cu | stomer Sample R | TP 118 | | TP 119 | | WS 101 | | WS 102 | WS 103 | | WS 104 | |
| # ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample. tiss.fitt Dissolved / fittered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * Subcontracted test. * Steroovery of the surrogate si check the efficiency of the me results of individual compoun samples aren't corrected for the (F) Trigger breach confirmed | tandard to thod. The L ds within L he recovery | Depth (m) Sample Type Date Sampled Date Received SDG Ref ab Sample No.(s) AGS Reference | | | 0.30 Soil/Solid 20/05/2011 21/05/2011 110523-40 3515886 | | 0.40 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515887 | | 0.70 Soli/Solid 16/05/2011 21/05/2011 110523-40 3515888 | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515891 | | 0.40 Soii/Solid 16/05/2011 21/05/2011 110523-40 3515894 | |
| Component Moisture | LOD/Units % | Method PM114 | 17.8 | | | | | _ | | | + | | |
| | | | | | | | | | | | + | | |
| Moisture content ratio | % | PM114 | 21.7 | | | | | | | | | | |
| Dry matter content ratio | % | PM114 | 82.2 | | | | | | | | | | |
| Asbestos Containing Material Screen | - | TM001 | No ACM Detec | ted | | | | | | No ACM Detected | d | | |
| Phenol | <0.01 | TM062 (S) | | | <0.01 | | <0.01 | | <0.01 | | T | <0.01 | |
| Phenols, Total Detected | mg/kg mg/kg | TM062 (S) | <0.1 | | <0.1 | | <0.1 | | <0.1 | <0.1 | t | <0.1 | |
| monohydric Organic Carbon, Total | <0.2 % | TM132 | | | | | 2.1 | | | | + | 0.971 | |
| Sulphur, Total | <0.02 % | TM132 | | | 0.04 | | 0.04 | # | 0.16 | | + | 0.02 | # |
| pH | 1 pH | TM133 | 8.23 | | 7.65 | # | 7.86 | # | # | 8.67 | + | 8.08 | # |
| | Units | | | М | | М | | М | М | N | и | | м |
| Chromium, Hexavalent | <0.6 ma/ka | TM151 | <0.6 | # | <0.6 | # | <0.6 | # | 1.37 # | <0.6 | # | <0.6 | # |
| Total Cyanide | <1 mg/kg | TM153 | | | <1 | м | <1 | м | 8.7 M | | | 1.13 | м |
| Free Cyanide | <1 mg/kg | TM153 | | | <1 | м | <1 | м | <1 M | | T | <1 | м |
| Thiocyanate | <1 mg/kg | TM153 | | | <1 | | <1 | | <1 | | t | <1 | |
| Cyanide, Free | <1 mg/kg | TM153 | <1 | | | М | | М | M | <1 | | | М |
| PCB congener 28 | <3 µg/kg | TM168 | | М | | | | | <3 | <3 | N | | |
| PCB congener 52 | <3 µg/kg | | | | | | | | M <3 | <3 | N | | |
| PCB congener 101 | | TM168 | | | | | | | M | <3 | N | | |
| | <3 µg/kg | | | | | | | | M | | и | | |
| PCB congener 118 | <3 µg/kg | | | | | | | | <3 M | | и | | |
| PCB congener 138 | <3 µg/kg | TM168 | | | | | | | <3 M | <3 N | и | | |
| PCB congener 153 | <3 µg/kg | TM168 | | | | | | | <3 M | <3 | и | | |
| PCB congener 180 | <3 µg/kg | TM168 | | | | | | _ | <3 M | <3 | И | | |
| PCBs, Total ICES 7 | µg/kg | TM168 | | | | | | | <3 | <3 | VI | | _ |
| Sulphide, Easily liberated | <15 | TM180 | | | <15 | | <15 | _ | <15 | | t | <15 | _ |
| Arsenic | mq/kq <0.6 | TM181 | 15.7 | | 8.26 | # | 40.3 | # | # 625 | 10.8 | + | 9.26 | # |
| Cadmium | mq/kq <0.02 | TM181 | <0.2 | М | 0.363 | М | 0.577 | М | M 1.82 | ۸ <0.02 | N | 0.345 | М |
| Chromium | mq/kq <0.9 | TM181 | 25.3 | М | 24 | М | 68.5 | М | M 477 | | и | 29.7 | м |
| | mg/kg | | | М | | М | | М | М | N | и | | м |
| Copper | <1.4 mg/kg | TM181 | 31.9 | м | | м | 78.5 | м | 447 M | | и | 21.6 | м |
| Lead | <0.7 mg/kg | TM181 | 40.1 | м | 17.3 | м | 105 | м | 485 M | 92.5 N | и | 19.7 | м |
| Mercury | <0.14 mg/kg | TM181 | <0.14 | м | <0.14 | м | <0.14 | м | 0.936 M | <0.14 | и | <0.14 | м |
| Nickel | <0.2 | TM181 | 34.5 | м | 38.1 | м | 28 | м | 36.8 M | 29.2 | | 34.8 | м |
| Selenium | mg/kg <1 mg/kg | TM181 | <10 | | <1 | | <5 | | 1.77 | <10 | Т | <1 | |
| Vanadium | <0.2 | TM181 | 30.3 | # | | # | | # | # | 46.1 | # | | # |
| Zinc | mq/kq <1.9 | TM181 | 113 | # | 81.4 | | 126 | | 396 | 91.7 | # | 79.1 | |
| Sulphate, Total | mg/kg <48 | TM221 | 272 | М | 310 | М | 135 | М | M 1440 | N 217 | N | 49.9 | м |
| | mg/kg | | 212 | М | <1 | М | <1 | М | <1 N | | N | <1 | м |
| Boron, water soluble | <1 mg/kg | 1111222 | | | <1 | М | <1 | м | <1 M | | | \$1 | м |

CERTIFICATE OF ANALYSIS

Validated

SDG: 110523-40 Location: Order Number: SH3068 Job: H_WARDELL_SHF-37 Customer: Wardell Armstrong LLP 135537 Report Number: **Client Reference:** SH10534 Attention: Mike Kelly Superseded Report: 132894

| Results Legend # ISO17025 accredited. | Cu | istomer Sample R | TP 118 | TP 119 | WS 101 | WS 102 | WS 103 | WS 104 |
|---|-----------|-----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| M mCERTS accredited. § Non-conforming work. | | Depth to 1 | 0.70 | | | | | |
| aq Aqueous / settled sample. | | Depth (m) Sample Type | 0.70 Soil/Solid | 0.30 Soil/Solid | 0.40 Soil/Solid | 0.70 Soil/Solid | 0.30 Soil/Solid | 0.40 Soil/Solid |
| diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. | | Date Sampled | 20/05/2011 | 20/05/2011 | 16/05/2011 | 16/05/2011 | 16/05/2011 | 16/05/2011 |
| * Subcontracted test. | | Date Received | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 |
| ** % recovery of the surrogate standar check the efficiency of the method. | The | SDG Ref | 110523-40 | 110523-40 | 110523-40 | 110523-40 | 110523-40 | 110523-40 |
| results of individual compounds wit | thin L | ab Sample No.(s) AGS Reference | 3515883 | 3515886 | 3515887 | 3515888 | 3515891 | 3515894 |
| samples aren't corrected for the rec (F) Trigger breach confirmed | overy | A03 Reference | | | | | | |
| Component | LOD/Units | Method | | | | | | |
| Water Soluble Sulphate as | <0.008 | TM243 | 0.0265 | | <0.008 | | 0.0206 | 0.0154 |
| SO4 2:1 Extract | q/l | | M | | M | | M | M |
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CERTIFICATE OF ANALYSIS

| Job: H_ | 0523-40 WARDELL_SH 10534 | F-37 | Location: Customer: Attention: | | ardell Armstrong ke Kelly | LLP | | | Order Number: Report Number: Superseded Repo | SH3068 135537 rt: 132894 | | | |
|--|--------------------------------|---|--|------|--|-----|--|---|--|--|---|--|------|
| Results Legend | Cu | stomer Sample R | WS 105 | | WS 106 | | WS 107 | | WS 108 | WS 109 | | WS 110 | |
| ISO17025 accredited. M mCERTS accredited. Son-conforming work. aq Aqueous / settled sample. diss.fit Dissolved / fittered sample. tot.unfit Tota/ unfittered sample. Subcontracted test. w recovery of the surrogate statcheck the efficiency of the mett results of individual compound samples aren't corrected for th | nod. The Li s within Li | Depth (m) Sample Type Date Sampled Date Received SDG Ref ab Sample No.(s) AGS Reference | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515895 | | 0.50 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515897 | | 0.50 Soii/Solid 17/05/2011 21/05/2011 110523-40 3515899 | | 0.40 Soli/Solid 17/05/2011 21/05/2011 110523-40 3515901 | 0.70 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515902 | | 0.60 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515903 | |
| (F) Trigger breach confirmed Component | LOD/Units | Method | | | | | | | | | | | |
| Moisture | % | PM114 | | | | | | | 24.2 | | | | |
| Moisture content ratio | % | PM114 | | | | | | | 31.9 | | | | — |
| Dry matter content ratio | % | PM114 | | | | | | | 75.8 | | | | _ |
| Asbestos Containing Material Screen | - | TM001 | No ACM Deteo | cted | | | | | No ACM Detected | | | No ACM Detec | cted |
| Phenol | <0.01 mg/kg | TM062 (S) | | | <0.01 | | | | | <0.01 | | | |
| Phenols, Total Detected monohydric | mg/kg | TM062 (S) | <0.1 | | <0.1 | | <0.1 | | <0.1 | <0.1 | | <0.1 | |
| Organic Carbon, Total | <0.2 % | TM132 | | | | | 5.69 | # | | 0.927 | # | 2.43 | # |
| Sulphur, Total | <0.02 % | TM132 | | | 0.13 | # | | | | 0.04 | # | | |
| рН | 1 pH Units | TM133 | 8.15 | м | 8.36 | м | 8.25 | м | 7.91 M | 7.94 | м | 8.4 | м |
| Chromium, Hexavalent | <0.6 ma/ka | TM151 | <0.6 | # | <1.2 | # | <0.6 | # | <3 # | <0.6 | # | <0.6 | # |
| Total Cyanide | <1 mg/kg | TM153 | | | 23.8 | м | | | | <1 | м | | |
| Free Cyanide | <1 mg/kg | | | | <1 | м | | | | <1 | м | | |
| Thiocyanate | <1 mg/kg | TM153 | | | <1 | м | | | | <1 | м | | |
| Cyanide, Free | <1 mg/kg | | <1 | м | | | <1 | м | <1 M | | | <1 | м |
| PCB congener 28 | <3 µg/kg | TM168 | <3 | м | | | | | <3 M | | | | |
| PCB congener 52 | <3 µg/kg | TM168 | <3 | м | | | | | <3 M | | | | |
| PCB congener 101 | <3 µg/kg | TM168 | <3 | М | | | | | <3 M | | | | |
| PCB congener 118 | <3 µg/kg | TM168 | <3 | м | | | | | <3 M | | | | |
| PCB congener 138 | <3 µg/kg | TM168 | <3 | м | | | | | <3 M | | | | |
| PCB congener 153 | <3 µg/kg | TM168 | <3 | М | | | | | <3 M | | | | |
| PCB congener 180 | <3 µg/kg | TM168 | <3 | М | | | | | <3 M | | | | |
| PCBs, Total ICES 7 | µg/kg | TM168 | <3 | | | | | | <3 | | | | |
| Sulphide, Easily liberated | <15 mq/kq | TM180 | | | <15 | # | | | | <15 | # | | |
| Arsenic | <0.6 mq/kq | TM181 | 5.56 | М | | м | 25.1 | м | 160 M | 15.8 | м | 17.2 | м |
| Cadmium | <0.02 mg/kg | TM181 | <0.02 | М | | м | 0.543 | м | <0.02 M | 0.481 | м | <0.02 | м |
| Chromium | <0.9 ma/ka | TM181 | 26.6 | М | | М | 32.4 | м | 168 M | 25.9 | м | 20.3 | м |
| Copper | <1.4 ma/ka | TM181 | 24.5 | М | | М | 41.7 | м | 259 M | 23.6 | м | 30.6 | м |
| Lead | <0.7 mg/kg | TM181 | 30.5 | М | | М | 112 | м | 508 M | 23.8 | м | 31.1 | м |
| Mercury | <0.14 mg/kg | TM181 | <0.14 | М | | М | <0.14 | м | 0.895 M | <0.14 | м | <0.14 | м |
| Nickel | <0.2 mg/kg | TM181 | 35.8 | М | 38 | М | 28.4 | м | 22.4 M | 33.6 | м | 35.7 | м |
| Selenium | <1 mg/kg | | <1 | # | <1 | # | 1.02 | # | <10 # | 1.06 | # | <1 | # |
| Vanadium | <0.2 mg/kg | TM181 | 20.1 | # | 000 | | 34.8 | # | 47.4 # | 00.4 | | 21.9 | # |
| Zinc | <1.9 mg/kg | TM181 | 87.5 | М | | М | 96.2 | м | 329 M | 90.1 | м | 88.2 | м |
| Sulphate, Total | <48 mg/kg | TM221 | 396 | М | | М | 598 | м | 1360 M | 139 | м | 254 | м |
| Boron, water soluble | <1 mg/kg | TM222 | | | <1 | м | | | | <1 | м | | |

CERTIFICATE OF ANALYSIS

Validated

SDG: 110523-40 Location: Order Number: SH3068 Job: H_WARDELL_SHF-37 Customer: Wardell Armstrong LLP 135537 Report Number: **Client Reference:** SH10534 Attention: Mike Kelly Superseded Report: 132894

| # 1 | Results Legend SO17025 accredited. | Cu | stomer Sample R | WS 105 | WS 106 | WS 107 | WS 108 | WS 109 | WS 110 |
|----------|--|---------------|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| M n | nCERTS accredited. | | | | | | | | |
| aq A | Non-conforming work. Aqueous / settled sample. | | Depth (m) | | 0.50 | 0.50 | 0.40 | 0.70 | 0.60 |
| | Dissolved / filtered sample. Total / unfiltered sample. | | Sample Type Date Sampled | Soil/Solid 16/05/2011 | Soil/Solid 16/05/2011 | Soil/Solid 17/05/2011 | Soil/Solid 17/05/2011 | Soil/Solid 17/05/2011 | Soil/Solid 17/05/2011 |
| * 5 | Subcontracted test. | | Date Received | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 |
| | % recovery of the surrogate standar sheck the efficiency of the method. 1 | The . | SDG Ref | 110523-40 3515895 | 110523-40 3515897 | 110523-40 3515899 | 110523-40 3515901 | 110523-40 3515902 | 110523-40 3515903 |
| | esults of individual compounds wit samples aren't corrected for the rec | | ab Sample No.(s) AGS Reference | 3313033 | 3313037 | 3313033 | 3313901 | 3313302 | 3313903 |
| (F) T | rigger breach confirmed | | | | | | | | |
| Compone | | LOD/Units | Method | 0.400 | | 0.010 | 0.44 | 0.0054 | -0.000 |
| | oluble Sulphate as | <0.008 q/l | TM243 | 0.102 M | | 0.013 M | 0.14 M | 0.0351 M | <0.008 M |
| 304 2.1 | | Q/I | | 111 | | IVI | - Wi | IVI | |
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CERTIFICATE OF ANALYSIS

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|--|---|---|---|--|------|--|----------|--|--------|--|--|----------|--|
| SDG Job: Clier | | 110523-40 H_WARDELL SH10534 | _SHF-37 | Location: Customer: Attention: | | ardell Armstrong ke Kelly | J LLP | | | Order Number: Report Number: Superseded Repor | SH3068 135537 t: 132894 | | |
| | by GCMS | 51110334 | | Attention. | IVII | te relly | | | | Superseued Repor | • 152054 | | |
| # M § aq diss.filt tot.unfilt * * | Results Legen ISO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled samp Dissolved / filtered samp Total / unfiltered sample. Subcontracted test. % recovery of the surrog check the efficiency of th results of individual com samples aren't corrected Trigger breach confirme | e. le. se method. The pounds within for the recovery d | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | 0.80 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515844 | | TP 105 0.90 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515854 | | TP 109 0.60 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515862 | | TP 112 0.50 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515870 | TP 114 0.80 Soli/Solid 19/05/2011 21/05/2011 110523-40 3515876 | | TP 117 0.40 Soil/Solid 20/05/2011 21/05/2011 110523-40 3515882 |
| Compo Napht | nent halene | LOD/U <9 με | | 55.4 | | 11.7 | _ | 166 | | <9 | <9 | | 155 |
| Acena | phthylene | <1 | 2 TM218 | <12 | Μ | <12 | М | 81.9 | м | M <12 | <12 | # | # <12 |
| Acena | phthene | μq/k <8 μί | | <8 | M | <8 | м | 186 | м | M <8 | <8 | # | # <8 |
| Fluore | ne | <10 µg/k | | <10 | M | <10 | M M | 153 | M M | <10 M | <10 | # | # 12.6 # |
| Phena | Inthrene | <1: μq/k | 5 TM218 | 92.4 | м | 24 | м | 1620 | м | <15 M | 77 | # | 206 # |
| Anthra | icene | <10 | 6 TM218 | <16 | м | 24.3 | м | 442 | м | <16 M | <16 | # | <16 # |
| Fluora | nthene | <1 µg/k | 7 TM218 | 80.9 | М | <17 | м | 2860 | м | <17 M | 70.7 | # | 23.8 # |
| Pyren | | <1: µq/k | q | 73.2 | М | 18.7 | м | 2400 | м | <15 M | 62.3 | # | 26.8 # |
| | a)anthracene | <14 µq/k | q | 69.6 | М | 24 | м | 1600 | м | <14 M | 53.9 | # | 24.8 # |
| Chryse | | <10 µq/k | q | 57.5 77.8 | М | 23.1 40.2 | м | 2200 | м | <10 M <15 | 56.1 43.7 | # | 33.1 # 25.8 |
| | (b)fluoranthene | <1: µq/k <14 | q | 27.6 | М | 40.2 <14 | м | 810 | м | <15 M <14 | 19.8 | # | 25.8 # <14 |
| | (a)pyrene | μq/k | q | 50.4 | М | <14 | м | 1560 | м | <14 M | 26.9 | # | <14 # |
| | o(1,2,3-cd)pyrene | µg/k | q | 31.9 | Μ | <18 | м | 992 | м | <18 M | <18 | # | <18 |
| | zo(a,h)anthracen | µg/k | q | <23 | Μ | <23 | М | 310 | М | M <23 | <23 | # | # <23 |
| Benzo | (g,h,i)perylene | μq/k <24 | 4 TM218 | 40.9 | М | <24 | М | 1100 | М | M <24 | 29.5 | # | # <24 |
| PAH, ⁻ USEP | Total Detected A 16 | µq/k | 8 TM218 | 658 | M | 166 | <u>M</u> | 18000 | M | M <118 | 440 | # | # 508 |
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CERTIFICATE OF ANALYSIS

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|--|---|--|---------------|--------------------------------|-----------------------------------|--|-----|--|-------|--|---|---|--|---|--|-------------|
| SDG Job: Clier | | 110523 H_WAR SH105 | RDELL_ | SHF-37 | | Location: Customer: Attention: | | ardell Armstron ke Kelly | g LLP | | | Order Number: Report Number: Superseded Repor | SH3068 135537 t: 132894 | } | | |
| | by GCMS | onnoo | 04 | | | Automoti. | | te rteny | | | | | - 102004 | | | |
| | Results Legend | ł | | Customer Sam | ple R | TP 119 | | WS 101 | | WS 102 | | WS 104 | WS 106 | | WS 109 | |
| # M § diss.filt tot.unfilt * * | ISO17025 accredited. mCERTS accredited. Mon-conforming work. Aqueous / settled sample Dissolved / filtered sample. Subcontracted test. % recovery of the surrogo check the efficiency of th results of individual com samples aren't corrected Trigger breach confirmed | le. ate standard e method. Ti pounds with for the reco | he in | Sample Date Sar Date Rec | npled eived G Ref Io.(s) | 0.30 Soil/Solid 20/05/2011 21/05/2011 110523-40 3515886 | | 0.40 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515887 | | 0.70 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515888 | | 0.40 Soil/Solid 16/05/2011 21/05/2011 1105/23-40 3515894 | 0.50 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515897 | | 0.70 Soii/Solid 17/05/201 21/05/201 110523-40 3515902 | 1 1 0 |
| Compo | | | LOD/Un | | | | | | | | | | | | | |
| Napht | halene | | <9 µg | /kg TM2 [/] | 8 | 36.2 | м | 49 | м | 6390 | м | 11.7 M | 567 | м | 85.7 | м |
| Acena | phthylene | | <12 µq/ka | 1 | | <12 | м | 28.3 | м | 395 | м | <12 M | 68.2 | м | <12 | м |
| Acena | phthene | | <8 µg | /kg TM2′ | 8 | <8 | м | 55 | м | 4050 | м | <8 M | 92.7 | м | <8 | м |
| Fluore | ne | | <10 µg/ko | | 8 | <10 | м | 36.4 | м | 3590 | м | <10 M | 71.7 | м | <10 | м |
| Phena | inthrene | | <15 µg/ko | | 8 | 179 | м | 620 | м | 29600 | м | 33.5 M | 1350 | м | 196 | м |
| Anthra | icene | | <16 µq/ka | | 8 | 18.9 | м | 174 | М | 7930 | м | <16 M | 259 | м | <16 | м |
| Fluora | nthene | | <17 µq/ka | TM2 | 8 | 130 | м | 2040 | М | 35800 | м | 33 M | 2290 | М | 64.5 | м |
| Pyren | e | | <15 µg/ko | TM2 | 8 | 125 | м | 1830 | М | 28600 | м | 30.4 M | 2060 | М | 60.4 | м |
| Benz(a | a)anthracene | | <14 µg/ko | TM2' | 8 | 82.3 | м | 1000 | м | 16500 | м | 31.4 M | 1550 | м | 54.4 | м |
| Chryse | ene | | <10 µg/ko | TM2 | 8 | 98.2 | м | 951 | м | 14000 | м | 24.7 M | 1460 | м | 67.8 | м |
| Benzo | (b)fluoranthene | | <15 µq/ko | TM2 | 8 | 147 | м | 1270 | м | 16500 | м | 37.5 M | 2260 | м | 62 | м |
| Benzo | (k)fluoranthene | | <14 µq/ko | TM2 | 8 | 39.9 | м | 528 | м | 7130 | м | <14 M | 859 | м | <14 | м |
| Benzo | (a)pyrene | | <15 µg/ko | TM2 | 8 | 69.2 | м | 1050 | м | 16300 | м | 19.9 M | 1980 | м | 29.5 | м |
| Indend | o(1,2,3-cd)pyrene | | <18 µq/ka | TM2 | 8 | 46.3 | м | 642 | м | 8940 | м | <18 M | 1470 | м | <18 | м |
| Diben | zo(a,h)anthracene | e | <23 µq/ka | TM2 | 8 | <23 | м | 165 | м | 2530 | м | <23 M | 400 | м | <23 | м |
| Benzo | (g,h,i)perylene | | <24 µg/ko | TM2 | 8 | 84.6 | м | 791 | м | 9650 | м | <24 M | 1850 | м | 41.2 | м |
| PAH, USEP | Total Detected A 16 | | <118 µq/ko | B TM2 | 8 | 1060 | | 11200 | | 208000 | | 222 | 18600 | | 661 | |
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CERTIFICATE OF ANALYSIS

| SDC: 11/023-40 H_WADELL_SHF-37 Location: Custome: Marking Wardel Armstrong LLP Order Number: Report Number: Super-State SH3081 135537 Strem Voice Fundamental Reference: H_WADELL_SHF-37 Custome: Marking Wardel Armstrong LLP Order Number: Super-State 135537 Strem Voice Fundamental Reference: Fundamental Strem Voice Fundamental Reference: The Strem Fundamental Reference: The Strem | | | | | | | | | | | | | | | | | | | | | |
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| Phenol <100 TM157 <100 <200 <100 <100 <100 <100 Pentachlorophenol <100 | TP 107 0.70 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515860 | | | | | | | | | | | | | | | | | | | | |
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| Hexachlorocyclopentadien <100 TM157 <200 <100 <200 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <th< td=""><td><100</td></th<> | <100 | | | | | | | | | | | | | | | | | | | | |
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| bis(2-Chloroethoxy)methan e < 100 µq/kq TM157 µq/kq < 100 < 200 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 < 100 </td <td><100</td> | <100 | | | | | | | | | | | | | | | | | | | | |
| bis(2-Chloroethyl)ether <100 TM157 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 < | <100 | | | | | | | | | | | | | | | | | | | | |
| Azobenzene <100 TM157 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Nitrophenol <100 µa/ka TM157 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100< | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Nitroaniline <100 µq/kq TM157 7 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <1 | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Methylphenol <100 TM157 <100 <200 <100 <100 <100 4-Chlorophenylphenylether <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Chlorophenylphenylether <100 TM157 <100 <200 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Chloroaniline <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Chloro-3-methylphenol <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 4-Bromophenylphenylether <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 3-Nitroaniline <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 2-Nitrophenol <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 2-Nitroaniline <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 2-Methylphenol <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 2-Chlorophenol <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |
| 2,6-Dinitrotoluene <100 TM157 <100 <200 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100 <100< | <100 | | | | | | | | | | | | | | | | | | | | |
| 2,4-Dinitrotoluene <100 TM157 <100 <200 <100 <100 <100 <100 | <100 | | | | | | | | | | | | | | | | | | | | |

CERTIFICATE OF ANALYSIS

Validated

SDG: 110523-40 Location: Order Number: SH3068 Job: H_WARDELL_SHF-37 Wardell Armstrong LLP 135537 Customer: Report Number: **Client Reference:** SH10534 Attention: Mike Kelly Superseded Report: 132894 Semi Volatile Organic Compounds

| Semi Volatile Organic Compo Results Legend # ISO17025 accredited. | | ompound | s | | | | | | |
|---|--|---------------|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | | Cu | istomer Sample R | TP 101 | TP 103 | TP 104 | TP 105 | TP 106 | TP 107 |
| м | mCERTS accredited. | | | | | | | | |
| § aq | Non-conforming work. Aqueous / settled sample. | | Depth (m) | 0.60 | 0.40 | 0.50 | 0.30 | 0.50 | 0.70 |
| diss.filt | Dissolved / filtered sample. | | Sample Type | Soil/Solid | Soil/Solid | Soil/Solid | Soil/Solid | Soil/Solid | Soil/Solid |
| tot.unfilt | Total / unfiltered sample. Subcontracted test. | | Date Sampled Date Received | 17/05/2011 21/05/2011 | 17/05/2011 21/05/2011 | 17/05/2011 21/05/2011 | 18/05/2011 21/05/2011 | 18/05/2011 21/05/2011 | 18/05/2011 21/05/2011 |
| ** | % recovery of the surrogate standar | | SDG Ref | 110523-40 | 110523-40 | 110523-40 | 110523-40 | 110523-40 | 110523-40 |
| | check the efficiency of the method. results of individual compounds wit | | ab Sample No.(s) | 3515843 | 3515847 | 3515852 | 3515853 | 3515856 | 3515860 |
| | samples aren't corrected for the rec | | AGS Reference | | | | | | |
| (F) Compo | Trigger breach confirmed | LOD/Units | Method | | | | | | |
| | methylphenol | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| 2,4-01 | meuryiphenoi | µg/kg | 1101137 | <100 | ~200 | <100 | <100 | <100 | <100 |
| 2 4-Di | chlorophenol | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| _, | | µq/kq | | | | | | | |
| 2,4,6-1 | Frichlorophenol | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| | | µq/kq | | | | | | | |
| 2,4,5-1 | Frichlorophenol | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| | | µq/kq | | | | | | | |
| 1,4-Di | chlorobenzene | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| 10.01 | | µq/kq | 714457 | | | -100 | .100 | .100 | |
| 1,3-Di | chlorobenzene | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| 1.2 Di | ablarabanzana | µq/kq <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| 1,2-01 | chlorobenzene | <100 µg/kg | 110137 | <100 | <200 | <100 | <100 | <100 | <100 |
| 2-Chlo | ronaphthalene | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| | | µg/kg | | | -200 | | | | 100 |
| 2-Meth | nylnaphthalene | <100 | TM157 | 373 | 260 | 982 | 334 | 180 | <100 |
| | | µq/kq | | | | | | | |
| Acena | phthylene | <100 | TM157 | <100 | <200 | <100 | <100 | <100 | <100 |
| | | µq/kq | | | | | | | |
| Acena | phthene | <100 | TM157 | 597 | 442 | <100 | <100 | 127 | <100 |
| | | µq/kq | | | | | | | |
| Anthra | icene | <100 | TM157 | 1030 | 1220 | <100 | <100 | 796 | <100 |
| | | µq/kq | | | | | | | |
| Benzo | (a)anthracene | <100 | TM157 | 1980 | 4630 | <100 | 236 | 2350 | <100 |
| Depre | (h)fuoranthona | µq/kq | T14457 | 1100 | 4070 | 104 | 070 | 1000 | <100 |
| Benzo | (b)fluoranthene | <100 | TM157 | 1100 | 4670 | 124 | 272 | 1860 | <100 |
| Benzo | (k)fluoranthene | µq/kq <100 | TM157 | 1480 | 4140 | <100 | 287 | 1830 | <100 |
| Delizo | (K)IIUUI aIIIII EIIE | μq/kq | 1101137 | 1400 | 4140 | <100 | 207 | 1650 | \$100 |
| Benzo | (a)pyrene | <100 | TM157 | 1720 | 5710 | <100 | 305 | 2400 | <100 |
| | (-)[] | µq/kq | | | | | | | |
| Benzo | (g,h,i)perylene | <100 | TM157 | 746 | 3210 | <100 | 199 | 1250 | <100 |
| | | µq/kq | | | | | | | |
| Chryse | ene | <100 | TM157 | 2020 | 4600 | 198 | 344 | 2210 | <100 |
| | | µq/kq | | | | | | | |
| Fluora | nthene | <100 | TM157 | 4520 | 8750 | 176 | 445 | 4790 | <100 |
| | | µq/kq | 714457 | 100 | 077 | .100 | . 100 | 110 | |
| Fluore | ne | <100 | TM157 | 483 | 377 | <100 | <100 | 116 | <100 |
| Indend | o(1,2,3-cd)pyrene | µq/kq <100 | TM157 | 690 | 3020 | <100 | 164 | 1140 | <100 |
| Indene | (1,2,0-cu)pyrene | µq/kq | 111107 | 050 | 5020 | | 104 | 1140 | |
| Phena | nthrene | <100 | TM157 | 4550 | 4350 | 622 | 382 | 1950 | <100 |
| | | µq/kq | | | | | | | |
| Pyrene | 5 | <100 | TM157 | 3880 | 7940 | 181 | 425 | 4140 | <100 |
| | | µq/kq | | | | | | | |
| Naphti | halene | <100 | TM157 | 795 | 381 | 387 | 162 | 166 | <100 |
| | | µq/kq | | | | | | | |
| Dibenz | zo(a,h)anthracene | <100 | TM157 | 178 | 739 | <100 | <100 | 255 | <100 |
| — | | µq/kq | | | | | | | |
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CERTIFICATE OF ANALYSIS

| | | | | CER | TIFICATE OF AI | NALYSIS | | | |
|--|--|----------------------------|---|--|---|--|--|--|--|
| SDG: Job: Client R | | 23-40 ARDELL_\$ 0534 | SHF-37 | | Wardell Armstrong LLP Mike Kelly | | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 | |
| Semi Vo | platile Organic C | ompour | nds | | | | | | |
| M mC § Nor aq Aq diss.filt Dis tot.unfilt Tot * Sut * % r che res san | Results Legend 017025 accredited. ERTS accredited. ERTS accredited. ERTS accredited. ueous / settled sample. tal / unfiltered sample. boohtracted test. recovery of the surrogate stand ext he efficiency of the method sults of individual compounds w mples aren't corrected for the re igger breach confirmed | ard to 1. The vithin | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | TP 108 0.75 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515861 | TP 110 50i/Solid 18/05/2011 21/05/2011 110523-40 3515863 | TP 111 0.70 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515866 | TP 111 1.20 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515869 | TP 113 0.45 Soli/Solid 19/05/2011 21/05/2011 1105/2011 3515872 | TP 115 0.30 Soli/Solid 19/05/2011 21/05/2011 110523-40 3515878 |
| Componer Phenol | nt | LOD/Uni <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| | | µq/kq | | | | | | | |
| Pentachlo | orophenol | <100 µq/kq | | <100 | <100 | <100 | <100 | <100 | <100 |
| n-Nitroso | o-n-dipropylamine | <100 µq/kq | | <100 | <100 | <100 | <100 | <100 | <100 |
| Nitrobenz | zene | <100 µq/kq | | <100 | <100 | <100 | <100 | <100 | <100 |
| Isophoror | ne | <100 µg/kg | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| Hexachlo | proethane | <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | procyclopentadien | µq/kq <100 | TM157 | <200 | <100 | <100 | <100 | <200 | <100 |
| e Hexachlo | probutadiene | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| Hexachlo | probenzene | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| n-Dioctyl | phthalate | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| Dimethyl | phthalate | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| Diethyl pł | hthalate | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| n-Dibutyl | phthalate | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| Dibenzof | uran | µq/kq <100 | | <100 | <100 | 264 | <100 | <100 | 224 |
| Carbazol | le | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| Butylbenz | zyl phthalate | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| bis(2-Eth | ylhexyl) phthalate | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| bis(2-Chl | loroethoxy)methan | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| e bis(2-Chl | loroethyl)ether | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| Azobenze | ene | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Nitroph | ienol | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Nitroan | niline | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Methylp | phenol | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| | phenylphenylether | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Chloroa | | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Chloro- | -3-methylphenol | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 4-Bromor | phenylphenylether | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 3-Nitroan | | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2-Nitroph | ienol | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2-Nitroan | | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2-Methylp | | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| | chlorobenzene | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2-Chlorop | | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,6-Dinitr | - | µq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-Dinitr | | μq/kq <100 | | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-0/110 | | µq/kq | | -100 | \$100 | 100 | | - 100 | |

CERTIFICATE OF ANALYSIS

SDG: 110523-40 Location: Order Number: SH3068 Job: H_WARDELL_SHF-37 Wardell Armstrong LLP 135537 Customer: Report Number: **Client Reference:** SH10534 Attention: Mike Kelly Superseded Report: 132894

Validated

Semi Volatile Organic Compounds

| Semi Volatile Organic Compo | | ompound | ds | | | | | | |
|-----------------------------|--|-----------------------|------------------------------|----------------------|----------------------|----------------------|----------------------|-------------------------|-------------------------|
| * | | Ci | ustomer Sample R | TP 108 | TP 110 | TP 111 | TP 111 | TP 113 | TP 115 |
| M § | mCERTS accredited. Non-conforming work. | | | | | | | | |
| aq | Aqueous / settled sample. | | Depth (m) Sample Type | 0.75 Soil/Solid | 1.00 Soil/Solid | 0.70 Soil/Solid | 1.20 Soil/Solid | 0.45 Soil/Solid | 0.30 Soil/Solid |
| diss.filt tot.unfilt | Dissolved / filtered sample. Total / unfiltered sample. | | Date Sampled | 18/05/2011 | 18/05/2011 | 18/05/2011 | 18/05/2011 | 19/05/2011 | 19/05/2011 |
| * | Subcontracted test. % recovery of the surrogate standar | d to | Date Received | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 110523-40 | 21/05/2011 110523-40 |
| | check the efficiency of the method. results of individual compounds wit | The | SDG Ref Lab Sample No.(s) | 110523-40 3515861 | 110523-40 3515863 | 110523-40 3515866 | 110523-40 3515869 | 3515872 | 3515878 |
| | samples aren't corrected for the rec | | AGS Reference | | | | | | |
| (F) Compo | Trigger breach confirmed | LOD/Units | Method | | | | | | |
| - | nethylphenol | <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4 01 | in a ship in a s | µg/kg | | 100 | 100 | 100 | | | 100 |
| 2,4-Dio | chlorophenol | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4,6-1 | richlorophenol | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | richlorophenol | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | chlorobenzene | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | chlorobenzene | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | chlorobenzene | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | ronaphthalene | <100 µq/kq | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | ylnaphthalene | <100 µq/kq | TM157 | <100 | <100 | 607 | 239 | <100 | 1160 |
| | phthylene | <100 µq/kq <100 | TM157 TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| Anthra | | µq/kq | TM157 | <100 | 132 | <100 | 226 | <100 | <100 |
| | (a)anthracene | <100 µq/kq <100 | TM157 TM157 | <100 | 544 | 128 | 628 | <100 | 191 |
| | (b)fluoranthene | μq/kq <100 | TM157 | <100 | 523 | <100 | 502 | <100 | 236 |
| | (k)fluoranthene | μq/kq <100 | TM157 | <100 | 466 | <100 | 456 | <100 | 150 |
| | (a)pyrene | μq/kq <100 | TM157 | <100 | 594 | <100 | 568 | <100 | 204 |
| | (g,h,i)perylene | μq/kq <100 | TM157 | <100 | 335 | <100 | 290 | <100 | 179 |
| Chryse | | µq/kq <100 | TM157 | <100 | 569 | 243 | 636 | <100 | 296 |
| Fluora | | µq/kq <100 | TM157 | <100 | 1040 | 135 | 1330 | <100 | 312 |
| Fluore | ne | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | (1,2,3-cd)pyrene | µq/kq <100 | TM157 | <100 | 291 | <100 | 267 | <100 | 133 |
| Phena | nthrene | µq/kq <100 | TM157 | <100 | 618 | 931 | 916 | <100 | 801 |
| Pyrene | 2 | µq/kq <100 | TM157 | <100 | 950 | 174 | 1130 | <100 | 317 |
| Naphth | | µq/kq <100 | TM157 | <100 | <100 | 187 | 133 | <100 | 309 |
| Dibenz | o(a,h)anthracene | µq/kq <100 | TM157 | <100 | <100 | <100 | <100 | <100 | <100 |
| | | µq/kq | | | | | | | |
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CERTIFICATE OF ANALYSIS

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|-----------------------|--|------------------------------------|--|--|--|--|--|--|--|
| SDG: Job: Clien | н | 110523-40 H_WARDELL_ SH10534 | _SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 | |
| | Volatile Organi | | Inds | | | | | | |
| tot.unfilt * ** | Results Legend ISO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Subcontracted test. % recovery of the surrogate check the efficiency of the n results of individual compox samples aren't corrected for Trigger breach confirmed | method. The unds within | Customer Sample R Depth (m) Sample Type Date Received Date Received SDG Ref Lab Sample No.(s) AGS Reference | TP 118 0.70 Soil/Solid 20/05/2011 21/05/2011 110523-40 3515883 | WS 103 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515891 | WS 105 0.30 Soli/Solid 16/05/2011 21/05/2011 110523-40 3515895 | WS 107 0.50 Soli/Solid 17/05/2011 21/05/2011 110523-40 3515899 | 0.40 Soli/Solid 17/05/2011 21/05/2011 110523-40 3515901 | WS 110 0.60 Soil/Solid 17/05/2011 21/05/2011 1105/2011 3515903 |
| Compose Pheno | | LOD/U | | <100 | <100 | <100 | <100 | <1000 | <100 |
| | | μq/k <10 | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | chlorophenol | µq/k | q | | | | | | |
| n-Nitro | oso-n-dipropylamine | е <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Nitrobe | enzene | <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Isopho | rone | <10 | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| Hexac | hloroethane | µq/ki <10 | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| | hlorocyclopentadie | | 0 TM157 | <100 | <100 | <100 | <200 | <1000 | <100 |
| e Hexacl | hlorobutadiene | µq/k <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Hexad | hlorobenzene | μq/k <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| n-Dioc | tyl phthalate | μq/ki <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| | hyl phthalate | μq/k <10 | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | | µq/k | q | | | | | | |
| Diethyl | I phthalate | <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| n-Dibu | ityl phthalate | <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Dibenz | zofuran | <10 µg/k | | <100 | <100 | <100 | 474 | 4750 | <100 |
| Carbaz | zole | <10 | 0 TM157 | <100 | <100 | <100 | 627 | 4870 | <100 |
| Butylbo | enzyl phthalate | µq/k <10 | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| bis(2-E | Ethylhexyl) phthalat | | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| bis(2-C | Chloroethoxy)metha | µq/k an <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| e bis(2-C | Chloroethyl)ether | μq/k <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Azobei | | μq/ko <10 | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | | µq/k | q | | | | <100 | <1000 | <100 |
| | phenol | <10 µg/k | q | <100 | <100 | <100 | | | |
| 4-Nitro | baniline | <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| 4-Meth | nylphenol | <10 µg/k | | <100 | <100 | <100 | <100 | <1000 | <100 |
| 4-Chlo | prophenylphenylethe | | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 4-Chlo | oroaniline | <10 | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 4-Chlo | pro-3-methylphenol | | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 4-Bron | nophenylphenylethe | | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 3-Nitro | aniline | µq/k <10 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| | phenol | μq/ko <10 | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | paniline | µq/k <10 | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | | µq/k | q | | | | | | |
| | hylphenol | <10 µg/k | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| | Trichlorobenzene | <10 µq/k | q | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2-Chlo | prophenol | <10 µg/k | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2,6-Dir | nitrotoluene | <10 µg/k | 0 TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| | | | | | | | | | |

| b , / | ALcontrol La | boratories | | | | | | | Validated |
|---|---|---|--|--|--|--|--|--|--|
| SDG: Job: | | 110523-40 H_WARDELL_ | SHF-37 | Location: Customer: | Wardell Armstrong LLP | IALYSIS | Order Number: Report Number: | SH3068 135537 | |
| | | SH10534 | ndo | Attention: | Mike Kelly | | Superseded Report: | 132894 | |
| emi v | Olatile Organ Results Legend | lic Compou | Customer Sample R | TP 118 | WS 103 | WS 105 | WS 107 | WS 108 | WS 110 |
| M § diss.filt tot.unfilt * * | SO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Subcontracted test. K recovery of the surrogal check the efficiency of the results of individual comp samples aren't corrected fi ringger breach confirmed | te standard to method. The ounds within | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | 0.70 Soil/Solid 20/05/2011 21/05/2011 110523-40 3515883 | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515891 | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515895 | 0.50 Soil/Solid 17/05/2011 21/05/2011 110523-40 3515899 | 0.40 Soii/Solid 17/05/2011 21/05/2011 110523-40 3515901 | 0.60 Soii/Solid 17/05/2011 21/05/2011 110523-40 3515903 |
| Compon | | LOD/Un | _ | | | | 100 | | |
| 2,4-Dim | ethylphenol | <100 µg/kg | | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2,4-Dicł | nlorophenol | <100 µg/kg |) TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2,4,6-Ti | ichlorophenol | <100 |) TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2,4,5-Ti | ichlorophenol | µq/kq <100 |) TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 1,4-Dicl | nlorobenzene | µq/kq <100 |) TM157 | <100 | <100 | <100 | <100 | <1000 | <100 |
| 1,3-Dict | nlorobenzene | µq/kq <100 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| 1,2-Dict | nlorobenzene | µq/kq <100 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| 2-Chlor | onaphthalene | µq/kq <100 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| | /Inaphthalene | µq/kq <100 | | <100 | 124 | 126 | 578 | 3910 | <100 |
| | hthylene | µq/kq <100 | | <100 | <100 | <100 | <100 | <1000 | <100 |
| Acenap | - | µq/kq <100 | | <100 | <100 | <100 | 498 | 8450 | <100 |
| | | µq/kq | | | | | | | |
| Anthrac | | <100 µq/ka | | <100 | 146 | <100 | 951 | 10400 | <100 |
| | a)anthracene | <100 µq/kq | | 215 | 372 | <100 | 1770 | 20300 | <100 |
| Benzo(I | o)fluoranthene | <100 µg/kg | | 205 | 307 | <100 | 1300 | 13900 | <100 |
| Benzo(I | ()fluoranthene | <100 µq/kq | | 181 | 288 | <100 | 1450 | 14100 | <100 |
| Benzo(a | a)pyrene | <100 µg/kg | | 229 | 375 | <100 | 1710 | 19400 | <100 |
| Benzo((| g,h,i)perylene | <100 µg/kg | | 142 | 242 | <100 | 751 | 9900 | <100 |
| Chryser | ne | <100 µg/kg |) TM157 | 247 | 392 | <100 | 1950 | 20500 | <100 |
| Fluoran | thene | <100 µg/kg |) TM157 | 386 | 765 | <100 | 4310 | 47100 | <100 |
| Fluoren | e | <100 µg/kg |) TM157 | <100 | <100 | <100 | 472 | 5920 | <100 |
| Indeno(| 1,2,3-cd)pyrene | <100 |) TM157 | 119 | 204 | <100 | 705 | 8860 | <100 |
| Phenan | threne | µq/kq <100 |) TM157 | 286 | 637 | 147 | 4650 | 49000 | 131 |
| Pyrene | | µq/kq <100 |) TM157 | 361 | 663 | <100 | 3780 | 40200 | <100 |
| Naphtha | alene | µq/kq <100 |) TM157 | <100 | 159 | <100 | 1110 | 7060 | <100 |
| Dibenzo | o(a,h)anthracene | |) TM157 | <100 | <100 | <100 | 163 | 2030 | <100 |
| | | juq/kq | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | 1 1 | | |

17:33:14 23/06/2011

CERTIFICATE OF ANALYSIS

| | | | | CE | RTI | FICATE OF A | NALYSIS | | | | |
|---|---|--|--|--|-----|--|--|---|--|--|--|
| SDG Job: Clier | I | 110523-40 H_WARDELL SH10534 | _SHF-37 | Location: Customer: Attention: | | ardell Armstrong LLI ke Kelly | P | | Order Number: Report Number: Superseded Repor | SH3068 135537 ft: 132894 | |
| | CWG (S) | | | , | | no riony | | | | 102001 | |
| | Results Legend | | Customer Samp | le R TP 104 | | TP 105 | TP 107 | | TP 110 | TP 111 | TP 111 |
| # M § diss.filt tot.unfilt * | ISO17025 accredited. mCERTS accredited. Mon-conforming work. Aqueous / settled sample. Dissolved / Filtered sample. Subcontracted test. % recovery of the surrogat check the efficiency of the results of individual comp samples aren't corrected for Trigger breach confirmed | e standard to method. The bunds within | Depth Sample T Date Samj Date Recei SDG Lab Sample No AGS Refere | ype Soil/Solid bled 17/05/2011 ived 21/05/2011 Ref 110523-40 b.(s) 3515852 | | 0.30 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515853 | 0.70 Soil/Solid 18/05/201 21/05/201 110523-40 3515860 | 1 | 1.00 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515863 | 0.70 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515866 | 1.20 Soil/Solid 18/05/2011 21/05/2011 110523-40 3515869 |
| Compo | | LOD/U | | | | 01 | | | 50 | 47 | 45 |
| recove | Surrogate % erv** | % | 5 TM089 | 9 29 | | 31 | 66 | | 52 | 17 | 45 |
| GRO : | >C5-C12 | <4 µg/k | | 9 49.5 | | <44 | <44 | | <44 | <44 | <44 |
| Methy (MTBE | I tertiary butyl ethe =) | r <5 µ | g/kg TM08 | 9 <5 | # | <5 # | <5 | # | <5 # | <5 # | <5 # |
| Benze | ne | <1 µq/k | | 9 <10 | М | <10 M | <10 | м | <10 M | <10 M | <10 M |
| Toluer | ne | <2 µ | g/kg TM08 | 9 <2 | м | 2.34 M | 6.72 | м | 3.81 M | 3.33 M | 4.64 M |
| Ethylb | enzene | <3 µį | g/kg TM08 | 9 4.22 | М | <3 M | 20.2 | м | 7.62 M | 7.77 M | 16.2 M |
| m,p-X | ylene | <6 hö | g/kg TM08 | 9 8.43 | М | <6 M | 8.96 | м | <6 M | <6 M | 8.12 M |
| o-Xyle | ne | <3 µ | g/kg TM08 | 9 <3 | М | <3 M | 4.48 | м | <3 M | <3 M | <3 M |
| | f detected mpo e by GC | μg/ | kg TM08 | 8.43 | | none detected | 13.4 | | none detected | none detected | 8.12 |
| sum o GC | f detected BTEX by | y µg/ | kg TM089 | 9 12.7 | | 2.34 | 40.3 | | 11.4 | 11.1 | 29 |
| Alipha | tics >C5-C6 | <1 µq/k | | 9 <10 | | <10 | <10 | | <10 | <10 | <10 |
| Alipha | tics >C6-C8 | <1 µq/k | | 9 14.8 | | <10 | <10 | | <10 | <10 | <10 |
| Alipha | tics >C8-C10 | <1 µq/k | | 9 <10 | | <10 | <10 | | <10 | <10 | <10 |
| Alipha | tics >C10-C12 | <1 µq/k | | 9 <10 | | <10 | <10 | | <10 | <10 | <10 |
| Alipha | tics >C12-C16 | <10 µq/k | | 3 79300 | | 33800 | 6260 | | 10100 | 36900 | 14300 |
| Alipha | tics >C16-C21 | <10 µq/k | | 81900 | | 48600 | 5310 | | 16500 | 32400 | 15100 |
| Alipha | tics >C21-C35 | <10 µq/k | | 3 99300 | | 240000 | 25800 | | 49400 | 48400 | 41400 |
| Alipha | tics >C35-C44 | <10 µq/k | | 3 8330 | | 36300 | 2380 | | 4870 | 4850 | 4760 |
| | Aliphatics >C12-C4 | 4 <10 μα/k | (q | | | 359000 | 39700 | | 80800 | 123000 | 75500 |
| | atics >EC5-EC7 | 1> µq/ا | q | | | <10 | <10 | | <10 | <10 | <10 |
| | atics >EC7-EC8 | <1 µq/k | (q | | | <10 | <10 | | <10 | <10 | <10 |
| | atics >EC8-EC10 | 1> µq/ا | (q | | | <10 | 32.5 | | 12.7 | 14.4 | 27.8 |
| Aroma | atics >EC10-EC12 | 1> µq/k | | 9 <10 | | <10 | <10 | | <10 | <10 | <10 |
| Aroma | atics >EC12-EC16 | <10 µq/k | | 3 44800 | | 25700 | 6970 | | 25800 | 29900 | 9750 |
| Aroma | atics >EC16-EC21 | <10 µq/k | | 3 54200 | | 32200 | 7140 | | 18400 | 39200 | 21800 |
| Aroma | atics >EC21-EC35 | <10 µq/k | | 3 118000 | | 151000 | 25000 | | 48400 | 67100 | 57900 |
| | atics >EC35-EC44 | <10 µg/k | (q | | | 44100 | 7340 | | 11600 | 9710 | 16500 |
| Aroma | atics >EC40-EC44 | <10 µg/k | (q | | | 15600 | 2990 | | 4140 | 2530 | 6120 |
| | Aromatics 2-EC44 | <10 µg/k | (q | | | 253000 | 46400 | | 104000 | 146000 | 106000 |
| Aroma | Aliphatics & atics >C5-C44 | <10 µg/k | (q | | | 612000 | 86200 | | 185000 | 268000 | 182000 |
| Total / | Aliphatics >C5-35 | <10 µg/k | (q | | | 323000 | 37400 | | 75900 | 118000 | 70800 |
| | Aromatics >C5-35 | <10 µg/k | | 3 217000 | | 209000 | 39100 | | 92600 | 136000 | 89500 |
| | Aliphatics & atics >C5-35 | <10 µg/k | | 3 477000 | | 531000 | 76500 | | 169000 | 254000 | 160000 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | - | - | | | | |

CERTIFICATE OF ANALYSIS

Validated

| | 110523-40 | | Location: | (| | Order Number: | SH3068 | |
|--|-----------------------|------------------------------|--------------------------|------------------------------------|--------------------------|-----------------------------------|----------------------|--|
| | H_WARDELL_ SH10534 | SHF-37 | | /ardell Armstrong LLF ike Kelly | , | Report Number: Superseded Repo | 135537 rt: 132894 | |
| | 01110004 | | Attention. | ince recity | | ouperseulu nepe | 102034 | |
| TPH CWG (S) Results Legend | | Customer Sample R | TP 115 | WS 103 | WS 105 | WS 108 | | |
| # ISO17025 accredited. M mCERTS accredited. | | | | | | | | |
| § Non-conforming work. aq Aqueous / settled sample. | | Depth (m) | 0.30 | 0.30 | 0.30 | 0.40 | | |
| diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. | | Sample Type Date Sampled | Soil/Solid 19/05/2011 | Soil/Solid 16/05/2011 | Soil/Solid 16/05/2011 | Soil/Solid 17/05/2011 | | |
| * Subcontracted test. | | Date Received | 21/05/2011 | 21/05/2011 | 21/05/2011 | 21/05/2011 | | |
| check the efficiency of the | method. The | SDG Ref Lab Sample No.(s) | 110523-40 3515878 | 110523-40 3515891 | 110523-40 3515895 | 110523-40 3515901 | | |
| results of individual compo samples aren't corrected fo | | AGS Reference | | | | | | |
| (F) Trigger breach confirmed | LOD/Uni | its Method | | | | | | |
| Component GRO Surrogate % | 0/01 | TM089 | 33 | 69 | 56 | 47 | | |
| recovery** | | | | | | | | |
| GRO >C5-C12 | <44 µq/kq | | <44 | 48.3 | 828 | 189 | | |
| Methyl tertiary butyl ether (MTBE) | r <5 µg/ | kg TM089 | <5 | | <5 # | <5 # | | |
| Benzene | <10 µq/kq | TM089 | <10 M | <10 M | <10 M | <10 M | | |
| Toluene | <2 µg/ | kg TM089 | <2 M | 5.49 M | 5.6 M | 13.5 M | | |
| Ethylbenzene | <3 µg/ | kg TM089 | <3 M | 9.88 M | 4.48 M | 7.38 M | | |
| m,p-Xylene | <6 µg/ | kg TM089 | <6 M | 6.59 M | 10.1 M | 9.84 M | | |
| o-Xylene | <3 µg/ | kg TM089 | <3 M | <3 M | 5.6 M | 4.92 M | | |
| m,p,o-Xylene | µg/ko | g TM089 | | | 15.7 | 14.8 | | |
| sum of detected mpo xylene by GC | µg/kç |) TM089 | none detected | 6.59 | | | | |
| BTEX, Total | µg/kç |) TM089 | | | 25.8 | 35.7 | | |
| sum of detected BTEX by GC | y µg/kg | g TM089 | none detected | 22 | | | | |
| Aliphatics >C5-C6 | <10 µg/kg | TM089 | <10 | <10 | 12.3 | <10 | | |
| Aliphatics >C6-C8 | <10 µg/kg | TM089 | <10 | <10 | 52.6 | 19.7 | | |
| Aliphatics >C8-C10 | <10 µg/kg | TM089 | <10 | <10 | 113 | 25.8 | | |
| Aliphatics >C10-C12 | <10 µg/kg | TM089 | <10 | 11 | 328 | 48 | | |
| Aliphatics >C12-C16 | <100 µq/kq | | 31600 | 7510 | 11900 | 9170 | | |
| Aliphatics >C16-C21 | <100 µg/kg | | 60200 | 9600 | 24100 | 14100 | | |
| Aliphatics >C21-C35 | <100 µq/kq | | 77200 | 33600 | 87500 | 115000 | | |
| Aliphatics >C35-C44 | <100 µq/kq | | 14200 | 4020 | 10900 | 25300 | | |
| Total Aliphatics >C12-C4 | 4 <100 µq/kq | | 183000 | 54700 | 134000 | 164000 | | |
| Aromatics >EC5-EC7 | <10 µq/kq | | <10 | <10 | <10 | <10 | | |
| Aromatics >EC7-EC8 | <10 µq/kq | TM089 | <10 | <10 | <10 | 13.5 | | |
| Aromatics >EC8-EC10 | <10 µq/kq | TM089 | <10 | 20.9 | 96.3 | 39.4 | | |
| Aromatics >EC10-EC12 | <10 µq/kq | TM089 | <10 | <10 | 218 | 32 | | |
| Aromatics >EC12-EC16 | <100 µq/kq | | 36200 | 8430 | 6670 | 58000 | | |
| Aromatics >EC16-EC21 | <100 µq/kq | | 52900 | 11300 | 13400 | 247000 | | |
| Aromatics >EC21-EC35 | <100 µg/kg | | 88500 | 33100 | 44900 | 517000 | | |
| Aromatics >EC35-EC44 | <100 µq/kq | TM173 | 26700 | 8560 | 7270 | 125000 | | |
| Aromatics >EC40-EC44 | <100 µg/kg | TM173 | 9820 | 2670 | 1440 | 36400 | | |
| Total Aromatics >EC12-EC44 | <100 µg/kg | TM173 | 204000 | 61400 | 72200 | 947000 | | |
| Total Aliphatics & | <100 | TM173 | 388000 | 116000 | 207000 | 1110000 | | |
| Aromatics >C5-C44 Total Aliphatics >C5-35 | µq/kq <100 | | 169000 | 50700 | 124000 | 139000 | | |
| Total Aromatics >C5-35 | µq/kq <100 | | 178000 | 52900 | 65300 | 822000 | | |
| Total Aliphatics & | µq/kq <100 | | 347000 | 104000 | 189000 | 961000 | | |
| Aromatics >C5-35 | µq/kq | | | | | | | |

Aromatics >C5-35

µq/kq

CERTIFICATE OF ANALYSIS

| | | | CER | TIFICATE O | F A | NALYSIS | | | | |
|---|---|--|--|---|-------|---|---|---|---|--|
| UNC RE() Description Description <thdescription< th=""> <thdescription< th=""> <t< th=""><th>H_WARD</th><th>DELL_SHF-37</th><th>Customer:</th><th></th><th>) LLP</th><th></th><th></th><th>Report Number:</th><th>135537</th><th></th></t<></thdescription<></thdescription<> | H_WARD | DELL_SHF-37 | Customer: | |) LLP | | | Report Number: | 135537 | |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | | | | | | | | |
| Image: Normal state state and the state sta | Results Legend | Customer Sample R | TP 104 | TP 105 | | TP 107 | | TP 110 | TP 111 | TP 111 |
| | RTS accredited. conforming work. ous / settled sample. Jundified sample. / unfittered sample. ontracted test. overy of the surrogate standard to k the efficiency of the method. The ts of individual compounds within les aren't corrected for the recovery | Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) | Soil/Solid 17/05/2011 21/05/2011 110523-40 3515852 | Soil/Solid 18/05/2011 21/05/2011 110523-40 | | Soil/Solid 18/05/2011 21/05/2011 110523-40 | | Soil/Solid 18/05/2011 21/05/2011 110523-40 | Soil/Solid 18/05/2011 21/05/2011 110523-40 | 1.20 Soli/Solid 18/05/2011 21/05/2011 110523-40 3515869 |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | L | | 1 | | | | | | | |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | oromethane** | % TM116 | 101 | 84.8 | | 101 | | 101 | | 104 § |
| | 8** | % TM116 | 93.5 | 109 | | 100 | | 92.6 | 98.8 | 99.9 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | iorobenzene** | % TM116 | 133 | 119 | | 116 | | 103 | | 110 § |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | luoromethane | <4 µg/kg TM116 | <4 | | м | <4 | м | | | <80 § |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | hane | <7 µg/kg TM116 | <7 | | # | <7 | # | | | <140 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | ride | | <10 | # | # | | # | | | <200 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | hane | | <13 | м | м | <13 | м | | | <260 § |
| | ane | | <14 | | м | <14 | м | | | <280 |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | | | м | м | | м | M | § | <120 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | µq/kq | | # | # | | # | # | § | <200 § |
| | | | | м | м | | м | м | § | <140 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | µq/kq | 11.1 | | # | <10 | # | # | | <200 § |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | tiary Butyl Ether | | <11 | | м | <11 | м | | | <220 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | Dichloroethene | | <11 | | М | <11 | м | | | <220 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | roethane | <8 µg/kg TM116 | <8 | | м | <8 | м | | | <160 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | chloroethene | <5 µg/kg TM116 | <5 | | м | <5 | м | | | <100 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | µq/kq | | м | м | | м | M | § | <240 § |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | µq/kq | | м | м | | м | м | § | <280 § |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | 10 0 | | М | м | | м | М | § | <160 § |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | 10 0 | | М | м | | м | M | § | <140 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | µq/kq | | м | м | | м | M | § | <220 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | achloride | µq/kq | | м | м | | м | м | | <280 |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | <5 | м | м | | м | M | | <100 § |
| $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | | М | м | | м | М | § | <180 § |
| $\begin{array}{c c c c c c c c c c c c c c c c c c c $ | | | | м | м | | м | М | § | <180 § |
| Bromodichloromethane <7 µg/kg TM116 <7 <7 <7 <7 <140 Cis-1-3-Dichloropropene <14 | | µq/kq | | м | м | | м | M | § | <240 § |
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$ | | 10 0 | | M | М | | м | M | § | <180 § |
| μq/kq M <td>loromethane</td> <td>10 0</td> <td></td> <td>M</td> <td>м</td> <td></td> <td>м</td> <td>M</td> <td></td> <td><140 §</td> | loromethane | 10 0 | | M | м | | м | M | | <140 § |
| Iteration M | hloropropene | µq/kq | | м | м | | м | M | § | <280 § |
| μq/kq μq/kq \$ 1.1.2-Trichloroethane <10 | | | | м | м | | м | M | § | <100 § |
| μg/kg M M M M § | | µq/kq | | | | | | | § | <280 § |
| | | µq/kq | | м | м | | м | M | § | <200 § |
| 1.3-Dichloropropane <7 µg/kg ТМ116 <7 <7 <7 12.3 <140 # # # # # # § | | 10 0 | | # | # | | # | # | § | <140 § |
| Tetrachloroethene <5 μg/kg TM116 79.9 12.5 <5 12.6 <100 M M M M M M § | | 10 0 | | М | м | | м | M | § | <100 § |
| Dibromochloromethane <13 TM116 <13 <13 <13 <13 <260 µg/kg M M M M § | loromethane | | <13 | | м | <13 | м | | | <260 § |

CERTIFICATE OF ANALYSIS

| Client Reference: | SH10534 | | Attention: | Mil | ke Kelly | | | | Superseded Repor | t: 132894 | |
|--|-----------------|--|--------------------------|-----|--------------------------|-----|--------------------------|-----|--------------------------|--------------------------|--------------------------|
| VOC MS (S) | | | | | | | | | | | |
| Results Legend | | Customer Sample R | TP 104 | | TP 105 | | TP 107 | | TP 110 | TP 111 | TP 111 |
| # ISO17025 accredited. M mCERTS accredited. | | | | | | | | | | | |
| § Non-conforming work. aq Aqueous / settled sample. | | Depth (m) | 0.50 | | 0.30 | | 0.70 | | 1.00 | 0.70 | 1.20 |
| diss.filt Dissolved / filtered sample | | Sample Type | Soil/Solid | | Soil/Solid | | Soil/Solid | | Soil/Solid | Soil/Solid | Soil/Solid |
| tot.unfilt Total / unfiltered sample. * Subcontracted test. | | Date Sampled Date Received | 17/05/2011 21/05/2011 | | 18/05/2011 21/05/2011 | | 18/05/2011 21/05/2011 | | 18/05/2011 21/05/2011 | 18/05/2011 21/05/2011 | 18/05/2011 21/05/2011 |
| ** % recovery of the surrogat | | SDG Ref | 110523-40 | | 110523-40 | | 110523-40 | | 110523-40 | 110523-40 | 110523-40 |
| check the efficiency of the results of individual comp | | Lab Sample No.(s) | 3515852 | | 3515853 | | 3515860 | | 3515863 | 3515866 | 3515869 |
| samples aren't corrected for (F) Trigger breach confirmed | or the recovery | AGS Reference | | | | | | | | | |
| Component | LOD/U | nits Method | | | | | | | | | |
| 1.2-Dibromoethane | <1 | 2 TM116 | <12 | | <12 | | <12 | | <12 | <240 | <240 |
| | µq/k | .q | | М | | М | | М | М | § | § |
| Chlorobenzene | <5 µç | g/kg TM116 | <5 | | <5 | | <5 | | 10.6 | <100 | <100 |
| | | | | М | | М | | м | M | § | § |
| 1.1.1.2-Tetrachloroethan | | | <10 | | <10 | | <10 | | <10 | <200 | <200 |
| Ethylbenzene | μα/k <4 μο | | 12.1 | М | 5.83 | М | 28.4 | М | M 22.2 | <u></u> <80 | <u></u> <80 |
| Lutyibenzene | ~4 þý | g/kg IIwiTiO | 12.1 | м | 0.00 | м | 20.4 | м | 22.2 M | S. | S. |
| p/m-Xylene | <14 | 4 TM116 | 33.2 | | <14 | | <14 | | 28 | <280 | <280 |
| · · · | µg/k | .q | | # | | # | | # | # | § | ş |
| o-Xylene | <1 | D TM116 | 17.1 | | <10 | | <10 | | <10 | <200 | <200 |
| | µq/k | | | М | | М | | М | M | § | § |
| Styrene | <1 | | <10 | | <10 | | 20.7 | | 13.8 | <200 | <200 |
| Descriptions | µq/k | | -10 | М | - 10 | М | -10 | М | M | § | § |
| Bromoform | <1 | | <10 | м | <10 | м | <10 | м | <10 M | <200 § | <200 § |
| Isopropylbenzene | μα/k <5 μς | | <5 | IVI | <5 | IVI | <5 | IVI | 7.59 | <100 | <100 |
| 130propyiberizerie | 10 PS | , ng i mirio | ~~ | м | -0 | м | ~~ | м | M | ş | § |
| 1.1.2.2-Tetrachloroethan | ie <1 | D TM116 | <10 | | <10 | | <10 | | <10 | <200 | <200 |
| | µq/k | .q | | # | | # | | # | # | ş | ş |
| 1.2.3-Trichloropropane | <1 | 7 TM116 | <17 | | <17 | | <17 | | <17 | <340 | <340 |
| | µq/k | | | М | | М | | М | M | § | § |
| Bromobenzene | <1 | | <10 | | <10 | | <10 | | <10 | <200 | <200 |
| Desculture | µq/k | | .4.4 | М | -44 | М | - 44 | М | M | § | § |
| Propylbenzene | <1 µg/k | | <11 | м | <11 | м | <11 | м | <11 M | <220 § | <220 § |
| 2-Chlorotoluene | µu/۸ <9 µر | | <9 | IVI | <9 | IVI | <9 | IVI | <9 | <180 | <180 |
| | -0 ps | , ng 11110 | | м | | м | | м | ~ М | ş | § |
| 1.3.5-Trimethylbenzene | <8 µç | j/kg TM116 | <8 | | <8 | | <8 | | <8 | <160 | <160 |
| | | | | # | | # | | # | # | § | § |
| 4-Chlorotoluene | <1 | | <12 | | <12 | | <12 | | <12 | <240 | <240 |
| | µq/k | | 10 | М | 10 | М | 10 | м | M | §. | § |
| tert-Butylbenzene | <1 | | <12 | # | <12 | # | <12 | # | <12 # | <240 § | <240 § |
| 1.2.4-Trimethylbenzene | μα/k <9 μς | | <9 | # | <9 | # | <9 | # | <9 # | <180 | <180 |
| 1.2.4 minearyibenzene | -0 PS | , ng i i i i i i i i i i i i i i i i i i | ~~ | # | | # | ~~ | # | | ş | ş |
| sec-Butylbenzene | <1 | D TM116 | <10 | | <10 | | <10 | _ | 14.9 | <200 | <200 |
| | µq/k | | | М | | М | | Μ | M | § | § |
| 4-Isopropyltoluene | <1 | | <11 | | <11 | | <11 | | <11 | <220 | <220 |
| | µq/k | | | М | | М | | М | M | § | <u>§</u> |
| 1.3-Dichlorobenzene | <6 µį | g/kg TM116 | <6 | м | <6 | м | <6 | м | <6 M | <120 § | <120 |
| 1.4-Dichlorobenzene | <5 µg | g/kg TM116 | <5 | IVI | <5 | IVI | <5 | IVI | <5 | <100 | <u></u> <100 |
| 1.4-Dichlorobenzene | <0 P | ang mining | | м | ~~ | м | ~0 | м | M | s loo | § |
| n-Butylbenzene | <1 | D TM116 | <10 | | <10 | | <10 | | 14.1 | <200 | <200 |
| | µg/k | .q | | М | | М | | М | м | § | § |
| 1.2-Dichlorobenzene | <1 | | <12 | | <12 | | <12 | | <12 | <240 | <240 |
| | µq/k | | | М | | М | | М | M | § | § |
| 1.2-Dibromo-3-chloropro | | | <14 | | <14 | | <14 | | <14 | <280 | <280 |
| ne Tert-amyl methyl ether | µq/k <1 | | <15 | М | <15 | М | <15 | М | M <15 | <300 | <u></u> <300 |
| ren-annyr meuryr eurer | µg/k | | <15 | | \$15 | | 10 | | 10 | <000 § | § |
| 1.2.4-Trichlorobenzene | <6 µç | | <6 | | <6 | | <6 | | <6 | <120 | <120 |
| | - 13 | , | _ | # | _ | # | _ | # | # | § | § |
| Hexachlorobutadiene | <1 | 2 TM116 | <12 | | <12 | | <12 | | <12 | <240 | <240 |
| | µq/k | | | | | | | | | ş | § |
| Naphthalene | <1 | | <13 | | <13 | | <13 | | 81.6 | <260 | <260 |
| 1.0.2 Trichlershonzono | µq/k | | -6 | М | -6 | М | -6 | М | M | \$ <100 | § |
| 1.2.3-Trichlorobenzene | <6 µç | g/kg TM116 | <6 | м | <6 | м | <6 | м | <6 M | <120 § | <120 § |
| | | | | 141 | | 191 | | TV1 | IVI | 8 | |
| | | | | | | | | | | | |
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CERTIFICATE OF ANALYSIS

Validated

| U | | | | | CEF | RTI | FICATE OF A | NA | LYSIS | | | | |
|--|--|---|--------------|--|--|-----|--|----|--|---|--|------------------|------|
| SDG Job: | | 110523-40 H_WARD | | 6HF-37 | Location: Customer: | | ardell Armstrong LLP | 5 | | | Order Number: Report Number: | SH3068 135537 | |
| | | SH10534 | | | Attention: | Mi | ke Kelly | | | | Superseded Repor | t: 132894 | |
| VOC MS (S) Results Legend Customer Sample R | | | | | | | WS 103 | | WS 105 | | WS 108 | | |
| # M § aq diss.filt tot.unfilt * * | ISO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Subcontracted test. % recovery of the surrogal check the efficiency of the results of individual comp samples aren't corrected fi Trigger breach confirmed | te standard to method. The ounds within | | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | TP 115 0.30 Soii/Solid 19/05/2011 21/05/2011 110523-40 3515878 | | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515891 | | 0.30 Soil/Solid 16/05/2011 21/05/2011 110523-40 3515895 | | 0.40 Soii/Solid 17/05/2011 21/05/2011 110523-40 3515901 | | |
| Compo | | | DD/Uni | | | | | | | | | | |
| Dibror | nofluoromethane** | í I | % | TM116 | 108 | ş | 93 | | 95.5 | | 101 | | |
| Toluer | ne-d8** | | % | TM116 | 99.8 | ş | 105 | | 98.1 | | 106 | | |
| | nofluorobenzene** | | % | TM116 | 107 | § | 108 | | 151 | | 127 | | |
| | rodifluoromethane | | :4 µg/ł | - | <80 | § | <4 M | | <4 | м | <8 M | | |
| | methane | < | :7 µg/ł | - | <140 | § | <7 # | | <7 | # | <14 # | | |
| Vinyl (| Chloride | | <10 µq/kq | TM116 | <200 | § | <10 # | | <10 | # | <20 # | | |
| | methane | | <13 µq/kq | TM116 | <260 | ş | <13 M | | <13 | м | <26 M | | |
| | ethane | | <14 µq/kq | TM116 | <280 | § | <14 M | | <14 | м | <28 M | | |
| | rofluorormethane | < | :6 µg/I | | <120 | § | <6 M | | <6 | м | <12 M | | |
| 1.1-Di | chloroethene | | <10 µq/kq | TM116 | <200 | § | <10 # | | <10 | # | <20 # | | |
| Carbo | n Disulphide | < | :7 µg/ł | (g TM116 | <140 | § | <7 M | | 26.5 | м | 56 M | | |
| | romethane | | <10 µq/kq | TM116 | <200 | ş | <10 # | | <10 | # | <20 # | | |
| Methy | Tertiary Butyl Eth | | <11 µq/kq | TM116 | <220 | ş | <11 M | | <11 | м | <22 M | | |
| trans- | I-2-Dichloroethene | | <11 µq/kq | TM116 | <220 | § | <11 M | | <11 | м | <22 M | | |
| | chloroethane | | :8 µg/ł | - | <160 | § | <8 M | | <8 | м | <16 M | | |
| cis-1-2 | 2-Dichloroethene | < | :5 µg/I | | <100 | § | <5 M | | <5 | м | <10 M | | |
| | chloropropane | | <12 µq/kq | TM116 | <240 | ş | <12 M | | <12 | м | <24 M | | |
| | chloromethane | | <14 µq/kq | TM116 | <280 | § | <14 M | | <14 | м | <28 M | | |
| Chloro | | | :8 µg/ŀ | | <160 | § | <8 M | | <8 | м | <16 M | | |
| | Frichloroethane | < | :7 µg/ł | | <140 | ş | <7 M | | <7 | м | <14 M | | |
| | chloropropene | | <11 µq/kq | TM116 | <220 | § | <11 M | | <11 | м | <22 M | | |
| | ntetrachloride | | <14 µq/kq | TM116 | <280 | ş | <14 M | | <14 | м | <28 M | | |
| 1.2-Di | chloroethane | | :5 µg/ł | | <100 | § | <5 M | | <5 | м | <10 M | | |
| Benze | | | :9 µg/ł | - | <180 | § | <9 M | | <9 | м | <18 M | | |
| | roethene | < | :9 µg/ł | | <180 | § | <9 M | | <9 | м | <18 M | | |
| | chloropropane | | <12 µq/kq | TM116 | <240 | § | <12 M | | <12 | м | <24 M | | |
| | nomethane | | :9 µg/ł | | <180 | ş | <9 M | | <9 | м | <18 M | | |
| Bromo | dichloromethane | < | :7 µg/ł | | <140 | § | <7 M | | <7 | м | <14 M | | |
| | -Dichloropropene | | <14 µq/kq | TM116 | <280 | § | <14 M | | <14 | м | <28 M | | |
| Toluer | | | :5 µg/ł | - | <100 | ş | 7.66 M | | 12.8 | м | 31.4 M | | |
| | I-3-Dichloroproper | | <14 µq/kq | TM116 | <280 | § | <14 | | <14 | | <28 | | |
| | Frichloroethane | | <10 µq/kq | TM116 | <200 | ş | <10 M | | <10 | м | <20 M | | |
| | chloropropane | | :7 µg/ł | - | <140 | § | <7 # | | <7 | # | <14 # | | |
| | hloroethene | < | :5 µg/I | | <100 | ş | <5 M | | <5 | м | <10 M | | |
| Dibror | nochloromethane | | <13 µq/kq | TM116 | <260 | § | <13 M | | <13 | м | <26 M | | |
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CERTIFICATE OF ANALYSIS

Validated

VOC MS (S)

| VOC MS (S) | | | | | | | | |
|-------------------|--|------------------|------------------------------|----------------------|-------------------------|----------------------|----------------------|------|
| | Results Legend 017025 accredited. | | Customer Sample R | TP 115 | WS 103 | WS 105 | WS 108 | |
| M m | CERTS accredited. | | | | | | | |
| aq A | queous / settled sample. | | Depth (m) | 0.30 Soil/Solid | 0.30 Soil/Solid | 0.30 Soil/Solid | 0.40 Soil/Solid | |
| | issolved / filtered sample. otal / unfiltered sample. | | Sample Type Date Sampled | 19/05/2011 | 16/05/2011 | 16/05/2011 | 17/05/2011 | |
| | ubcontracted test. recovery of the surrogate standar | rd to | Date Received | 21/05/2011 | 21/05/2011 110523-40 | 21/05/2011 | 21/05/2011 | |
| d | heck the efficiency of the method. Soults of individual compounds wit | The | SDG Ref Lab Sample No.(s) | 110523-40 3515878 | 3515891 | 110523-40 3515895 | 110523-40 3515901 | |
| S | amples aren't corrected for the rec | | AGS Reference | | | | | |
| (F) Tr Compone | rigger breach confirmed | LOD/Unit | s Method | | | | | |
| | omoethane | <12 | TM116 | <240 | <12 | <12 | <24 | |
| | | µq/kq | | § | М | М | M | |
| Chlorobe | enzene | <5 µg/k | g TM116 | <100 | <5 M | <5 M | <10 M | |
| 1112-1 | Tetrachloroethane | <10 | TM116 | <u></u> <200 | <10 | <10 | <20 | |
| | cuacinoroculario | µg/kg | | § | м | M | M | |
| Ethylben | nzene | <4 µg/k | g TM116 | <80 | 9.78 | 11.8 | 11.3 | |
| n/m Vula | | -14 | TM116 | § | M <14 | M 17.7 | M | |
| p/m-Xyle | ene | <14 µg/kg | 11/1116 | <280 § | <14 # | 17.7 | <28 # | |
| o-Xylene | 9 | <10 | TM116 | <200 | <10 | <10 | <20 | |
| | | µq/kq | | § | М | М | M | |
| Styrene | | <10 | TM116 | <200 § | <10 M | <10 M | <20 M | |
| Bromofo | orm | µq/kq <10 | TM116 | <200 | M <10 | M <10 | <20 | |
| | | µq/kq | | \$200 § | м | M | M | |
| Isopropy | lbenzene | <5 µg/k | g TM116 | <100 | <5 | <5 | <10 | |
| 44007 | | -10 | Th440 | § | M | M | M | I |
| 1.1.2.2-1 | Tetrachloroethane | <10 µq/kq | TM116 | <200 § | <10 # | <10 # | <20 # | |
| 1.2.3-Tri | ichloropropane | <17 | TM116 | <340 | π <17 | <17 | <34 | |
| | | µq/kq | | § | М | М | М | |
| Bromobe | enzene | <10 | TM116 | <200 | <10 | <10 | <20 | |
| Dropylbe | 202000 | µq/kq <11 | TM116 | § <220 | M <11 | M <11 | M <22 | |
| Propylbe | enzene | µg/kg | TIVITIO | <220 § | м | M | <22 M | |
| 2-Chloro | otoluene | <9 µg/k | g TM116 | <180 | <9 | <9 | <18 | |
| | | | | § | М | M | M | |
| 1.3.5-Tri | imethylbenzene | <8 µg/k | g TM116 | <160 § | <8 # | <8 # | <16 # | |
| 4-Chloro | otoluene | <12 | TM116 | <240 | <12 | <12 | <24 | |
| | | µq/kq | | § | М | м | M | |
| tert-Buty | Ibenzene | <12 | TM116 | <240 | <12 | <12 | <24 | |
| 124-Tri | imethylbenzene | µq/kq <9 µg/k | a TM116 | <u></u> <180 | # <9 | # 21.8 | # <18 | |
| 1.2.4-111 | incuryibenzene | ~5 µg/k | ig nimitio | s iou | ~5 # | 21.0 | <10 # | |
| sec-Buty | /lbenzene | <10 | TM116 | <200 | <10 | <10 | <20 | |
| | | µq/kq | | § | M | M | M | |
| 4-Isopro | pyltoluene | <11 µg/kg | TM116 | <220 § | <11 M | <11 M | <22 M | |
| 1.3-Dich | lorobenzene | <6 µg/kg | a TM116 | <120 | <6 | <6 | <12 | |
| | | | | § | М | М | M | |
| 1.4-Dich | lorobenzene | <5 µg/k | g TM116 | <100 | <5 | <5 | <10 | |
| n-Butylb | enzene | <10 | TM116 | <u></u> <200 | M <10 | M <10 | M <20 | |
| | | µq/kq | | ~200 § | чю М | чю М | <20 M | |
| 1.2-Dich | lorobenzene | <12 | TM116 | <240 | <12 | <12 | <24 | |
| 4.0.5" | | µq/kq | Thus | § | M | M | M | I |
| 1.2-Dibro | omo-3-chloropropa | <14 µg/kg | TM116 | <280 § | <14 M | <14 M | <28 M | |
| | yl methyl ether | <15 | TM116 | <300 | <15 | <15 | <30 | |
| | - | µq/kq | | § | | | | |
| 1.2.4-Tri | ichlorobenzene | <6 µg/k | g TM116 | <120 | <6 | <6 | <12 | |
| Hevachi | orobutadiene | <12 | TM116 | <u></u> <240 | # <12 | # <12 | # <24 | |
| I ICAGUIII | | <12 µg/kg | TWITE | <240 § | ×12 | 512 | ~24 | |
| Naphtha | llene | <13 | TM116 | <260 | 737 | <13 | 564 | |
| | | µq/kq | | § | М | M | M | |
| 1.2.3-Tri | ichlorobenzene | <6 µg/k | g TM116 | <120 § | <6 M | <6 M | <12 M | |
| — | | | | | IVI | IVI | М | I |
| | | | | | | | | |
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CERTIFICATE OF ANALYSIS

Validated

SDG: 110523-40 Location: Order Number: SH3068 Job: H_WARDELL_SHF-37 Wardell Armstrong LLP 135537 Customer: Report Number: **Client Reference:** SH10534 Attention: Mike Kelly Superseded Report: 132894

Asbestos Identification

| | | Date of Analysis | Analysed By | Comments | Amosite (Brown) Asbestos | Chrysotile (White) Asbestos | Crocidolite (Blue) Asbestos | Fibrous Actinolite | Fibrous Anthophyllite | Fibrous Tremolite | Non-Asbestos Fibre |
|---|---|------------------|-----------------------|----------|--------------------------------|-----------------------------------|--------------------------------|-----------------------|--------------------------|----------------------|-----------------------|
| Customer Sample Ref. Depth (m) Sample Type Date Sampled Date Receiverd SDG Original Sample Method Number | TP 103 NS Z 0.40 SOLID 17/05/2011 00:00:00 23/05/2011 11:03:10 110523-40 3,515,847 TM048 | 28/05/11 | Tomasz Pawlikowski | cement | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Not Detected (#) | Detected |

| | | | ATE OF ANA | | | | | |
|---|-------------|---|----------------|--------------------------------|--|----------------------------|--|--|
| SDG: 110523-40 Job: H_WARDELL Client Reference: SH10534 | L_SHF-37 C | ocation: ustomer: Wardell ttention: Mike Ke | Armstrong LLP | R | rder Number: eport Number: uperseded Report: | SH3068 135537 132894 | | |
| | | CEN 10:1 S | TAGE BATCI | I TEST | | | | |
| WAC ANALYTICAL RESU | JLTS | | | | | REF : B | S EN 12457 | |
| Client Reference | | | Site Location | | | | | |
| Mass Sample taken (kg) | 0.104 | | Moisture Conte | ent Ratio (%) | 15.8 | | | |
| Mass of dry sample (kg) | 0.175 | | Dry Matter Cor | itent Ratio (%) | 86.4 | | | |
| Particle Size <4mm | >95% | | | | | | | |
| Case | | | | | | | | |
| SDG | 110523-40 | | | | | | | |
| ab Sample Number(s) | 3515843 | | | | | | | |
| Sampled Date | 17-May-2011 | | | | | | | |
| Customer Sample Ref. | TP 101 | | | | | | | |
| Depth (m) | 0.60 | | | | | | | |
| Solid Waste Analysis | Result | | - | | | | | |
| otal Organic Carbon (%) | 1.87 | | - | | - | - | - | |
| oss on Ignition (%) | - | | | | - | - | - | |
| um of BTEX (mg/kg) um of 7 PCBs (mg/kg) | - | | | | - | - | - | |
| fineral Oil (mg/kg) | - | | | | - | - | - | |
| PAH Sum of 17 (mg/kg) | - | | | | - | - | - | |
| H (pH Units) | 8.13 | | | | - | - | - | |
| NC to pH 6 (mol/kg) NC to pH 4 (mol/kg) | - | | | | - | - | - | |
| Eluate Analysis | | | A2 10:1 cor | c ⁿ leached (mg/kg) | using | | ues for compliance leaching test BS EN 12457-3 at L/S 10 l/kg | |
| Arsenic | Result | Limit of Detection | | Limit of Detection | | | | |
| Barium | 0.000431 | <0.00012 | 0.00431 | <0.0012 | - | - | | |
| Cadmium | <0.0001 | < 0.0001 | < 0.001 | < 0.001 | | - | | |
| Chromium | 0.00476 | <0.00022 | 0.0476 | < 0.0022 | - | - | - | |
| Copper | 0.00134 | <0.00085 | 0.0134 | <0.0085 | - | - | - | |
| Aercury Dissolved (CVAF) | <0.00001 | <0.00001 | <0.0001 | <0.0001 | | - | - | |
| lolybdenum lickel | - 0.000827 | - <0.00015 | - 0.00827 | - <0.0015 | - | - | - | |
| ead | 0.000827 | <0.00013 | 0.00827 | <0.0013 | | - | - | |
| Intimony | - | - | - | - | - | - | - | |
| Selenium | <0.00039 | <0.00039 | <0.0039 | < 0.0039 | - | - | - | |
| | 0.00221 | <0.00041 | 0.0221 | < 0.0041 | | - | - | |
| Chloride | | | | - | - | - | - | |
| Sulphate (soluble) | | | | | | - | | |
| otal Dissolved Solids | - | - | - | - | - | - | - | |
| otal Monohydric Phenols (W) | - | - | - | - | - | - | - | |
| issolved Organic Carbon | | - | - | - | - | - | - | |
| each Test Information | | | | | | | | |

| Date Prepared | 15-Jun-2011 |
|-------------------------------|-------------|
| pH (pH Units) | 7.12 |
| Conductivity (µS/cm) | 101.00 |
| Temperature (°C) | 22.30 |
| Volume Leachant (Litres) | 0.886 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Meerts Certification does not apply to leachates

23/06/2011 17:33:37

17:33:14 23/06/2011

| ALcontrol Lat | | | CEF | RTIFIC | ATE OF ANAI | LYSIS | | | |
|---|-------------------------------------|------------------------|--------------------------------------|--------------------|------------------------------|---------------------------------|---|----------------------------|--------------------|
| Job: H | 10523-40 I_WARDELL_SHF H10534 | -37 | Location: Customer: Attention: | Wardell Mike Ke | Armstrong LLP | F | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 | |
| | | | CEN | 10:1 S | TAGE BATCH | H TEST | | | |
| VAC ANALYTICA | | S | | | | | | REF | : BS EN 12457 |
| Client Reference | | - | | | Site Location | | | | |
| Mass Sample taken (| (ka) | 0.104 | | | Moisture Conte | opt Batio (%) | 15.8 | | |
| Mass of dry sample (| , | 0.175 | | | Dry Matter Con | | | | |
| Particle Size <4mm | | >95% | | | Dry Matter Con | | 00.4 | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| ab Sample Number | (s) | 3515843 | | | | | | 1 | |
| Sampled Date | | 17-May-201 | 1 | | | | | | |
| Customer Sample Re | | TP 101 | | | | | | | |
| Depth (m) | | 0.60 | | | | | | | |
| Solid Waste Analysis | 3 | Result | | | | | | | |
| otal Organic Carbon (%) | | 1.87 | | | | | - | - | - |
| oss on Ignition (%) | | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) | | - | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg) | | - | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 8.13 | | | | | - | - | - |
| ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| Elucto Anchroio | | C2 Conc ⁿ | in 10:1 eluate | e (mg/l) | A2 10:1 con | ic ⁿ leached (mg/kg) | Limit valu | es for compli | ance leaching test |
| Eluate Analysis | | Result | Limit o | of Detection | Result | Limit of Detecti | | S EN 12457- | 3 at L/S 10 l/kg |
| PAH Spec MS - Aqueous (| (W) | | | | | | | | |
| Acenaphthalene by GCMS | | <0.0001 0.0000178 | |).0001 000015 | <u><0.001</u> 0.000178 | <0.001 <0.00015 | - | - | - |
| Acenaphthylene by GCMS | | < 0.0000178 | | 000013 | < 0.000178 | <0.00013 | | - | |
| Fluoranthene by GCMS | | < 0.000017 | | 000017 | < 0.00017 | < 0.00017 | - | - | - |
| Anthracene by GCMS | | <0.000015 | | 000015 | <0.00015 | <0.00015 | - | - | - |
| Phenanthrene by GCMS | | <0.000022 | | 000022 | <0.00022 | <0.00022 | - | - | - |
| Iuorene by GCMS | | < 0.000014 | | 000014 | < 0.00014 | < 0.00014 | - | - | - |
| Pyrene by GCMS | | <0.000013 <0.000015 | | 000013 000015 | <0.00013 <0.00015 | <0.00013 <0.00015 | | - | |
| Benz(a)anthracene by GCN | ИS | < 0.000013 | | 000015 | <0.00013 | <0.00013 | | - | - |
| Benzo(b)fluoranthene by G | | <0.000023 | | 000023 | < 0.00023 | < 0.00023 | - | - | - |
| Benzo(k)fluoranthene by G | CMS | <0.000027 | <0. | 000027 | <0.00027 | <0.00027 | - | - | - |
| Benzo(a)pyrene by GCMS | 00110 | <0.00009 | | 000009 | <0.00009 | <0.00009 | - | - | - |
| Dibenzo(ah)anthracene by Benzo(ghi)perylene by GCI | | < 0.000016 | | 000016 | <0.00016 | < 0.00016 | - | - | - |
| ndeno(123cd)pyrene by G | | <0.000016 <0.000014 | | 000016 000014 | <0.00016 | <0.00016 | | - | - |
| PAH 16 EPA Total by GCN | | 0.0000178 | | <0 | 0.000178 | <0.00014 | | - | - |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Leach Test Informat | ion | | 1 | | I | | | | |
| ate Prepared | | 15-Jun-2011 | | | | | | | |
| H (pH Units) | | 7.12 | | | | | | | |
| Conductivity (µS/cm) | | 101.00 | | | | | | | |
| Temperature (°C) | | 22.30 | | | | | | | |

| Volume of Eluate VE1 (Litres) | | |
|---|-------------------------|-----------------------------|
| | | |
| Solid Results are expressed on a dry weight basis | after correction for mo | isture content where applic |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

22.30

0.886

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

Temperature (°C)

Volume Leachant (Litres)

| SDG: 110523-40 Job: H_WARDELL Client Reference: SH10534 WAC ANALYTICAL RESU Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case SDG | _SHF-37 Cu At | ention: Mike Kelly CEN 10:1 ST | | Rep Supe | er Number: ort Number: erseded Report: | SH3068 135537 132894 | |
|---|---------------------------------------|-----------------------------------|------------------|------------------------------|--|---|-------------|
| Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case | 0.098 0.175 | CEN 10:1 ST | AGE BATCH | TEST | | | |
| Client Reference Mass Sample taken (kg) Mass of dry sample (kg) Particle Size <4mm Case | 0.098 0.175 | | Site Location | | | | |
| lass Sample taken (kg) lass of dry sample (kg) article Size <4mm case | 0.175 | | Site Location | | | REF : BS | EN 12457 |
| /lass of dry sample (kg) Particle Size <4mm Case | 0.175 | | | | | | |
| Particle Size <4mm Case | | | Moisture Conte | nt Ratio (%) | 8.51 | | |
| Case | >95% | | Dry Matter Con | tent Ratio (%) | 92.2 | | |
| | | | | | | | |
| DG | | | | | | | |
| 000 | 110523-40 | | | | | | |
| .ab Sample Number(s) | 3515852 | | | | | I | |
| Sampled Date | 17-May-2011 | | | | | | |
| Customer Sample Ref. | TP 104 | | | | | | |
| Depth (m) | 0.50 | | | | | | |
| Solid Waste Analysis | Result | | | | | | |
| otal Organic Carbon (%) | - | | | | - | - | - |
| oss on Ignition (%) | - | | | | - | - | - |
| um of BTEX (mg/kg) um of 7 PCBs (mg/kg) | 0.0127 | | | | - | - | - |
| lineral Oil (mg/kg) | - | | | | - | - | - |
| AH Sum of 17 (mg/kg) | - | | | | - | - | - |
| H (pH Units) NC to pH 6 (mol/kg) | 7.90 | | | | - | - | - |
| NC to pH 4 (mol/kg) | - | - | | | - | - | - |
| Eluate Analysis | C ₂ Conc ⁿ in 2 | l0:1 eluate (mg/l) | A2 10:1 cond | ⁿ leached (mg/kg) | | es for compliance le S EN 12457-3 at L/S | |
| Vraenia | Result | Limit of Detection | Result | Limit of Detection | | | - |
| krsenic Barium | 0.000608 | <0.00012 | 0.00608 | <0.0012 | - | - | - |
| Cadmium | <0.0001 | <0.0001 | <0.001 | <0.001 | - | - | - |
| Chromium | 0.00271 | <0.00022 | 0.0271 | <0.0022 | - | - | - |
| Copper | 0.00465 | <0.00085 | 0.0465 | <0.0085 | - | - | - |
| lercury Dissolved (CVAF) | <0.00001 | <0.00001 | <0.0001 - | <0.0001 | - | - | - |
| lickel | 0.000684 | <0.00015 | 0.00684 | < 0.0015 | - | | - |
| ead | 0.000599 | <0.00002 | 0.00599 | < 0.0002 | - | - | - |
| eau | | | - | - | | | |
| ntimony | - | - | | | - | - | - |
| ntimony elenium | <0.00039 | <0.00039 | < 0.0039 | <0.0039 | - | - | - |
| ntimony ielenium inc | <0.00039 0.00613 | <0.00039 <0.00041 | 0.0613 | <0.0039 <0.0041 | - | - | - |
| eau Antimony Selenium Cinc Chloride | <0.00039 | <0.00039 | | <0.0039 | - | - | - |
| Intimony Belenium inc Chloride Iuoride Buphate (soluble) | <0.00039 0.00613 - | <0.00039 <0.00041 - | 0.0613 | <0.0039 <0.0041 - | - - - | | - - - |
| ntimony elenium inc hloride luoride | <0.00039 0.00613 - - | <0.00039 <0.00041 - - | 0.0613 - - | <0.0039 <0.0041 - - | - - - - | - - - - | |

| Date Prepared | 15-Jun-2011 |
|-------------------------------|-------------|
| pH (pH Units) | 7.69 |
| Conductivity (µS/cm) | 78.90 |
| Temperature (°C) | 22.40 |
| Volume Leachant (Litres) | 0.892 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Meerts Certification does not apply to leachates

23/06/2011 17:33:37

| ALcontrol Lal | | | CERT | FICA | TE OF ANAL | YSIS | | | Validated |
|---|--------------------------------------|------------------------|-------------------|-----------------------|----------------------|--------------------------------|--|----------------------------|--------------------|
| Job: H | 10523-40 1_WARDELL_SHF 6H10534 | -37 | | /ardell / ike Kell | Armstrong LLP | R | rder Number: eport Number: uperseded Report: | SH3068 135537 132894 | |
| | | | | | | | | | |
| VAC ANALYTIC | AL RESULT | S | | | | | | REF | : BS EN 12457 |
| lient Reference | | | | | Site Location | | | | |
| Aass Sample taken | (ka) | 0.098 | | | Moisture Conte | nt Ratio (%) | 8.51 | | |
| Aass of dry sample | () | 0.175 | | | Dry Matter Con | | 92.2 | | |
| Particle Size <4mm | (0) | >95% | | | Dry matter oon | | 02.2 | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| ab Sample Number | (s) | 3515852 | | | | | | | I |
| Sampled Date | | 17-May-2011 | | | | | | | |
| Customer Sample R | | TP 104 | | | | | | | |
| Depth (m) | | 0.50 | | | | | | | |
| Solid Waste Analysi | S | Result | | | | | | | |
| otal Organic Carbon (%) | | - | | | I | | - | - | - |
| oss on Ignition (%) | | - | | | | | - | - | - |
| um of BTEX (mg/kg) um of 7 PCBs (mg/kg) | | 0.0127 | | | | | - | - | - |
| fineral Oil (mg/kg) | | - | | | | | - | - | - |
| AH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 7.90 | | | | | - | - | - |
| NC to pH 6 (mol/kg) NC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate (m | g/l) | A2 10:1 con | c ⁿ leached (mg/kg) | | | ance leaching test |
| - | | Result | Limit of De | tection | Result | Limit of Detectio | | IS EN 12457- | 3 at L/S 10 l/kg |
| PAH Spec MS - Aqueous | (W) | | | | | | | | |
| laphthalene by GCMS | | <0.0001 <0.000015 | <0.000 | | <0.001 <0.00015 | <0.001 <0.00015 | - | - | - |
| cenaphthylene by GCMS | | < 0.000011 | <0.0000 | | <0.00010 | <0.00010 | - | - | - |
| luoranthene by GCMS | | <0.000017 | <0.000 | | <0.00017 | <0.00017 | - | - | - |
| Inthracene by GCMS | | <0.000015 | <0.0000 | | <0.00015 | < 0.00015 | | - | - |
| Phenanthrene by GCMS | | < 0.000022 | <0.0000 | | <0.00022 | < 0.00022 | | - | - |
| Chrysene by GCMS | | <0.000014 <0.000013 | <0.0000 | | <0.00014 <0.00013 | <0.00014 <0.00013 | | - | |
| Pyrene by GCMS | | < 0.000015 | <0.0000 | | <0.00015 | < 0.00015 | - | - | - |
| Benz(a)anthracene by GC | | <0.000017 | <0.000 | | <0.00017 | <0.00017 | - | - | - |
| Benzo(b)fluoranthene by G | | <0.000023 | <0.0000 | | <0.00023 | <0.00023 | | - | - |
| Benzo(k)fluoranthene by G Benzo(a)pyrene by GCMS | | <0.000027 | <0.0000 | | <0.00027 | < 0.00027 | - | - | - |
| Dibenzo(a)pyrene by GCMS | | <0.000009 <0.000016 | <0.0000 | | <0.00009 <0.00016 | <0.00009 <0.00016 | | - | |
| Benzo(ghi)perylene by GC | | < 0.000016 | <0.0000 | | <0.00016 | < 0.00016 | | | |
| ndeno(123cd)pyrene by G | | < 0.000014 | <0.0000 | | < 0.00014 | < 0.00014 | - | - | - |
| AH 16 EPA Total by GCN | ЛS | 0 | <0 | | 0 | <0 | - | - | - |
| | | | | | | | | | |
| each Test Informat | ion | | | | | | | | |
| ate Prepared | | 15-Jun-2011 | | | | | | | |
| H (pH Units) onductivity (µS/cm) | | 7.69 78.90 | | | | | | | |
| Temperature (°C) | | 78.90 | | | | | | | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

22.40

0.892

Mcerts Certification does not apply to leachates

Volume of Eluate VE1 (Litres)

23/06/2011 17:33:37 17:33:14 23/06/2011

Temperature (°C)

Volume Leachant (Litres)

| Mass of dry sample (kg) (C Particle Size <4mm 2 Case SDG 2 Lab Sample Number(s) 2 Sampled Date 2 Customer Sample Ref. 7 Depth (m) 2 Solid Waste Analysis Total Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) DH (pH Units) | -37 Cu Att | ention: Mike Kelly CEN 10:1 ST | AGE BATCH Site Location Moisture Conte | Report Supers | Number: t Number: seded Report: 21.2 82.5 | SH3068 135537 132894 REF : BS | 5 EN 12457 |
|---|--|-----------------------------------|--|--|---|--|------------|
| Client Reference Mass Sample taken (kg) (Mass of dry sample (kg) (Particle Size <4mm 2 Case SDG 2 Lab Sample Number(s) 2 Sampled Date 2 Customer Sample Ref. 2 Depth (m) 2 Solid Waste Analysis Total Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) De (pH Units) | 0.109 0.175 >95% 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - 0.029 - | S | Site Location | ent Ratio (%) | | REF : BS | EN 12457 |
| Client Reference Mass Sample taken (kg) (f) Mass of dry sample (kg) (f) Particle Size <4mm (f) Case (f) SDG (f) Cab Sample Number(s) (f) Sampled Date (f) Customer Sample Ref. (f) Depth (m) (f) Solid Waste Analysis (f) otal Organic Carbon (%) (f) oss on Ignition (%) (f) um of T PCBs (mg/kg) (f) um of 17 (mg/kg) (f) AH Sum of 17 (mg/kg) (f) H (pH Units) (f) | 0.109 0.175 >95% 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - 0.029 - | Ν | Noisture Conte | | | REF : B | EN 12457 |
| Mass Sample taken (kg) O Mass of dry sample (kg) O Particle Size <4mm | 0.175 >95% 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - 0.029 - | Ν | Noisture Conte | | | | |
| Mass of dry sample (kg) (C Particle Size <4mm 2 Case SDG 2 Lab Sample Number(s) (C Sampled Date 2 Customer Sample Ref. 2 Depth (m) 2 Solid Waste Analysis 2 Solid Waste Analysis 2 Solid Organic Carbon (%) 2 Soss on Ignition (%) 2 Sum of BTEX (mg/kg) 2 Sum of 7 PCBs (mg/kg) 2 Sum of 17 (mg/kg) 2 H Sum of 17 (mg/kg) 2 H (pH Units) 2 | 0.175 >95% 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - 0.029 - | | | | | | |
| Particle Size <4mm Case Case SDG Cab Sample Number(s) Sampled Date Customer Sample Ref. Depth (m) Solid Waste Analysis Total Organic Carbon (%) Sous on Ignition (%) Sour of BTEX (mg/kg) Sour of 7 PCBs (mg/kg) Alineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) | >95% 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - - 0.029 - | | Dry Matter Con | itent Ratio (%) | 82.5 | | |
| Case SDG // Lab Sample Number(s) // Sampled Date // Customer Sample Ref. // Depth (m) // Solid Waste Analysis Fotal Organic Carbon (%) Loss on Ignition (%) Sour of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) | 110523-40 3515869 18-May-2011 TP 111 1.20 Result - - 0.029 - | | | | | | |
| SDG A Lab Sample Number(s) C Sampled Date A Customer Sample Ref. C Depth (m) A Solid Waste Analysis A Fotal Organic Carbon (%) B Sour of BTEX (mg/kg) B Jineral Oil (mg/kg) A PAH Sum of 17 (mg/kg) H H (pH Units) A | 3515869 18-May-2011 TP 111 1.20 Result - - - 0.029 - | | | | | | |
| Lab Sample Number(s) C Sampled Date C Sustomer Sample Ref. C Depth (m) C Solid Waste Analysis C Solid Organic Carbon (%) C Depth (m) C Solid Organic Carbon (%) C Dum of BTEX (mg/kg) C Lineral Oil (mg/kg) C AH Sum of 17 (mg/kg) C H (pH Units) C | 3515869 18-May-2011 TP 111 1.20 Result - - - 0.029 - | | | | | | |
| Sampled Date Customer Sample Ref. Customer Sample Ref. Customer Sample Ref. Depth (m) Customer Sample Ref. Solid Waste Analysis Customer Sample Ref. Solid Organic Carbon (%) Customer Sample Ref. Solid Waste Analysis | 18-May-2011 TP 111 1.20 Result - - 0.029 - | | | | | | |
| Customer Sample Ref. Image: Customer Sample Ref. Depth (m) Image: Customer Sample Ref. Solid Waste Analysis Image: Customer Sample Ref. Solid Organic Carbon (%) Image: Customer Sample Ref. Image: Customer Sample Ref. Image: Customer Sample Ref. | TP 111 1.20 Result - - - 0.029 - | | | | | | |
| Depth (m) Solid Waste Analysis otal Organic Carbon (%) oss on Ignition (%) um of BTEX (mg/kg) um of 7 PCBs (mg/kg) lineral Oil (mg/kg) AH Sum of 17 (mg/kg) H (pH Units) | 1.20 Result - 0.029 - | | | | | | |
| Solid Waste Analysis Total Organic Carbon (%) oss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) | Result - 0.029 - | | | | | | |
| Total Organic Carbon (%) Loss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) Mineral Oil (mg/kg) PAH Sum of 17 (mg/kg) H (pH Units) | - - 0.029 - | | | - | | | |
| oss on Ignition (%) Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg) PAH Sum of 17 (mg/kg) IH (pH Units) | - 0.029 - | | | | | | |
| um of BTEX (mg/kg) um of 7 PCBs (mg/kg) lineral Oil (mg/kg) 'AH Sum of 17 (mg/kg) H (pH Units) | 0.029 | | | _ | - | - | - |
| um of 7 PCBs (mg/kg) lineral Oil (mg/kg) AH Sum of 17 (mg/kg) H (pH Units) | - | | | - | - | - | - |
| AH Sum of 17 (mg/kg) H (pH Units) | _ | | | | - | - | - |
| H (pH Units) | - | | | _ | - | - | - |
| | 7.76 | | | _ | - | - | - |
| NC to pH 6 (mol/kg) | - | | | | - | - | - |
| NC to pH 4 (mol/kg) | - | | | | - | - | - |
| Eluate Analysis | C ₂ Conc ⁿ in 1 | 0:1 eluate (mg/l) | A2 10:1 con | c ⁿ leached (mg/kg) | | ues for compliance le BS EN 12457-3 at L/ | |
| Arsenic | Result 0.0044 | Limit of Detection <0.00012 | Result 0.044 | <pre>Limit of Detection <0.0012</pre> | - | - | - |
| Barium | - | - | - | - | - | - | - |
| Cadmium | <0.0001 | <0.0001 | <0.001 | <0.001 | - | - | - |
| Chromium Copper | 0.00185 | <0.00022 <0.00085 | 0.0185 | <0.0022 <0.0085 | - | - | - |
| Mercury Dissolved (CVAF) | <0.00001 | <0.00003 | <0.0001 | <0.0003 | - | - | - |
| lolybdenum | - | - | - | - | - | - | - |
| lickel ead | 0.00147 | < 0.00015 | 0.0147 | <0.0015 | - | - | - |
| ntimony | 0.000223 | <0.00002 | 0.00223 | <0.0002 | - | - | - |
| elenium | 0.000657 | <0.00039 | 0.00657 | <0.0039 | - | - | - |
| inc Chloride | 0.00109 | <0.00041 | 0.0109 | <0.0041 | - | - | - |
| luoride | - | - | - | | - | - | - |
| sulphate (soluble) | 57.2 | <2 | 572 | <20 | - | - | - |
| | 01.2 | | - | | | | |
| otal Dissolved Solids otal Monohydric Phenols (W) | - 0 | - <0 | 0 | - <0 | - | - | - |

| Date Prepared | |
|----------------------|--|
| pH (pH Units) | |
| Conductivity (µS/cm) | |

| , | |
|-------------------------------|--------|
| Conductivity (µS/cm) | 248.00 |
| Temperature (°C) | 22.30 |
| Volume Leachant (Litres) | 0.881 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

7.76

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

| ALcontrol La | 5012101165 | | CEF | RTIFIC | ATE OF ANAL | YSIS | | | Validated |
|--|--------------------------------------|------------------------|--------------------------------------|---------------------|----------------------|--------------------------------|---|----------------------------|--|
| Job: | 110523-40 H_WARDELL_SH SH10534 | F-37 | Location: Customer: Attention: | Wardell Mike Ke | Armstrong LLP | Re | der Number: port Number: perseded Report: | SH3068 135537 132894 | |
| | | | | | | | | | |
| VAC ANALYTIC | AL RESULT | S | | | | | | REF | : BS EN 12457 |
| lient Reference | | • | | | Site Location | | | | |
| lass Sample taken | (ka) | 0.109 | | | Moisture Conte | nt Patio (%) | 21.2 | | |
| Mass of dry sample | , | 0.175 | | | Dry Matter Con | | 82.5 | | |
| Particle Size <4mm | (kg) | >95% | | | Dry Matter Con | | 02.0 | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| _ab Sample Number | r(s) | 3515869 | | | | | | 1 | |
| Sampled Date | .(0) | 18-May-201 | 1 | | | | | | |
| Customer Sample R | of | TP 111 | | | | | | | |
| Depth (m) | .ei. | 1.20 | | | | | | | |
| / | le. | Result | | | | | • | | |
| Solid Waste Analysi | 15 | Result | | | | | | | |
| otal Organic Carbon (%) | | - | | | | | - | - | - |
| oss on Ignition (%) Sum of BTEX (mg/kg) | | - 0.029 | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | | - | | | | | - | - | - |
| lineral Oil (mg/kg) | | - | | | | | - | - | - |
| AH Sum of 17 (mg/kg) | | - 7.76 | | | | | - | - | - |
| H (pH Units) NC to pH 6 (mol/kg) | | - | | | | | - | - | - |
| ANC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| Eluate Analysis | | | in 10:1 eluate | | | c ⁿ leached (mg/kg) | using E | | ance leaching test 3 at L/S 10 l/kg |
| Hexavalent Chromium | | Result <0.03 | | f Detection 0.03 | Result <0.3 | Limit of Detection <0.3 | - | | |
| bH | | 7.8 | - 1 | 0.001 | 78 | < 0.01 | - | - | - |
| Sulphide | | <0.01 | < | 0.01 | <0.1 | <0.1 | - | - | - |
| otal Cyanide (W) | | < 0.05 | | 0.05 | <0.5 | < 0.5 | - | - | - |
| Free Cyanide (W) Phenol by HPLC (W) | | <0.05 <0.002 | | 0.05).002 | <0.5 | <0.5 | - | - | - |
| hiocyanate (W) | | <0.002 | | 0.002 | <0.02 | <0.02 | - | - | |
| Boron | | 0.0254 | | .0094 | 0.254 | < 0.094 | - | - | - |
| AH Spec MS - Aqueous | (W) | | | | | | | | |
| laphthalene by GCMS | | <0.0001 | | .0001 | <0.001 | <0.001 | - | - | - |
| cenaphthene by GCMS | 2 | <0.000015 | | 000015 | <0.00015 <0.00011 | <0.00015 | - | - | - |
| luoranthene by GCMS | 5 | <0.000011 <0.000017 | |)00011)00017 | <0.00017 | <0.00011 <0.00017 | - | - | - |
| Anthracene by GCMS | | < 0.000015 | | 000015 | < 0.00015 | < 0.00017 | - | - | - |
| henanthrene by GCMS | | <0.000022 | <0.0 | 00022 | <0.00022 | <0.00022 | - | - | - |
| luorene by GCMS | | <0.000014 | | 000014 | <0.00014 | <0.00014 | - | - | - |
| Chrysene by GCMS | | < 0.000013 | | 00013 | < 0.00013 | < 0.00013 | - | - | - |
| Pyrene by GCMS Benz(a)anthracene by GC | MS | <0.000015 <0.000017 | |)00015)00017 | <0.00015 <0.00017 | <0.00015 <0.00017 | - | - | - |
| Benzo(b)fluoranthene by (| | < 0.000023 | | 000023 | < 0.00023 | < 0.00023 | - | - | - |
| Benzo(k)fluoranthene by C | GCMS | <0.000027 | | 000027 | <0.00027 | <0.00027 | - | - | - |
| Benzo(a)pyrene by GCMS | | <0.000009 | | 00009 | <0.00009 | <0.00009 | - | - | - |
| bibenzo(ah)anthracene by | GCMS | <0.000016 | <0.0 | 000016 | <0.00016 | <0.00016 | - | - | - |
| each Test Informa | tion | | | | | | | | |
| ate Prepared | | 15-Jun-2011 | | | | | | | |
| H (pH Units) | | 7.76 | | | | | | | |
| Conductivity (µS/cm) | | 248.00 | | | | | | | |
| Temperature (°C) /olume Leachant (Litres) | | 22.30 | | | | | | | |

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

0.881

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

Volume Leachant (Litres)

| ALcontrol La | | | CEF | RTIFIC | ATE OF ANA | ALYSIS | | | Validated |
|--|--------------------------------------|----------------------|--------------------------------------|-----------------------|---|----------------------------------|---|----------------------------|--|
| Job: | 110523-40 H_WARDELL_SH SH10534 | F-37 | Location: Customer: Attention: | Wardell . Mike Kel | Armstrong LLP | F | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 | |
| | | | | | | | | | |
| VAC ANALYTIC | | .e | | | | | | DEE | : BS EN 12457 |
| | AL RESULI | 3 | | | O ¹ / ₁ I ¹ / ₁ | | | REF | . DS EN 1245/ |
| Client Reference | 4 \ | 0.400 | | | Site Location | | 04.0 | | |
| Mass Sample taken | | 0.109 | | | | tent Ratio (%) | 21.2 | | |
| Mass of dry sample | (kg) | 0.175 | | | Dry Matter Co | ontent Ratio (%) | 82.5 | | |
| Particle Size <4mm | | >95% | | | | | | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| _ab Sample Number | r(s) | 3515869 | | | | | | | |
| Sampled Date | | 18-May-2011 | 1 | | | | | | |
| Customer Sample R | ef. | TP 111 | | | | | | | |
| Depth (m) | | 1.20 | | | | | | | |
| Solid Waste Analysi | ŝ | Result | | | | | | | |
| | ~ | | | | • | | | | |
| otal Organic Carbon (%) | | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) | | 0.029 | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | | - | | | | | - | - | - |
| /lineral Oil (mg/kg) | | - | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) H (pH Units) | | 7.76 | | | | | - | - | - |
| NC to pH 6 (mol/kg) | | - | | | | | - | - | - |
| ANC to pH 4 (mol/kg) | | - | | | - | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate | e (mg/l) | A2 10:1 c | onc ⁿ leached (mg/kg) | | | ance leaching test 3 at L/S 10 l/kg |
| • | | Result | Limit o | of Detection | Result | Limit of Detecti | | 5 EN 12457 . | at 2/5 10 1/ kg |
| PAH Spec MS - Aqueous | (W) | | | | | | | | |
| Benzo(ghi)perylene by GC | | < 0.000016 | | 000016 | < 0.00016 | < 0.00016 | - | - | - |
| ndeno(123cd)pyrene by C PAH 16 EPA Total by GCI | | <0.000014 0 | <0.0 | 000014 <0 | <0.00014 0 | <0.00014 | - | - | - |
| TPH CWG (W) | wice | 0 | | ~0 | 0 | | - | - | - |
| Surrogate Recovery | | - | | <0 | - | <0 | - | - | - |
| GRO TOT (C5-C12) | | < 0.05 | | 0.05 | <0.5 | <0.5 | - | - | - |
| Aliphatics C5-C6 | | < 0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aliphatics >C6-C8 Aliphatics >C8-C10 | | <0.01 <0.01 | | 0.01 | <u><0.1</u> <0.1 | <0.1 | | - | - |
| Aliphatics >C10-C12 | | <0.01 | | 0.01 | <0.1 | <0.1 | | - | |
| Aliphatics >C12-C16 | | < 0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aliphatics >C16-C21 | | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aliphatics >C21-C35 | | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| otal Aliphatics >C12-C35 |) | < 0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics >C7-C8 | | <0.01 <0.01 | | 0.01 | <u><0.1</u> <0.1 | <u><0.1</u> <0.1 | - | - | - |
| ATBE GC-FID | | < 0.003 | | 0.003 | < 0.03 | < 0.03 | - | - | - |
| Aromatics >EC8 -EC10 | | <0.01 | < | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics >EC10-EC12 | | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics >EC12-EC16 | | < 0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics >EC16-EC21 Aromatics >EC21-EC35 | | <0.01 <0.01 | | 0.01 | <u><0.1</u> <0.1 | <u><0.1</u> <0.1 | - | - | - |
| Total Aromatics >EC12-E | C35 | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| each Test Informat | tion | | | | | | | | |
| Date Prepared | | 15-Jun-2011 | | | | | | | |
| H (pH Units) | | 7.76 | | | | | | | |
| Conductivity (µS/cm) | | 248.00 | | | | | | | |
| Temperature (°C) /olume Leachant (Litres) | | 22.30 | | | | | | | |
| | | | | | | | | | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

0.881

Mcerts Certification does not apply to leachates

Volume of Eluate VE1 (Litres)

23/06/2011 17:33:37

Volume Leachant (Litres)

| ALcontrol La | | | CEF | RTIFIC | ATE OF ANAL | YSIS | | | Validated |
|---|---------------------------|---------------------|------------------------|-------------|-----------------|------------------------------|----------------------------|------------------|-------------------------------------|
| Job: | 110523-40 H_WARDELL_SH | IF-37 | Location: Customer: | | Armstrong LLP | Rep | er Number: oort Number: | SH3068 135537 | |
| Client Reference: | SH10534 | | Attention: | Mike Kel | • | | erseded Report: | 132894 | |
| | | | CEN | 10:1 5 | TAGE BATCH | IESI | | | |
| VAC ANALYTIC | AL RESULI | ſS | | | | | | REF | : BS EN 12457 |
| Client Reference | | | | | Site Location | | | | |
| Mass Sample taken | (kg) | 0.109 | | | Moisture Conte | nt Ratio (%) | 21.2 | | |
| Mass of dry sample | (kg) | 0.175 | | | Dry Matter Cont | ent Ratio (%) | 82.5 | | |
| Particle Size <4mm | | >95% | | | | | | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| _ab Sample Number | r(s) | 3515869 | | | | | | | |
| Sampled Date | | 18-May-201 | 1 | | | | | | |
| Customer Sample R | ef. | TP 111 | | | | | | | |
| Depth (m) | | 1.20 | | | | | | | |
| Solid Waste Analysi | S | Result | | | | | | | |
| otal Organic Carbon (%) | | - | | | | | - | - | - |
| oss on Ignition (%) | | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) | | 0.029 | | | | | - | - | |
| /lineral Oil (mg/kg) | | - | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 7.76 | | | | | - | - | - |
| ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| are to pri i (iio#iig) | | 1 | | | | | | | |
| Eluate Analysis | | C2 Conc | in 10:1 eluate | e (mg/l) | A2 10:1 conc | ⁿ leached (mg/kg) | | | nce leaching test at L/S 10 l/kg |
| TPH CWG (W) | | Result | Limit o | f Detection | Result | Limit of Detection | | | |
| Benzene by GC | | <0.007 | <(| 0.007 | <0.07 | <0.07 | - | - | - |
| Toluene by GC | | < 0.004 | | 0.004 | < 0.04 | < 0.04 | - | - | - |
| Ethylbenzene by GC | | <0.005 | | 0.005 | <0.05 | <0.05 | - | - | - |
| n & p Xylene by GC | | < 0.008 | | 0.008 | <0.08 | < 0.08 | - | - | - |
| Sum m&p and o Xylene by | / GC | <0.003 0 | | 0.003 <0 | <0.03 0 | <0.03 <0 | - | - | |
| Sum of BTEX by GC | , | 0 | | <0 | 0 | <0 | - | - | |
| TPH (Total Aliphatics + To | otal | < 0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics) >C5-C35 | | | | | | | | | |
| each Test Informat Date Prepared H (pH Units) | tion | 15-Jun-2011 7.76 | | | | | | | |
| Conductivity (µS/cm) | | 248.00 | | | | | | | |
| Temperature (°C) | | 240.00 | | | | | | | |

Temperature (°C) 22.30 Volume Leachant (Litres) 0.881 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

| Mass of dry sample (kg)0.1Particle Size <4mm>9Case110SDG110Lab Sample Number(s)35Sampled Date19 | 7 CL At 103 175 15% 0523-40 15878 -May-2011 2 115 | tention: Mike Kelly CEN 10:1 ST | | Repo Super | Number: rt Number: rseded Report: 14.3 87.5 | SH3068 135537 132894 REF : BS | EN 1245 |
|--|---|--|--|--|---|--|---|
| WAC ANALYTICAL RESULTSClient ReferenceMass Sample taken (kg)0.1Mass of dry sample (kg)0.1Particle Size <4mm>9:Case110SDG110Lab Sample Number(s)35:Sampled Date19:Customer Sample Ref.TPDepth (m)0.3 | 103 175 95% 0523-40 15878 I-May-2011 2 115 | CEN 10:1 ST | FAGE BATCH Site Location Moisture Conte | I TEST | 14.3 | | EN 1245 |
| Client Reference Mass Sample taken (kg) 0.1 Mass of dry sample (kg) 0.1 Particle Size <4mm >9: Case 50G 110 Lab Sample Number(s) 35: Sampled Date 19: Customer Sample Ref. TP Depth (m) 0.3 | 175 95% 0523-40 15878 -May-2011 2 115 | | Site Location Moisture Conte | ent Ratio (%) | | REF : BS | EN 12457 |
| Client Reference Mass Sample taken (kg) 0.1 Mass of dry sample (kg) 0.1 Varticle Size <4mm | 175 95% 0523-40 15878 -May-2011 2 115 | | Moisture Conte | | | REF : BS | EN 12457 |
| Mass Sample taken (kg) 0.1 Mass of dry sample (kg) 0.1 Particle Size <4mm | 175 95% 0523-40 15878 -May-2011 2 115 | | Moisture Conte | | | | |
| Mass of dry sample (kg) 0.1 Particle Size <4mm | 175 95% 0523-40 15878 -May-2011 2 115 | | | | | | |
| Particle Size <4mm | 0523-40 15878 -May-2011 2 115 | | Dry Matter Con | tent Ratio (%) | 87.5 | | |
| Case SDG 110 Lab Sample Number(s) 35 Sampled Date 19 Customer Sample Ref. TP Depth (m) 0.3 | 0523-40 15878 I-May-2011 P 115 | | | | | | |
| SDG110Lab Sample Number(s)35Sampled Date19Customer Sample Ref.TPDepth (m)0.3 | 15878 -May-2011 2 115 | - | | | | | |
| SDG110Lab Sample Number(s)35Sampled Date19Customer Sample Ref.TPDepth (m)0.3 | 15878 -May-2011 2 115 | | | | | | |
| Lab Sample Number(s)35Sampled Date19-Customer Sample Ref.TPDepth (m)0.3 | 15878 -May-2011 2 115 | | | 1 | | | |
| Sampled Date19-Customer Sample Ref.TPDepth (m)0.3 | -May-2011 ? 115 | | | | | | |
| Customer Sample Ref.TPDepth (m)0.3 | P 115 | | | | | | |
| Depth (m) 0.3 | | | | | | | |
| , | <() | | | | | | |
| Solid Waste Analysis | 50 | | | | | | |
| | Result | | | | | | |
| otal Organic Carbon (%) | - | | | | - | - | - |
| oss on Ignition (%) | - | | | | - | - | - |
| | none detected | | | | - | - | - |
| um of 7 PCBs (mg/kg) fineral Oil (mg/kg) | - | | | | - | - | - |
| AH Sum of 17 (mg/kg) | - | | | | - | - | - |
| H (pH Units) | 7.94 | | | | - | - | - |
| NC to pH 6 (mol/kg) | - | | | | - | - | - |
| ANC to pH 4 (mol/kg) | - | | | | - | - | - |
| Eluate Analysis | C2 Conc ⁿ in | 10:1 eluate (mg/l) | A2 10:1 con | c ⁿ leached (mg/kg) | | es for compliance lea S EN 12457-3 at L/S | - |
| | Result | Limit of Detection | Result | Limit of Detection | | | |
| Arsenic | 0.00334 | <0.00012 | 0.0334 | <0.0012 | - | - | - |
| Barium | | - | - | - | - | - | - |
| Chromium | <0.0001 0.00333 | <0.0001 <0.00022 | <0.001 0.0333 | <0.001 <0.0022 | - | - | - |
| Copper | 0.00333 | <0.00022 | 0.0333 | <0.0022 | - | - | - |
| /ercury Dissolved (CVAF) | 0.0000142 | <0.00000 | 0.000142 | < 0.0001 | - | - | - |
| | | - | | | | | |
| Nolybdenum | - | - | - | - | - | - | - |
| | - 0.00109 | - <0.00015 | - 0.0109 | - <0.0015 | - | - | - |
| Nolybdenum lickel lead | 0.00109 0.000323 | <0.00015 <0.00002 | 0.0109 0.00323 | <0.0015 <0.0002 | | | |
| lickel | 0.00109 0.000323 - | <0.00015 <0.00002 - | 0.0109 0.00323 - | <0.0015 <0.0002 - | | | - |
| lickel | 0.00109 0.000323 - 0.000493 | <0.00015 <0.00002 - <0.00039 | 0.0109 0.00323 - 0.00493 | <0.0015 <0.0002 - <0.0039 | - - - - | - - - - | - - - - |
| lickel ead statement of the second statement of the se | 0.00109 0.000323 - 0.000493 0.00125 | <0.00015 <0.00002 - <0.00039 <0.00041 | 0.0109 0.00323 - 0.00493 0.0125 | <0.0015 <0.0002 - <0.0039 <0.0041 | - - - - - | - - - - - | - - - - |
| Vickel vi | 0.00109 0.000323 - 0.000493 0.00125 - | <0.00015 <0.00002 - <0.00039 <0.00041 - | 0.0109 0.00323 - 0.00493 0.0125 - | <0.0015 <0.0002 - <0.0039 <0.0041 - | - - - - - - | - - - - - - - | |
| lickel ead ntimony selenium fünc | 0.00109 0.000323 - 0.000493 0.00125 - - | <0.00015 <0.00002 - <0.00039 <0.00041 - - | 0.0109 0.00323 - 0.00493 0.0125 - - - | <0.0015 <0.0002 - <0.0039 <0.0041 - - | - - - - - | - - - - - | - - - - |
| lickel ead edd edd edd edd edd edd edd edd edd | 0.00109 0.000323 - 0.000493 0.00125 - | <0.00015 <0.00002 - <0.00039 <0.00041 - | 0.0109 0.00323 - 0.00493 0.0125 - | <0.0015 <0.0002 - <0.0039 <0.0041 - | - - - - - - - - | - - - - - - - - - | - - - - - - - |
| lickel ead | 0.00109 0.000323 - 0.000493 0.00125 - - 58.1 | <0.00015 <0.00002 - <0.00039 <0.00041 - - - <2 | 0.0109 0.00323 - 0.00493 0.0125 - - 581 | <0.0015 <0.0002 - <0.0039 <0.0041 - - <20 | - - - - - - - - | - - - - - - - - | - - - - - - - - - |

| Date Prepared | 15-Jun-2011 |
|-------------------------------|-------------|
| pH (pH Units) | 7.45 |
| Conductivity (µS/cm) | 220.00 |
| Temperature (°C) | 22.30 |
| Volume Leachant (Litres) | 0.887 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

| ALcontrol La | 501010163 | | CEF | RTIFIC | ATE OF ANAL | YSIS | | | Validated |
|--|--------------------------------------|------------------------|--------------------------------------|---------------------|----------------------|----------------------|---|----------------------------|--|
| Job: | 110523-40 H_WARDELL_SH SH10534 | F-37 | Location: Customer: Attention: | Wardell Mike Kel | Armstrong LLP | Re | der Number: port Number: perseded Report: | SH3068 135537 132894 | |
| | | | CEN | 10:1 S | TAGE BATCH | I TEST | | | |
| VAC ANALYTIC | AL RESULT | S | | | | | | REF | : BS EN 12457 |
| Client Reference | | • | | | Site Location | | | | |
| Mass Sample taken | (ka) | 0.103 | | | Moisture Conte | nt Potio (%) | 14.3 | | |
| - | , | | | | | | | | |
| Mass of dry sample | (Kg) | 0.175 | | | Dry Matter Con | tent Ratio (%) | 87.5 | | |
| Particle Size <4mm | | >95% | | | | | | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| ab Sample Number | r(s) | 3515878 | | | | | | 1 | |
| Sampled Date | | 19-May-2011 | | | | | | | |
| Customer Sample R | ef. | TP 115 | | | | | | | |
| Depth (m) | | 0.30 | | | | | | | |
| Colid Wests Analysi | | Result | | | | | | | |
| Solid Waste Analysi | 3 | Acoun | | | | | | | |
| otal Organic Carbon (%) | | - | | | | | - | - | - |
| oss on Ignition (%) Sum of BTEX (mg/kg) | | none detected | | | | | - | - | - |
| um of 7 PCBs (mg/kg) | | - | | | | | - | - | - |
| lineral Oil (mg/kg) | | - | | | | | - | - | - |
| AH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) NC to pH 6 (mol/kg) | | 7.94 | | | | | - | - | - |
| NC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | | | | | | | ance leaching test 3 at L/S 10 l/kg |
| | | Result | | f Detection | | Limit of Detection | | 5 EN 12457- | 5 at 1/5 10 1/kg |
| Hexavalent Chromium | | <0.03 7.7 | | 0.03 | <0.3 | <0.3 | - | - | |
| Sulphide | | <0.01 | | 0.001 0.01 | <0.1 | <0.01 | - | - | |
| otal Cyanide (W) | | < 0.05 | | 0.05 | <0.5 | <0.5 | - | - | - |
| ree Cyanide (W) | | < 0.05 | | 0.05 | <0.5 | <0.5 | - | - | - |
| Phenol by HPLC (W) | | < 0.002 | | 0.002 | <0.02 | <0.02 | - | - | - |
| hiocyanate (W) | | <0.05 0.0215 | | 0.05 .0094 | <0.5 0.215 | <0.5 | - | - | - |
| AH Spec MS - Aqueous | (W) | 0.0213 | | .0034 | 0.215 | -0.0 0 - | _ | | |
| laphthalene by GCMS | | <0.0001 | <0 | .0001 | <0.001 | <0.001 | - | - | - |
| cenaphthene by GCMS | | <0.000015 | | 000015 | <0.00015 | <0.00015 | - | - | - |
| cenaphthylene by GCMS luoranthene by GCMS | 3 | < 0.000011 | | 000011 | < 0.00011 | < 0.00011 | - | - | - |
| Inthracene by GCMS | | <0.000017 <0.000015 | | 000017 | <0.00017 <0.00015 | <0.00017 <0.00015 | - | - | |
| henanthrene by GCMS | | <0.000013 | | 000013 | <0.00013 | <0.00013 | - | - | |
| luorene by GCMS | | <0.000014 | <0.0 | 000014 | <0.00014 | <0.00014 | - | - | - |
| hrysene by GCMS | | < 0.000013 | | 000013 | <0.00013 | <0.00013 | - | - | - |
| yrene by GCMS enz(a)anthracene by GC | MC | < 0.000015 | | 000015 | < 0.00015 | <0.00015 | - | - | - |
| enzo(b)fluoranthene by GC | | <0.000017 <0.000023 | | 000017 000023 | <0.00017 <0.00023 | <0.00017 <0.00023 | - | - | |
| enzo(k)fluoranthene by C | | <0.000023 | | 000023 | <0.00023 | <0.00023 | - | - | - |
| enzo(a)pyrene by GCMS | 3 | <0.00009 | | 00009 | <0.00009 | <0.00009 | - | - | - |
| ibenzo(ah)anthracene by | GCMS | <0.000016 | <0.(| 000016 | <0.00016 | <0.00016 | - | - | - |
| each Test Informat | tion | | | | | | | | |
| ate Prepared | | 15-Jun-2011 | | | | | | | |
| H (pH Units) | | 7.45 | | | | | | | |
| Conductivity (µS/cm) | | 220.00 | | | | | | | |
| Femperature (°C) | | 22.30 | | | | | | | |

Temperature (°C) 22.30 Volume Leachant (Litres) 0.887 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

| ALcontrol La | aburaturies | | CEF | RTIFIC/ | ATE O | F ANAI | _YSIS | | | Validated |
|---|--------------------------------------|----------------------|--------------------------------------|--------------------|------------|------------------------|--------------------------------|---|----------------------------|--|
| Job: | 110523-40 H_WARDELL_SH SH10534 | F-37 | Location: Customer: Attention: | Wardell Mike Ke | Armstron | g LLP | R | der Number: port Number: perseded Report: | SH3068 135537 132894 | |
| | | | | | • | BATCH | | .porocourt incporti | 102001 | |
| | | _ | | | | | | | | |
| VAC ANALYTIC | AL RESULT | S | | | | | | | REF | : BS EN 12457 |
| Client Reference | | | | | | ocation | | | | |
| Mass Sample taken | (kg) | 0.103 | | | Moistu | ire Conte | ent Ratio (%) | 14.3 | | |
| Mass of dry sample | (kg) | 0.175 | | | Dry Ma | atter Cor | tent Ratio (%) | 87.5 | | |
| Particle Size <4mm | | >95% | | | | | | | | |
| Case | | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | | |
| _ab Sample Numbe | r(s) | 3515878 | | | | | | | | |
| Sampled Date | () | 19-May-2011 | | | | | | | | |
| Customer Sample F | Ref. | TP 115 | | | | | | | | |
| Depth (m) | | 0.30 | | | | | | | | |
| Solid Waste Analys | is | Result | | | | | | | | |
| otal Organic Carbon (%) | | _ | | | | | | | | |
| Loss on Ignition (%) | | - | | | | | | - | - | - |
| Sum of BTEX (mg/kg) | | none detected | | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | | - | | | | | | - | - | - |
| /lineral Oil (mg/kg) PAH Sum of 17 (mg/kg) | | - | | | | | | - | - | - |
| H (pH Units) | | 7.94 | | | | | | - | - | - |
| NC to pH 6 (mol/kg) | | - | | | | | | - | - | - |
| ANC to pH 4 (mol/kg) | | - | | | I | | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate | (mg/l) | A 2 | 10:1 con | c ⁿ leached (mg/kg) | | - | ance leaching test 8 at L/S 10 l/kg |
| PAH Spec MS - Aqueous | (141) | Result | Limit o | f Detection | F | Result | Limit of Detectio | n | | |
| Benzo(ghi)perylene by G | | <0.000016 | <0.0 | 00016 | ~0 | .00016 | <0.00016 | | | |
| ndeno(123cd)pyrene by | | < 0.000014 | | 000014 | | 0.00014 | < 0.00014 | - | - | - |
| PAH 16 EPA Total by GC | MS | 0 | | <0 | | 0 | <0 | - | - | - |
| TPH CWG (W) | | | | | 1 | | | | | |
| Surrogate Recovery GRO TOT (C5-C12) | | - <0.05 | | <0 0.05 | | - <0.5 | <0 | - | - | - |
| Aliphatics C5-C6 | | <0.03 | | 0.03 | | <0.1 | <0.1 | - | - | - |
| Aliphatics >C6-C8 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| liphatics >C8-C10 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Niphatics >C10-C12 Niphatics >C12-C16 | | < 0.01 | | 0.01 | - | <0.1 | <0.1 | - | - | - |
| Aliphatics >C16-C21 | | <0.01 <0.01 | | 0.01 0.01 | | <0.1 <0.1 | <0.1 | - | - | - |
| Aliphatics >C21-C35 | | <0.01 | | 0.01 | | <0.1 | <0.1 | | - | - |
| otal Aliphatics >C12-C3 | 5 | <0.01 | | 0.01 | - | <0.1 | <0.1 | - | - | - |
| Aromatics C6-C7 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aromatics >C7-C8 | | <0.01 | | 0.01 | | <0.1 | <0.1 | | - | - |
| ATBE GC-FID Aromatics >EC8 -EC10 | | < 0.003 | | 0.003 | _ | < 0.03 | < 0.03 | - | - | - |
| Aromatics >EC10-EC12 | | <0.01 <0.01 | | 0.01 0.01 | | <u><0.1</u> <0.1 | <0.1 | - | - | |
| Aromatics >EC12-EC16 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aromatics >EC16-EC21 | | <0.01 | | 0.01 | _ | <0.1 | <0.1 | - | - | - |
| Aromatics >EC21-EC35 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| otal Aromatics >EC12-E | C35 | <0.01 | < | 0.01 | | <0.1 | <0.1 | - | - | - |
| .each Test Informa | tion | | | | | | | | | |
| Date Prepared | | 15-Jun-2011 | | | | | | | | |
| H (pH Units) | | 7.45 | | | | | | | | |
| Conductivity (µS/cm) | | 220.00 | | | | | | | | |
| Femperature (°C) | | 22.30 | | | | | | | | |

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

0.887

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

Volume Leachant (Litres)

| | aboratories | | CEF | RTIFICA | ATE OF ANAL | YSIS | | | Validated |
|---|--------------------------|----------------------|------------------------|----------------|----------------|--------------------------------|-----------------------------|------------------|-------------------------------------|
| SDG: Job: | 110523-40 H_WARDELL_S | SHF-37 | Location: Customer: | | Armstrong LLP | Rep | ler Number: oort Number: | SH3068 135537 | |
| Client Reference: | SH10534 | | Attention: | Mike Kel | - | | perseded Report: | 132894 | |
| | | | CEN | 10:1 S | TAGE BATCH | ITEST | | | |
| VAC ANALYTI | CAL RESUL | TS | | | | | | REF | : BS EN 12457 |
| lient Reference | | | | | Site Location | | | | |
| Mass Sample take | n (kg) | 0.103 | | | Moisture Conte | nt Ratio (%) | 14.3 | | |
| Mass of dry sampl | le (kg) | 0.175 | | | Dry Matter Con | tent Ratio (%) | 87.5 | | |
| Particle Size <4mr | | >95% | | | | | | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| ab Sample Numb | er(s) | 3515878 | | | | | | | |
| Sampled Date | | 19-May-201 | 1 | | | | | | |
| Customer Sample | Ref. | TP 115 | | | | | | | |
| Depth (m) | - | 0.30 | | | | | | | |
| Solid Waste Analy | eie | Result | | | | | | | |
| Total Organic Carbon (%) | | | | | • | | | - | |
| Loss on Ignition (%) | | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) | | none detected | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | | - | | | | | - | - | - |
| /lineral Oil (mg/kg) PAH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 7.94 | | | | | - | - | - |
| ANC to pH 6 (mol/kg) | | - | | | | | - | - | - |
| ANC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate | e (mg/l) | A2 10:1 cond | c ⁿ leached (mg/kg) | | | nce leaching test at L/S 10 l/kg |
| | | Result | Limit c | of Detection | Result | Limit of Detection | | | ,, y |
| TPH CWG (W) | | 0.007 | | | 0.07 | | | | |
| Benzene by GC Foluene by GC | | <0.007 <0.004 | | 0.007 0.004 | <0.07 <0.04 | <0.07 <0.04 | - | - | |
| Ethylbenzene by GC | | < 0.005 | | 0.005 | <0.05 | <0.05 | - | - | - |
| m & p Xylene by GC | | <0.008 | | 0.008 | <0.08 | <0.08 | - | - | - |
| Xylene by GC | | < 0.003 | | 0.003 | < 0.03 | <0.03 | - | - | - |
| Sum m&p and o Xylene Sum of BTEX by GC | by GC | 0 | | <0 | 0 | <0 | - | - | - |
| FPH (Total Aliphatics + | Total | 0 | | <0 :0.01 | 0<0.1 | <0 <0.1 | | - | - |
| Aromatics) >C5-C35 | | | | | | | | | |
| Leach Test Inform | ation | 15-Jun-2011 | | | | | | | |
| H (pH Units) Conductivity (µS/cm) | | 7.45 | | | | | | | |
| Conductivity (µS/cm) | | 220.00 | | | | | | | |

| Conductivity (µS/cm) | 220.00 |
|-------------------------------|--------|
| Temperature (°C) | 22.30 |
| Volume Leachant (Litres) | 0.887 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

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| | 110522.40 | | | | ATE OF ANAL | | | 6110000 | | |
|--|---------------------------------------|----------------------|--------------------------------------|------------------------|----------------|--------------------------------|--|--|-------|-------|
| SDG: Job: Client Reference: | 110523-40 H_WARDELL_SHI SH10534 | F-37 | Location: Customer: Attention: | Wardell A Mike Kell | Armstrong LLP | R | rder Number: eport Number: uperseded Report: | SH3068 135537 132894 | | |
| | | | CEN | 10:1 ST | | ITEST | | | | |
| | AL RESULT | S | | | | | | REF : | BS EN | 12457 |
| lient Reference | | | | | Site Location | | | | | |
| Mass Sample taker | n (ka) | 0.109 | | | Moisture Conte | nt Ratio (%) | 21.7 | | | |
| Mass of dry sample | | 0.175 | | | Dry Matter Con | | 82.2 | | | |
| Particle Size <4mm | | >95% | | | | | | | | |
| Case | | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | | |
| ab Sample Numbe | er(s) | 3515883 | | | | | | | | |
| Sampled Date | | 20-May-201 | 1 | | | | | | | |
| Customer Sample | Ref. | TP 118 | | | | | | | | |
| Depth (m) | | 0.70 | | | | | | | | |
| Solid Waste Analys | sis | Result | | | | | | | | |
| otal Organic Carbon (%) | | - | | | • | | - | - | | - |
| oss on Ignition (%) Sum of BTEX (mg/kg) | | - | | | | | - | - | | - |
| sum of 7 PCBs (mg/kg) | | - | | | | | - | - | | - |
| lineral Oil (mg/kg) | | - | | | | | - | - | | - |
| AH Sum of 17 (mg/kg) | | - | | | | | - | - | | - |
| H (pH Units) NC to pH 6 (mol/kg) | | 8.23 | | | | | - | - | | - |
| NC to pH 4 (mol/kg) | | - | | | | | - | - | | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate | e (mg/l) | A2 10:1 cond | c ⁿ leached (mg/kg) | | alues for compliance leaching test g BS EN 12457-3 at L/S 10 l/kg | | |
| , | | Result | Limit o | f Detection | Result | Limit of Detection | | 55 EN 12457-5 | | ky |
| Arsenic Barium | | 0.000466 | <0. | 00012 | 0.00466 | < 0.0012 | | - | | - |
| Cadmium | | < 0.0001 | <0 | .0001 | - <0.001 | < 0.001 | | - | | - |
| Chromium | | 0.0026 | | 00022 | 0.026 | < 0.0022 | - | - | | - |
| Copper | | 0.00158 | | 00085 | 0.0158 | <0.0085 | - | - | | - |
| lercury Dissolved (CVA lolybdenum | F) | <0.00001 | <0. | 00001 | <0.0001 | <0.0001 | - | - | | - |
| lickel | | - 0.0015 | <0 | - 00015 | - 0.015 | - <0.0015 | - | - | | - |
| ead | | 0.000661 | | 00002 | 0.00661 | < 0.0002 | - | - | | - |
| ntimony | | - | | - | - | - | - | - | | - |
| Selenium | | < 0.00039 | | 00039 | <0.0039 | <0.0039 | - | - | | - |
| Zinc Chloride | | 0.00346 | <0. | 00041 | 0.0346 | <0.0041 | - | - | | - |
| luoride | | - | | - | - | - | - | - | | - |
| Sulphate (soluble) | | - | | - | - | - | - | - | | - |
| otal Dissolved Solids | | - | | - | - | - | - | - | | - |
| otal Monohydric Pheno Dissolved Organic Carbo | | - | | - | - | - | - | - | | - |
| | | | | | | | | | | |
| each Test Informa | ation | 15-Jun-2011 | | | | | | | | |

| Date Prepared | 15-Jun-2011 |
|-------------------------------|-------------|
| pH (pH Units) | 7.68 |
| Conductivity (µS/cm) | 128.00 |
| Temperature (°C) | 22.30 |
| Volume Leachant (Litres) | 0.880 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Meerts Certification does not apply to leachates

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| SDC: 11057 | | | | | | | | |
|--|--|--|---|--|--|---|---|---|
| | 23-40 ARDELL_SHF-37 534 | Location: Custome Attention | r: Wardell A | rmstrong LLP | Rep | er Number: ort Number: erseded Report: | SH3068 135537 132894 | |
| | | CE | | AGE BATCH | | | | |
| | RESULTS | | | | | | REF | BS EN 12457 |
| Client Reference | | | | Site Location | | | | |
| Mass Sample taken (kg) | 0.109 | | | Moisture Conte | nt Patio (%) | 21.7 | | |
| | | | | | | | | |
| Mass of dry sample (kg) Particle Size <4mm | 0.175 >95% | | - | Dry Matter Con | itent Ratio (%) | 82.2 | | |
| | - 5570 | | | | | | | |
| Case | | - | | | | | | |
| SDG | 110523-4 | 0 | | | | | | |
| _ab Sample Number(s) | 3515883 | | | | | | | |
| Sampled Date | 20-May-2 | 011 | | | | | | |
| Customer Sample Ref. | TP 118 | | | | | | | |
| Depth (m) | 0.70 | | | | | | | |
| Solid Waste Analysis | Resul | t | | | | | | |
| otal Organic Carbon (%) | - | | | | | - | - | - |
| oss on Ignition (%) | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) | - | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | - | | | | | - | - | - |
| /ineral Oil (mɑ/kɑ) | - | | | | | - | - | - |
| | - | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) bH (pH Units) | - 8.23 | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) DH (pH Units) ANC to pH 6 (mol/kg) | - | | | | | - | - | - |
| PAH Sum of 17 (mg/kg) DH (pH Units) ANC to pH 6 (mol/kg) | - 8.23 - - | | | | | | - - - | |
| PAH Sum of 17 (mg/kg) pH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) | - 8.23 - - | onc ⁿ in 10:1 elu | iate (mg/l) | A2 10:1 con | c ⁿ leached (mg/kg) | - - - - Limit valu | - - - es for complia | - - - |
| PAH Sum of 17 (mg/kg) oH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis | - 8.23 - - | | nate (mg/l) hit of Detection | A2 10:1 con Result | c ⁿ leached (mg/kg) | - - - - Limit valu | - - - es for complia | - - - - nce leaching test |
| Vineral Oil (mg/kg) PAH Sum of 17 (mg/kg) OH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS | - 8.23 - - C 2 Ca | ılt Lim | | 7.12 | | - - - - Limit valu | - - - es for complia | - - - - nce leaching test |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS | - 8.23 - - C2 Cc Resu <0.000 <0.0000 | 1 lt Lim 01 015 < | it of Detection <0.0001 :0.000015 | Result <0.001 <0.00015 | Limit of Detection <0.001 <0.00015 | - - - Limit valu using E | - - - S For complia | - - - - nce leaching test |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS | - 8.23 - - C2 Cc Resu <0.000 <0.0000 | Ilt Lim 01 | <pre>it of Detection <0.0001 <0.000015 <0.000011</pre> | Result <0.001 <0.00015 <0.00011 | Limit of Detection <0.001 <0.00015 <0.00011 | - - - Limit valu using E - - | - - - - - - - - - - - - - | - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Fluoranthene by GCMS | - 8.23 C2 Cc Resu 0.0000 <0.0000 | IIt Lim 01 015 015 < | <pre>it of Detection <0.0001 <0.000015 <0.000011 <0.000017</pre> | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 | - - - Limit valu using E | - - - S For complia | - - - - nce leaching test |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Fluoranthene by GCMS Anthracene by GCMS | - 8.23 - - C2 Cc Resu <0.000 <0.0000 | IIt Lim D1 015 D11 < | <pre>it of Detection <0.0001 <0.000015 <0.000011</pre> | Result <0.001 <0.00015 <0.00011 | Limit of Detection <0.001 <0.00015 <0.00011 | - - - Limit valu using E - - | - - - - - - - - - - - - - | - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Fluorene by GCMS Fluorene by GCMS Fluorene by GCMS | | IIt Lim 01 | <0.0001 <0.000015 <0.000015 <0.000017 <0.000015 <0.000015 <0.000022 <0.000014 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 <0.00015 <0.00022 <0.00014 | - - - - - Limit valu using E - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Fluorene by GCMS Fluorene by GCMS Fluorene by GCMS Fluorene by GCMS | | IIt Lim 01 | <0.0001 <0.000015 <0.000015 <0.000017 <0.000015 <0.000015 <0.000022 <0.000014 <0.000013 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 <0.00015 <0.00015 <0.00022 <0.00014 <0.00013 | - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - at L/S 10 I/kg - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Fluorene by GCMS Fluorene by GCMS Physene by GCMS Pyrene by GCMS | | IIt Lim 01 | <0.0001 <0.00015 <0.000015 <0.000017 <0.000015 <0.000015 <0.000022 <0.000014 <0.000013 <0.000015 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 <0.00015 <0.00012 <0.00014 <0.00013 <0.00015 | - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Eluorene by GCMS | | IIt Lim 01 | <pre>it of Detection <0.0001 <0.000015 <0.000011 <0.000017 <0.000015 <0.000022 <0.000014 <0.000013 <0.000015 <0.000015 <0.000015 <0.000017 </pre> | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 <0.00015 <0.00012 <0.00014 <0.00013 <0.00015 <0.00015 <0.00015 <0.00017 | - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - at L/S 10 I/kg - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Fluorene by GCMS Fluorene by GCMS Eluorene by GCMS Pyrene by GCMS Pyrene by GCMS Pyrene by GCMS Banz(a)anthracene by GCMS Banz(a)anthracene by GCMS | | IIt Lim 01 | <0.0001 <0.00015 <0.000015 <0.000017 <0.000015 <0.000015 <0.000022 <0.000014 <0.000013 <0.000015 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00011 <0.00017 <0.00015 <0.00012 <0.00014 <0.00013 <0.00015 | - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) bH (pH Units) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Naphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Phenanthrene by GCMS Eluorene by GCMS Eluorene by GCMS Eluorene by GCMS Pyrene by GCMS Pyrene by GCMS Banz(a)anthracene by GCMS Banzo(b)fluoranthene by GCMS Banzo(a)pyrene by GCMS | | IIt Lim 01 | <pre>it of Detection </pre> <0.0001 <0.000015 <0.000017 <0.000017 <0.000015 <0.000015 <0.000014 <0.000013 <0.000015 <0.000015 <0.000017 <0.000017 <0.000023 <0.000027 <0.000009 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00017 <0.00017 <0.00015 <0.00022 <0.00014 <0.00013 <0.00015 <0.00015 <0.00017 <0.00017 <0.00023 <0.00027 <0.00009 | - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) PAH Sum of 17 (mg/kg) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Vaphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCM | | IIt Lim 01 | <pre>it of Detection </pre> <0.0001 <0.000015 <0.000017 <0.000017 <0.000015 <0.000015 <0.000014 <0.000013 <0.000015 <0.000017 <0.000017 <0.000017 <0.000023 <0.000027 <0.000009 <0.000016 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00017 <0.00017 <0.00015 <0.00022 <0.00014 <0.00013 <0.00015 <0.00015 <0.00017 <0.00017 <0.00023 <0.00027 <0.00009 <0.00016 | - - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |
| PAH Sum of 17 (mg/kg) PAH Sum of 17 (mg/kg) ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) Eluate Analysis PAH Spec MS - Aqueous (W) Vaphthalene by GCMS Acenaphthene by GCMS Acenaphthylene by GCMS Fluoranthene by GCMS Phenanthrene by GCMS Phenanthrene by GCMS Eluorene by GCMS Phenanthrene by GCMS P | | IIt Lim 01 | <pre>it of Detection </pre> <0.0001 <0.000015 <0.000017 <0.000017 <0.000015 <0.000015 <0.000014 <0.000013 <0.000015 <0.000015 <0.000017 <0.000017 <0.000023 <0.000027 <0.000009 | Result <0.001 | Limit of Detection <0.001 <0.00015 <0.00017 <0.00017 <0.00015 <0.00022 <0.00014 <0.00013 <0.00015 <0.00015 <0.00017 <0.00017 <0.00023 <0.00027 <0.00009 | - - - - - - - using E - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - | - - - - - - - - - - - - - - - - - - - |

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

0.880

Mcerts Certification does not apply to leachates

23/06/2011 17:33:37

Volume Leachant (Litres)

| ALcontrol Labo | | | CEF | RTIFICA | TE OF ANAL | YSIS | | | |
|--|-------------------------------|-------------------------|--------------------------------------|------------------------|---------------------------|-------------------------------|---|-----------------------------------|------------------------------------|
| Job: H_W | 523-40 VARDELL_SHF 0534 | -37 | Location: Customer: Attention: | Wardell A Mike Kell | Armstrong LLP | Rej | ler Number: port Number: perseded Report: | SH3068 135537 132894 | |
| | | | CEN | 10:1 S | TAGE BATCH | TEST | | | |
| VAC ANALYTICAL | RESULTS | 6 | | | | | | REF : | BS EN 12457 |
| Client Reference | | | | | Site Location | | | | |
| Mass Sample taken (kg | j) (|).119 | | | Moisture Conter | nt Ratio (%) | 31.9 | | |
| Mass of dry sample (kg | g) (| 0.175 | | | Dry Matter Cont | ent Ratio (%) | 75.8 | | |
| Particle Size <4mm | > | >95% | | | | | | | |
| ase | | | | | | | | | |
| SDG | 1 | 110523-40 | | | | | | | |
| ab Sample Number(s) |) 3 | 3515901 | | | | | | | |
| Sampled Date | | 17-May-2011 | | | | | | | |
| Customer Sample Ref. | | NS 108 | | | | | | | |
| Depth (m) | | 0.40 | | | | | | | |
| Solid Waste Analysis | | Result | | | | | | | |
| otal Organic Carbon (%) | | - | | | | | - | - | |
| oss on Ignition (%) | | - | | | | | - | - | - |
| um of BTEX (mg/kg) um of 7 PCBs (mg/kg) | | 0.0357 <3.00 | | | | | - | - | - |
| lineral Oil (mg/kg) | | - | | | | | - | - | - |
| AH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 7.91 | | | | | - | - | - |
| NC to pH 6 (mol/kg) NC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| | | | | | T | | - | | |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluat | e (mg/l) | A2 10:1 conc ¹ | leached (mg/kg) | | es for complian S EN 12457-3 a | ce leaching test it L/S 10 l/kg |
| Arsenic | | Result 0.0224 | | of Detection | Result 0.224 | Limit of Detection <0.0012 | | | - |
| Barium | | - | ~0 | .00012 | | - | - | - | |
| Cadmium | | <0.0001 | <0 | 0.0001 | <0.001 | <0.001 | - | - | - |
| Chromium | | 0.00489 | | .00022 | 0.0489 | <0.0022 | - | - | - |
| Copper | | 0.0609 | | .00085 | 0.609 | <0.0085 | - | - | - |
| fercury Dissolved (CVAF) | | 0.0000194 | <0 | .00001 | 0.000194 | <0.0001 | - | - | - |
| lolybdenum lickel | | - 0.00315 | <0 | - | - 0.0315 | - <0.0015 | - | - | - |
| ead | | 0.00169 | | .00002 | 0.0169 | <0.0013 | - | | |
| ntimony | | - | | - | - | - | - | - | - |
| Selenium | | 0.00443 | <0 | .00039 | 0.0443 | <0.0039 | - | - | - |
| linc | | 0.00383 | <0 | .00041 | 0.0383 | <0.0041 | - | - | - |
| Chloride | | - | | - | - | - | | - | |
| Sulphate (soluble) | | - 30.2 | | - <2 | 302 | <20 | - | - | |
| otal Dissolved Solids | | - | | - | - | - | - | - | - |
| otal Monohydric Phenols (W |) | 0 | | <0 | 0 | <0 | - | - | - |
| issolved Organic Carbon | | - | | - | - | - | - | - | - |
| | | | | | | | | | |
| | | | | | | | | | |
| each Test Information | n | | | | | | | | |
| ate Prepared | | 15-Jun-2011 | | | | | | | |

| Date Prepared | 15-Jun-2011 |
|-------------------------------|-------------|
| pH (pH Units) | 7.68 |
| Conductivity (µS/cm) | 215.00 |
| Temperature (°C) | 22.20 |
| Volume Leachant (Litres) | 0.871 |
| Volume of Eluate VE1 (Litres) | |

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Meerts Certification does not apply to leachates

23/06/2011 17:33:37

| ALcontrol Laboratories CERTIFICATE OF ANALYSIS | | | | | | | | | | |
|---|--------------------------------------|------------------------|--------------------------------------|--------------------|----------------------|--------------------------------|---|----------------------------|--|--|
| Job: | 110523-40 1_WARDELL_SH 6H10534 | F-37 | Location: Customer: Attention: | Wardell Mike Ke | Armstrong LLP | Re | der Number: port Number: perseded Report: | SH3068 135537 132894 | | |
| | | | | | | | | | | |
| | | .e | | | | | | DEE | : BS EN 12457 | |
| | AL RESULI | 5 | | | | | | REF | : BS EN 1245/ | |
| Client Reference | | | | | Site Location | | | | | |
| Mass Sample taken | | 0.119 | | | Moisture Conte | | 31.9 | | | |
| Mass of dry sample | (kg) | 0.175 | | | Dry Matter Con | tent Ratio (%) | 75.8 | | | |
| Particle Size <4mm | | >95% | | | | | | | | |
| Case | | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | | |
| Lab Sample Number | .(s) | 3515901 | | | | | | 1 | | |
| Sampled Date | (-) | 17-May-201 | 1 | | | | | | | |
| Customer Sample R | of | WS 108 | | | | | | | | |
| - | C 1. | 0.40 | | | | | | | | |
| Depth (m) | | 0.40 | | | | | | | | |
| Solid Waste Analysi | s | Result | | | | | | | | |
| Fotal Organic Carbon (%) | | - | | | _ | | - | - | - | |
| oss on Ignition (%) | | - | | | | | - | - | - | |
| Sum of BTEX (mg/kg) | | 0.0357 <3.00 | | | | | - | - | - | |
| Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg) | | - | | | | | - | - | - | |
| PAH Sum of 17 (mg/kg) | | - | | | | | - | - | - | |
| oH (pH Units) | | 7.91 | | | | | - | - | - | |
| ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) | | - | | | | | - | - | - | |
| | | | | | | | | | | |
| Eluate Analysis | | | in 10:1 eluate | | , | c ⁿ leached (mg/kg) | using E | | ance leaching test 3 at L/S 10 l/kg | |
| Hexavalent Chromium | | Result | | f Detection | Result <0.3 | Limit of Detection | - | | | |
| bH | | <0.03 8 | | 0.03).001 | 80 | <0.3 <0.01 | - | - | | |
| Sulphide | | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - | |
| Fotal Cyanide (W) | | 0.056 | | 0.05 | 0.56 | <0.5 | - | - | - | |
| Free Cyanide (W) | | < 0.05 | | 0.05 | <0.5 | < 0.5 | - | - | - | |
| Phenol by HPLC (W) Thiocyanate (W) | | <0.002 <0.05 | | 0.002 0.05 | <0.02 <0.5 | <0.02 <0.5 | - | - | - | |
| Boron | | 0.0781 | | .0094 | 0.781 | <0.094 | | | | |
| PAH Spec MS - Aqueous | (W) | | | | | | | | | |
| Naphthalene by GCMS | | <0.0001 | | .0001 | <0.001 | <0.001 | - | - | - | |
| Acenaphthene by GCMS | | 0.0000803 | | 000015 | 0.000803 | < 0.00015 | - | - | - | |
| Acenaphthylene by GCMS Fluoranthene by GCMS | • | <0.000011 0.0000523 | | 000011 000017 | <0.00011 0.000523 | <0.00011 <0.00017 | - | - | - | |
| Anthracene by GCMS | | 0.0000523 | | 000017 | 0.000523 | <0.00017 | - | | - | |
| Phenanthrene by GCMS | | 0.000027 | | 000022 | 0.00027 | < 0.00022 | - | - | - | |
| luorene by GCMS | | 0.0000311 | | 000014 | 0.000311 | <0.00014 | - | - | - | |
| Chrysene by GCMS | | 0.0000277 | | 000013 | 0.000277 | <0.00013 | - | - | - | |
| Pyrene by GCMS | MS | 0.0000565 | | 000015 | 0.000565 | < 0.00015 | - | - | - | |
| Benz(a)anthracene by GCl Benzo(b)fluoranthene by G | | 0.0000247 | | 000017 000023 | 0.000247 | <0.00017 <0.00023 | - | - | - | |
| Benzo(k)fluoranthene by G | | <0.000023 | | 000023 | <0.00023 | <0.00023 | - | - | - | |
| Benzo(a)pyrene by GCMS | | 0.00000926 | ; <0.(| 00009 | 0.0000926 | <0.00009 | - | - | - | |
| Dibenzo(ah)anthracene by | GCMS | <0.000016 | <0.0 | 000016 | <0.00016 | <0.00016 | - | - | - | |
| each Test Informat | ion | | | | | | | | | |
| Date Prepared | | 15-Jun-2011 | | | | | | | | |
| H (pH Units) | | 7.68 | | | | | | | | |
| Conductivity (µS/cm) | | 215.00 | | | | | | | | |
| Temperature (°C) | | 22.20 | | | | | | | | |
| Volume Leachant (Litres) | | 0.871 | | | | | | | | |

Volume Leachant (Litres) 0.871 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

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| ALcontrol La | abuidluiles | | CEF | RTIFIC | ΑΤΕ Ο | | LYSIS | | | Validated |
|---|--------------------------------------|----------------------|--------------------------------------|--------------------|------------|---------------|---------------------------------|--|----------------------------|--|
| SDG: Job: Client Reference: | 110523-40 H_WARDELL_SH SH10534 | F-37 | Location: Customer: Attention: | Wardell Mike Ke | Armstron | g LLP | R | rder Number: eport Number: uperseded Report: | SH3068 135537 132894 | |
| | | | | | • | BATC | | | | |
| VAC ANALYTIC | | 'e | | | | | | | DEE | : BS EN 12457 |
| | | 5 | | | 0.4 | | | | | . DO EN 12437 |
| Client Reference | (1) | 0.440 | | | | ocation | | 24.0 | | |
| Mass Sample taker | | 0.119 | | | | | ent Ratio (%) | 31.9 | | |
| Mass of dry sample | | 0.175 | | | Dry Ma | atter Cor | ntent Ratio (%) | 75.8 | | |
| Particle Size <4mm | | >95% | | | | | | | | |
| Case | | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | | |
| _ab Sample Numbe | er(s) | 3515901 | | | | | | | | |
| Sampled Date | | 17-May-201 | 1 | | | | | | | |
| Customer Sample I | Ref. | WS 108 | | | | | | | | |
| Depth (m) | | 0.40 | | | | | | | | |
| Solid Waste Analys | sis | Result | | | | | | | | |
| otal Organic Carbon (%) | | _ | | | | | | _ | | - |
| oss on Ignition (%) | | - | | | | | | - | - | - |
| Sum of BTEX (mg/kg) | | 0.0357 | | | | | | - | - | - |
| Sum of 7 PCBs (mg/kg) | | <3.00 | | | | | | - | - | - |
| /lineral Oil (mg/kg) PAH Sum of 17 (mg/kg) | | - | | | | | | - | - | - |
| H (pH Units) | | 7.91 | | | | | | - | - | - |
| ANC to pH 6 (mol/kg) | | - | | | | | | - | - | - |
| ANC to pH 4 (mol/kg) | | - | | | 1 | | | - | - | - |
| Eluate Analysis | | C2 Conc ⁿ | in 10:1 eluate | e (mg/l) | A 2 | 10:1 cor | nc ⁿ leached (mg/kg) | | - | ance leaching test 3 at L/S 10 l/kg |
| PAH Spec MS - Aqueous | s (W) | Result | Limit o | of Detection | I F | Result | Limit of Detectio | n | | |
| Benzo(ghi)perylene by G | | <0.000016 | <0 (| 000016 | <(| 0.00016 | <0.00016 | | _ | |
| ndeno(123cd)pyrene by | | < 0.000014 | | 000014 | | 0.00014 | < 0.00014 | - | - | - |
| PAH 16 EPA Total by GC | CMS | 0.000336 | | <0 | 0. | .00336 | <0 | - | - | - |
| TPH CWG (W) Gurrogate Recovery | | | | 10 | | | 10 | | | |
| GRO TOT (C5-C12) | | - <0.05 | | <0 0.05 | + | - <0.5 | <0 | | - | |
| Aliphatics C5-C6 | | < 0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aliphatics >C6-C8 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aliphatics >C8-C10 Aliphatics >C10-C12 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aliphatics >C10-C12 | | <0.01 <0.01 | | 0.01 | | <0.1 <0.1 | <0.1 | - | - | - |
| Aliphatics >C16-C21 | | <0.01 | | 0.01 | | <0.1 | <0.1 | | - | - |
| Aliphatics >C21-C35 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Total Aliphatics >C12-C3 | 5 | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aromatics C6-C7 Aromatics >C7-C8 | | <0.01 | | 0.01 | | <0.1 | <0.1 | | - | |
| Aromatics >C7-C8 | | <0.01 <0.003 | | 0.01 | | <0.1 <0.03 | <0.1 | - | - | - |
| Aromatics >EC8 -EC10 | | <0.003 | | 0.01 | | <0.1 | <0.03 | | - | - |
| Aromatics >EC10-EC12 | | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | - |
| Aromatics >EC12-EC16 | | <0.01 | | 0.01 | | <0.1 | <0.1 | | - | - |
| Aromatics >EC16-EC21 Aromatics >EC21-EC35 | | <0.01 <0.01 | | 0.01 | + | <0.1 <0.1 | <0.1 | | - | |
| Total Aromatics >EC12-E | EC35 | <0.01 | | 0.01 | | <0.1 | <0.1 | - | - | |
| .each Test Informa | ation | | | | | | | | | |
| Date Prepared | | 15-Jun-2011 | | | | | | | | |
| H (pH Units) | | 7.68 | | | | | | | | |
| Conductivity (µS/cm) | | 215.00 | | | | | | | | |
| Temperature (°C) | | 22.20 | | | | | | | | |
| /olume Leachant (Litres) | | 0.871 | | | | | | | | |

Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

0.871

Mcerts Certification does not apply to leachates

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Volume Leachant (Litres)

| | aboratories | | CEF | RTIFICA | TE OF ANAL | YSIS | | | |
|--|---------------------------|--------------------|-------------------------------|---|----------------|--------------------|---|------------------|-------------|
| SDG: Job: | 110523-40 H_WARDELL_SH | F-37 | Location: Customer: | | Armstrong LLP | Re | der Number: port Number: | SH3068 135537 | |
| Client Reference: | SH10534 | | Attention: | Mike Kell | • | | perseded Report: | 132894 | |
| | | | CEN | 10:1 S | TAGE BATCH | TEST | | | |
| VAC ANALYTIC | AL RESULT | S | | | | | | REF : | BS EN 12457 |
| Client Reference | | | | | Site Location | | | | |
| Mass Sample take | n (kg) | 0.119 | | | Moisture Conte | ent Ratio (%) | 31.9 | | |
| Mass of dry sampl | e (kg) | 0.175 | | | Dry Matter Con | tent Ratio (%) | 75.8 | | |
| Particle Size <4mm | l | >95% | | | | | | | |
| Case | | | | | | | | | |
| SDG | | 110523-40 | | | | | | | |
| ab Sample Numb | er(s) | 3515901 | | | | | | | |
| Sampled Date | | 17-May-201 | 11 | | | | | | |
| Customer Sample | Ref. | WS 108 | | | | | | | |
| Depth (m) | | 0.40 | | | | | | | |
| Solid Waste Analy | sis | Result | | | | | | | |
| otal Organic Carbon (%) | | - | | | • | | - | - | - |
| oss on Ignition (%) | | - | | | | | - | - | - |
| Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg) | | 0.0357 <3.00 | | | | | - | - | - |
| lineral Oil (mg/kg) | | | | | | | - | - | - |
| AH Sum of 17 (mg/kg) | | - | | | | | - | - | - |
| H (pH Units) | | 7.91 | | | | | - | - | - |
| ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg) | | - | | | | | - | - | - |
| (noing) | | 1 | | | I. | | | | |
| Eluate Analysis C2 C | | C ₂ Con | c ⁿ in 10:1 eluate | in 10:1 eluate (mg/l) A 2 10:1 conc ⁿ leached (mg/kg) | | | Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg | | |
| IPH CWG (W) | | Result | Limit o | of Detection | Result | Limit of Detection | n | | |
| Benzene by GC | | <0.007 | < | 0.007 | <0.07 | <0.07 | <u> </u> | _ | |
| oluene by GC | | < 0.004 | | 0.004 | <0.04 | < 0.04 | - | - | - |
| thylbenzene by GC | | <0.005 | <(| 0.005 | <0.05 | <0.05 | - | - | - |
| n & p Xylene by GC | | <0.008 | | 0.008 | <0.08 | <0.08 | - | - | - |
| Xylene by GC Sum m&p and o Xylene | by CC | <0.003 0 | | 0.003 <0 | <0.03 0 | <0.03 <0 | | - | - |
| Sum of BTEX by GC | | 0 | | <0 | 0 | <0 | - | | - |
| PH (Total Aliphatics + | otal | <0.01 | | 0.01 | <0.1 | <0.1 | - | - | - |
| Aromatics) >C5-C35 | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| each Test Inform | ation | | | | | | | | |
| | ation | 45 bis 001 | 1 | | | | | | |
| Leach Test Inform Date Prepared DH Units) | ation | 15-Jun-201 7.68 | 1 | | | | | | |

215.00 onductivity (µ Temperature (°C) 22.20 Volume Leachant (Litres) 0.871 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

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CERTIFICATE OF ANALYSIS

Validated

| SDG: 1 | 10523-40 | Location: | | Order Number: | SH3068 |
|---------------------|------------------|------------|-----------------------|--------------------|--------|
| 300. 11 | 1_WARDELL_SHF-37 | Customer: | Wardell Armstrong LLP | Report Number: | 135537 |
| Client Reference: S | SH10534 | Attention: | Mike Kelly | Superseded Report: | 132894 |

Notification of Non-Conforming Work

| | | | | | U | |
|------------------|-------------------------|-----------|--------|------------|--|--|
| Sample Number | Customer Sample Ref. | Depth (m) | Matrix | Test Name | Component Name | Comment |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1,1,2-Trichloro-1,2,2-Trifluoroethane (TIC) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1.1.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1.1-Trichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1.2.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1.2-Trichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1-Dichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1-Dichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.1-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2.3-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2.3-Trichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2.4-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2.4-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2-Dibromo-3-chloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2-Dibromoethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2-Dichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.3.5-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.3-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.3-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 1.4-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 2.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 2-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 4-Bromofluorobenzene** | Volatile Analysis performed on vessel with headspace due testing requirement |

CERTIFICATE OF ANALYSIS

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|--------------------------------|-----------------------|-----------------|--------------------------------------|-------------------------------------|---|--|
| SDG: Job: Client Referer | | 0 ELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516050 | Sample Ref. TP 111 | 0.70 | SOLID | VOC MS (S) | 4-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | 4-Isopropyltoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Bromobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Bromochloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Bromodichloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Bromoform | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Bromomethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Carbon disulphide | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Carbontetrachloride | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Chlorobenzene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Chloroethane | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Chloroform | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Chloromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | cis-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | cis-1-3-Dichloropropene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dibromochloromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dibromofluoromethane** | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dibromomethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dichlorodifluoromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dichloromethane | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Dilution | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Isopropylbenzene | Volatile Analysis performed on vessel with headspace due testin requirement |

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| SDG: Job: Client Referen | |) ELL_SHF-37 | Location: | | Order Number: | SH3068 |
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| | | | Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Report Number: Superseded Report: | 135537 132894 |
| Sample | Customer Sample Ref. | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | LCS Reagent | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Methyl Tertiary Butyl Ether | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Naphthalene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | n-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | o-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | p/m-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Propylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | sec-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Styrene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Tert-amyl methyl ether | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | tert-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Tetrachloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | TIC Instructions | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Toluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Toluene-d8** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | trans-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | trans-1-3-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Trichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Trichlorofluoromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Trichlorofluorormethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | Vinyl Chloride | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516050 | TP 111 | 0.70 | SOLID | VOC MS (S) | VOC TIC | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1,1,2-Trichloro-1,2,2-Trifluoroethane (TIC) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1.1.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1.1-Trichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |

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| SDG: Job: Client Refer | _ | DELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516059 | Sample Ref. TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1.2.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1.2-Trichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1-Dichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1-Dichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.1-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2.3-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2.3-Trichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2.4-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2.4-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2-Dibromo-3-chloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2-Dibromoethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2-Dichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.3.5-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.3-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.3-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 1.4-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 2.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 2-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 4-Bromofluorobenzene** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 4-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | 4-Isopropyltoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Bromobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
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| SDG: Job: Client Referer | |) ELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516059 | Sample Ref. TP 111 | 1.20 | SOLID | VOC MS (S) | Bromochloromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Bromodichloromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Bromoform | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Bromomethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Carbon disulphide | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Carbontetrachloride | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Chlorobenzene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Chloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Chloromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | cis-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Dibromofluoromethane** | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Dibromomethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Dichloromethane | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Dilution | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Hexachlorobutadiene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Isopropylbenzene | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | LCS Reagent | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Methyl Tertiary Butyl Ether | Volatile Analysis performed on vessel with headspace due testir requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Naphthalene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | n-Butylbenzene | Volatile Analysis performed on vessel with headspace due testin requirement |

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| SDG: Job: Client Referen | _ |) ELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 : 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516059 | Sample Ref. TP 111 | 1.20 | SOLID | VOC MS (S) | o-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | p/m-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Propylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | sec-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Styrene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Tert-amyl methyl ether | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | tert-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Tetrachloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | TIC Instructions | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Toluene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Toluene-d8** | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | trans-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | trans-1-3-Dichloropropene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Trichloroethene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Trichlorofluoromethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Trichlorofluorormethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | Vinyl Chloride | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516059 | TP 111 | 1.20 | SOLID | VOC MS (S) | VOC TIC | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1,1,2-Trichloro-1,2,2-Trifluoroethane (TIC) | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1.1.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1.1-Trichloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1.2.2-Tetrachloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1.2-Trichloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1-Dichloroethane | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1-Dichloroethene | Volatile Analysis performed on vessel with headspace due testin requirement |

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| SDG: Job: Client Refere | _ | DELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516101 | Sample Ref. TP 115 | 0.30 | SOLID | VOC MS (S) | 1.1-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2.3-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2.3-Trichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2.4-Trichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2.4-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2-Dibromo-3-chloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2-Dibromoethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2-Dichloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.3.5-Trimethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.3-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.3-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 1.4-Dichlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 2.2-Dichloropropane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 2-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 4-Bromofluorobenzene** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 4-Chlorotoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | 4-Isopropyltoluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Bromobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Bromochloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Bromodichloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Bromoform | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Bromomethane | Volatile Analysis performed on vessel with headspace due testing requirement |

CERTIFICATE OF ANALYSIS

| Ľ | | | CEI | RTIFICATE OF AN | ALYSIS | |
|--------------------------------|-----------------------|-----------------|--------------------------------------|-------------------------------------|---|--|
| SDG: Job: Client Referer | | 0 ELL_SHF-37 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3516101 | Sample Ref. TP 115 | 0.30 | SOLID | VOC MS (S) | Carbon disulphide | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Carbontetrachloride | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Chlorobenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Chloroethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Chloroform | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Chloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | cis-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | cis-1-3-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dibromochloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dibromofluoromethane** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dibromomethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dichlorodifluoromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dichloromethane | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Dilution | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Hexachlorobutadiene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Isopropylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | LCS Reagent | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Methyl Tertiary Butyl Ether | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Naphthalene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | n-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | o-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | p/m-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Propylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | sec-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |

Validated

| SDG : 110523-40 | | | CEI | Location: Order Number: | | | | |
|--|-------------------------|--------------------------------------|-------------------------------------|--|----------------------------|--|--|--|
| Job: H_WARDELL_SHF-37 Client Reference: SH10534 | | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report | SH3068 135537 132894 | | | |
| Sample Number | Customer Sample Ref. | Depth (m) | Matrix | Test Name | Component Name | Comment | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Styrene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Tert-amyl methyl ether | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | tert-Butylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Tetrachloroethene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | TIC Instructions | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Toluene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Toluene-d8** | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | trans-1-2-Dichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | trans-1-3-Dichloropropene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Trichloroethene | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Trichlorofluoromethane | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Trichlorofluorormethane | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | Vinyl Chloride | Volatile Analysis performed on vessel with headspace due testing requirement | | |
| 3516101 | TP 115 | 0.30 | SOLID | VOC MS (S) | VOC TIC | Volatile Analysis performed on vessel with headspace due testing requirement | | |

Note : Test results may be invalid

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| CERTIFICATE | OF ANALYSIS |
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SH3068 SDG: 110523-40 Location: Order Number: Job: H_WARDELL_SHF-37 Customer: Wardell Armstrong LLP 135537 Report Number: Client Reference: SH10534 Attention: Mike Kelly Superseded Report: 132894

Table of Results - Appendix

| No Determinatio | on Possible | # | ISO 17025 Accredited | | * | Subcontracted Test | M | MCERTS Accredited |
|----------------------|---|--------------|--|------------------------|------------|--|---------------|--------------------|
| No Fibres Detec | ted | PFD | Possible Fibres Detected | | » | Result previously reported (Incremental reports only) | EC | Equivalent Carbon |
| hod detection limits | are not always achievable (| due to vario | ous circumstances beyond our | control | | (incremental reports only) | | (Aromatics C8-C35) |
| Method No | | Refe | rence | | | Description | | Wet/Dry Surro |
| PM001 | | | | Preparati | on of Sar | ples for Metals Analysis | | Sample 1 Corre |
| PM024 | Modified BS 1377 | | | Soil prepa | aration in | cluding homogenisation, moistur | e screens of | |
| | | | | soils for A | sbestos | Containing Material | | |
| PM114 | | | | Leaching Cumulativ | | e for CEN Two Stage BatchTes | t 2:1/8:1 | |
| PM115 | | | | | | e for CEN One Stage Leach Te | st 2:1 & 10:1 | |
| | | | | 1 Step | | jj- | | |
| TM001 | In - house Method | | | | ation of a | sbestos containing material by s | creening on | |
| TM048 | HSG 248, Asbesto | e. The a | nalvete' quide for | Solids | tion of As | bestos in Bulk Material | | |
| 11040 | sampling, analysis | | | lacitatica | | bestos in Duik Material | | |
| TM061 | Method for the Det | erminatio | on of | Determina | ation of E | xtractable Petroleum Hydrocarb | ons by | |
| | EPH,Massachuset | | | GC-FID (| | | | |
| TM062 (S) | | - | lings Methods for the mples from National | Determina | ation of F | henols in Soils by HPLC | | |
| | Grid Sites version | | | | | | | |
| TM089 | Modified: US EPA | | | Determina | ation of G | asoline Range Hydrocarbons (G | RO) and | |
| | | | | | | pounds by Headspace GC-FID | | |
| TM101 | Method 4500B & C 1999 | , AWWA | APHA, 20th Ed., | Determina Kone Ana | | ulphide in soil and water sample | s using the | |
| TM116 | Modified: US EPA | Method | 8260, 8120, 8020. | | | olatile Organic Compounds by H | leadspace / | |
| | 624, 610 & 602 | | , | GC-MS | | ,- | | |
| TM132 | In - house Method | | | ELTRA C | S800 Op | erators Guide | | |
| TM133 | BS 1377: Part 3 19 | 990;BS 6 | 068-2.5 | | ation of p | H in Soil and Water using the Gl | _рН рН | |
| TM151 | Method 3500D, AV | | HA 20th Ed 1999 | Meter | ation of L | exavalent Chromium using Kon | a analyser | |
| TM151 | Method 3125B, AV | | | | | exavalent Chromium using Kone us Samples by ICP-MS | e analysei | |
| TM152 | Method 4500A,B,C | | | | | otal Cyanide, Free (Easily Libera | atable) | |
| TWIT55 | Ed., 1999 | , I, IVI AV | WWA/AFTIA, 2001 | | | vanate using the Skalar SANS+ | | |
| | | | | Segmente | ed Flow A | nalyser | - | |
| TM157 | | _ | ph (GC) system and | | | VOC in Soils by GC-MS extracte | ed by | |
| TM168 | HP 5973 Mass Sel | | prinated Biphenyls by | sonication | | Acetone /HO12 and EC7 Polychlorinated | Binhenvl | |
| INITOO | Gas Chromatograp | | Sinated Diprenyis by | | | MS in Soils | Dipricityi | |
| TM173 | Analysis of Petrole | - | | | | peciated Extractable Petroleum | | |
| | Environmental Mee Hydrocarbon Criter | | al Petroleum | Hydrocarl | bons in S | oils by GC-FID | | |
| TM174 | Analysis of Petrole | | ocarbons in | Determina | ation of S | peciated Extractable Petroleum | | |
| | Environmental Med | | | | | aters by GC-FID | | |
| | Hydrocarbon Criter | | | | | | | |
| TM178 | Modified: US EPA | Method | 8100 | Determina GC-MS ir | | olynuclear Aromatic Hydrocarbo | ns (PAH) by | |
| TM180 | Sulphide in waters | and was | te waters 1991 ISBN | | | Of Easily Liberated Sulphide In | Soil | |
| | 01 175 7186 SCA | | | Samples | by Ion Se | lective Electrode Technique | | |
| TM181 | US EPA Method 60 | 010B | | | | outine Metals in Soil by iCap 65 | 00 Duo | |
| TM183 | BS EN 23506-2003 |) (BS 60 | 68-2.74:2002) ISBN | ICP-OES Determin | | race Level Mercury in Waters ar | nd Leachates | |
| 111100 | 0 580 38924 3 | -, (00 00 | 00-2.14.2002/10DN | | | ur Atomic Fluorescence Spectro | | |
| TM184 | EPA Methods 325. | 1 & 325. | 2, | The Dete | rmination | of Anions in Aqueous Matrices | | |
| TMOTO | Minner | | A method 05 to | | | ometric Analysers | | |
| TM218 | Microwave extracti | | | | | on - EPA method 3546 | hu IDIO | |
| TM221 | | | a - Atomic Emission Spectral Information: | Determina Emission | | cid extractable Sulphate in Soils | by IRIS | |
| | Winge, Fassel, Pet | | | 2111001011 | 200000 | | | |
| TM222 | In-House Method | | | | | lot Water Soluble Boron in Soils | (10:1 | |
| TM007 | Otondard an attact | for the | vemination of contain | | | Emission Spectrometer | tabla) | |
| TM227 | Standard methods and wastewaters 2 | | xamination of waters | Determina Cyanide a | | otal Cyanide, Free (Easily Libera vanate | atable) | |
| | Method 4500. | Ser Card | | Syamoo | | , | | |
| TM241 | Methods for the Ex | | | | | of Hexavalent Chromium in Wa | ters and | |
| | Associated Materia | | | Leachate | s using th | e Kone Analyser | | |
| TM243 | Potable Waters and | u sewag | e eniuents 1980. | | | | | |
| TM245 | By GC-FID | | | Determin | ation of 6 | RO by Headspace in waters | | |
| TM245 | • | of Flectr | ical Conductivity and | | | H in Water and Leachate using t | he GLoH nH | |
| | the Laboratory dete | | | Meter | and or p | | | |
| | Natural, Treated ar | nd Waste | waters HMSO | | | | | |

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| | Laboratories | CEF | RTIFICATE OF ANAL | YSIS | | V | alidated |
|-----------------------------------|--|--------------------------------------|-------------------------------------|---|----------------------------|-------------------------------|------------------------|
| SDG: Job: Client Reference: | 110523-40 H_WARDELL_SHF-37 SH10534 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 135537 132894 | | |
| Method No TM259 | Reference by HPLC | I | Determination of Pheno | Description Is in Waters and Leachates by HPLC | | /et/Dry ample ¹ | Surrogate Corrected |

¹ Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

Validated

| SDG: | 110523-40 | Location: | Order Number: | SH3068 |
|-------------------|------------------|-------------------|--------------------------------|------------|
| Job: | H_WARDELL_SHF-37 | Customer: Wardel | I Armstrong LLP Report Number: | 135537 |
| Client Reference: | SH10534 | Attention: Mike K | elly Superseded Repo | rt: 132894 |

Test Completion Dates

| | | Tes | | | | | | | | |
|--|---|---|--|---|--|---|--|--|---|---|
| Lab Sample No(s) | 3515843 | 3515844 | 3515847 | 3515852 | 3515853 | 3515854 | 3515856 | 3515860 | 3515861 | 3515862 |
| Customer Sample Ref. | TP 101 | TP 102 | TP 103 | TP 104 | TP 105 | TP 105 | TP 108 | TP 107 | TP 108 | TP 109 |
| oustonier oumpie Kei. | | | | | | | | | | |
| AGS Ref. | | | | | | | | | | |
| Depth | 0.60 | 0.80 | 0.40 | 0.50 | 0.30 | 0.90 | 0.50 | 0.70 | 0.75 | 0.60 |
| • | | | | | | | | | | |
| Туре | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID |
| Anions by Kone (soil) | 27-May-2011 | | 02-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | | 01-Jun-2011 | 01-Jun-2011 | 27-May-2011 | 27-May-2011 |
| Asbestos Containing Material Screen | | | 26-May-2011 | 26-May-2011 | 25-May-2011 | | 26-May-2011 | 28-May-2011 | | |
| Asbestos Identification | | 07.14 0044 | 28-May-2011 | | | 07.14 00.44 | | | | 04.04 |
| Boron Water Soluble | 15-Jun-2011 | 27-May-2011 | | 15-Jun-2011 | | 27-May-2011 | | | | 31-May-2011 |
| CEN 10:1 Leachate (1 Stage) CEN Readings | 21-Jun-2011 | | | 21-Jun-2011 | | | | | | |
| Cyanide Comp/Free/Total/Thiocyanate | 01-Jun-2011 | 01-Jun-2011 | 02-Jun-2011 | 31-May-2011 | 01-Jun-2011 | 01-Jun-2011 | 31-May-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 |
| Dissolved Metals by ICP-MS | 17-Jun-2011 | 01-301-2011 | 02-3011-2011 | 17-Jun-2011 | 01-001-2011 | 01-501-2011 | 51-Way-2011 | 01-001-2011 | 01-3011-2011 | 01-301-2011 |
| Easily Liberated Sulphide | 11-0011-2011 | 02-Jun-2011 | | 17-001-2011 | | 02-Jun-2011 | | | | 01-Jun-2011 |
| EPH CWG (Aliphatic) GC (S) | | 02 001 2011 | | 02-Jun-2011 | 27-May-2011 | 02 001 2011 | | 02-Jun-2011 | | 01 0411 2011 |
| EPH CWG (Aromatic) GC (S) | | | | 02-Jun-2011 | 27-May-2011 | | | 02-Jun-2011 | | |
| GRO by GC-FID (S) | | | | 02-Jun-2011 | 02-Jun-2011 | | | 02-Jun-2011 | | |
| Hexavalent Chromium (s) | 31-May-2011 | 31-May-2011 | 02-Jun-2011 | 02-Jun-2011 | 31-May-2011 | 31-May-2011 | 02-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 |
| Mercury Dissolved | 20-Jun-2011 | | | 20-Jun-2011 | | | | | | |
| Metals by iCap-OES (Soil) | | 27-May-2011 | 02-Jun-2011 | 02-Jun-2011 | 31-May-2011 | 01-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 | 31-May-201 |
| PAH by GCMS | | 02-Jun-2011 | | | - | 31-May-2011 | | | | 02-Jun-2011 |
| PAH Spec MS - Aqueous (W) | 21-Jun-2011 | | | 21-Jun-2011 | | | | | | |
| рН | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 |
| Phenols by HPLC (S) | 31-May-2011 | 31-May-2011 | 02-Jun-2011 | 01-Jun-2011 | 31-May-2011 | 31-May-2011 | 01-Jun-2011 | 02-Jun-2011 | 27-May-2011 | 27-May-201 |
| Sample description | 24-May-2011 | 24-May-2011 | 01-Jun-2011 | 27-May-2011 | 24-May-2011 | 24-May-2011 | 27-May-2011 | 31-May-2011 | 25-May-2011 | 25-May-201 |
| Semi Volatile Organic Compounds | 31-May-2011 | - | 02-Jun-2011 | 01-Jun-2011 | 31-May-2011 | - | 01-Jun-2011 | 01-Jun-2011 | 31-May-2011 | |
| Total Organic Carbon | 31-May-2011 | | 02-Jun-2011 | | | | 01-Jun-2011 | | | 01-Jun-2011 |
| Total Sulphate | 31-May-2011 | 31-May-2011 | 02-Jun-2011 | 01-Jun-2011 | 31-May-2011 | 31-May-2011 | 01-Jun-2011 | 01-Jun-2011 | 31-May-2011 | 31-May-2011 |
| Total Sulphur | | 31-May-2011 | | | | 31-May-2011 | | | | 31-May-2011 |
| TPH CWG GC (S) | | | | 02-Jun-2011 | 02-Jun-2011 | | | 02-Jun-2011 | | |
| VOC MS (S) | | | | 01-Jun-2011 | 01-Jun-2011 | | | 01-Jun-2011 | | |
| Lab Sample No(s) | 3515863 | 3515866 | 3515869 | 3515870 | 3515872 | 3515876 | 3515878 | 3515882 | 3515883 | 3515886 |
| Lab Sample No(S) | 3313003 | | 3313003 | 3313070 | 3313072 | | | | | |
| • • • • | TD 440 | TD 444 | TD 444 | TD 440 | TD 442 | | | | | |
| Customer Sample Ref. | TP 110 | TP 111 | TP 111 | TP 112 | TP 113 | TP 114 | TP 115 | TP 117 | TP 118 | TP 119 |
| Customer Sample Ref. | TP 110 | TP 111 | TP 111 | TP 112 | TP 113 | TP 114 | TP 115 | TP 117 | TP 118 | TP 119 |
| Customer Sample Ref. AGS Ref. | | TP 111 | TP 111 | TP 112 | TP 113 | TP 114 | TP 115 | TP 117 | TP 118 | TP 119 |
| Customer Sample Ref. | | TP 111 0.70 | TP 111 1.20 | TP 112 | TP 113 0.45 | TP 114 | TP 115 | TP 117 | 0.70 | TP 119 |
| Customer Sample Ref. AGS Ref. | | | | | | | | | | |
| Customer Sample Ref. AGS Ref. Depth Type | 1.00 | 0.70 SOLID | 1.20 | 0.50 | 0.45 SOLID | 0.80 SOLID | 0.30 | 0.40 | 0.70 | 0.30 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) | 1.00 SOLID | 0.70 | 1.20 SOLID 02-Jun-2011 | 0.50 | 0.45 | 0.80 | 0.30 SOLID 01-Jun-2011 | 0.40 | 0.70 SOLID | 0.30 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) | 1.00 SOLID | 0.70 SOLID | 1.20 SOLID | 0.50 | 0.45 SOLID | 0.80 SOLID | 0.30 SOLID | 0.40 | 0.70 SOLID | 0.30 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) | 1.00 SOLID 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 | 0.50 | 0.45 SOLID | 0.80 SOLID | 0.30 SOLID 01-Jun-2011 20-Jun-2011 | 0.40 | 0.70 SOLID 01-Jun-2011 | 0.30 SOLID |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen | 1.00 SOLID 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 | 0.50 SOLID | 0.45 SOLID | 0.80 SOLID 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 | 0.40 SOLID | 0.70 SOLID 01-Jun-2011 | 0.30 SOLID |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble | 1.00 SOLID 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 | 0.50 SOLID | 0.45 SOLID | 0.80 SOLID 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 | 0.40 SOLID | 0.70 SOLID 01-Jun-2011 28-May-2011 | 0.30 SOLID |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) | 1.00 SOLID 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 | 0.50 SOLID | 0.45 SOLID | 0.80 SOLID 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 | 0.40 SOLID | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 | 0.30 SOLID 31-May-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings | 1.00 SOLID 02-Jun-2011 26-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 | 0.50 SOLID 27-May-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 | 0.40 SOLID 31-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 | 0.30 SOLID 31-May-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate | 1.00 SOLID 02-Jun-2011 26-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 17-Jun-2011 | 0.50 SOLID 27-May-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 25-Jun-2011 21-Jun-2011 17-Jun-2011 | 0.40 SOLID 31-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS | 1.00 SOLID 02-Jun-2011 26-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 17-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 25-Jun-2011 21-Jun-2011 17-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide | 1.00 SOLID 02-Jun-2011 26-May-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 22-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) EPH CWG (Aromatic) GC (S) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 |
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| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (W) Hexavalent Chromium (s) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 15-Jun-2011 21-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (W) Hexavalent Chromium (s) Hexavalent Chromium (w) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 0-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (W) Hexavalent Chromium (s) Hexavalent Chromium (w) Mercury Dissolved | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 22-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 17-Jun-2011 20-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 20-Jun-2011 20-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 01-Jun-2011 17-Jun-2011 02-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 |
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| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) GC (S) EPH CWG (Aromatic) GC (S) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (S) GRO by GC-FID (W) Hexavalent Chromium (s) Hexavalent Chromium (s) Mercury Dissolved Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 31-May-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 |
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| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (S) GRO by GC-FID (S) Hexavalent Chromium (s) Hexavalent Chromium (w) Mercury Dissolved Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH pH Value Phenols by HPLC (S) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 02-Jun-2011 01-Jun-2011 02-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 02-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 02-Jun-2011 31-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 02-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 02-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (S) GRO by GC-FID (S) Hexavalent Chromium (s) Hexavalent Chromium (s) Hexavalent Chromium (w) Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH pH Value Phenols by HPLC (S) | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 17-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 | 0.30 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (S) GRO by GC-FID (S) GRO by GC-FID (W) Hexavalent Chromium (s) Hexavalent Chromium (s) Hexavalent Chromium (w) Mercury Dissolved Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH pH Value Phenols by HPLC (S) Phenols by HPLC (W) Sample description | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 02-Jun-2011 01-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 02-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 31-May-2011 01-Jun-2011 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 21-Jun-2011 02-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) GC (S) GRO by GC-FID (W) Hexavalent Chromium (w) Mercury Dissolved Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH Phenols by HPLC (S) Phenols by HPLC (S) Phenols by HPLC (W) Sample description | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 20-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Ju | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 27-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 15-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 02-Jun-2011 01-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 01-Jun-2011 |
| Customer Sample Ref. AGS Ref. Depth Type Anions by Kone (soil) Anions by Kone (w) Asbestos Containing Material Screen Boron Water Soluble CEN 10:1 Leachate (1 Stage) CEN Readings Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Easily Liberated Sulphide EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aliphatic) Aqueous GC (W) EPH CWG (Aromatic) Aqueous GC (W) Bert CWG (Aromatic) Aqueous GC (W) Mercury Dissolved Metals by iCap-OES (Soil) PAH by GCMS PAH Spec MS - Aqueous (W) pH pH Value Phenols by HPLC (S) Phenols by HPLC (S) Phenols by HPLC (W) Sample description Semi Volatile Organic Compounds Sulphide | 1.00 SOLID 02-Jun-2011 26-May-2011 31-May-2011 31-May-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 28-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 1.20 SOLID 02-Jun-2011 20-Jun-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 02-Jun-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 20-Jun-2011 | 0.50 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.45 SOLID 27-May-2011 01-Jun-2011 01-Jun-2011 31-May-2011 27-May-2011 25-May-2011 31-May-2011 | 0.80 SOLID 01-Jun-2011 27-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.30 SOLID 01-Jun-2011 20-Jun-2011 28-May-2011 28-May-2011 21-Jun-2011 17-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 | 0.40 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 01-Jun-2011 01-Jun-2011 01-Jun-2011 | 0.70 SOLID 01-Jun-2011 28-May-2011 21-Jun-2011 01-Jun-2011 17-Jun-2011 17-Jun-2011 02-Jun-2011 02-Jun-2011 02-Jun-2011 21-Jun-2011 02-Jun-2011 | 0.30 SOLID 31-May-2011 01-Jun-2011 02-Jun-2011 02-Jun-2011 31-May-2011 01-Jun-2011 01-Jun-2011 |
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CERTIFICATE OF ANALYSIS

| CERTIFICATE OF ANALYSIS SDG: H10523-40 Job: H_WARDELL_SHF-37 Client Reference: SH10534 Coder Number: SH3068 Report Number: S13557 Superseded Report: 132894 Lab Sample No(s) Customer Sample Ref. S15988 S15988 S15989 S15999 S15999 S15990 S15900 S15900< | | | | | | | | | | | |
|--|-----------------|---------------|-------------|---------------|--------------|-------------|----------------------------|-------------|----------------------------|----------------------------|---------------|
| Job: | H_WARDELL_SHF | -37 | Customer: | | | | Repo | rt Number: | 13553 | 7 | |
| L | ab Sample No(s) | 3515887 | 3515888 | 3515891 | 3515894 | 3515895 | 3515897 | 3515899 | 3515901 | 3515902 | 3515903 |
| | • • • • | WS 101 | WS 102 | WS 103 | WS 104 | WS 105 | WS 106 | WS 107 | WS 108 | WS 109 | WS 110 |
| | Depth | | | | | | | | | | |
| A 1 1 12 / 10 | 1,160 | | SOLID | | | | SOLID | | | | |
| | | 01-Jun-2011 | | 02-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | | 01-Jun-2011 | | 01-Jun-2011 | 01-Jun-2011 |
| 2 V / | harial Oana an | | | 20 May 2014 | | 20.142014 | | | | | 20 Mars 2014 |
| v | terial Screen | 27 May 2011 | 27 May 2014 | 28-Iviay-2011 | 27 Mars 2011 | 28-May-2011 | 27 Mars 2011 | | 28-Iviay-2011 | | 28-10lay-2011 |
| | \ | 27-May-2011 | 27-May-2011 | | 27-May-2011 | | 27-May-2011 | | 45 bm 2014 | 27-May-2011 | |
| | age) | | | | | | | | | | |
| · · · · · | UThis suggests | 21 May 2011 | 01 hrs 2011 | 01 hrs 2011 | 21 May 2011 | 01 has 2011 | 01 hm 2011 | 01 hm 2011 | | 24 Mars 2011 | 01 1 |
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| · · · · · | | 01 hup 2011 | 02 hup 2011 | | 01 hm 2011 | | 02 km 2011 | | 17-Jun-2011 | 02 km 2011 | |
| | | 01-Jun-2011 | 02-JUN-2011 | | 01-Jun-2011 | | 02-Jun-2011 | | 22 1 - 2011 | 02-Jun-2011 | |
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| · · · · · · · · · · · · · · · · · · · | / | 02-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 | 02-Jun-2011 | 02-JUN-2011 | 02-JUN-2011 | 02-Jun-2011 | | 02-Jun-2011 | 02-Jun-2011 |
| | () | | | | | | | | | | |
| Mercury Dissolved | | 04 has 2014 | 01 h = 2011 | 02 1 | 04 hm 2014 | 02 1 - 2011 | 01 br 2011 | 01 1 - 2011 | 20-Jun-2011 | 01 bm 2011 | 02 1 - 2011 |
| Metals by iCap-OES (So | 1) | 01-Jun-2011 | 01-Jun-2011 | 02-Jun-2011 | 01-Jun-2011 | 02-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 02-Jun-2011 | | 02-Jun-2011 |
| PAH by GCMS | 440 | 02-Jun-2011 | 02-Jun-2011 | | 02-Jun-2011 | | 02-Jun-2011 | | 04.1.0044 | 02-Jun-2011 | |
| PAH Spec MS - Aqueous | S (VV) | | 20.14 2014 | 02 1 2014 | | 02-Jun-2011 | | | 21-Jun-2011 02-Jun-2011 | | |
| PCBs by GCMS | | 04 1 2014 | 29-May-2011 | | 04 1 0044 | | 04.1.0044 | 04 1 0044 | | 04 1 0044 | 04.1.0044 |
| pH | | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 | 01-Jun-2011 |
| pH Value | | 07.14 00.44 | 07.14 00.44 | 00.1.0044 | 07.14 00.44 | 00.1.0044 | 07.14 | 07.14 00.44 | 20-Jun-2011 | | 00.1.0044 |
| Phenols by HPLC (S) | | 27-May-2011 | 27-May-2011 | 02-Jun-2011 | 27-May-2011 | 02-Jun-2011 | 27-May-2011 | 27-May-2011 | 02-Jun-2011 | 31-May-2011 | 02-Jun-2011 |
| Phenols by HPLC (W) | | 24 May 2011 | 24 May 2014 | 24 May 2014 | 24 Mar 2014 | 24 Mar 2011 | 24 May 2014 | 24 May 2014 | 20-Jun-2011 | 24 Mars 2011 | 24 Mars 2014 |
| Sample description | | 24-May-2011 | 24-May-2011 | | 31-May-2011 | 31-May-2011 | 24-May-2011 | 24-May-2011 | | 24-May-2011 | 31-May-2011 |
| Semi Volatile Organic Co | mpounas | | | 01-Jun-2011 | | 01-Jun-2011 | | 31-May-2011 | 01-Jun-2011 20-Jun-2011 | | 01-Jun-2011 |
| Sulphide | | 01 hrs 2014 | | | 01-Jun-2011 | | | 01 hrs 2014 | 20-JUN-2011 | 01 brs 2014 | 01 hrs 2044 |
| Total Organic Carbon | | 01-Jun-2011 | 21 Mar 2011 | 02 hrs 2044 | | 01 hrs 2011 | 24 Mar 2014 | 01-Jun-2011 | 02 10 2011 | 01-Jun-2011 | 01-Jun-2011 |
| Total Sulphate | | | 31-May-2011 | 02-Jun-2011 | 31-May-2011 | 01-Jun-2011 | 31-May-2011 31-May-2011 | 31-May-2011 | 02-Jun-2011 | 31-May-2011 31-May-2011 | 01-Jun-2011 |
| Total Sulphur TPH CWG (W) | | 51-Iviay-2011 | 31-May-2011 | | 31-May-2011 | | 51-Iviay-2011 | | 23-Jun-2011 | 51-Iviay-2011 | |
| · · · | | | | 02 hrs 2044 | | 02 hrs 2044 | | | | | |
| TPH CWG GC (S) | | | | 02-Jun-2011 | | 02-Jun-2011 | | | 02-Jun-2011 | | |
| VOC MS (S) | | | | 01-Jun-2011 | | 02-Jun-2011 | | | 02-Jun-2011 | | |

CERTIFICATE OF ANALYSIS

| SDG | : | 110523-40 | Location: | | Order Number: | SH3068 |
|-------|--------------|------------------|------------|-----------------------|--------------------|--------|
| Job: | | H_WARDELL_SHF-37 | Customer: | Wardell Armstrong LLP | Report Number: | 135537 |
| Clien | t Reference: | SH10534 | Attention: | Mike Kelly | Superseded Report: | 132894 |

Appendix

 Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

SOLID MATRICES EXTRACTION SUMMARY

| ANALYSIS | D/C OR WET | EXTRACTION SOLVENT | Extraction Method | ANALYSIS |
|--|------------------|-----------------------|----------------------|-------------|
| SOLVENT EXTRACTABLE MATTER | D&C | DOM | SOXTHERM | GRAVIMETRIC |
| CYCLOHEXANE EXT. MATTER | D&C | CYCLOHEXANE | MALE INCO | GRAVIMETRIC |
| THIN LAYER CHROMATOGRAPHY | D&C | DOM | NALE NUMBER OF COLOR | ATROSCAN |
| ELEMENTALSULPHUR | D&C | DOM | MALEHUXOS | HFLC |
| PHENOLSBYGOMS | WET | DOM | SDXTHERM | GCMS |
| HERBICIDES | D&C | HEXANEACETONE | SOXTHERM | GCMS |
| PESTICIDES | D&C | HEXANEACETONE | SOXTHERM | GCMS |
| EPH (DRO) | D&C | HEXANEACETONE | END OVEREND | GCFD |
| EPH (MNOL) | D&C | HEXANEACETONE | END OVEREND | GCFID |
| EPH (OLEANED UP) | D&C | HEXANEADETONE | ENDOWEREND | GCFID |
| EPH CMG BYGC | D&C | HEXANEACETONE | END OMEREND | GCFID |
| POB TOT / POB CON | D&C | HEXANEACETONE | END OVEREND | GCMS |
| FOL VAROMATIC HYDROCARBONS (MS) | WET | HEXANEACETONE | MCROWAVE TM218. | GCMS |
| 08-040(08-040)ez Flash | WET | HEXANEACETONE | SHAMER | GCFZ |
| POLYAROMATIC Hydrocarbons Rafid GC | WET | HEXANEACETONE | SHARER | GCFZ |
| SEM VOLATILEORGANIC COMFOUNDS | WET | DOMAGETONE | SONICATE | GCMS |

LIQUID MATRICES EXTRACTION SUMMARY

| ANALYSIS | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|----------------------|-----------------------|-----------------------------|----------|
| PAHMS | HEXANE | STIRREDEXTRACTION(STIRBAR) | GCMS |
| BPH | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| EPH CMG | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| MINERALOIL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| POB 700 NGENERS | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| POB TOTAL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| SVOC | DOM | LIQUID/LIQUID SHAKE | GCMS |
| FREESUPHUR | DOM | SOLID PHASE EXTRACTION | HFLC |
| PEST COPYOPP | DOM | LIQUID/LIQUID SHAKE | GCMS |
| TRAZINE HEREG | DOM | LIQUID/LIQUID SHAKE | GCMS |
| PHENOLSMS | DOM | SOLID PHASE EXTRACTION | GCMS |
| TIH by INFRARED (IR) | TCE | LIQUID/LIQUID SHAKE | HFLC |
| MNERALOIL by R | TCE | LIQUID/LIQUID SHAKE | HFLC |
| GLYCOLS | NONE | DIRECT INJECTION | GCMS |

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

| Asbestos Type | Common Name |
|----------------------|---------------|
| Chrysofile | WhiteAsbestos |
| Ancale | BrownAsbestos |
| Ooiddie | BLe Advestos |
| Fibraus Asingle | - |
| Florous Anthophylite | - |
| Fibrous Trendile | - |



Wardell Armstrong LLP Unit 4 Newton Business Centre Thorncliffe Park Sheffield South Yorkshire S35 2PH

Attention: James Lymer

CERTIFICATE OF ANALYSIS

| Date: | |
|------------------------------|--|
| Customer: | |
| Sample Delivery Group (SDG): | |
| Your Reference: | |
| Location: | |
| Report No: | |

01 June 2011 H_WARDELL_SHF 110521-14 SH10534 131526

We received 2 samples on Friday May 20, 2011 and 2 of these samples were scheduled for analysis which was completed on Wednesday June 01, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Sonia McWhan Operations Manager



Alcontrol Laboratories is a trading division of ALcontrol UK Limited Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

| ALcontrol I | Laboratories | CER | TIFICATE OF ANALYS | IS | | Validated |
|-----------------------------------|--|--------------------------------------|-------------------------------------|---|------------------|--------------|
| SDG: Job: Client Reference: | 110521-14 H_WARDELL_SHF-37 SH10534 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 131526 | |
| | CERTIFICATE OF ANALYSIS Certificate of analysis IG: 110521-14 Location: Order Number: SH3068 b: H_WARDELL_SHF-37 Customer: Wardell Armstrong LLP Report Number: 131526 ent Reference: SH10534 Attention: Mike Kelly Superseded Report: 131526 Received Sample Overview | | | | | |
| Lab Sample No(| s) Custome | r Sample Ref. | AGS R | ef. Depth (m |) | Sampled Date |
| 3508811 | V | VS105 | | | | 19/05/2011 |

19/05/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

WS110

3508812

| Job: H_WAR | Nob: H_WARDELL_SHF-37 Custo Client Reference: SH10534 Atten | | | Location: Order Number: 7 Customer: Wardell Armstrong LLP Report Number Attention: Mike Kelly Superseded Re | | | | | | |
|--|--|---------------------|--|---|---------|--|--------------|--|--|--|
| IQUID Results Legend | Lab Sample | | 3508811 | | 3508812 | | Superseued r | | | |
| No Determination Possible | Custon Sample Ref | | WS105 | | WS110 | | | | | |
| | AGS Refe | erence | | | | | | | | |
| | Depth | (m) | | | | | | | | |
| | Contair | ner | Vial 1lplastic 1l green glass bottle | 11 green glass bottle | Vial | | | | | |
| nions by Kone (w) | All | NDPs: 0 Tests: 2 | x | | x | | | | | |
| Syanide Comp/Free/Total/Thiocyanate | All | NDPs: 0 Tests: 2 | x | X | | | | | | |
| vissolved Metals by ICP-MS | All | NDPs: 0 Tests: 2 | x | | × | | | | | |
| PH CWG (Aliphatic) Aqueous GC W) | All | NDPs: 0 Tests: 2 | x | x | | | | | | |
| PH CWG (Aromatic) Aqueous GC W) | All | NDPs: 0 Tests: 2 | x | x | | | | | | |
| ree Sulphur | All | NDPs: 0 Tests: 2 | x | X | | | | | | |
| GRO by GC-FID (W) | All | NDPs: 0 Tests: 2 | x | | X | | | | | |
| lexavalent Chromium (w) | All | NDPs: 0 Tests: 2 | x | | x | | | | | |
| Mercury Dissolved | All | NDPs: 0 Tests: 2 | x | x | | | | | | |
| Netals by iCap-OES Dissolved (W) | All | NDPs: 0 Tests: 2 | ^ X | | x | | | | | |
| PAH Spec MS - Aqueous (W) | All | NDPs: 0 Tests: 2 | x | x | | | | | | |
| H Value | All | NDPs: 0 Tests: 2 | ^ X | | × | | | | | |
| Phenols by HPLC (W) | All | NDPs: 0 Tests: 2 | | | | | | | | |
| Sulphide | All | NDPs: 0 Tests: 2 | X | x | | | | | | |
| SVOC MS (W) - Aqueous | All | NDPs: 0 Tests: 2 | x | | × | | | | | |

| ALcontrol Laboratories CERTIFICATE OF ANALYSIS | | | | | | | | | |
|--|---------------------------------|------------------------------|-------------------------------------|--|--|--|---|------------------|--|
| SDG: Job: Client Reference: | 110521-14 H_WARDE SH10534 | ELL_SHF-37 | Location: Customer Attention: | r: Wardell Armstrong LLP | | | Order Number: Report Number: Superseded Report: | SH3068 131526 | |
| LIQUID Results Legend X Test | | Lab Sample | No(s) | 3508811 | 3508812 | | | | |
| No Determin Possible | ation | Customer Sample Reference | | | WS110 | | | | |
| | | AGS Refere | ence | | | | | | |
| | | Depth (n | n) | | | | | | |
| | | Containe | ər | Vial 1lplastic 1l green glass bottle | Vial 1lplastic 1l green glass bottle | | | | |
| TPH CWG (W) | | All | NDPs: 0 Tests: 2 | x | x | | | | |
| VOC MS (W) | | All | NDPs: 0 Tests: 2 | x | x | | | | |

CERTIFICATE OF ANALYSIS

| Results Legend # ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.infilt Total / unfiltered sample. * Subcontracted lest. * % recovery of the surogate standard to otheck the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery [F] Trigger breach confirmed | | to he l | ustomer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | WS105 Water(GW/SW) 19/05/2011 20/05/2011 110521-14 3508811 | WS110 Water(GW/SW 19/05/2011 20/05/2011 110521-14 3508812 |) | | | |
|--|-----------|------------------|--|---|--|---|--|---|---|
| Component | | LOD/Units | | -0.04 | -0.04 | | | | |
| Sulphide | | <0.01 mq/l | TM101 | <0.01 # | <0.01 | # | | | |
| Arsenic (diss.filt) | | <0.12 µq/l | TM152 | 0.693 # | 0.834 | # | | | |
| Boron (diss.filt) | | <9.4 µg/ | 1 TM152 | 59.3 | 108 | | | | |
| Cadmium (diss.fil | t) | <0.1 µg/ | 1 TM152 | # <0.1 | 0.102 | # | | | |
| Chromium (diss.f | ilt) | <0.22 | TM152 | # 9.8 | 9.74 | # | | _ | |
| | , | µq/l | | # | | # | | | |
| Copper (diss.filt) | | <0.85 µq/l | TM152 | 2.43 # | 3.8 | # | | | |
| Lead (diss.filt) | | <0.02 µq/l | TM152 | 0.231 # | 0.161 | # | | | |
| Nickel (diss.filt) | | <0 .15 | TM152 | 18.5 | 8.9 | | | | |
| Selenium (diss.fil | t) | µq/l <0.39 | TM152 | # 0.842 | 0.779 | # | | | |
| Zinc (diss.filt) | | µq/l <0.41 | TM152 | # 13.3 | 2.09 | # | | | |
| | | µq/l | | # | | # | | | |
| Mercury (diss.filt) | | <0.01 µq/l | TM183 | <0.01 # | <0.01 | # | | | |
| Sulphate | | <2 mg/l | TM184 | 147 # | 90.4 | # | | | |
| Cyanide, Total | | <0.05 | TM227 | <0.05 | <0.05 | | | | |
| Cyanide, Free | | mq/l <0.05 | TM227 | # <0.05 | <0.05 | # | | | |
| Thiocyanate | | mq/l <0.05 | TM227 | # <0.05 | <0.05 | # | | | |
| - | | mq/l | | # | | # | | | |
| Hardness, Total a | is CaCO3 | <1 mg/l | TM228 | 466 # | 399 | # | | | |
| Chromium, Hexa | valent | <0.03 mg/l | TM241 | 0.035 | 0.054 | | | | |
| рН | | <1 pH | TM256 | 7.46 | 7.13 | | | | |
| Phenol | | Units <0.002 | TM259 | # <0.002 | <0.002 | # | | | |
| Cresols | | mq/l <0.006 | TM259 | # <0.006 | <0.006 | # | | | |
| | | mq/l | | # | | # | | | |
| Xylenols | | <0.008 mg/l | TM259 | <0.008 # | <0.008 | # | | | |
| 1-Naphthol | | <0.01 mg/l | TM259 | <0.01 | <0.01 | | | | |
| 2,3,5-Trimethylph | enol | <0.003 | TM259 | <0.003 | <0.003 | | | | |
| Phenols, Total De | etected 5 | mg/l mg/l | TM259 | # <0.013 | <0.013 | # | | | |
| speciated Sulphur, Free | | <0.05 | TM294 | <0.05 | <0.05 | | | | |
| | | mq/l | | | | | | | |
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CERTIFICATE OF ANALYSIS

| | | | | CER | | FICATE OF A | NALISIS | | | |
|--|-----------------------------|-----------------------------------|--|--|---|---|---------|--|-------------------------|--|
| SDG Job: Clier | : F | 10521-14 I_WARDELL_ 6H10534 | _SHF-37 | Location: Customer: Attention: | | ardell Armstrong LLP ke Kelly | | Order Number: Report Number: Superseded Repo | SH3068 131526 rt: | |
| | Spec MS - Aque | | | | | | | | | |
| | Results Legend | .ous (W) | Customer Sample R | WS105 | | WS110 | | | | |
| # M S diss.filt tot.unfilt * * | | nethod. The unds within | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(5) AGS Reference | Water(GW/SW) 19/05/2011 20/05/2011 110521-14 3508811 | | Water (GW/SW) 19/05/2011 20/05/2011 110521-14 3508812 | | | | |
| Compo | | LOD/U | | | | 1.00 | | | | |
| Napht | halene (aq) | <0.1 | µg/l TM178 | <0.1 | # | 1.22 # | | | | |
| | phthene (aq) | 0.0> ا/pµ | | <0.015 | # | 0.0228 # | | | | |
| | phthylene (aq) | 0.0> /µq | | <0.011 | # | <0.011 # | | | | |
| Fluora | inthene (aq) | 0.0> /рц | | <0.017 | # | <0.017 # | | | | |
| Anthra | acene (aq) | 0.0> /µq | | <0.015 | # | <0.015 # | | | | |
| Phena | anthrene (aq) | :0.0> //рц | | <0.022 | # | <0.022 # | | | | |
| Fluore | ene (aq) | 0.0> /µu | 14 TM178 | <0.014 | # | <0.014 # | | | | |
| Chrys | ene (aq) | 0.0> /μq/ | 13 TM178 | <0.013 | # | <0.013 # | | | | |
| Pyren | e (aq) | ν.0.0 μq/ | 15 TM178 | <0.015 | # | <0.015 # | | | | |
| Benzo | o(a)anthracene (aq) | | 17 TM178 | <0.017 | # | <0.017 # | | | | |
| Benzo | (b)fluoranthene (aq | | 23 TM178 | <0.023 | # | <0.023 # | | | | |
| Benzo | o(k)fluoranthene (aq | | 27 TM178 | <0.027 | # | <0.027 # | | | | |
| Benzo | o(a)pyrene (aq) | μq/ 0.0> μq/ | 09 TM178 | <0.009 | # | ~0.009 # | | | | |
| Diben: (aq) | zo(a,h)anthracene | ν.0.0> μq/ | 16 TM178 | <0.016 | # | <0.016 # | | | | |
| | o(g,h,i)perylene (aq) | | 16 TM178 | <0.016 | # | <0.016 # | | | | |
| Inden (aq) | o(1,2,3-cd)pyrene | ν.0.0 μq/ | 14 TM178 | <0.014 | # | <0.014 # | | | | |
| PAH, | Total Detected A 16 (ag) | hð | | <0.17 | | 1.24 | | | | |
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CERTIFICATE OF ANALYSIS

110521-14 SH3068 SDG: Location: Order Number: Job: H WARDELL SHF-37 Customer: Wardell Armstrong LLP Report Number: 131526 Superseded Report: **Client Reference:** SH10534 Attention: Mike Kelly SVOC MS (W) - Aqueous Customer Sample R WS105 WS110 ISO17025 accredited mCERTS accredited. # M 8 Non-conforming work. Aqueous / settled sample Depth (m) Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted test. % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery Water(GW/SW) Water(GW/SW) diss filt Sample Typ tot unfilt Date Sample 19/05/2011 19/05/2011 20/05/2011 20/05/2011 Date Receive ... SDG Re 110521-14 110521-14 3508811 Lab Sample No.(s) AGS Reference 3508812 Trigger breach confirmed (F) LOD/Units Component Method 1,2,4-Trichlorobenzene TM176 <1 <1 <1 µg/l (aq) 1,2-Dichlorobenzene (aq) <1 µg/l TM176 <1 <1 1.3-Dichlorobenzene (ag) <1 µg/l TM176 <1 <1 1,4-Dichlorobenzene (aq) TM176 <1 <1 <1 µg/l TM176 2,4,5-Trichlorophenol (aq) <1 µg/l <1 <1 2,4,6-Trichlorophenol (aq) <1 µg/l TM176 <1 <1 TM176 2.4-Dichlorophenol (ag) <1 µg/l <1 <1 2,4-Dimethylphenol (aq) <1 µg/l TM176 <1 <1 2,4-Dinitrotoluene (aq) TM176 <1 <1 µg/l <1 2,6-Dinitrotoluene (aq) <1 µg/l TM176 <1 <1 2-Chloronaphthalene (aq) TM176 <1 µa/l <1 <1 2-Chlorophenol (aq) TM176 <1 <1 <1 µg/l 2-Methylnaphthalene (aq) TM176 <1 µg/l <1 <1 2-Methylphenol (aq) TM176 <1 <1 <1 µg/l 2-Nitroaniline (ag) TM176 <1 µg/l <1 <1 2-Nitrophenol (aq) <1 µg/l TM176 <1 <1 TM176 3-Nitroaniline (aq) <1 µg/l <1 <1 4-Bromophenylphenylether <1 µg/l TM176 <1 <1 (ag) 4-Chloro-3-methylphenol TM176 <1 µg/l <1 <1 (aq) 4-Chloroaniline (aq) <1 µg/l TM176 <1 <1 4-Chlorophenylphenylether TM176 <1 µg/l <1 <1 (aq) 4-Methylphenol (aq) TM176 <1 <1 <1 µg/l TM176 4-Nitrophenol (aq) <1 ua/l <1 <1 4-Nitroaniline (aq) <1 µg/l TM176 <1 <1 Azobenzene (aq) TM176 <1 µg/l <1 <1 bis(2-Chloroethyl)ether <1 µg/l TM176 <1 <1 (ag) bis(2-Chloroethoxy)methan TM176 <1 µg/l <1 <1 e (aq) bis(2-Ethylhexyl) phthalate <2 µg/l TM176 <2 <3 (aq) Butylbenzyl phthalate (aq) TM176 <1 µg/l <1 <1 Benzo(k)fluoranthene (aq) <1 µg/l TM176 <1 <1 TM176 Carbazole (aq) <1 µg/l <1 <1 Dibenzofuran (aq) <1 µg/l TM176 <1 <1 n-Dibutyl phthalate (aq) TM176 <1 <1 <1 µa/l Diethyl phthalate (aq) <1 µg/l TM176 <1 <1

Dimethyl phthalate (aq)

<1 µg/l

TM176

<1

<1

CERTIFICATE OF ANALYSIS

Validated

SVOC MS (W) - Aqueous

| SVOC MS (W) - Aqueous | | | | | | |
|---|---------------------|---|---|---|------|------|
| Results Legend # ISO17025 accredited. M mCERTS accredited. M mCERTS accredited. S Non-conforming work. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. diss.filt Dissolved / filtered sample. * Subcontracted test. * % recovery of the surrogate standar check the efficiency of the method results of individual compounds wit samples aren't corrected for the reo (F) Trigger breach confirmed | d to The thin | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | WS105 Water(GW/SW) 19/05/2011 20/05/2011 11/05/21-14 3508811 | WS110 Water(GW/SW) 19/05/2011 20/05/2011 11/05/21-14 3508812 | | |
| Component | LOD/Uni | ts Method | | | | |
| n-Dioctyl phthalate (aq) | <5 µg/ | /I TM176 | <5 | <5 | | |
| Hexachlorobenzene (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Hexachlorobutadiene (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Pentachlorophenol (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Phenol (aq) | <1 µg | /I TM176 | <1 | <1 | | |
| n-Nitroso-n-dipropylamine (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Hexachloroethane (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Nitrobenzene (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Isophorone (aq) | <1 µg/ | /I TM176 | <1 | <1 | | |
| Hexachlorocyclopentadien e (aq) | <1 µg | /I TM176 | <1 | <1 | | |
| Indeno(1,2,3-cd)pyrene | <1 µg | /I TM176 | <1 | <1 | | |
| (aq) SVOC TIC (aq) | - | TM176 | No TICs identified | No TICs identified | | |
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CERTIFICATE OF ANALYSIS

| | Labola | toriot | , | CER | TIFICATE OF A | NALYSIS | L | Valuated | |
|--|---|--------------|--|---|--|--|--------|----------|--|
| SDG: | 110521 | | | Location: | | Order Number: | SH3068 | | |
| Job: Client Reference: | H_WAF SH105 | | SHF-37 | | Wardell Armstrong LLF Mike Kelly | P Report Number: Superseded Report: | 131526 | | |
| TPH CWG (W) | | | | | , | · · · | | | |
| Results Lege # ISO17025 accredited. | end | | Customer Sample R | WS105 | WS110 | | | | |
| M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sam diss.filt Dissolved / filtered sam toLunfilt Total / unfiltered samp * Subcontracted test. * % recovery of the sum check the efficiency of results of individual oc samples aren't correct | iple. mple. le. ogate standard f the method. Th ompounds with ted for the recov | he in | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | Water(GW/SW) 19/05/2011 20/05/2011 11/0521-14 3508811 | Water(GW/SW) 19/05/2011 20/05/2011 110521-14 3508812 | | | | |
| (F) Trigger breach confirm Component | ned | LOD/U | nits Method | | | | | | |
| GRO Surrogate % | | % | | 90 | 91 | | | | |
| recovery** GRO >C5-C12 | | <50 | ıq/I TM245 | <50 | § § <50 | | | | |
| Methyl tertiary butyl et | ther | <3 µ | - | <3 | § § <3 | | | | |
| (MTBE) Benzene | | <7 µ | g/I TM245 | <7 | <u>§</u> § <7 | | | | |
| Toluene | | <4 µ | g/l TM245 | <4 | § § <4 | | | _ | |
| Ethylbenzene | | <5 µ | - - | | <u>§</u> <5 | | | | |
| | | | - | | § § | | | | |
| m,p-Xylene | | <8 µ <3 µ | - | <8 | <8 § § <3 | | | | |
| | | < 5 H | <u> </u> | | § § | | | | |
| Sum of detected Xyler | nes | μg | 1 TM245 | none detected | none detected § § | | | | |
| Sum of detected BTE | x | hð | 1 TM245 | none detected | none detected | | | | |
| Aliphatics >C5-C6 | | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aliphatics >C6-C8 | | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aliphatics >C8-C10 | | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aliphatics >C10-C12 | | <10 | ıg/I TM245 | <10 | <10 § § § | | | | |
| Aliphatics >C12-C16 (| (aq) | <10 | ıg/I TM174 | <10 | <10 | | | | |
| Aliphatics >C16-C21 (| (aq) | <10 | ıg/l TM174 | <10 | <10 | | | | |
| Aliphatics >C21-C35 (| (aq) | <10 | ıg/l TM174 | <10 | <10 | | | | |
| Total Aliphatics >C12- (ag) | -C35 | <10 | ıg/l TM174 | <10 | <10 | | | | |
| Aromatics >EC5-EC7 | | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aromatics >EC7-EC8 | | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aromatics >EC8-EC1 | 0 | <10 | ıg/I TM245 | <10 | <10 § § | | | | |
| Aromatics >EC10-EC | | <10 | - | | <10 § § | | | | |
| Aromatics >EC12-EC (aq) | | <10 | - | <10 | <10 | | | | |
| Aromatics >EC16-EC2 (aq) | 21 | <10 | ıg/I TM174 | <10 | <10 | | | | |
| Aromatics >EC21-EC (aq) | 35 | <10 | | <10 | 17 | | | | |
| Total Aromatics >EC12-EC35 (aq) | | <10 | | <10 | 17 | | | | |
| Total Aliphatics & Aromatics >C5-35 (ag | 1) | <10 | ıg/I TM174 | <10 | 18 | | | | |
| | | | | | | | | | |
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CERTIFICATE OF ANALYSIS

Validated

| | | | CERI | IFICATE OF A | INAL 1515 | | | |
|---|----------------------------|-----------------------------|----------------------------|---|--------------|--|------------------|--|
| | 21-14 ARDELL_SH)534 | F-37 | | Vardell Armstrong LLF /like Kelly | , R e | rder Number: eport Number: uperseded Report: | SH3068 131526 | |
| VOC MS (W) | | | | | | | | |
| Results Legend | Cu | stomer Sample R | WS105 | WS110 | | | | |
| # ISO17025 accredited. M mCERTS accredited. | | | | | | | | |
| § Non-conforming work. aq Aqueous / settled sample. | | Depth (m) | | | | | | |
| diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. | | Sample Type Date Sampled | Water(GW/SW) 19/05/2011 | Water(GW/SW) 19/05/2011 | | | | |
| * Subcontracted test. ** % recovery of the surrogate stands | ard to | Date Received | 20/05/2011 110521-14 | 20/05/2011 110521-14 | | | | |
| check the efficiency of the method results of individual compounds w | The . | SDG Ref ab Sample No.(s) | 3508811 | 3508812 | | | | |
| samples aren't corrected for the re (F) Trigger breach confirmed | covery | AGS Reference | | | | | | |
| Component | LOD/Units | Method | | | | | | |
| Dibromofluoromethane** | % | TM208 | 106 | 106 | | | | |
| Toluene-d8** | % | TM208 | 99.7 | 97.8 | | | | |
| 4-Bromofluorobenzene** | % | TM208 | 96 | 91.2 | | | | |
| Dichlorodifluoromethane | <7 µg/l | TM208 | <7 | <7 # # | | | | |
| Chloromethane | <9 µg/l | TM208 | <9 | <9 # # | | | | |
| Vinyl chloride | <1.2 µg/l | TM208 | <1.2 | <1.2 # # | | | | |
| Bromomethane | <2 µg/l | TM208 | | <2 # # | | | | |
| Chloroethane | <2.5 µg/l | TM208 | | <2.5 # # | | | | |
| Trichlorofluoromethane | <1.3 µg/l | TM208 TM208 | <1.3 <1.2 | <1.3 # <1.2 | | | | |
| Carbon disulphide | <1.2 µg/l | | | # # <1.3 | | | | |
| Dichloromethane | <3.7 µg/l | | | # # | | | | |
| Methyl tertiary butyl ether | <1.6 µg/l | | <1.6 | # # <1.6 | | | | |
| (MTBE) trans-1,2-Dichloroethene | <1.9 µg/l | TM208 | <1.9 | # # <1.9 | | | | |
| 1,1-Dichloroethane | <1.2 µg/l | TM208 | <1.2 | # # <1.2 | | | | |
| cis-1,2-Dichloroethene | <2.3 µg/l | TM208 | <2.3 | # # <2.3 # # | | | | |
| 2,2-Dichloropropane | <3.8 µg/l | TM208 | <3.8 | <pre>// // // // // // // // // // // // //</pre> | | | | |
| Bromochloromethane | <1.9 µg/l | | <1.9 | <1.9 # # | | | | |
| Chloroform | <1.8 µg/l | | | <1.8 # # | | | | |
| 1,1,1-Trichloroethane | <1.3 µg/l | | | <1.3 # # | | | | |
| 1,1-Dichloropropene | <1.3 µg/l | | | <1.3 # | | | | |
| Carbontetrachloride | <1.4 μg/l <3.3 μg/l | | <1.4 <3.3 | <1.4 # # <3.3 | | | | |
| Benzene | <1.3 µg/l | | <1.3 | <1.3 | | | | |
| Trichloroethene | <2.5 µg/l | | | # # <2.5 | | | | |
| 1,2-Dichloropropane | <3 µg/l | TM208 | | # # <3 | | | | |
| Dibromomethane | <2.7 µg/l | TM208 | <2.7 | # # <2.7 | | | | |
| Bromodichloromethane | <0.9 µg/l | TM208 | <0.9 | # # <0.9 | | | | |
| cis-1,3-Dichloropropene | <1.9 µg/l | TM208 | <1.9 | # # <1.9 # # | | | | |
| Toluene | <1.4 µg/l | TM208 | <1.4 | # # 1.44 # # | | | | |
| trans-1,3-Dichloropropene | <3.5 µg/l | TM208 | <3.5 | * * * <3.5 # # | | | | |
| 1,1,2-Trichloroethane | <2.2 µg/l | TM208 | <2.2 | , | | | | |
| 1,3-Dichloropropane | <2.2 µg/l | | | <2.2 # # | | | | |
| Tetrachloroethene | <1.5 µg/l | | | <1.5 # # | | | | |
| Dibromochloromethane | <1.7 µg/l | TM208 | <1.7 | <1.7 # # | | | | |

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CERTIFICATE OF ANALYSIS

VOC MS (W)

| VOC MS (W) | | | | | | |
|---|-----------|------------------------------------|--------------------------|--------------------------|------|------|
| Results Legend # ISO17025 accredited. | C | ustomer Sample R | WS105 | WS110 | | |
| M mCERTS accredited. § Non-conforming work. | | Depth (m) | | | | |
| aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. | | Sample Type | Water(GW/SW) | Water(GW/SW) | | |
| tot.unfilt Total / unfiltered sample. * Subcontracted test. | | Date Sampled Date Received | 19/05/2011 20/05/2011 | 19/05/2011 20/05/2011 | | |
| ** % recovery of the surrogate standar check the efficiency of the method. | The | SDG Ref | 110521-14 3508811 | 110521-14 3508812 | | |
| results of individual compounds wi samples aren't corrected for the rec | thin | Lab Sample No.(s) AGS Reference | 3300011 | 3300012 | | |
| (F) Trigger breach confirmed | LOD/Units | Mothod | | | | |
| Component 1,2-Dibromoethane | <2.3 µg/ | _ | <2.3 | <2.3 | | |
| | | | # | # | | |
| Chlorobenzene | <3.5 µg/ | 1 TM208 | <3.5 # | <3.5 # | | |
| 1,1,1,2-Tetrachloroethane | <1.3 µg/ | 1 TM208 | <1.3 | <1.3 | | |
| Etherite and a | -0.5 | | # | # | | |
| Ethylbenzene | <2.5 µg/ | /I TM208 | <2.5 # | <2.5 # | | |
| m,p-Xylene | <2.5 µg/ | I TM208 | <2.5 | <2.5 | | |
| o-Xylene | <1.7 µg/ | 1 TM208 | # <1.7 | # <1.7 | | |
| | | | # | # | | |
| Styrene | <1.2 µg/ | 1 TM208 | <1.2 # | <1.2 # | | |
| Bromoform | <3 µg/l | TM208 | <3 | <3 | | |
| | | | # | # | | |
| Isopropylbenzene | <1.4 µg/ | 1 TM208 | <1.4 | <1.4 # | | |
| 1,1,2,2-Tetrachloroethane | <5.2 µg/ | 1 TM208 | <5.2 | <5.2 | | |
| 1.2.2 Trichloropropago | <7.9 μα | 1 TM208 | <7.8 | <7.8 | | |
| 1,2,3-Trichloropropane | <7.8 µg/ | | <7.0 | <7.0 # | | |
| Bromobenzene | <2 µg/I | TM208 | <2 | <2 | | |
| Propylbenzene | <2.6 µg/ | 1 TM208 | # <2.6 | # <2.6 | | |
| Topybenzene | <2.0 μg/ | 1 110200 | ×2.0 # | ~2.0 # | | |
| 2-Chlorotoluene | <1.9 µg/ | 1 TM208 | <1.9 | <1.9 | | |
| 1,3,5-Trimethylbenzene | <1.8 µg/ | 1 TM208 | # <1.8 | # <1.8 | | |
| | | | # | # | | |
| 4-Chlorotoluene | <1.9 µg/ | 1 TM208 | <1.9 # | <1.9 # | | |
| tert-Butylbenzene | <2 µg/I | TM208 | <2 | <2 | | |
| 1,2,4-Trimethylbenzene | <1.7 µg/ | 1 TM208 | # <1.7 | # <1.7 | | |
| 1,2,4-mineuryibenzene | <1.7 µg/ | | <1.7 | <1.7 # | | |
| sec-Butylbenzene | <1.7 µg/ | 1 TM208 | <1.7 | <1.7 | | |
| 4-iso-Propyltoluene | <2.6 µg/ | 1 TM208 | # <2.6 | # <2.6 | | |
| | | | # | # | | |
| 1,3-Dichlorobenzene | <2.2 µg/ | 1 TM208 | <2.2 # | <2.2 # | | |
| 1,4-Dichlorobenzene | <2.7 µg/ | 1 TM208 | <2.7 | <2.7 | | |
| - Dut the server | .0 | T1 1000 | # | # | | |
| n-Butylbenzene | <2 µg/l | TM208 | <2 # | <2 # | | |
| 1,2-Dichlorobenzene | <3.7 µg/ | I TM208 | <3.7 | <3.7 | | |
| 1,2-Dibromo-3-chloropropa | <9.8 µg/ | 1 TM208 | <9.8 | <9.8 | | |
| ne | | | | | | |
| 1,2,4-Trichlorobenzene | <2.3 µg/ | 1 TM208 | <2.3 # | <2.3 # | | |
| Hexachlorobutadiene | <2.5 µg/ | 1 TM208 | <2.5 | # <2.5 | | |
| | | | # | # | | |
| tert-Amyl methyl ether (TAME) | <1 µg/I | TM208 | <1 # | <1 # | | |
| Naphthalene | <3.5 µg/ | I TM208 | <3.5 | <3.5 | | |
| 1,2,3-Trichlorobenzene | <3.1 µg/ | 1 TM208 | # <3.1 | # <3.1 | | |
| 1,2,0-1101000012010 | <о.тµу/ | | <3.1 | <3.1 # | | |
| 1,3,5-Trichlorobenzene | <10 µg/ | 1 TM208 | <10 | <10 | | |
| VOC TIC | - | TM208 | No TICs identified | No TICs identified | | |
| | | | | | | |
| Total Xylenes | µg/I | TM208 | <5 | <5 | | |
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CERTIFICATE OF ANALYSIS

Validated

| SDG: Job: Client Reference: | 110521-14 H_WARDELL_SHF-37 SH10534 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 131526 | | | | |
|-----------------------------------|--|--------------------------------------|-------------------------------------|---|------------------|--|--|--|--|
| | Notification of Non Conforming Work | | | | | | | | |

| Notification | of Non-0 | Conform | ing Worl | K |
|--------------|----------|---------|----------|---|
|--------------|----------|---------|----------|---|

| Sample | Customer Sample Ref | Depth (m) Matrix | Test Name | Component Name | Comment |
|-------------------|------------------------|------------------|-------------------|------------------------------------|--|
| Number 3508816 | Sample Ref. WS105 | LIQUID | GRO by GC-FID (W) | Aliphatics >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aliphatics >C5-C6 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aliphatics >C6-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aliphatics >C8-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aromatics >EC10-EC12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aromatics >EC5-EC7 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aromatics >EC7-EC8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Aromatics >EC8-EC10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) mg/l | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C5-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C5-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C5-C6 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C6-C7 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C6-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C7-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO >C8-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO QC | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | GRO Surrogate % recovery** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | m,p-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | LIQUID | GRO by GC-FID (W) | Methyl tertiary butyl ether (MTBE) | Volatile Analysis performed on vessel with headspace due testing requirement |

CERTIFICATE OF ANALYSIS

Validated

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|-------------------------------|----------------------|-------------|--------------------------|----------------------------|--|--|
| SDG: Job: Client Refere | | DELL_SHF-37 | Locat Custo Attent | mer: Wardell Armstrong LLP | Order Number: Report Number: Superseded Report | SH3068 131526 : |
| Sample | Customer | Depth (m) | Matrix | Test Name | Component Name | Comment |
| Number 3508816 | Sample Ref. WS105 | | LIQUID | GRO by GC-FID (W) | o-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | QC raw | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Sum of detected BTEX | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Sum of detected Xylenes | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | tert-Amyl methyl ether (TAME) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Toluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Total Aliphatics >C5-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Total Aromatics >EC5-EC12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508816 | WS105 | | LIQUID | GRO by GC-FID (W) | Trace | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aliphatics >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aliphatics >C5-C6 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aliphatics >C6-C8 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aliphatics >C8-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aromatics >EC10-EC12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aromatics >EC5-EC7 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aromatics >EC7-EC8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Aromatics >EC8-EC10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) mg/l | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | GRO >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | GRO >C5-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | GRO >C5-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3508823 | WS110 | | LIQUID | GRO by GC-FID (W) | GRO >C5-C6 | Volatile Analysis performed on vessel with headspace due testing requirement |

CERTIFICATE OF ANALYSIS

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|-----------------------------------|------------------------|-------------|--------|----------------------------|-------------------------------------|--|---|
| SDG: Job: Client Reference: | _ | DELL_SHF-37 | Cust | ation: comer: ntion: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report | SH3068 131526 : |
| | Customer ample Ref. | Depth (m) | Matrix | | Test Name | Component Name | Comment |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO >C6-C7 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO >C6-C8 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO >C7-C8 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO >C8-C10 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO QC | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | GRO Surrogate % recovery** | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | m,p-Xylene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Methyl tertiary butyl ether (MTBE) | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | o-Xylene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | QC raw | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Sum of detected BTEX | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Sum of detected Xylenes | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | tert-Amyl methyl ether (TAME) | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Toluene | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Total Aliphatics >C5-C12 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Total Aromatics >EC5-EC12 | Volatile Analysis performed on vessel with headspace due testin requirement |
| 3508823 | WS110 | | LIQUID | GR | O by GC-FID (W) | Trace | Volatile Analysis performed on vessel with headspace due testin requirement |

Note : Test results may be invalid

| CERTIFICATE | OF ANALYSIS |
|-------------|--------------------|
|-------------|--------------------|

Validated

| Client Reference: SH10534 Attention: Mike Kelly Superseded Report: | | 110521-14 H_WARDELL_SHF-37 SH10534 | Location: Customer: Attention: | Wardell Armstrong LLP Mike Kelly | Order Number: Report Number: Superseded Report: | SH3068 131526 |
|--|--|--|--------------------------------------|-------------------------------------|---|------------------|
|--|--|--|--------------------------------------|-------------------------------------|---|------------------|

Table of Results - Appendix

| DP FD Metho | No Determination No Fibres Detection limits | ted | # PFD due to vario | ISO 17025 Accredited Possible Fibres Detected us circumstances beyond our c | control | * » | Subcontracted Test Result previously reported (Incremental reports only) | M EC | MCERTS Accred Equivalent Carbo (Aromatics C8-C | on |
|-------------------|--|--|--------------------------|---|------------------------|------------|--|---------------|--|--------------------|
| | lethod No | | Refer | | | | Description | | Wet/Dry Sample 1 | Surroga Correct |
| | TM061 | Method for the De EPH,Massachuse | | | Determina GC-FID (0 | | xtractable Petroleum Hydroca | rbons by | | |
| | TM101 | Method 4500B & 0 1999 | , awwa | APHA, 20th Ed., | Determina Kone Ana | | ulphide in soil and water samp | les using the | | |
| | TM152 | Method 3125B, AV | WA/APH | IA, 20th Ed., 1999 | | - | is Samples by ICP-MS | | | |
| | TM174 | Analysis of Petrole Environmental Me Hydrocarbon Crite | dia – Ťota | | | | peciated Extractable Petroleu /aters by GC-FID | n | | |
| | TM176 | EPA 8270D Semi- by Gas Chromatog (GC/MS) | | rganic Compounds iss Spectrometry | Determina | ation of S | VOCs in Water by GCMS | | | |
| | TM178 | Modified: US EPA | Method 8 | 100 | Determina GC-MS in | | olynuclear Aromatic Hydrocar | bons (PAH) by | | |
| | TM183 | BS EN 23506:200 0 580 38924 3 | 2, (BS 60 | 68-2.74:2002) ISBN | | | race Level Mercury in Waters ur Atomic Fluorescence Spec | | | |
| | TM184 | EPA Methods 325 | 1 & 325.2 | 2, | | | of Anions in Aqueous Matrice ometric Analysers | s using the | | |
| | TM208 | Modified: US EPA | Method 8 | 260b & 624 | Determina GC-MS in | | olatile Organic Compounds by | Headspace / | | |
| | TM227 | Standard methods and wastewaters 2 Method 4500. | | amination of waters n, AWWA/APHA | Determina Cyanide a | | otal Cyanide, Free (Easily Libe yanate | eratable) | | |
| | TM228 | US EPA Method 6 | 010B | | Determina ICP-OES | ation of M | lajor Cations in Water by iCap | 6500 Duo | | |
| | TM241 | Methods for the Ex Associated Materia Potable Waters an | als; Chron | nium in Raw and | | | of Hexavalent Chromium in W e Kone Analyser | aters and | | |
| | TM245 | By GC-FID | | | Determina | ation of G | RO by Headspace in waters | | | |
| | TM256 | The measurement the Laboratory det Natural, Treated a 1978. ISBN 011 75 | erminatio nd Waste | · · · · | Determina Meter | ation of p | H in Water and Leachate using | g the GLpH pH | | |
| | TM259 | by HPLC | | | Determina | ation of P | henols in Waters and Leachat | es by HPLC | | |
| | TM294 | | | | | | | | | |

NA = not applicable.

CERTIFICATE OF ANALYSIS

Validated

| SDG: | 110521-14 | Location: | | Order Number: | SH3068 |
|-------------------|------------------|------------|-----------------------|--------------------|--------|
| Job: | H_WARDELL_SHF-37 | Customer: | Wardell Armstrong LLP | Report Number: | 131526 |
| Client Reference: | SH10534 | Attention: | Mike Kelly | Superseded Report: | |

Test Completion Dates

| Lab Sample No(s) | 3508811 | 3508812 |
|-------------------------------------|-------------|-------------|
| Customer Sample Ref. | WS105 | WS110 |
| AGS Ref. | | |
| Depth | | |
| Туре | LIQUID | LIQUID |
| Anions by Kone (w) | 27-May-2011 | 27-May-2011 |
| Cyanide Comp/Free/Total/Thiocyanate | 27-May-2011 | 27-May-2011 |
| Dissolved Metals by ICP-MS | 25-May-2011 | 25-May-2011 |
| EPH CWG (Aliphatic) Aqueous GC (W) | 31-May-2011 | 31-May-2011 |
| EPH CWG (Aromatic) Aqueous GC (W) | 31-May-2011 | 31-May-2011 |
| Free Sulphur | 01-Jun-2011 | 01-Jun-2011 |
| GRO by GC-FID (W) | 28-May-2011 | 28-May-2011 |
| Hexavalent Chromium (w) | 24-May-2011 | 24-May-2011 |
| Mercury Dissolved | 25-May-2011 | 25-May-2011 |
| Metals by iCap-OES Dissolved (W) | 25-May-2011 | 25-May-2011 |
| PAH Spec MS - Aqueous (W) | 31-May-2011 | 26-May-2011 |
| pH Value | 24-May-2011 | 24-May-2011 |
| Phenols by HPLC (W) | 25-May-2011 | 25-May-2011 |
| Sulphide | 01-Jun-2011 | 01-Jun-2011 |
| SVOC MS (W) - Aqueous | 28-May-2011 | 28-May-2011 |
| TPH CWG (W) | 31-May-2011 | 31-May-2011 |
| VOC MS (W) | 26-May-2011 | 26-May-2011 |

CERTIFICATE OF ANALYSIS

| SDG: | 110521-14 | Location: | |
|-------------------|------------------|------------|-----------------------|
| Job: | H_WARDELL_SHF-37 | Customer: | Wardell Armstrong LLP |
| Client Reference: | SH10534 | Attention: | Mike Kelly |

Appendix

 Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Order Number: Report Number: Superseded Report: SH3068 131526

SOLID MATRICES EXTRACTION SUMMARY

| | D/C OR | EXTRACTION | EXTRACTION | | | |
|--|-----------|---------------|--------------------|-------------|--|--|
| ANALYSIS | WET | SOLVENT | METHOD | ANALYSIS | | |
| SOLVENT EXTRACTABLE MATTER | D&C | DOM | SOXTHERM | GRAVIMETRIC | | |
| CYCLOHEXANE EXT. MATTER | D&C | CYCLOHEXANE | SOXTHERM | GRAVIMETRIC | | |
| THIN LAYER CHROMATOGRAPHY | D&C | DOM | SOXTHEFTM | IATROSCAN | | |
| ELEMENTALSULPHUR | D&C | DOM | MFEHTX CZ | HFLC | | |
| PHENOLSBYGOMS | WET | DOM | SDXTHERM | GCMS | | |
| HEREICODES | D&C | HEXANEACETONE | SDXTHERM | GCMS | | |
| PESIICDES | D&C | HEXANEACETONE | SOXTHERM | GCMS | | |
| ETH (DRO) | D&C | HEXANEACETONE | ENDOWEREND | GCFID | | |
| EFH (MNOL) | D&C | HEXANEACETONE | END OVEREND | GCFID | | |
| EPH (OLEANED UP) | D&C | HEXANEACETONE | END OVEREND | GCFID | | |
| EPH CANG BYGC | D&C | HEXANEACETONE | END OVEREND | GCFID | | |
| POB TOT / POB CON | D&C | HEXANEACETONE | ENDOWEREND | GCMS | | |
| POLVAROMATIC HYDROCARBONS (MS) | WET | HEXANEACETONE | MCROWAVE TM218. | GCMS | | |
| 08-040(08-040) EZ FLASH | WET | HEXANEACETONE | SHAMER | GCÆZ | | |
| POLYAROMATIC Hydrocarbons Rafid GC | WET | HEXANEACETONE | SHAMER | GCEZ | | |
| SEM VOLATILEORGANIC COMFOUNDS | WET | DOMAGETONE | SONICATE | GCMS | | |

LIQUID MATRICES EXTRACTION SUMMARY

| ANALYSIS | EXTRACTION SOLVENT | EXTRACTION METHOD | ANALYSIS |
|----------------------|-----------------------|-----------------------------|----------|
| PAHMS | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| BHI | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| EPHONG | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| MNERALOIL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFD |
| POB 7 CONGENERS | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| POBITOTAL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| SVOC | DOM | LIQUID/LIQUID SHAKE | GCMS |
| FREESULPHUR | DOM | SOLID PHASE EXTRACTION | HFLC |
| PEST 00P/0PP | DOM | LIQUID/LIQUID SHAKE | GCMS |
| TRAZINE HERES | DOM | LIQUID/LIQUID SHAKE | GCMS |
| PHENOLSMS | DOM | SOLD PHASE EXTRACTION | GCMS |
| THH by INFRARED (IR) | TCE | LIQUID/LIQUID SHAKE | HFLC |
| MINERALCIL by R | TCE | LIQUID/LIQUID SHAKE | HFLC |
| GLYCOLS | NONE | DIRECT NECTION | GCMS |

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

| Asbestos Type | Common Name |
|---------------------|---------------|
| Orrysolie | WhiteAsbestos |
| Ancele | BrownAsbestos |
| Qoádate | Bije Astestos |
| Fibraus Adinalie | - |
| Rorous Anthophylite | - |
| Fibrous Trendile | - |

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Wardell Armstrong LLP Unit 4 Newton Business Centre Thorncliffe Park Sheffield South Yorkshire S35 2PH

Attention: Joanne Shaw

CERTIFICATE OF ANALYSIS

Date: Customer: Sample Delivery Group (SDG): Your Reference: Location: Report No: 13 June 2011 H_WARDELL_SHF 110602-86 SH10534 North Bierley 133631

We received 3 samples on Thursday June 02, 2011 and 3 of these samples were scheduled for analysis which was completed on Monday June 13, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:

Sonia McWhan Operations Manager



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| ALcontrol Laboratories | | | | | | | | | |
|-----------------------------------|--|--------------------------------------|---|--------|---|------------------|--------------|--|--|
| SDG: Job: Client Reference: | 110602-86 H_WARDELL_SHF-38 SH10534 | Location: Customer: Attention: | North Bierley Wardell Armstrong LLP Joanne Shaw | Ore | der Number: port Number: perseded Report: | SH3068 133631 | | | |
| | | Receiv | ved Sample Ov | erview | | | | | |
| Lab Sample No(s | s) Customer | Sample Ref. | AG | S Ref. | Depth (m) | | Sampled Date | | |
| 3589940 | E | BH5 | | | | | 01/06/2011 | | |
| 3589941 | E | BH6 | | | | | 01/06/2011 | | |

01/06/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

WS102

3589939

| SDG: 110602- Job: H_WAR Client Reference: SH1053 | DELL_SHF-38 | Location: Custome Attention | r: Wa | orth B ardell anne | Arms | ong LLP Order Number: Superseded Rep | |
|--|------------------------|-----------------------------------|--|-------------------------------|-------------------------------|---|--|
| IQUID esults Legend X Test | Lab Sample | No(s) | 3589940 | 3589941 | 3589939 | | |
| No Determination Possible | Custome Sample Refe | BH5 | BH6 | WS102 | | | |
| | AGS Refere | ence | | | | | |
| | Depth (n | - | | | | | |
| | Containe | er | Vial 1lplastic 1l green glass bottle | Vial 1l green glass bottle | Vial 1l green glass bottle | | |
| Anions by Kone (w) | All | NDPs: 0 Tests: 2 | x | x | | | |
| yanide omp/Free/Total/Thiocyanate | All | NDPs: 0 Tests: 2 | x | x | | | |
| issolved Metals by ICP-MS | All | NDPs: 0 Tests: 2 | x | x | | | |
| PH CWG (Aliphatic) Aqueous GC W) | All | NDPs: 1 Tests: 2 | x | X | N | | |
| EPH CWG (Aromatic) Aqueous GC W) | All | NDPs: 1 Tests: 2 | x | x | N | | |
| ree Sulphur | All | NDPs: 0 Tests: 2 | x | X | | | |
| GRO by GC-FID (W) | All | NDPs: 0 Tests: 3 | x | x | x | | |
| Hexavalent Chromium (w) | All | NDPs: 0 Tests: 2 | x | x | | | |
| Mercury Dissolved | All | NDPs: 0 Tests: 2 | x | x | | | |
| Metals by iCap-OES Dissolved (W) | All | NDPs: 0 Tests: 2 | x | x | | | |
| PAH Spec MS - Aqueous (W) | All | NDPs: 0 Tests: 2 | x | X | | | |
| oH Value | All | NDPs: 0 Tests: 2 | x | X | | | |
| Phenols by HPLC (W) | All | NDPs: 0 Tests: 2 | X | X | | | |
| Sulphide | All | NDPs: 0 Tests: 2 | x | x | | | |
| SVOC MS (W) - Aqueous | All | NDPs: 0 Tests: 3 | | | x | | |

| ALcontrol I | | | | | | | OF ANALYSIS | | |
|-----------------------------------|--------------------------------|---------------------------|-------------------------------------|--|-------------------------------|-------------------------------|------------------------------------|-------------|--|
| SDG: Job: Client Reference: | 110602-86 H_WARD SH10534 | S ELL_SHF-38 | Location: Customer Attention: | n Wa | rth B ardell anne | Arm | trong LLP Order Numb Superseded | ber: 133631 | |
| LIQUID | | | | ω | ω | ω | | | |
| Results Legend | | Lab Sample I | No(s) | 3589940 | 3589941 | 3589939 | | | |
| No Determination Possible | | Customer Sample Refere | | BH5 | BH6 | WS102 | | | |
| | | AGS Refere | nce | | | | | | |
| | | Depth (m |) | | | | | | |
| | Contair | | r | Vial 1lplastic 1l green glass bottle | Vial 11 green glass bottle | Vial 1l green glass bottle | | | |
| TPH CWG (W) | | All | NDPs: 1 Tests: 2 | x | x | N | | | |
| VOC MS (W) | | All | NDPs: 0 Tests: 2 | x | x | | | | |

CERTIFICATE OF ANALYSIS

Validated

| ISO17025 accredited. M mCERTS accredited. S Non-conforming work. aq Aqueous / settled sample. diss.fitt Dissolved / filtered sample. to.unfilt Total / unfiltered sample. * Subcontracted test. * Subcontracted test. * % recovery of the surrogate standar check the efficiency of the method. | TS accredited. snforming work. Us / settled sample. Us / settled sample. Unfiltered sample. Unfiltered sample. Date Sampled Intracted test. Date Received Wayr of the surrogate standard to SDG Ref | | Depth (m) Sample Type Water(GW/SW) Date Sampled 01/06/2011 Date Received 02/06/2011 SDG Ref 110602-86 Lab Sample No.(s) 3589940 | | | | |
|---|---|-----------------|---|---------------|---|--|--|
| results of individual compounds wit samples aren't corrected for the rec (F) Trigger breach confirmed | | AGS Reference | | 3589941 | | | |
| Component Sulphide | LOD/Units <0.01 | Method TM101 | <0.1 | <0.25 | _ | | |
| | mg/l | | # | | # | | |
| Arsenic (diss.filt) | <0.12 µq/l | TM152 | 3.08 # | 2.31 | # | | |
| Boron (diss.filt) | <9.4 µg/l | TM152 | 69.8 # | 56.3 | # | | |
| Cadmium (diss.filt) | <0.1 µg/l | TM152 | <0.1 # | 0.346 | # | | |
| Chromium (diss.filt) | <0.22 µg/l | TM152 | 29.1 # | 6.14 | # | | |
| Copper (diss.filt) | <0.85 µg/l | TM152 | 7.35 # | 2.66 | # | | |
| Lead (diss.filt) | <0.02 | TM152 | 0.065 | 0.146 | | | |
| Nickel (diss.filt) | µq/l <0.15 | TM152 | # 11.5 | 50.2 | # | | |
| Selenium (diss.filt) | µq/l <0.39 | TM152 | # 2.66 | 4.44 | # | | |
| Zinc (diss.filt) | µq/l <0.41 | TM152 | # 2.54 | 10.5 | # | | |
| Mercury (diss.filt) | µq/l <0.01 | TM183 | # <0.01 | <0.01 | # | | |
| Sulphate | µq/l <2 mg/l | TM184 | # 71.4 | 884 | # | | |
| | <0.05 | TM227 | <0.05 | <0.05 | # | | |
| Cyanide, Total | mg/l | | # | | # | | |
| Cyanide, Free | <0.05 mg/l | TM227 | <0.05 # | <0.05 | # | | |
| Thiocyanate | <0.05 mg/l | TM227 | <0.05 # | <0.05 | # | | |
| Hardness, Total as CaCO3 | <1 mg/l | TM228 | 502 # | 1220 | # | | |
| Chromium, Hexavalent | <0.03 mg/l | TM241 | <0.03 | <0.03 | | | |
| рН | <1 pH Units | TM256 | 8.43 # | 7.99 | # | | |
| Phenol | <0.002 | TM259 | <0.002 | <0.002 | | | |
| Cresols | mq/l <0.006 | TM259 | # <0.006 | <0.006 | # | | |
| Xylenols | mq/l <0.008 | TM259 | # <0.008 | <0.008 | # | | |
| 1-Naphthol | mq/l <0.01 | TM259 | # <0.01 | <0.01 | # | | |
| 2,3,5-Trimethylphenol | mq/l <0.003 | TM259 | <0.003 | <0.003 | - | | |
| Phenols, Total Detected 5 | mq/l mg/l | TM259 | # none detected | none detected | # | | |
| speciated Sulphur, Free | <0.05 | TM294 | <0.05 | <0.188 | | | |
| | <0.03 mg/l | 111/2.54 | <0.05 | <0.100 | | | |
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| | aboratories | 6 | CER | TIFIC | | YSIS | | Γ | Validated |
|--|---|---|---|-------------------------------|---------------|------|---|------------------|-----------|
| Job: | 110602-86 H_WARDELL SH10534 | _SHF-38 | | North Bi Wardell Joanne | Armstrong LLP | | Order Number: Report Number: Superseded Repor | SH3068 133631 | |
| GRO by GC-FID (W | | | Attention. | Juanne | Shaw | | Superseule Repor | | |
| Results Legend # ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample diss.filt Dissolved / filtered sample. * Subcontracted test. * Subcontracted test. * Subcontracted test. * Subcontracted test. (F) Trigger breach confirmed | e. etandard to e. method. The sounds within for the recovery | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | WS102 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589939 | | | | | | |
| Component GRO Surrogate % | LOD/U | | 96 | | | | | | |
| recovery** GRO >C5-C12 | <50 | µg/I TM245 | <50 | _ | | | | | |
| Methyl tertiary butyl ethe | | | <3 | # | | | | | |
| (MTBE) Benzene | <7 | ıg/I TM245 | <7 | # | | | | | |
| Toluene | <4 | ıg/I TM245 | <4 | # | | | | | |
| Ethylbenzene | <5 | ıg/I TM245 | <5 | # | | | | | |
| m,p-Xylene | <8 | ıg/I TM245 | <8 | # | | | | | |
| o-Xylene | <3 | ıg/I TM245 | <3 | # | | | | | |
| Sum of detected Xylene | s µg | /I TM245 | none detected | | | | | | |
| Sum of detected BTEX | hð | /I TM245 | none detected | | | | | | |
| Aliphatics >C5-C6 | <10 | µg/I TM245 | <10 | | | | | | |
| Aliphatics >C6-C8 | <10 | µg/I TM245 | <10 | | | | | | |
| Aliphatics >C8-C10 | <10 | µg/I TM245 | <10 | | | | | | |
| Aliphatics >C10-C12 | <10 | µg/I TM245 | <10 | | | | | | |
| Aromatics >EC5-EC7 | <10 | µg/I TM245 | <10 | | | | | | |
| Aromatics >EC7-EC8 | <10 | µg/I TM245 | <10 | | | | | | |
| Aromatics >EC8-EC10 | <10 | | <10 | | | | | | |
| Aromatics >EC10-EC12 | <10 | µg/I TM245 | <10 | | | | | | |
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CERTIFICATE OF ANALYSIS

| | | | | CERI | TIFI | CATE OF A | NALYSIS | | | |
|--|---|--|--|--|------|--|---------|---------------------------------|------------------|--|
| SDG Job: | 1 | 110602-86 H_WARDELL | _SHF-38 | Customer: | Ward | n Bierley dell Armstrong LLP | | Order Number: Report Number: | SH3068 133631 | |
| | nt Reference: | SH10534 | | Attention: | Joan | ne Shaw | | Superseded Repo | n: | |
| | Spec MS - Aq Results Legend | ueous (w) | Customer Sample R | BH5 | | BH6 | | | | |
| # M aq diss.filt tot.unfilt * ** | ISO17025 accredited. mCERTS accredited. Non-conforming work. Aqueous / settled sample Dissolved / lunfiltered sample. Subcontracted test. % recovery of the surrog check the efficiency of th results of individual com samples aren't corrected Trigger breach confirmed | le. ate standard to e method. The pounds within for the recovery | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589940 | | Water(GW/SW) 01/06/2011 02/06/2011 110602-66 3589941 | | | | |
| Compo | | LOD/U | | | | | | | | |
| Napht | halene (aq) | <0.1 | µg/I TM178 | 0.383 | # | <0.1 # | | | | |
| Acena | aphthene (aq) | 0.0> /µq/ | | 0.562 | # | 0.079 # | | | | |
| Acena | phthylene (aq) | <0.0 | | 0.0318 | # | <0.011 # | | | | |
| Fluora | inthene (aq) | μαμ 0.0> γμαμ |)17 TM178 | 2.91 | # | 0.268 # | | | | |
| Anthra | acene (aq) | 0.0> иди |)15 TM178 | 0.416 | # | 0.08 # | | | | |
| Phena | anthrene (aq) | 0.0> ирц |)22 TM178 | 1.02 | # | 0.351 # | | | | |
| Fluore | ene (aq) | 0.0> μq |)14 TM178 | 0.287 | # | 0.0599 # | | | | |
| Chrys | ene (aq) | 0.0> μq |)13 TM178 | 1.75 | # | 0.0547 # | | | | |
| Pyren | e (aq) | 0.0> /µq/ |)15 TM178 | 2.75 | # | 0.225 # | | | | |
| Benzo | o(a)anthracene (a | |)17 TM178 | 1.89 | # | 0.0519 # | | | | |
| Benzo | o(b)fluoranthene (a | |)23 TM178 | 1.84 | # | 0.0402 # | | | | |
| Benzo | o(k)fluoranthene (a | | 27 TM178 | 2.34 | # | 0.0393 # | | | | |
| Benzo | o(a)pyrene (aq) | 0.0> иди | 009 TM178 | 2.55 | # | 0.0414 # | | | | |
| Diben: (aq) | zo(a,h)anthracene | |)16 TM178 | 0.369 | # | <0.016 # | | | | |
| Benzo | o(g,h,i)perylene (a | 0.0> (р µq/ | | 1.2 | # | 0.0221 # | | | | |
| Inden (aq) | o(1,2,3-cd)pyrene | 0.0> иди | | 1.06 | # | 0.016 # | | | | |
| | Total Detected A 16 (ag) | μg | µ/I TM178 | 21.4 | | 1.33 | | | | |
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CERTIFICATE OF ANALYSIS

Validated

SVOC MS (W) - Aqueous

| SVOC MS (W) - Aqueous Results Legend | | ustomer Sample R | BUE | BUG | W6402 | | |
|---|----------------------|---|---|---|---|------|--|
| ISO17025 accredited. M mCERTS accredited. M mCERTS accredited. Son-conforming work. aq Aqueous / settled sample. diss.fit Dissolved / fittered sample. tot.unfit Total / unfittered sample. Subcontracted test. W recovery of the surrogate standarcheck the efficiency of the method. results of individual compounds will | rd to The thin | Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) | BH5 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589940 | BH6 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589941 | WS102 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589939 | | |
| samples aren't corrected for the rec (F) Trigger breach confirmed | - | AGS Reference | | | | | |
| Component 1,2,4-Trichlorobenzene | LOD/Units <1 µg/l | | <1 | <1 | <1 | | |
| (aq) 1,2-Dichlorobenzene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| 1,3-Dichlorobenzene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| 1,4-Dichlorobenzene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| 2,4,5-Trichlorophenol (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| 2,4,6-Trichlorophenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2,4-Dichlorophenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2,4-Dimethylphenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2,4-Dinitrotoluene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2,6-Dinitrotoluene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Chloronaphthalene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Chlorophenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Methylnaphthalene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Methylphenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Nitroaniline (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 2-Nitrophenol (aq) | <1 µg/I | TM176 | <1 | <1 | <1 | | |
| 3-Nitroaniline (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Bromophenylphenylether (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Chloro-3-methylphenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Chloroaniline (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Chlorophenylphenylether (ag) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Methylphenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Nitrophenol (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| 4-Nitroaniline (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| Azobenzene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| Acenaphthylene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |
| Acenaphthene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| Anthracene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| bis(2-Chloroethyl)ether (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| bis(2-Chloroethoxy)methan e (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| bis(2-Ethylhexyl) phthalate (aq) | <2 µg/l | | 8.11 | 3.92 | <2 | | |
| Benzo(a)anthracene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| Butylbenzyl phthalate (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| Benzo(b)fluoranthene (aq) | <1 µg/l | | <1 | <1 | <1 | | |
| Benzo(k)fluoranthene (aq) | <1 µg/l | TM176 | <1 | <1 | <1 | | |

CERTIFICATE OF ANALYSIS

Validated

SVOC MS (W) - Aqueous

| SVOC MS (W) - Aqueous | | | | | | | |
|---|--------------------------|---|---|---|---|------|--|
| Results Legend ISO17025 accredited. M mCERTs accredited. M mCERTs accredited. Son-conforming work. aq Aqueous / settled sample. diss.fit Dissolved / fittered sample. totunfit Total / unfittered sample. Subcontracted test. W recovery of the surrogate stands check the efficiency of the method results of individual compounds w samples aren' corrected for the rec | ard to . The ithin | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(5) AGS Reference | BH5 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589940 | BH6 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589941 | WS102 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589939 | | |
| (F) Trigger breach confirmed Component | LOD/Un | its Method | | | | | |
| Benzo(a)pyrene (aq) | <1 µg | | <1 | <1 | <1 | | |
| Benzo(g,h,i)perylene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Carbazole (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Chrysene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Dibenzofuran (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| n-Dibutyl phthalate (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Diethyl phthalate (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Dibenzo(a,h)anthracene (aq) | <1 µg | | <1 | <1 | <1 | | |
| Dimethyl phthalate (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| n-Dioctyl phthalate (aq) | <5 µg | µ/I TM176 | <5 | <5 | <5 | | |
| Fluoranthene (aq) | <1 µg | µ/I TM176 | <1 | <1 | <1 | | |
| Fluorene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Hexachlorobenzene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Hexachlorobutadiene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Pentachlorophenol (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Phenol (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| n-Nitroso-n-dipropylamine (ag) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Hexachloroethane (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Nitrobenzene (aq) | <1 µg | | <1 | <1 | <1 | | |
| Naphthalene (aq) | <1 µg | | <1 | <1 | <1 | | |
| Isophorone (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Hexachlorocyclopentadien e (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Phenanthrene (aq) | <1 µg | g/I TM176 | <1 | <1 | <1 | | |
| Indeno(1,2,3-cd)pyrene (aq) | <1 µg | | <1 | <1 | <1 | | |
| Pyrene (aq) | <1 µg | | <1 | <1 | <1 | | |
| SVOC TIC (aq) | - | TM176 | See Attached | No TICs identified | No TICs identified | | |
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|--|--|----------|---|---|---|--|-------|---------|---------------------------------|------------------|--|
| SDG: Job: | 110602 H WAR | | SHF-38 | | | th Bierley dell Armstron | | | Order Number: Report Number: | SH3068 133631 | |
| Client Reference: | SH105 | _ | _3111 -30 | | | nne Shaw | y LLF | | Superseded Repo | | |
| IPH CWG (W) | | | | | | | | | | | |
| Results Leg # ISO17025 accredited. M mCERTS accredited. § Non-conforming work aq Aqueous / settled san diss.filit Dissolved / filtered sa toLunfit Total / unfiltered sam toLunfit Total / unfiltered sam check the efficiency of results of individual o samples aren't correc (F) Trigger breach confir | k. Imple. Imple. ple. Trogate standard of the method. Th compounds with cted for the record | he in | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference | BH5 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589940 | | BH6 Water(GW/S) 01/06/2011 02/06/2011 110602-86 3589941 | | | | | |
| Component | ineu | LOD/U | nits Method | | | | | | | | |
| GRO Surrogate % recovery** | | % | TM245 | 95 | | 54 | ş | | | | |
| GRO >C5-C12 | | <50 µ | ıg/I TM245 | <50 | # | <50 | 6 | | | | |
| Methyl tertiary butyl e (MTBE) | ether | <3 µ | g/I TM245 | <3 | # | <3 | ş | | | | |
| Benzene | | <7 µ | g/I TM245 | <7 | # | <7 | ş | | | | |
| Toluene | | <4 µ | g/I TM245 | <4 | # | 8 | ş | | | | |
| Ethylbenzene | | <5 µ | g/I TM245 | <5 | # | <5 | ş | | | | |
| m,p-Xylene | | <8 µ | g/I TM245 | <8 | # | <8 | ş | | | | |
| o-Xylene | | <3 µ | g/I TM245 | <3 | # | <3 | ş | | | | |
| Sum of detected Xyle | enes | µg/ | 1 TM245 | none detected | _ | none detec | | | | | |
| Sum of detected BTE | X | µg/ | 1 TM245 | none detected | 1 | 8 | ş | | | | |
| Aliphatics >C5-C6 | | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aliphatics >C6-C8 | | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aliphatics >C8-C10 | | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aliphatics >C10-C12 | | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aliphatics >C12-C16 | (aq) | <10 µ | ıg/I TM174 | <10 | | 155 | | | | | |
| Aliphatics >C16-C21 | (aq) | <10 µ | ıg/I TM174 | 20 | | 524 | | | | | |
| Aliphatics >C21-C35 | (aq) | <10 µ | ıg/I TM174 | 216 | | 3390 | | | | | |
| Total Aliphatics >C12 (aq) | 2-C35 | <10 µ | ıg/I TM174 | 236 | | 4070 | | | | | |
| Aromatics >EC5-EC7 | ' | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aromatics >EC7-EC8 | 3 | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aromatics >EC8-EC1 | 0 | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aromatics >EC10-EC | :12 | <10 µ | ıg/I TM245 | <10 | | <10 | ş | | | | |
| Aromatics >EC12-EC (aq) | :16 | <10 µ | ıg/I TM174 | <10 | | 83 | | | | | |
| Aromatics >EC16-EC (aq) | 21 | <10 µ | ıg/I TM174 | <10 | | 264 | | | | | |
| Aromatics >EC21-EC (aq) | 35 | <10 µ | ıg/I TM174 | 43 | | 1870 | | | | | |
| Total Aromatics >EC12-EC35 (aq) | | <10 µ | ıg/I TM174 | 43 | | 2220 | | | | | |
| Total Aliphatics & Aromatics >C5-35 (ad | g) | <10 µ | ıg/I TM174 | 279 | | 6300 | | | | | |
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CERTIFICATE OF ANALYSIS

Validated

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|---|---|-------------------|---|---|-----|---|----------|---|------------------|----------|----|
| Job: | 110602-8 H_WARD SH10534 | DELL_ | SHF-38 | Customer: | Wa | rth Bierley Irdell Armstrong LL anne Shaw | Р | Order Number: Report Number: Superseded Report: | SH3068 133631 | | |
| VOC MS (W) | 51110554 | , | | Attention. | 500 | | | Superseded Report. | | | |
| Results Legend # ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfit Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate check the efficiency of the r results of individual compo samples aren to corrected for (F) Trigger breach confirmed | e standard to method. The ounds within or the recovery | y | Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(5) AGS Reference | BH5 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589940 | | BH6 Water(GW/SW) 01/06/2011 02/06/2011 110602-86 3589941 | | | | | |
| Component Dibromofluoromethane** | | OD/Uni % | ts Method TM208 | 104 | | 105 | | + | | | |
| Toluene-d8** | + | % | TM208 | 98.1 | | 98.6 | | | | | |
| 4-Bromofluorobenzene** | | % | TM208 | 89.1 | | 90.8 | | | | | |
| Dichlorodifluoromethane | | <7 µg | /I TM208 | <7 | # | <7 | ŧ | | | | |
| Chloromethane | | <9 µg | /I TM208 | <9 | # | <9 | ŧ | | | | |
| Vinyl chloride | | <1.2 µ | g/I TM208 | <1.2 | # | <1.2 | ŧ | | | | |
| Bromomethane | | <2 µg | | <2 | # | | ŧ | | | | |
| Chloroethane | | <2.5 µ | | <2.5 | # | | ŧ | | | | |
| Trichlorofluoromethane | | <1.3 µ | | <1.3 | # | | ŧ | | | | |
| 1,1-Dichloroethene | | <1.2 µ | | <1.2 | # | <1.2 | ŧ | | | | |
| Carbon disulphide | | <1.3 µ | | <1.3 | # | | ŧ | | | | |
| Dichloromethane | | <3.7 µ | | <3.7 | # | | ŧ | | | | |
| Methyl tertiary butyl ether (MTBE) | | <1.6 µ | | <1.6 | # | | ŧ | | | | |
| trans-1,2-Dichloroethene | | <1.9 µ | - | <1.9 | # | | ŧ | | | | |
| 1,1-Dichloroethane | | <1.2 µ | | <1.2 | # | | ŧ | | | | |
| cis-1,2-Dichloroethene | | <2.3 µ | | <2.3 | # | | ŧ | | | | |
| 2,2-Dichloropropane Bromochloromethane | | <3.8 μ <1.9 μ | | <3.8 | # | <3.8 <1.9 | ŧ | | | _ | |
| Chloroform | | <1.9 µ | | <1.5 | # | | ŧ | | | _ | |
| 1,1,1-Trichloroethane | | < 1.6 µ <1.3 µ | - | <1.0 | # | | ŧ | | | _ | |
| 1,1-Dichloropropene | | <1.3 µ | | <1.3 | # | | ŧ | | | | |
| Carbontetrachloride | | <1.4 μ | - | <1.4 | # | | ŧ | | | | |
| 1,2-Dichloroethane | | <3.3 µ | | <3.3 | # | | ŧ | | | | |
| Benzene | | <1.3 µ | | <1.3 | | <1.3 | | | | | |
| Trichloroethene | | <2.5 µ | | <2.5 | # | | ŧ | | | | |
| 1,2-Dichloropropane | _ | <3 µg | | <3 | # | | ŧ | | | _ | |
| Dibromomethane | | <2.7 µ | | <2.7 | # | <2.7 | ŧ | + | | | |
| Bromodichloromethane | | <0.9 µ | - | <0.9 | # | ÷ <0.9 | ŧ | + | | | |
| cis-1,3-Dichloropropene | | <1.9 µ | | <1.9 | # | <1.9 | ŧ | + | | | |
| Toluene | | <1.4 µ | | <1.4 | # | <1.4 | ŧ | + | | | |
| trans-1,3-Dichloropropene | e · | <3.5 µ | g/I TM208 | <3.5 | # | <3.5 | <u> </u> | | | | |
| 1,1,2-Trichloroethane | - | <2.2 µ | g/I TM208 | <2.2 | # | <2.2 | ŧ | + + | | | |
| 1,3-Dichloropropane | - | <2.2 µ | g/I TM208 | <2.2 | # | <2.2 | £ | | | | |
| Tetrachloroethene | - | <1.5 µ | g/I TM208 | <1.5 | # | <1.5 | £ | + + | | | |
| Dibromochloromethane | | <1.7 µ | g/I TM208 | <1.7 | # | <1.7 | £ £ | | | | |
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CERTIFICATE OF ANALYSIS

Validated

VOC MS (W)

| VOC MS (W) | | | | | | | |
|---|-----------|------------------------------------|--------------------------|--------------------------|----------|------|--|
| Results Legend # ISO17025 accredited. | с | ustomer Sample R | BH5 | BH6 | | | |
| M mCERTS accredited. § Non-conforming work. | | Depth (m) | | | | | |
| aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. | | Sample Type | Water(GW/SW) | Water(GW/SW) | | | |
| tot.unfilt Total / unfiltered sample. * Subcontracted test. | | Date Sampled Date Received | 01/06/2011 02/06/2011 | 01/06/2011 02/06/2011 | | | |
| ** % recovery of the surrogate standar check the efficiency of the method. | The | SDG Ref | 110602-86 3589940 | 110602-86 | | | |
| results of individual compounds wit samples aren't corrected for the rec | thin | Lab Sample No.(s) AGS Reference | 3569940 | 3589941 | | | |
| (F) Trigger breach confirmed | LOD/Units | s Method | | | | | |
| Component 1,2-Dibromoethane | <2.3 µg | | <2.3 | <2.3 | | | |
| | | | # | # | | | |
| Chlorobenzene | <3.5 µg/ | /I TM208 | <3.5 | <3.5 # | | | |
| 1,1,1,2-Tetrachloroethane | <1.3 µg | I TM208 | <1.3 | <1.3 | | | |
| Ethylhonzono | <2.5 µg | 1 TM208 | # <2.5 | # <2.5 | | | |
| Ethylbenzene | ~2.5 μg/ | 1 11/1200 | ~2.5 | ~2.5 | | | |
| m,p-Xylene | <2.5 µg | I TM208 | <2.5 | <2.5 | | | |
| o-Xylene | <1.7 µg | 1 TM208 | # <1.7 | # <1.7 | | | |
| | | | # | # | | | |
| Styrene | <1.2 µg/ | /I TM208 | <1.2 | <1.2 # | | | |
| Bromoform | <3 µg/I | TM208 | <3 | <3 | | | |
| Isopropylbenzene | <1.4 µg | 1 TM208 | # <1.4 | # <1.4 | | | |
| Isopropylbenzene | < 1.4 µg/ | | <1.4 | <1.4 | | | |
| 1,1,2,2-Tetrachloroethane | <5.2 µg | I TM208 | <5.2 | <5.2 | | | |
| 1,2,3-Trichloropropane | <7.8 µg | /I TM208 | <7.8 | <7.8 | | | |
| | | | # | # | | | |
| Bromobenzene | <2 µg/I | TM208 | <2 # | <2 # | | | |
| Propylbenzene | <2.6 µg | I TM208 | <2.6 | <2.6 | | | |
| 2 Chlorotoluono | <1.9 µg/ | 1 TM208 | # <1.9 | # | | | |
| 2-Chlorotoluene | < 1.9 µg/ | | <1.9 | <1.9 # | | | |
| 1,3,5-Trimethylbenzene | <1.8 µg | I TM208 | <1.8 | <1.8 | | | |
| 4-Chlorotoluene | <1.9 µg/ | 1 TM208 | # <1.9 | # <1.9 | | | |
| | | | # | # | | | |
| tert-Butylbenzene | <2 µg/l | TM208 | <2 # | <2 # | | | |
| 1,2,4-Trimethylbenzene | <1.7 µg | /I TM208 | <1.7 | <1.7 | | | |
| sec-Butylbenzene | <1.7 µg | 1 TM208 | # <1.7 | # <1.7 | | | |
| | | | # | # | | | |
| 4-iso-Propyltoluene | <2.6 µg | /I TM208 | <2.6 # | <2.6 # | | | |
| 1,3-Dichlorobenzene | <2.2 µg | /I TM208 | <2.2 | <2.2 | | | |
| 1,4-Dichlorobenzene | <2.7 µg | 1 TM208 | # <2.7 | # <2.7 | | | |
| | | | # | # | | | |
| n-Butylbenzene | <2 µg/I | TM208 | <2 # | <2 # | | | |
| 1,2-Dichlorobenzene | <3.7 µg | I TM208 | <3.7 | <3.7 | | | |
| 1,2-Dibromo-3-chloropropa | <9.8 µg | 1 TM208 | <9.8 | <9.8 | <u>├</u> | | |
| ne | | | | | | | |
| 1,2,4-Trichlorobenzene | <2.3 µg/ | 1 TM208 | <2.3 # | <2.3 # | | | |
| Hexachlorobutadiene | <2.5 µg/ | I TM208 | <2.5 | <2.5 | | | |
| tert-Amyl methyl ether | <1 µg/l | | # <1 | # <1 | | | |
| (TAME) | | | # | # | | | |
| Naphthalene | <3.5 µg/ | I TM208 | <3.5 | <3.5 | | | |
| 1,2,3-Trichlorobenzene | <3.1 µg | /I TM208 | # <3.1 | # <3.1 | <u> </u> | | |
| | | | # | # | | | |
| 1,3,5-Trichlorobenzene | <10 µg/ | 1 TM208 | <10 | <10 | | | |
| VOC TIC | - | TM208 | No TICs identified | No TICs identified | | | |
| Sum of detected Xylenes | µg/l | TM208 | none detected | none detected | <u>├</u> | | |
| | P.0/1 | 111/200 | none deletted | | | | |
| | | | | | | | |
| | | | | | <u>├</u> | | |
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CERTIFICATE OF ANALYSIS

Validated

SH3068 SDG: 110602-86 Location: North Bierley Order Number: H_WARDELL_SHF-38 Wardell Armstrong LLP 133631 Job: Customer: Report Number: Client Reference: SH10534 Attention: Joanne Shaw Superseded Report:

Notification of Non-Conforming Work

| Sample Number | Customer Sample Ref. | Depth (m) Matrix | Test Name | Component Name | Comment |
|------------------|-------------------------|------------------|-------------------|------------------------------------|--|
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aliphatics >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aliphatics >C5-C6 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aliphatics >C6-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aliphatics >C8-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aromatics >EC10-EC12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aromatics >EC5-EC7 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aromatics >EC7-EC8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Aromatics >EC8-EC10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Benzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | EPH (C6-C10) mg/l | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Ethylbenzene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C10-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C5-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C5-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C5-C6 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C6-C7 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C6-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C7-C8 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO >C8-C10 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO QC | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | GRO Surrogate % recovery** | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | m,p-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | LIQUID | GRO by GC-FID (W) | Methyl tertiary butyl ether (MTBE) | Volatile Analysis performed on vessel with headspace due testing requirement |

CERTIFICATE OF ANALYSIS

Validated

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|-------------------------------|-------------------------|-------------|--------|--------------------------------------|---|--|--|
| SDG: Job: Client Refere | _ | DELL_SHF-38 | | Location: Customer: Attention: | North Bierley Wardell Armstrong LLP Joanne Shaw | Order Number: Report Number: Superseded Report | SH3068 133631 : |
| Sample Number | Customer Sample Ref. | Depth (m) | Matrix | | Test Name | Component Name | Comment |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | o-Xylene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | QC raw | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Sum of detected BTEX | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Sum of detected Xylenes | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | tert-Amyl methyl ether (TAME) | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Toluene | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Total Aliphatics >C5-C12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Total Aromatics >EC5-EC12 | Volatile Analysis performed on vessel with headspace due testing requirement |
| 3589975 | BH6 | | LIQUID | GR | O by GC-FID (W) | Trace | Volatile Analysis performed on vessel with headspace due testing requirement |

Note : Test results may be invalid



CERTIFICATE OF ANALYSIS

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|-------------------|------------------|------------|-----------------------|--------------------|--------|
| SDG: | 110602-86 | Location: | North Bierley | Order Number: | SH3068 |
| Job: | H_WARDELL_SHF-38 | Customer: | Wardell Armstrong LLP | Report Number: | 133631 |
| Client Reference: | SH10534 | Attention: | Joanne Shaw | Superseded Report: | |

Notification of NDPs (No determination possible)

Date Received : 02/06/2011 15:28:07

| Sample No | Customer Sample Ref. | Depth (m) | Test | Comment |
|-----------|----------------------|-----------|------------------------------------|---------------------|
| 3589939 | WS102 | | TPH CWG (W) | Insufficient Sample |
| 3589939 | WS102 | | EPH CWG (Aliphatic) Aqueous GC (W) | Insufficient Sample |
| 3589939 | WS102 | | EPH CWG (Aromatic) Aqueous GC (W) | Insufficient Sample |

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Validated

Table of Results - Appendix

| DP | No Determinati | on Possible | # | ISO 17025 Accredited | | Subcontracted Test | м | MCERTS Accredit | ted |
|-----|---------------------------------|---|-----------------------|--------------------------------------|------------------------------------|--|--------------|-----------------|----------|
| FD | No Fibres Dete | cted | PFD | Possible Fibres Detected | » | Equivalent Carbo (Aromatics C8-C3 | | | |
| | od detection limit lethod No | s are not always achievable | due to vario Refer | us circumstances beyond our c | control | Description | | Wet/Dry | Surrogat |
| IV. | | Mathed for the De | | | Determination | | and hu | Sample 1 | Correcte |
| | TM061 | Method for the De EPH,Massachuse | | | GC-FID (C10-C | of Extractable Petroleum Hydrocart 40) | oons by | | |
| | TM101 | Method 4500B & (1999 | C, AWWA | APHA, 20th Ed., | Determination of Kone Analyser | of Sulphide in soil and water sampl | es using the | | |
| | TM152 | Method 3125B, AV | WWA/APH | IA, 20th Ed., 1999 | Analysis of Aqu | eous Samples by ICP-MS | | | |
| | TM174 | Analysis of Petrole Environmental Me Hydrocarbon Crite | dia – Ťota | | | of Speciated Extractable Petroleum n Waters by GC-FID | I | | |
| | TM176 | EPA 8270D Semi- by Gas Chromato (GC/MS) | | rganic Compounds iss Spectrometry | Determination of | of SVOCs in Water by GCMS | | | |
| | TM178 | Modified: US EPA | Method 8 | 100 | Determination of GC-MS in Wate | of Polynuclear Aromatic Hydrocarb ers | ons (PAH) by | | |
| | TM183 | BS EN 23506:200 0 580 38924 3 | 2, (BS 60 | 58-2.74:2002) ISBN | | of Trace Level Mercury in Waters a apour Atomic Fluorescence Spectr | | | |
| | TM184 | EPA Methods 325 | .1 & 325.2 | 2, | | tion of Anions in Aqueous Matrices notometric Analysers | using the | | |
| | TM208 | Modified: US EPA | Method 8 | 260b & 624 | Determination of GC-MS in Wate | of Volatile Organic Compounds by ers | Headspace / | | |
| | TM227 | Standard methods and wastewaters 2 Method 4500. | | amination of waters n, AWWA/APHA | Determination of Cyanide and Th | of Total Cyanide, Free (Easily Liber niocyanate | atable) | | |
| | TM228 | US EPA Method 6 | 010B | | Determination of ICP-OES | of Major Cations in Water by iCap 6 | 5500 Duo | | |
| | TM241 | Methods for the E Associated Materi Potable Waters ar | als; Chror | nium in Raw and | | ion of Hexavalent Chromium in Wa g the Kone Analyser | aters and | | |
| | TM245 | By GC-FID | | | Determination of | of GRO by Headspace in waters | | | |
| | TM256 | The measurement the Laboratory def Natural, Treated a 1978. ISBN 011 7 | erminatio nd Waste | | Determination of Meter | of pH in Water and Leachate using | the GLpH pH | | |
| | TM259 | by HPLC | | | Determination of | of Phenols in Waters and Leachate | s by HPLC | | |
| | TM294 | | | | | | | | |

13:29:14 13/06/2011

CERTIFICATE OF ANALYSIS

Validated

| SDG: | 110602-86 | Location: | North Bierley | Order Number: | SH3068 |
|-------------------|------------------|------------|-----------------------|--------------------|--------|
| Job: | H WARDELL SHF-38 | Customer: | Wardell Armstrong LLP | Report Number: | 133631 |
| Client Reference: | SH10534 | Attention: | Joanne Shaw | Superseded Report: | |

Test Completion Dates

| Lab Sample No(s) | 3589940 | 3589941 | 3589939 |
|-------------------------------------|-------------|-------------|-------------|
| Customer Sample Ref. | BH5 | BH6 | WS102 |
| AGS Ref. | | | |
| Depth | | | |
| Туре | LIQUID | LIQUID | LIQUID |
| Anions by Kone (w) | 09-Jun-2011 | 09-Jun-2011 | |
| Cyanide Comp/Free/Total/Thiocyanate | 07-Jun-2011 | 07-Jun-2011 | |
| Dissolved Metals by ICP-MS | 08-Jun-2011 | 08-Jun-2011 | |
| EPH CWG (Aliphatic) Aqueous GC (W) | 09-Jun-2011 | 09-Jun-2011 | |
| EPH CWG (Aromatic) Aqueous GC (W) | 09-Jun-2011 | 09-Jun-2011 | |
| Free Sulphur | 08-Jun-2011 | 09-Jun-2011 | |
| GRO by GC-FID (W) | 10-Jun-2011 | 10-Jun-2011 | 10-Jun-2011 |
| Hexavalent Chromium (w) | 07-Jun-2011 | 07-Jun-2011 | |
| Mercury Dissolved | 07-Jun-2011 | 08-Jun-2011 | |
| Metals by iCap-OES Dissolved (W) | 07-Jun-2011 | 07-Jun-2011 | |
| PAH Spec MS - Aqueous (W) | 09-Jun-2011 | 09-Jun-2011 | |
| pH Value | 08-Jun-2011 | 08-Jun-2011 | |
| Phenols by HPLC (W) | 08-Jun-2011 | 09-Jun-2011 | |
| Sulphide | 07-Jun-2011 | 08-Jun-2011 | |
| SVOC MS (W) - Aqueous | 10-Jun-2011 | 10-Jun-2011 | 10-Jun-2011 |
| TPH CWG (W) | 10-Jun-2011 | 10-Jun-2011 | |
| VOC MS (W) | 09-Jun-2011 | 09-Jun-2011 | |

SVOC Tentatively Identified Compounds

| Job Number | - | 110602-86 |
|----------------------|---|-----------------|
| Customer | - | H_WARDELL_SHF |
| Sample Identity | - | 3612430 / BH5[] |
| Sample Type [Units] | - | Water - µg/l |
| Date Acquired | - | 10/06/11 |
| Date Reported | - | 10/06/11 |
| Analyst | - | YL |

| Tentative Compound Identification | | Retention Time min | Concentration µg/l |
|-----------------------------------|---|-----------------------|--------------------|
| Unknown hydrocarbons | - | 13.3 - 17.19 | 6808 |
| | - | | |
| | - | | |
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MAY INCLUDE PREVIOUSLY QUANTIFIED RESULTS

Please Note: the identification and semi-quantification of these tentatively identified compounds is outside the scope of the UKAS accreditation for this method

CERTIFICATE OF ANALYSIS

| SDG: | 110602-86 | | North Bierley |
|-------------------|------------------|------------|-----------------------|
| Job: | H_WARDELL_SHF-38 | Customer: | Wardell Armstrong LLP |
| Client Reference: | SH10534 | Attention: | Joanne Shaw |

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2 Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour 5. We take responsionly for any less performed by sub-contractors (marked with an asiensk), we endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately

11. Results relate only to the items tested.

12 LODs for wet tests reported on a dry weight basis are not corrected for moisture content

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed

Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and ethylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 15 4-Methylphenol) Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeayour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised

Order Number: Report Number: SH3068 133631

SOLID MATRICES EXTRACTION SUMMARY

| ANALYSIS | DIC OR WET | EXTRACTION SOLVENT | Extraction Method | ANALYSS | | |
|---|------------------|-----------------------|----------------------|-------------|--|--|
| SOLVENT EXTRACTABLE MATTER | D&C | DOM | SOXTHERM | GRAVIMETRIC | | |
| CYCLOHEXANE EXT. MATTER | D&C | CYCLOHEXANE | SDXTHEFEM | GRAVIMETRIC | | |
| THIN LAYER CHROMATOGRAPHY | D&C | DOM | NPTH-TXC2 | ATROSCAN | | |
| ELEMENTALSULFHUR | D&C | DOM | MFEHTXOR | HFLC | | |
| PHENOLSBYGOMS | WET | DOM | SOXTHERM | GCMS | | |
| HEREICIDES | D&C | HEXANEACETONE | SOXTHERM | GCMS | | |
| PESTICIDES D&C | | HEXANEACETONE | SOXTHERM | GCMS | | |
| EPH (DRO) | D&C | HEXANEACETONE | ENDOWEREND | GCFD | | |
| ETH (MNOL) | D&C | HEXANEACETONE | ENDOWEREND | GCFD | | |
| EPH (OLENNED UP) | D&C | HEXANEACETONE | ENDOWEREND | GCFD | | |
| EPH CMG BYGC | D&C | HEXANEACETONE | ENDOWEREND | GCFD | | |
| POB TOT / POB CON | D&C | HEXANEACETONE | ENDOWEREND | GCMS | | |
| FOLVAROMATIC HYDROCARBONS (MS) | WET | HEXANEACETONE | MCROWAVE TM218. | GCMS | | |
| 08-040(08-040)ez Flash | WET | HEXANEACETONE | SHAMER | GCEZ | | |
| POL VAROMATIC HYDROCARBONS RAFID GC | WET | HEXANEACETONE | SHAMER | GCEZ | | |
| SEM VOLATILEORGANIC COMPOUNDS | WET | DOMAGETONE | SONICATE | GCMS | | |

LIQUID MATRICES EXTRACTION SUMMARY

| ANALYSIS | EXTRACTION SOLVENT | Extraction Method | ANALYSIS |
|----------------------|-----------------------|-----------------------------|----------|
| PAHMS | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| BH | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| EPHONG | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| MINERALOIL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCFID |
| POB 700 NGENERS | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| POB TOTAL | HEXANE | STIRREDEXTRACTION(STIR-BAR) | GCMS |
| SVOC | DOM | LIQUID/LIQUID SHAKE | GCMS |
| FREESUPHUR | DOM | SOLID PHASE EXTRACTION | HFLC |
| PEST COPIOPP | DOM | LIQUID/LIQUID SHAKE | GCMS |
| TRAZINE HEREG | DOM | LIQUID/LIQUID SHAKE | GCMS |
| PHENOLSMS | DOM | SOLID FHASE EXTRACTION | GCMS |
| TRH by INFRARED (IR) | TCE | LIQUID/LIQUID SHAKE | HFLC |
| MNERALOIL by R | TCE | LIQUID/LIQUID SHAKE | HFLC |
| GLYCOLS | NONE | DIRECT NUECTION | GCMS |

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk The results for identification of asbestos in bi materials are obtained from supplied bulk materials those identified as potentially asbestos contani during sample description which have be examined to determine the presence of asbest fibres using Alcontrol Laboratories (Hawarde in-house method of transmitted/polarised lig microscopy and central stop dispersion stainin based on HSG 248 (2005). ials o be

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation

| Asbestos Type | Common Name |
|----------------------|-----------------|
| Chrysofile | WhiteAddeedatos |
| Ancale | BrownAsbestos |
| Ooiddie | BLe Advestos |
| Fibraus Asindhe | - |
| Florous Anthophylite | - |
| Fibrous Trendile | - |

Superseded Report:



APPENDIX VII

Statistical Analysis of Geochemical Laboratory Results



STATISTICAL ANALYSIS OF SOIL CONTAMINATION DATA - PLANNING SCENARIO (Based on CL-AIRE/CIEH Guidance on Comparing Soil Contamination Data with a Critical Concentration, May 2008)

| ng | Job Number: | SH11534 | Job Name: | North Bierley |
|----|--------------------|-------------------------|-----------|---------------|
| 0 | Assessor: | J Lymer | Date | 15/05/2015 |
| | Proposed Land Use: | Commercial / Industrial | Zone: | All Data |

Key Question: Is there significant evidence that the true mean concentration of the contaminant is less than the screening value (critical concentration)?

Null Hypothesis (H0): The true mean concentration is equal to or greater than the screening value (critical concentration; μ * Cc)

| Alternative Hypothesis (H1): The true mean concentration is less than the screening value (critical concentration; $\mu < cc$) | | | | | | | |
|---|--|--|--|--|--|--|--|
| SAMPLE IDENTIFICATION / STATISTICAL | | | | | | | |

| | TEST | Phenol (total- | | | | | | | | 1 | - | | | | | | |
|------------------|---|----------------|--------------|---------------|--------------|------------|--------------|--------------|---------------|-------------|--------------|-----------------|------------|------------------|----------------|-----------------------------|------------|
| | | Arsenic (As) | Cadmium (Cd) | Chromium (Cr) | Copper (Cu) | Lead (Pb) | Mercury (Hg) | Nickel (Ni) | Selenium (Se) | Boron (B) | Zinc (Zn) | Cyanide (total) | mono) | Sulphate (total) | Sulphate (2:1) | Sulphide (S ²⁻) | Chromium |
| Location | Depth (mbgl) | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | % | g/l | mg/kg | mg/kg |
| WS 109 | 0.70 | 15.8 | 0.5 | 25.9 | 23.6 | 23.8 | 0.1 | 33.6 | 1.1 | 1.0 | 90.1 | 1.0 | 0.10 | 0.014 | 0.035 | 15.00 | 0.60 |
| TP 101 | 0.60 | 18.2 | 1.6 | 19.7 | 84.6 | 1680.0 | 0.1 | 20.8 | 1.0 | | 1230.0 | | 0.10 | 0.025 | 0.008 | | 0.60 |
| TP 102 | 0.80 | 25.6 | 0.5 | 25.6 | 115.0 | 1150.0 | 0.6 | 39.2 | 1.0 | 1.0 | 122.0 | 3.8 | 0.10 | 0.010 | | 15.00 | 0.60 |
| TP 103 | 0.40 | 41.2 | 0.0 | 810.0 | 85.1 | 73.1 | 0.1 | 50.6 | 2.7 | | 154.0 | | 0.10 | 0.134 | 0.088 | | 1.20 |
| TP 104 | 0.50 | 12.8 | 0.5 | 23.1 | 45.1 | 26.1 | 0.1 | 49.3 | 1.0 | | 113.0 | | 0.10 | 0.022 | 0.039 | | 0.60 |
| TP 105 | 0.30 | 20.7 | 0.5 | 166.0 | 85.6 | 95.8 | 0.1 | 34.7 | 1.1 | | 208.0 | | 0.10 | 0.141 | 0.058 | | 0.60 |
| TP 105 | 0.90 | 6.1 | 0.4 | 28.0 | 22.8 | 21.5 | 0.1 | 31.9 | 1.0 | 1.0 | 76.0 | 1.0 | 0.10 | 0.017 | | 15.00 | 0.60 |
| TP 106 | | 8.6 | | 24.1 | 32.1 | 21.2 | 0.1 | 34.3 | 1.0 | | 92.0 | | 0.10 | 0.075 | 0.029 | | 0.60 |
| TP 107 TP 108 | 0.70 | 10.0 | 0.0 | 24.6 | 24.0 24.8 | 21.7 | 0.1 | 36.1 10.6 | 1.0 | | 92.2 51.1 | | 0.10 | 0.077 | 0.167 | | 0.60 |
| TP 108 TP 109 | 0.75 | 101.0 | 1.1 | 24.3 | 127.0 | 160.0 | 0.1 | 10.6 | 10.0 | 1.0 | 219.0 | 1.5 | 0.10 | 0.016 | 0.023 | 15.00 | 1.20 |
| TP 109 TP 110 | 1.00 | 28.1 | | | | | 0.1 | 29.6 | 2.1 | 1.0 | 313.0 | 1.5 | 0.10 | 0.051 | 0.016 | 15.00 | 0.60 |
| TP 110 TP 111 | 0.70 | 45.9 | 1.3 | 25.4 | 85.4 37.9 | 70.1 22.2 | 0.1 | 30.3 | 1.0 | | 62.9 | | 0.10 | 0.026 | 0.041 | | 1.20 |
| TP 111 TP 111 | 1.20 | 45.9 52.3 | 0.0 | 30.4 | 51.0 | 43.5 | 0.1 | 30.3 | 1.0 | | 79.8 | | 0.10 | 0.456 | 0.204 | 1 | 0.60 |
| TP 111 TP 112 | 1.20 | 9.6 | 0.2 | 23.4 | 24.0 | 43.5 | 0.1 | 36.7 | 1.0 | 1.0 | 79.8 | 1.0 | 0.10 | 0.084 | 0.200 | 15.00 | 0.60 |
| TP 112 | 0.35 | 9.8 | 0.3 | 23.4 | 16.7 | 10.5 | 0.1 | 18.8 | 1.0 | 1.0 | 59.8 | 1.0 | 0.10 | 0.008 | 0.016 | 13.00 | 0.60 |
| TP 115 | 0.45 | 19.4 | 1.8 | 40.0 | 40.1 | 34.4 | 0.1 | 33.3 | 1.0 | 1.0 | 130.0 | 1.0 | 0.10 | 0.007 | 0.008 | 15.00 | 0.60 |
| TP 114 | 0.30 | 56.8 | 0.0 | 63.7 | 64.3 | 52.6 | 0.1 | 33.1 | 1.0 | 1.0 | 115.0 | | 0.10 | 0.204 | 0.123 | | 0.60 |
| TP 117 | 0.40 | 5.8 | 0.3 | 26.6 | 46.3 | 16.9 | 0.1 | 52.4 | 1.0 | 1.0 | 105.0 | 1.0 | 0.10 | 0.014 | | 15.00 | 0.60 |
| TP 118 | 0.70 | 15.7 | 0.2 | 25.3 | 31.9 | 40.1 | 0.1 | 34.5 | 10.0 | | 113.0 | 2.0 | 0.10 | 0.027 | 0.027 | | 0.60 |
| TP 119 | 0.30 | 8.3 | 0.4 | 24.0 | 26.1 | 17.3 | 0.1 | 38.1 | 1.0 | 1.0 | 81.4 | 1.0 | 0.10 | 0.031 | | 15.00 | 0.60 |
| WS 101 | 0.40 | 40.3 | 0.6 | 68.5 | 78.5 | 105.0 | 0.1 | 28.0 | 5.0 | 1.0 | 126.0 | 1.0 | 0.10 | 0.014 | 0.008 | 15.00 | 0.60 |
| WS 102 | 0.70 | 625.0 | 1.8 | 477.0 | 447.0 | 485.0 | 0.9 | 36.8 | 1.8 | 1.0 | 396.0 | 8.7 | 0.10 | 0.144 | | 15.00 | 1.37 |
| WS 103 | 0.30 | 10.8 | 0.0 | 35.5 | 49.6 | 92.5 | 0.1 | 29.2 | 10.0 | | 91.7 | | 0.10 | 0.022 | 0.021 | | 0.60 |
| WS 104 | 0.40 | 9.3 | 0.3 | 29.7 | 21.6 | 19.7 | 0.1 | 34.8 | 1.0 | 1.0 | 79.1 | 1.1 | 0.10 | 0.005 | 0.015 | 15.00 | 0.60 |
| WS 105 | 0.30 | 5.6 | 0.0 | 26.6 | 24.5 | 30.5 | 0.1 | 35.8 | 1.0 | | 87.5 | | 0.10 | 0.040 | 0.102 | | 0.60 |
| WS 106 | 0.50 | 28.0 | 0.7 | 176.0 | 158.0 | 137.0 | 0.1 | 38.0 | 1.0 | 1.0 | 209.0 | 23.8 | 0.10 | 0.078 | | 15.00 | 1.20 |
| WS 107 | 0.50 | 25.1 | 0.5 | 32.4 | 41.7 | 112.0 | 0.1 | 28.4 | 1.0 | | 96.2 | | 0.10 | 0.060 | 0.013 | | 0.60 |
| WS 108 | 0.40 | 160.0 | 0.0 | 168.0 | 259.0 | 508.0 | 0.9 | 22.4 | 10.0 | | 329.0 | | 0.10 | 0.136 | 0.140 | | 3.00 |
| WS 110 | 0.60 | 17.2 | 0.0 | 20.3 | 30.6 | 31.1 | 0.1 | 35.7 | 1.0 | | 88.2 | | 0.10 | 0.025 | 0.008 | | 0.60 |
| | Number of samples (N) | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 11 | 29 | 11 | 29 | 29 | 22 | 11 | 29 |
| | Minimum | 5.56 | 0.02 | 19.7 | 16.7 | 16.5 | 0.14 | 10.6 | 1 | 1 | 51.1 | 1 | 0.1 | 0.00499 | 0.008 | 15 | 0.6 |
| | Maximum | 625 | 1.82 | 810.0 | 447 | 1680 | 0.936 | 52.4 | 10 | 1 | 1230 | 23.8 | 0.1 | 0.456 | 0.204 | 15 | 3 |
| | Standard Deviation | 115 | 1 | 166 | 88 | 370 | 0 | 9 | 4 | 0 | 221 | 7 | 0 | 0 | 0 | 0 | 0 |
| | g Value (Critical Conc.; Cc) | 640 | 190 | 8600 | 68000 | 2330 | 1100 | 980 | 12000 | 9000 | 730000 | 20 | 760 | n/a | n/a | n/a | 33 |
| | Source of Screening Value | | | | | | | | | | | | | | | | |
| utlier Identific | | | | | | | | | | | | | | | | | |
| | Standardised Value (Tn) | 3.140 | 1.275 | 2.961 | 2.716 | 2.588 | 3.163 | 1.526 | 1.620 | #DIV/01 | 3.375 | 2.302 | -0.983 | 2.266 | 1.576 | #DIV/01 | 3.666 |
| | Critical Value (Tcrit) | 2.730 | 2.730 | 2.730 | 2.730 | 2.730 | 2.730 | 2.730 | 2.730 | 2.234 | 2.730 | 2.234 | 2.730 | 2.730 | 2.603 | 2.234 | 2.730 |
| | there an Outlier (Tn > Tcrit) | YES | NO | YES | NÖ | NO | YES | NO | NO | #DIV/01 | YES | YES | NO | NO | NO | #DIV/01 | YES |
| Outli | ier location(s) and depth(s) | | | | | | | | | | | | | | | | |
| | Outlier status | | | | | | | | | | | | | | | | |
| | ave a Normal Distribution? | | | | | | | | | | | | | | | | |
| Visual E | Estimate (probablitity plot) | NO 0.37 | NO 0.82 | NO 0.46 | NO 0.61 | NO 0.48 | NO 0.37 | YES 0.96 | NO 0.61 | n/a stdev=0 | NO 0.48 | #REF! #REF! | NO 0.00 | NO 0.65 | NO 0.56 | n/a stdev=0 | NO 0.45 |
| | Shapiro-Wilk statistic (W) | 0.37 NO | 0.82 NO | 0.46 NO | 0.61 NO | 0.48 NO | 0.37 NO | U.96 YES | 0.61 NO | n/a stdev=0 | 0.48 NO | #REF! | NO NO | 0.65 NO | 0.56 NO | n/a stdev=0 | 0.45 NO |
| | Wilk Test (is W > Sig(0.05)) n Concentration (95% UCL) | | n/a | n/a | n/a | n/a | n/a | 36 | | n/a stdev=0 | | #REF! | | n/a | | n/a stdev=0 15 | n/a |
| | enificant evidence that the | n/a | 11/a | n/a | 11/a | n/a | 11/2 | 36 | n/a | 1 | n/a | entr! | n/a | n/a | n/a | -15 | n/a |
| | ncentration is less than the | n/a | n/a | n/a | n/a | n/a | n/a | YES | n/a | YES | n/a | #REF! | n/a | n/a | n/a | YES | n/a |
| ean cor | screening value (µ < Cc)? | 1.74 | | /a | /a | / a | .1/4 | .65 | .44 | .25 | .17.8 | WALEP I | | .1/4 | /a | .23 | ii/a |
| | Level of Evidence (p., %) | n/a | n/a | n/a | n/a | n/a | n/a | 100 | n/a | #DIV/01 | n/a | #REF! | n/a | n/a | n/a | n/a | n/a |
| oes the Data h | ave a Non-normal Distributi | | | | | | | | | | | | | | | | |
| | Chebychey Theorem. | YES | YES | YES | YES | YES | YES | NO | YES | NO | YES | #REF! | YES | YES | YES | NO | YES |
| Mean | n Concentration (95% UCL) | 143 | 1 | 224 | 147 | 477 | 0 | n/a | 7 | n/a | 351 | #REF! | 0 | 0 | 0 | n/a | 1 |
| | gnificant evidence that the | | | | | | | | | | | | | | | | |
| | ncentration is less than the | YES | YES | YES | YES | YES | YES | n/a | YES | n/a | YES | #REF! | YES | n/a | n/a | n/a | YES |
| | screening value (u < Cc)? | | | | | | | | | /- | | | | | /- | | |
| | | | | | | | | | | | | | | | | | 99 |



STATISTICAL ANALYSIS OF SOIL CONTAMINATION DATA - PLANNING SCENARIO (Based on CLAIRE/CIEH Guidance on Comparing Soil Contamination Data with a Critical Concentration, May 2008)

| Job Number: | SH11534 | Job Name: | North Bierley |
|---------------------|-------------------------|-----------|---------------|
| Assessor: | J Lymer | Date: | 15/05/2015 |
| Proposed Land Line: | Commercial / Industrial | 7000 | All Data |

Key Question: Is there significant evidence that the true mean concentration of the contaminant is less than the screening value (critical concentration)?

Null Hypothesis (H0): The true mean concentration is equal to or greater than the screening value (critical concentration; μ ^a Cc)

| Alternative Hypothesis (H1): The true mean concentration is less than the screening value (critical concentration; µ < cc) |
|--|
| |

| SAMPLE IDENTIFICATION / STATISTICAL TEST | | | | | | | | RECORDE | D CONCENTRATION | / STATISICAL RE | SULT | | | | | | |
|---|--|--------------|----------------|------------|------------------------|----------------|--------------------------|------------------------|--------------------------|-----------------|---------------------------|--------------|----------|-------------------------|-------------|--------------|------------|
| | | Acenaphthene | Acenaphthylene | Anthracene | Benzo(a) anthracene | Benzo(a)pyrene | Benzo(b) fluoranthene | Benzo(ghi) perylene | Benzo(k) fluoranthene | Chrysene | Dibenzo(ah) anthracene | Fluoranthene | Fluorene | Indeno(123cd) pyrene | Naphthalene | Phenanthrene | Pyrene |
| Location | Depth (mbgl) | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg |
| TP 101 | 0.60 | 597 | 100.0 | 1030 | 1980 | 1720 | 1100 | 746 | 1480 | 2020 | 178 | 4520 | 483.00 | 690 | 795 | 4550 | 3880 |
| TP 102 | 0.80 | 8 | 12.0 | 16 | 70 | 50 | 78 | 41 | 28 | 58 | 23 | 81 | 10.00 | 32 | 55 | 92 | 73 |
| TP 103 | 0.40 | 442 | 200.0 | 1220 | 4630 | 5710 | 4670 | 3210 | 4140 | 4600 | 739 | 8750 | 377.00 | 3020 | 381 | 4350 | 7940 |
| TP 104 TP 105 | 0.50 | 100 | 100.0 | 100 | 100 236 | 100 | 124 272 | 100 199 | 100 287 | 198 344 | 100 | 176 445 | 100.00 | 100 | 387 162 | 622 382 | 181 425 |
| TP 105 | 0.30 | 100 | 100.0 | 24 | 236 | 305 | 40 | 24 | 14 | 23 | 23 | 445 | 100.00 | 164 | 162 | 382 | 425 |
| TP 105 | 0.50 | 127 | 100.0 | 796 | 2350 | 2400 | 1860 | 1250 | 1830 | 2210 | 255 | 4790 | 116.00 | 1140 | 166 | 1950 | 4140 |
| TP 107 | 0.70 | 100 | 100.0 | 100 | 100 | 100 | 1000 | 100 | 1000 | 100 | 100 | 100 | 100.00 | 100 | 100 | 100 | 100 |
| TP 108 | 0.75 | 100 | 100.0 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.00 | 100 | 100 | 100 | 100 |
| TP 109 | 0.60 | 186 | 81.9 | 442 | 1600 | 1560 | 2200 | 1100 | 810 | 1500 | 310 | 2860 | 153.00 | 992 | 166 | 1620 | 2400 |
| TP 110 | 1.00 | 100 | 100.0 | 132 | 544 | 594 | 523 | 335 | 466 | 569 | 100 | 1040 | 100.00 | 291 | 100 | 618 | 950 |
| TP 111 | 0.70 | 100 | 100.0 | 100 | 128 | 100 | 100 | 100 | 100 | 243 | 100 | 135 | 100.00 | 100 | 187 | 931 | 174 |
| TP 111 | 1.20 | 100 | 100.0 | 226 | 628 | 568 | 502 | 290 | 456 | 636 | 100 | 1330 | 100.00 | 267 | 133 | 916 | 1130 |
| TP 112 | 0.50 | 8 | 12.0 | 16 | 14 | 15 | 15 | 24 | 14 | 10 | 23 | 17 | 10.00 | 18 | 9 | 15 | 15 |
| TP 113 | 0.45 | 100 | 100.0 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.00 | 100 | 100 | 100 | 100 |
| TP 114 | 0.80 | 8 | 12.0 | 16 | 54 | 27 | 44 | 30 | 20 | 56 | 23 | 71 | 10.00 | 18 | 9 | 77 | 62 |
| TP 115 | 0.30 | 100 | 100.0 | 100 | 191 | 204 | 236 | 179 | 150 | 296 | 100 | 312 | 100.00 | 133 | 309 | 801 | 317 |
| TP 117 | 0.40 | 8 | 12.0 | 16 | 25 | 15 | 26 | 24 | 14 | 33 | 23 | 24 | 12.60 | 18 | 155 | 206 | 27 |
| TP 118 | 0.70 | 100 | 100.0 | 100 | 215 | 229 | 205 | 142 | 181 | 247 | 100 | 386 | 100.00 | 119 | 100 | 286 | 361 |
| TP 119 | 0.30 | 8 | 12.0 | 19 | 82 | 69 | 147 | 85 | 40 | 98 | 23 | 130 | 10.00 | 46 | 36 | 179 | 125 |
| WS 101 | 0.40 | 55 | 28.3 | 174 | 1000 | 1050 | 1270 | 791 | 528 | 951 | 165 | 2040 | 36.40 | 642 | 49 | 620 | 1830 |
| WS 102 | 0.70 | 4050 | 395.0 | 7930 | 16500 | 16300 | 16500 | 9650 | 7130 | 14000 | 2530 | 35800 | 3590.00 | 8940 | 6390 | 29600 | 28600 |
| WS 103 | 0.30 | 100 | 100.0 | 146 | 372 | 375 | 307 | 242 | 288 | 392 | 100 | 765 | 100.00 | 204 | 159 | 637 | 663 |
| WS 104 | 0.40 | 8 | 12.0 | 16 | 31 | 20 | 38 | 24 | 14 | 25 | 23 | 33 | 10.00 | 18 | 12 | 34 | 30 |
| WS 105 | 0.30 | 100 | 100.0 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100.00 | 100 | 100 | 147 | 100 |
| WS 106 | 0.50 | 93 | 68.2 | 259 | 1550 | 1980 | 2260 | 1850 | 859 | 1460 | 400 | 2290 | 71.70 | 1470 | 567 | 1350 | 2060 |
| WS 107 | 0.50 | 498 | 100.0 | 951 | 1770 | 1710 | 1300 | 751 | 1450 | 1950 | 163 | 4310 | 472.00 | 705 | 1110 | 4650 | 3780 |
| WS 108 | 0.40 | 8450 | 1000.0 | 10400 | 20300 | 19400 | 13900 | 9900 | 14100 | 20500 | 2030 | 47100 | 5920.00 | 8860 | 7060 | 49000 | 40200 |
| WS 109 | 0.70 | 8 100 | 12.0 | 16 100 | 54 | 30 | 62 100 | 41 100 | 14 100 | 68 100 | 23 | 65 100 | 10.00 | 18 | 86 100 | 196 131 | 60 100 |
| WS 110 | 0.60 Number of samples (N) | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | Minimum | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 17 | 30 | 18 | 30 | 30 | 30 |
| | Maximum | 8450 | 1000 | 10400.0 | 20300 | 15 | 15 | 24 9900 | 14 | 20500 | 2530 | 47100 | 5920 | 18 8940 | 7060 | 49000 | 40200 |
| | Standard Deviation | 1665 | 1000 | 2312 | 4641 | 4525 | 3843 | 9900 2467 | 2852 | 4407 | 567 | 10498 | 1224 | 2248 | 1675 | 10151 | 40200 |
| Caracala | ng Value (Critical Conc.; Cc) | 1665 | 212000 | 540000000 | 4641 | 4525 | 3843 | 4000000 | 1200000 | 350000 | 3600 | 23000000 | 68000000 | 510000 | 183000 | 22000000 | 5400000 |
| Screenin | Source of Screening Value | 141000 | 212000 | 54000000 | 170000 | 35000 | 44000 | 400000 | 1200000 | 350000 | 3600 | 2300000 | 68000000 | 510000 | 183000 | 2200000 | 5400000 |
| utlier Identific | | | 1 | | | | | | | | 1 | - | | | | 1 | |
| actier identific | Standardised Value (Tn) | 2.628 | 2.417 | 2.494 | 2.253 | 2.133 | 2.229 | 2.236 | 2.203 | 2.243 | 2.536 | 2.171 | 2.639 | 2.178 | 2.448 | 2.433 | 2.187 |
| | Critical Value (Tcrit) | 2.745 | 2.745 | 2.745 | 2.745 | 2.745 | 2.745 | 2.745 | 2.745 | 2.745 | 2.336 | 2.745 | 2.035 | 2.745 | 2.745 | 2.745 | 2.187 |
| | there an Outlier (Tn > Tcrit) | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| | lier location(s) and depth(s) | NO | NO | | NO | 110 | NO | NO | NO | NO | NO NO | NO | NO | 10 | | NO | |
| ouu | Outlier status | | | | | | | | | | | | | | | | |
| es the Data h | have a Normal Distribution? | | | | | | | | | | | | | | | | |
| | Estimate (probablitity plot) | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| | Shapiro-Wilk statistic (W) | 0.33 | 0.46 | 0.38 | 0.43 | 0.44 | 0.45 | 0.45 | 0.45 | 0.44 | 0.45 | 0.41 | 0.35 | 0.45 | 0.38 | 0.37 | 0.42 |
| Shapiro | -Wilk Test (is W > Sig(0.05)) | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO | NO |
| | in Concentration (95% UCL) | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | ignificant evidence that the | | | | | | | | | | | | | | | | |
| mean co | ncentration is less than the | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | screening value (μ < Cc)? | | 1 | | 1 | | | | | | | | | | | 1 | |
| | Level of Evidence (p1, %) | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| oes the Data h | have a Non-normal Distribut | | | | | | | | | | | | | | | | |
| | Chebychev Theorem. | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| | in Concentration (95% UCL) | 1854 | 261 | 2669 | 5526 | 5437 | 4669 | 3018 | 3438 | 5274 | 727 | 12290 | 1394 | 2740 | 1970 | 11557 | 10307 |
| | ignificant evidence that the | | | | | | | | | | | | | | | | |
| mean co | ncentration is less than the | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| | screening value (μ < Cc)? Level of Evidence (p1, %) | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| | | | | | | | | | | | | | | | | | |



APPENDIX VIII

Geotechnical Laboratory Results



LABORATORY REPORT



4043

Contract Number: PSL11/1223

Client's Reference:

Report Date: 09 June 2011

Client Name: Wardell Armstrong Unit 4, Newton Business Centre Thorncliffe Park Chapeltown Sheffield S35 2PH

For the attention of: Mike Kelly

Contract Title: North Bierley WWTW

Date Received:24-May-11Date Commenced:24-May-11Date Completed:09-June-11

Notes: Observations and Interpretations are outside the UKAS Accreditation

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

Checked and Approved Signatories:

lo

R Gunson (Director) A Watkins (Director) M Beastall (Laboratory Manager)

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SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Hole Number | Sample Number | Sample Type | Depth m | Description of Sample |
|----------------|------------------|----------------|------------|---|
| BH1 | 4 | В | 0.85-1.20 | Brown gravelly very sandy CLAY. |
| BH1 | 8 | U | 2.00-2.45 | Very stiff brown gravelly very sandy CLAY. |
| BH1 | 9 | D | 2.50 | Brown gravelly very sandy CLAY. |
| BH1 | 12 | U | 3.50-3.95 | Stiff brown slightly gravelly slightly sandy very silty CLAY. |
| BH1 | 13 | D | 4.00 | Brown slightly sandy very silty CLAY. |
| BH1 | 19 | D | 6.10 | Brown sandy slightly clayey GRAVEL. |
| BH2 | 2 | В | 0.50-1.00 | Brown very gravelly very sandy CLAY. |
| BH2 | 5 | В | 2.00-2.60 | Brown mottled grey gravelly slightly sandy CLAY. |
| BH2 | 8 | D | 3.40 | Dark grey very gravelly CLAY. |
| BH2 | 17 | В | 6.60-7.10 | Brown very sandy very clayey GRAVEL. |
| BH2 | 20 | D | 8.40 | Brown sandy GRAVEL. |
| BH3 | 6 | В | 1.10-1.70 | Brown slightly gravelly very sandy CLAY. |
| BH3 | 4 | U | 1.20-1.65 | Stiff brown mottled grey gravelly sandy CLAY. |
| BH3 | 5 | D | 1.70 | Brown very gravelly sandy CLAY. |
| BH3 | 8 | U | 2.30-2.70 | Very stiff brown gravelly very sandy CLAY. |
| BH3 | 9 | D | 2.70 | Brown gravelly very sandy CLAY. |
| BH3 | 14 | В | 4.70-5.20 | Brown very clayey SAND & GRAVEL. |
| BH4 | 2 | В | 0.50-1.00 | Grey very gravelly sandy very silty CLAY. |
| BH4 | 3,4 | В | 1.20-2.40 | Brown slighlty gravelly sandy CLAY. |

| | Compiled by | Date | Checked by | Date | Approved by | Date |
|-------------------------------|-------------|----------|------------|--------------|-------------|----------|
| l | (DD) | 09/06/11 | RC | 09/06/11 | R | 09/06/11 |
| Professional Soils Laboratory | NO | DTH DIFD | | Contract No: | PSL11/1223 | |
| | NO. | | LEY WWTW. | | Client Ref: | SH10534 |

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Hole Number | Sample Number | Sample Type | Depth m | Description of Sample |
|----------------|------------------|----------------|------------|---|
| BH4 | 5 | D | 2.40 | Brown gravelly sandy CLAY. |
| BH4 | 6 | U | 2.50-2.95 | Firm brown mottled grey slightly gravelly sandy silty CLAY. |
| BH4 | 7 | D | 3.00 | Brown mottled grey very gravelly sandy silty CLAY. |
| BH4 | 9 | U | 4.50-4.95 | Grey mottled brown gravelly sandy silty CLAY. |
| BH4 | 12 | U | 2.20-2.65 | Brown mottled grey gravelly sandy CLAY. |
| BH4 | 13 | D | 7.00 | Dark brown gravelly sandy CLAY. |
| BH4 | 17 | D | 7.80 | Brown very gravelly sandy CLAY. |
| BH5 | 2,3,4 | В | 0.50-2.70 | Grey very gravelly sandy CLAY. |
| BH5 | 5,7 | В | 3.20-4.50 | Brown mottled grey very gravelly very sandy CLAY |
| BH5 | 7 | В | 4.00-4.50 | Brown mottled grey very gravelly very sandy CLAY |
| BH5 | 10 | U | 5.70-6.15 | Soft brown mottled grey slightly gravelly very sandy CLAY. |
| BH5 | 11 | D | 6.20 | Brown mottled grey slightly gravelly very sandy CLAY. |
| BH5 | 12 | В | 5.80-6.50 | Brown mottled grey slightly gravelly very sandy CLAY. |
| BH5 | 13 | U | 6.70-7.15 | Firm brown mottled grey gravelly sandy CLAY. |
| BH5 | 14 | D | 7.20 | Brown mottled grey gravelly sandy CLAY. |
| BH6 | 2,3,4 | D | 0.50-1.80 | Brown gravelly sandy CLAY. |
| BH6 | 5 | В | 2.20-2.90 | Brown mottled grey very gravelly sandy CLAY. |
| BH6 | 10 | В | 5.20-5.70 | Brown mottled grey very gravelly very sandy CLAY. |
| BH6 | 10,11 | В | 5.20-6.70 | Brown mottled grey very gravelly very sandy CLAY. |

| | Compiled by | Date | Checked by | Date | Approved by | Date |
|-------------------------------|---------------|----------|------------|--------------|-------------|----------|
| est. | \mathcal{A} | 09/06/11 | RC | 09/06/11 | R | 09/06/11 |
| Professional Soils Laboratory | NO | оти рігр | | Contract No: | PSL11/1223 | |
| | NO. | | RLEY WWTW. | | Client Ref: | SH10534 |

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Hole Number | Sample Number | Sample Type | Depth m | Description of Sample |
|----------------|------------------|----------------|------------|---|
| BH6 | 13 | U | 7.00-7.45 | Firm grey slightly gravelly slightly sandy silty CLAY. |
| BH6 | 14 | D | 7.50 | Grey gravelly silty CLAY. |
| BH6 | 17 | U | 8.50-8.95 | Stiff brown gravelly sandy CLAY. |
| BH6 | 18 | D | 9.00 | Brown gravelly sandy CLAY. |
| BH6 | 20 | U | 9.50-9.85 | Firm brown very gravelly very sandy CLAY. |
| BH6 | 21 | D | 9.85 | Brown very gravelly sandy CLAY. |
| BH7 | 3 | U | 1.20-1.65 | Brown mottled grey very gravelly sandy CLAY. |
| BH7 | 4 | D | 1.70 | Dark grey mottled brown very gravelly sandy silty CLAY. |
| BH7 | 6 | U | 2.20-2.65 | Stiff brown mottled grey gravelly sandy CLAY. |
| BH7 | 15 | U | 5.50-5.85 | Firm brown slightly gravelly sandy silty CLAY. |
| BH7 | 16 | D | 6.00 | Brown gravelly sandy silty CLAY. |
| BH7 | 21 | D | 7.40 | Brown gravelly sandy silty CLAY. |
| TP102 | | В | 1.20 | Brown mottled grey gravelly very sandy very silty CLAY. |
| TP108 | | В | 0.90 | Brown mottled grey gravelly very sandy very silty CLAY. |
| TP111 | | В | 2.20 | Brown slightly gravelly sandy CLAY. |
| TP114 | | В | 1.10 | Brown very gravelly very sandy silty CLAY. |
| TP118 | | В | 1.40 | Brown slightly gravelly slightly sandy CLAY. |
| | | | | |

| | Compiled by | Date | Checked by | Date | Approved by | Date |
|-------------------------------|-------------|----------|------------|----------|--------------|------------|
| PSL | 6000 | 09/06/11 | RC | 09/06/11 | R | 09/06/11 |
| Professional Soils Laboratory | NO | оти рігр | LEY WWTW. | | Contract No: | PSL11/1223 |
| | NO. | | | | Client Ref: | SH10534 |

SUMMARY OF SOIL CLASSIFICATION TESTS

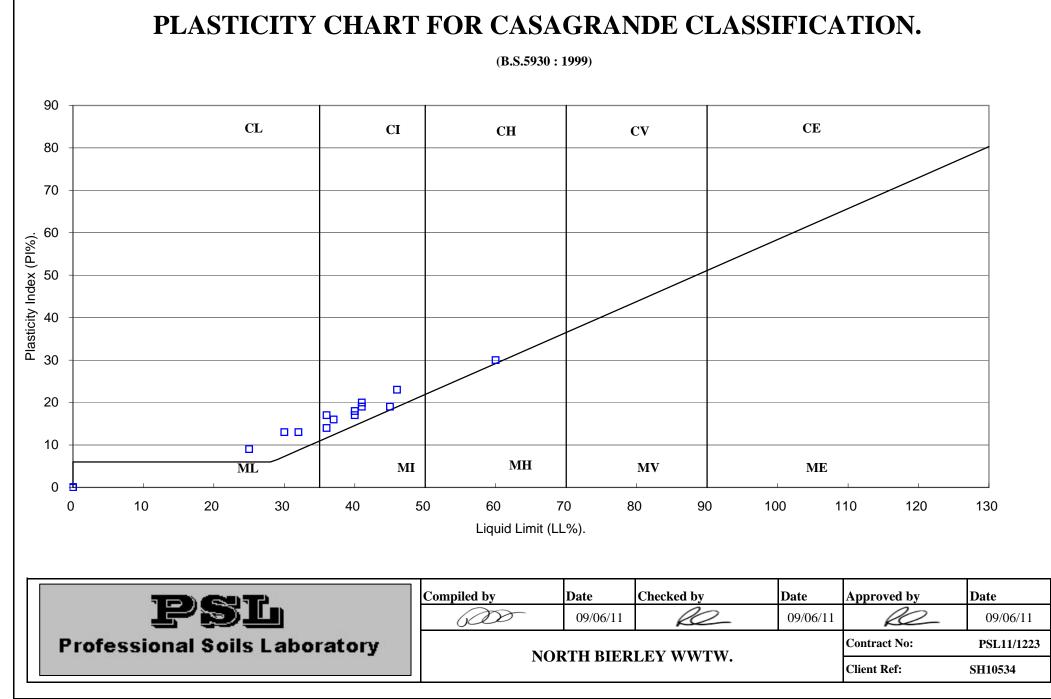
(B.S. 1377 : PART 2 : 1990)

| Hole Number | Sample Number | Sample Type | Depth m | Moisture Content % | Bulk Density Mg/m ³ | Dry Density Mg/m ³ | Particle Density Mg/m ³ | Liquid Limit % | Plastic Limit % | Plasticity Index % | % Passing .425mm | Remarks |
|----------------|------------------|----------------|------------|--------------------------|--------------------------------------|-------------------------------------|--|----------------------|-----------------------|--------------------------|------------------------|-----------------------------|
| | | | | Clause 3.2 | Clause 7.2 | Clause 7.2 | Clause 8. | Clause 4.3/4.4 | Clause 5. | Clause 6. | | |
| BH1 | 9 | D | 2.50 | 14 | | | | 25 | 16 | 9 | 68 | Low plasticity CL. |
| BH1 | 13 | D | 4.00 | 17 | | | | 37 | 21 | 16 | 95 | Intermediate plasticity CI. |
| BH1 | 19 | D | 6.10 | 7.4 | | | | | NP | | | |
| BH2 | 2 | В | 0.50-1.00 | 11 | | | | | | | | |
| BH2 | 5 | В | 2.00-2.60 | 27 | | | | | | | | |
| BH2 | 8 | D | 3.40 | 14 | | | | | | | | |
| BH2 | 20 | D | 8.40 | 9.4 | | | | | | | | |
| BH3 | 5 | D | 1.70 | 14 | | | | 32 | 19 | 13 | 68 | Low plasticity CL. |
| BH3 | 9 | D | 2.70 | 14 | | | | 30 | 17 | 13 | 81 | Low plasticity CL. |
| BH4 | 2 | В | 0.50-1.00 | 36 | | | | | | | | |
| BH4 | 5 | D | 2.40 | 19 | | | | 36 | 22 | 14 | 81 | Intermediate plasticity CI. |
| BH4 | 7 | D | 3.00 | 14 | | | | 40 | 23 | 17 | 68 | Intermediate plasticity CI. |
| BH4 | 13 | D | 7.00 | 28 | | | | 60 | 30 | 30 | 82 | High plasticity CH. |
| BH4 | 17 | D | 7.80 | 17 | | | | 45 | 26 | 19 | 61 | Intermediate plasticity CI. |
| BH5 | 7 | В | 4.00-4.50 | 19 | | | | 41 | 21 | 20 | 50 | Intermediate plasticity CI. |
| BH5 | 11 | D | 6.20 | 32 | | | | 46 | 23 | 23 | 90 | Intermediate plasticity CI. |
| BH5 | 14 | D | 7.20 | 18 | | | | 41 | 22 | 19 | 79 | Intermediate plasticity CI. |
| BH6 | 14 | D | 7.50 | 16 | | | | 36 | 19 | 17 | 77 | Intermediate plasticity CI. |
| BH6 | 18 | D | 9.00 | 20 | | | | 40 | 22 | 18 | 80 | Intermediate plasticity CI. |

SYMBOLS : NP : Non Plastic

*: Liquid Limit and Plastic Limit Wet Sieved.

| | Compiled by | Date | Checked by | Date | Approved by | Date |
|-------------------------------|---------------|----------|--------------|------------|-------------|----------|
| est. | \mathcal{A} | 09/06/11 | RC | 09/06/11 | R | 09/06/11 |
| Professional Soils Laboratory | NOI | | Contract No: | PSL11/1223 | | |
| | NOI | AIN DIEK | LEY WWTW. | | Client Ref: | SH10534 |



SUMMARY OF SOIL CLASSIFICATION TESTS

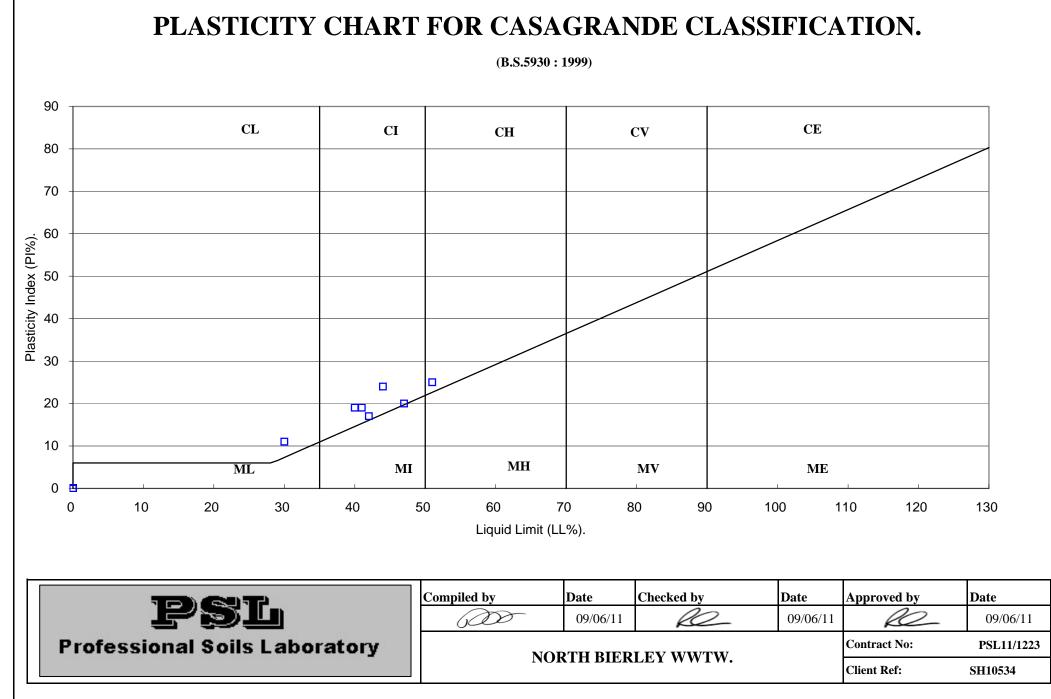
(B.S. 1377 : PART 2 : 1990)

| | | | | Moisture | Bulk | Dry | Particle | Liquid | Plastic | Plasticity | % | |
|--------------|--------|--------|-------|------------|-------------------|-------------------|-------------------|----------------|-----------|------------|---------|-----------------------------|
| Hole | _ | Sample | Depth | Content | Density | Density | Density | Limit | Limit | Index | Passing | Remarks |
| Number | Number | Туре | m | % | Mg/m ³ | Mg/m ³ | Mg/m ³ | % | % | % | .425mm | |
| | | | | Clause 3.2 | Clause 7.2 | Clause 7.2 | Clause 8. | Clause 4.3/4.4 | Clause 5. | Clause 6. | | |
| BH6 | 21 | D | 9.85 | 15 | | | | 40 | 21 | 19 | 68 | Intermediate plasticity CI. |
| BH7 | 4 | D | 1.70 | 22 | | | | 42 | 25 | 17 | 70 | Intermediate plasticity CI. |
| BH7 | 16 | D | 6.00 | 19 | | | | 44 | 20 | 24 | 82 | Intermediate plasticity CI. |
| BH7 | 21 | D | 7.40 | 12 | | | | 41 | 22 | 19 | 84 | Intermediate plasticity CI. |
| TP102 | | В | 1.20 | 26 | | | | 47 | 27 | 20 | 81 | Intermediate plasticity CI. |
| TP108 | | В | 0.90 | 28 | | | | 51 | 26 | 25 | 87 | Intermediate plasticity CI. |
| TP114 | | В | 1.10 | 13 | | | | 30 | 19 | 11 | 54 | Low plasticity CL. |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
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| | 1 | | | | | | | | | | | |
| | | | | | | | | | | | | |

SYMBOLS : NP : Non Plastic

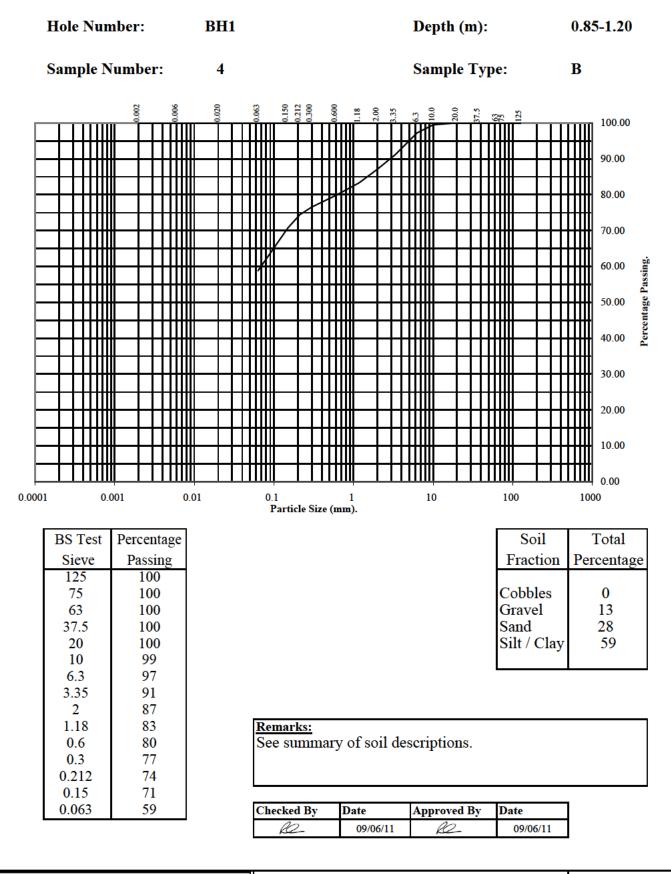
*: Liquid Limit and Plastic Limit Wet Sieved.

| | Compiled by | Date | Checked by | Date | Approved by | Date |
|-------------------------------|---------------|----------|--------------|------------|-------------|----------|
| est. | \mathcal{A} | 09/06/11 | R | 09/06/11 | R | 09/06/11 |
| Professional Soils Laboratory | NOI | | Contract No: | PSL11/1223 | | |
| | NOF | AIN DIEK | LEY WWTW. | | Client Ref: | SH10534 |



BS1377 : Part 2 : 1990

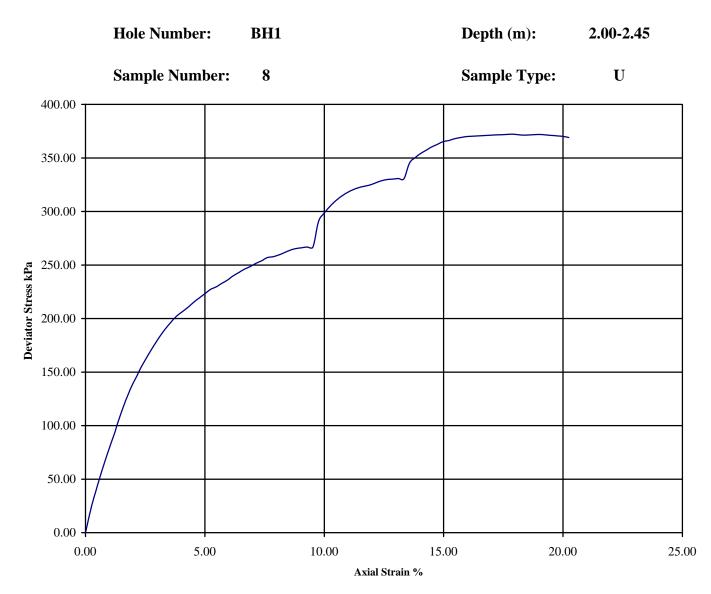
Wet Sieve, Clause 9.2





NORTH BIERLEY WWTW.

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 9 : 1990

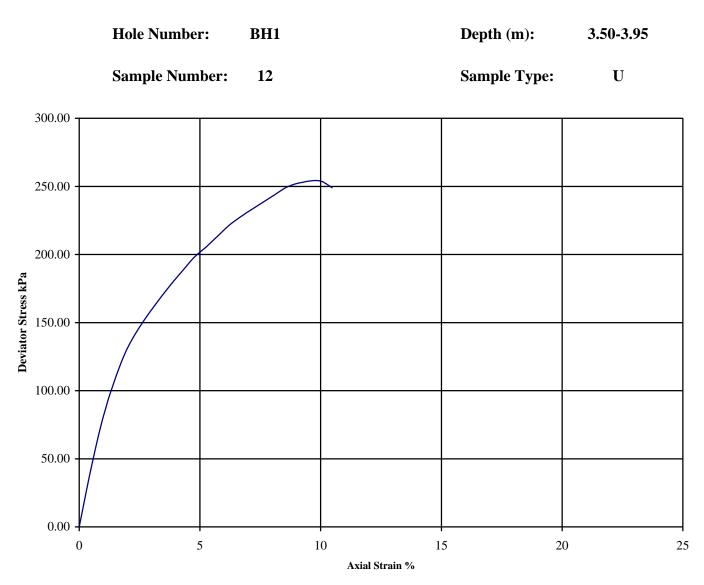


| Diamete | er (mm): | 102 | Height (| mm): | 210 | Test: | 1001 | nm Multis | stage | | | | |
|----------|---|---------|----------|------------|---------------------------|--|---------|-----------|--------------|--------------------------------------|-------------------|----------|--|
| | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Ren | narks | | |
| Specimen | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tak | Sample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of stra | Rate of strain = $1.9 \%/\text{min}$ | | | |
| | | | | | (kPa) | (kPa) | | | Latex Men | nbrane use | ed 0.2 mm t | hickness | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Membrane | Membrane Correction applied (kPa) | | | |
| А | 13 | 2.06 | 1.82 | 40 | 267 | 133 | 9.5 | Brittle | 0.35 | 0.35 | 0.34 | | |
| | | | | 80 | 331 | 165 | 13.1 | | See summa | ary of soil | description | ıs. | |
| | | | | 160 | 372 | 186 | 17.9 | | Checked | Date | Approved | Date | |
| | | | | | | | | | R | 09/06/11 | R | 09/06/11 | |
| Profes | PSL Professional Soils Laboratory | | | | NORTH BIERLEY WWTW. | | | | | | act No: 1/1223 | | |

PSLR030 Issue 1

Professional Soils Laboratory

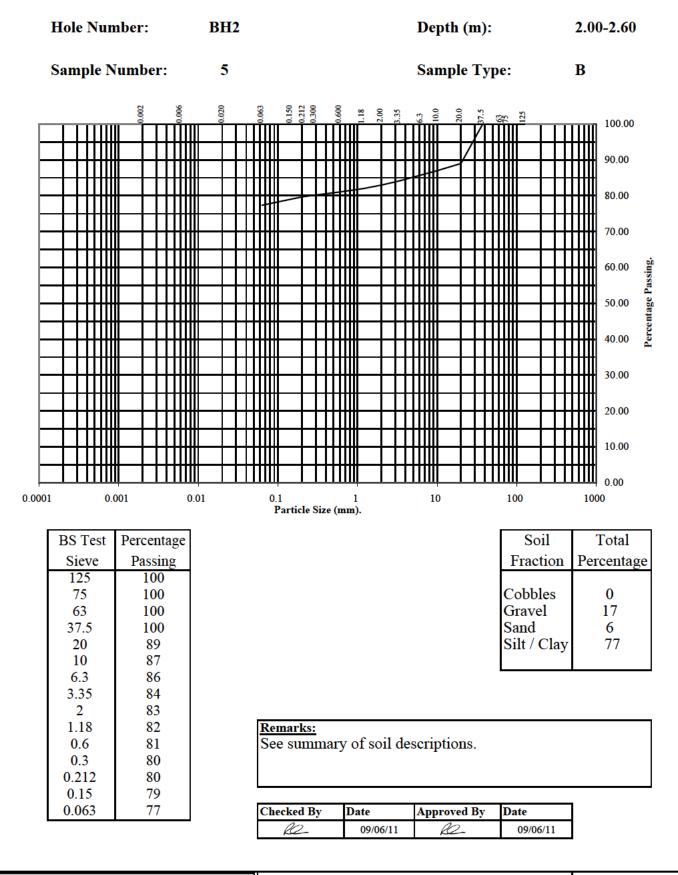
without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 8 : 1990



| Diamete | er (mm): | 102.0 | Height (| mm): | 210.0 | Test: | 100 m | m Single | Stage. | Undistur | bed | | |
|----------|-----------------------|-------------------------|----------|------------|---------------------------|--|---------|----------|--|-------------------------------|-------------------|-----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Ren | narks | | |
| | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tak | Sample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of stra | | | | |
| | (kPa) (kPa) | | | | | | | | Latex Mem | ıbrane use | ed 0.2 mm t | hickness, | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Correction applied 0.35 kPa | | | kPa | |
| А | 17 | 2.06 | 1.75 | 70 | 254 | 127 | 10.0 | Brittle | Single stage due to early brittle failur | | | failure. | |
| | | | | | | | | | | | | | |
| | | | | | | | | | Checked | Date | Approved | Date | |
| | | | | | | | | | R | 09/06/11 | R | 09/06/11 | |
| Profes | P ssional S | SL ioils Labo | oratory | N | ORTH B | SIERLEY | YWWT | W. | | | act No: 1/1223 | | |

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

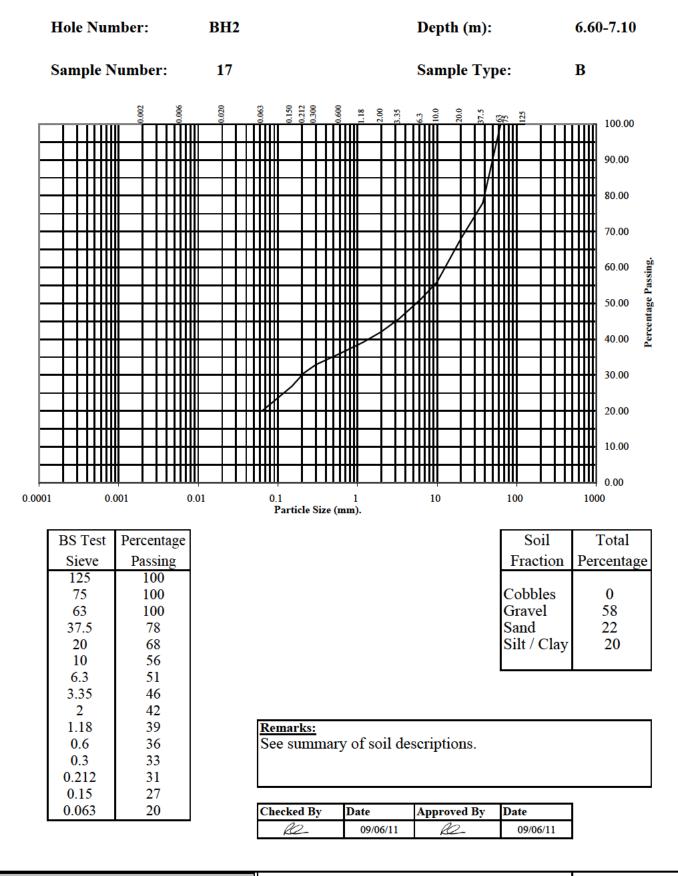




NORTH BIERLEY WWTW.

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

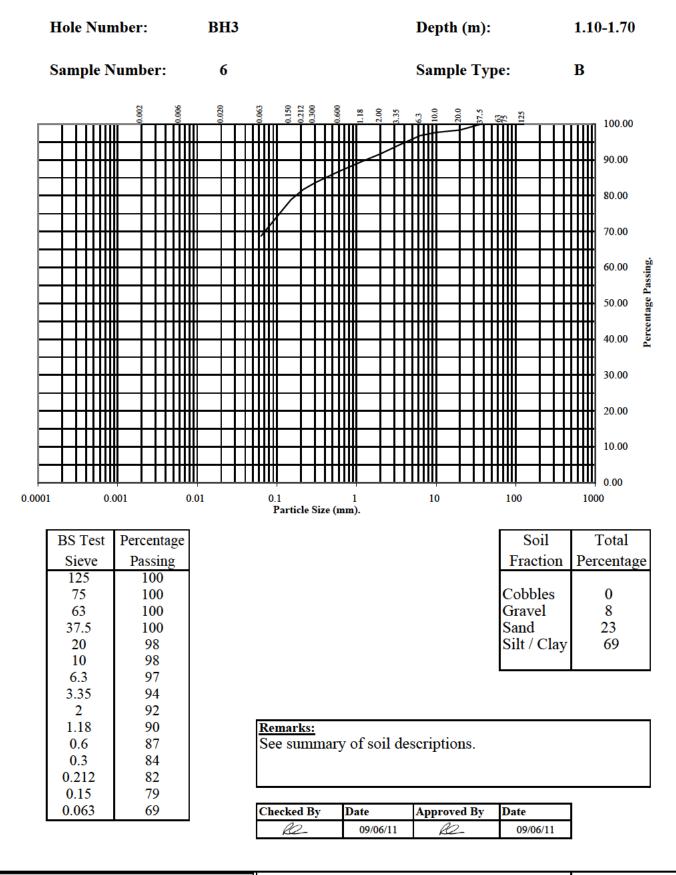




NORTH BIERLEY WWTW.

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2





NORTH BIERLEY WWTW.

One Dimensional Consolidation Properties BS 1377: Part 5: 1990

Hole Number: BH3

4

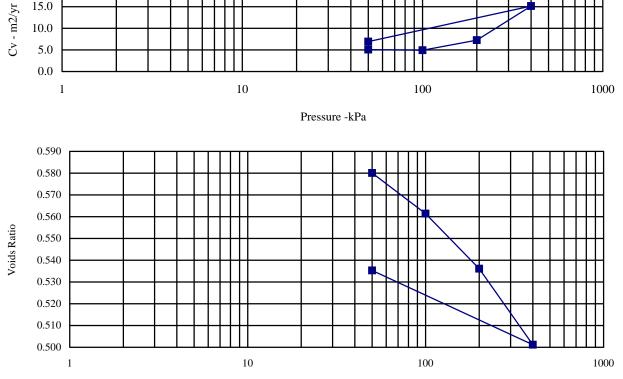
Sample Number:

Sample Type: U

1.20-1.65

Depth (m):

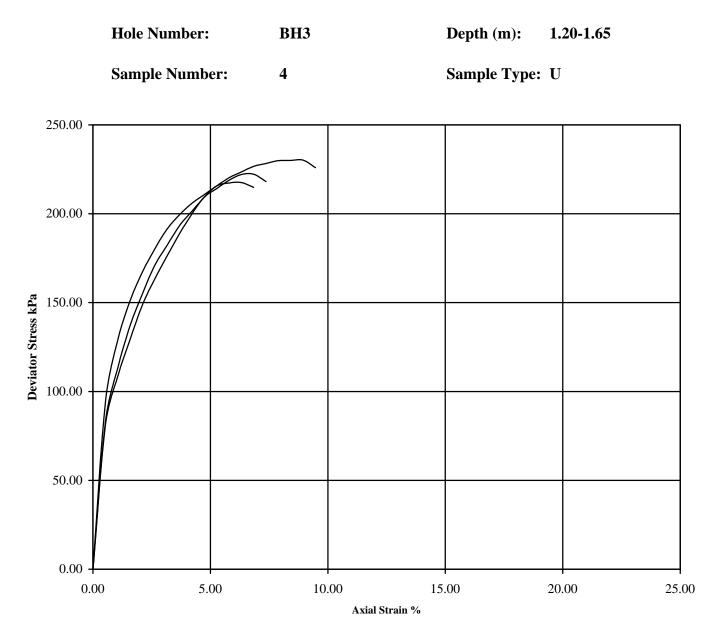
| Initial Conditions | | Pres | sure Ra | nge | Mv | Cv | Specimen location | |
|---------------------------|--------|------|---------|-----|-------|--------|-----------------------------|--------|
| Moisture Content (%): | 24 | | kPa | | m2/MN | m2/yr | within tube: | Тор |
| Bulk Density (Mg/m3): | 2.05 | 0 | - | 50 | 0.259 | 5.057 | Method used to | |
| Dry Density (Mg/m3): | 1.66 | 50 | - | 100 | 0.236 | 4.932 | determine CV: | t90 |
| Voids Ratio: | 0.6008 | 100 | - | 200 | 0.162 | 7.248 | Nominal temperature | |
| Degree of saturation: | 104.2 | 200 | - | 400 | 0.114 | 15.148 | during test ' C: | 20 |
| Height (mm): | 19.82 | 400 | - | 50 | 0.065 | 6.916 | Remarks: | |
| Diameter (mm) | 75.12 | | | | | | See summary of soils descri | ption. |
| Particle Density (Mg/m3): | 2.65 | | | | | | | |
| Assumed | | | | | | | | |
| 20.0 5 15.0 | | | | | | | | П |



Pressure - kPa

| | | Date | Approved by | Date |
|-------------------------------|---------------|--------------|-----------------|------------|
| | RC | 11/03/11 | R | 11/03/11 |
| PSL NORTH | I BIERLEY WWT | Contract No. | | |
| Professional Soils Laboratory | | | PSL11/2 Page | 1223 of |

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 8 : 1990



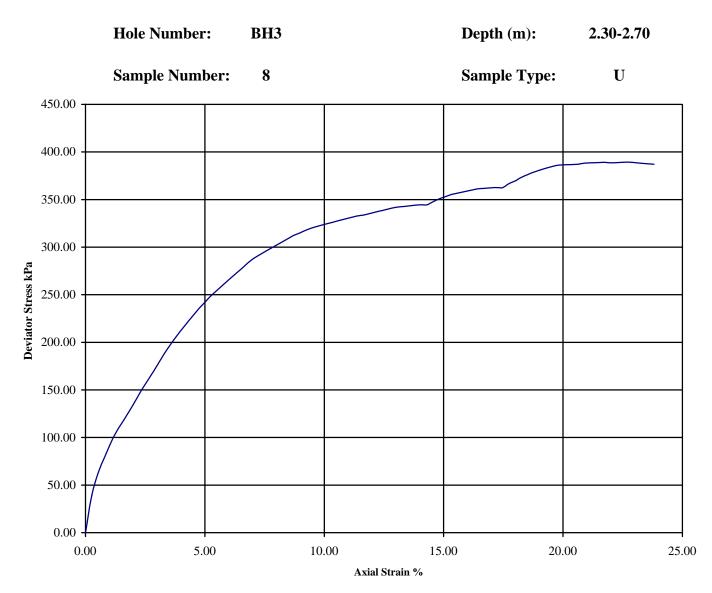
| Diamete | er (mm): | 38 | Height | (mm): | 76 | Test: | Set of Thre | ee, 38 mm | Samples |
|----------|----------|---------|---------|----------|----------|----------|-------------|-----------|---|
| | Moisture | Bulk | Dry | Cell | Deviator | Cohesion | Failure | Mode | Remarks |
| Specimen | Content | Density | Density | Pressure | Stress | | Strain | of | Insufficient to carry out U100 triaxial |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | (kPa) | (kPa) | (%) | Failure | |
| 1 | 22.4 | 2.05 | 1.68 | 20 | 218 | 109 | 6.3 | Brittle | |
| 2 | 22.7 | 2.11 | 1.72 | 40 | 222 | 111 | 6.8 | Brittle | |
| 3 | 23.0 | 2.07 | 1.68 | 80 | 230 | 115 | 8.9 | Brittle | |

Checked and Approved By Date 09/0

PSL Professional Soils Laboratory

BORTH BIERLEY WWTW.

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 9 : 1990



| Diamete | er (mm): | 102 | Height (| mm): | 189 | Test: | 1001 | nm Multis | stage | | | |
|----------|----------|---------|----------|------------|---------------------------|--|---------|-------------|-----------------------------------|------------------------------------|-------------|------|
| | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Remarks | | |
| Specimen | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tal | Sample taken from top of tube | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of str | Rate of strain = $2.1 $ %/min | | |
| | | | | | (kPa) | (kPa) | | | Latex Mer | Latex Membrane used 0.2 mm thickne | | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Membrane Correction applied (kPa) | | | kPa) |
| А | 14 | 2.23 | 1.95 | 25 | 345 | 172 | 14.0 | Brittle | 0.35 | 0.34 | 0.33 | |
| | | | | 50 | 363 | 181 | 17.2 | | See summ | ary of soil | description | ıs. |
| | | | | 100 | 389 | 195 | 22.8 | | Checked | Date | Approved | Date |
| | | | | | | | | | 09/06/11 R 09/06/ | | | |
| | PSL | | | | орти в | TEDI EV | V WWT | XX 7 | | Contra | act No: | |

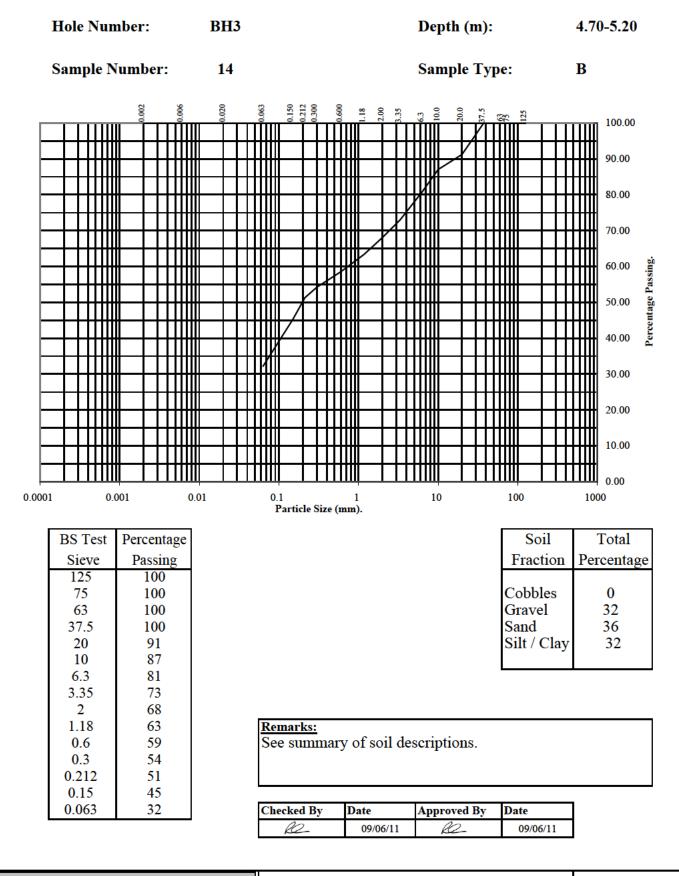
Professional Soils Laboratory

NORTH BIERLEY WWTW.

PSL11/1223

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

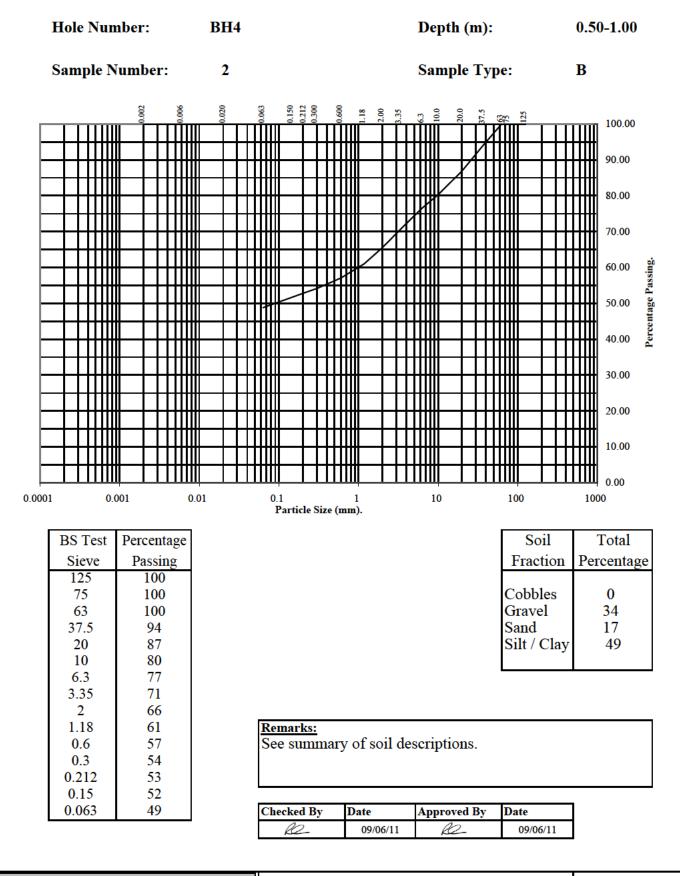




NORTH BIERLEY WWTW.

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

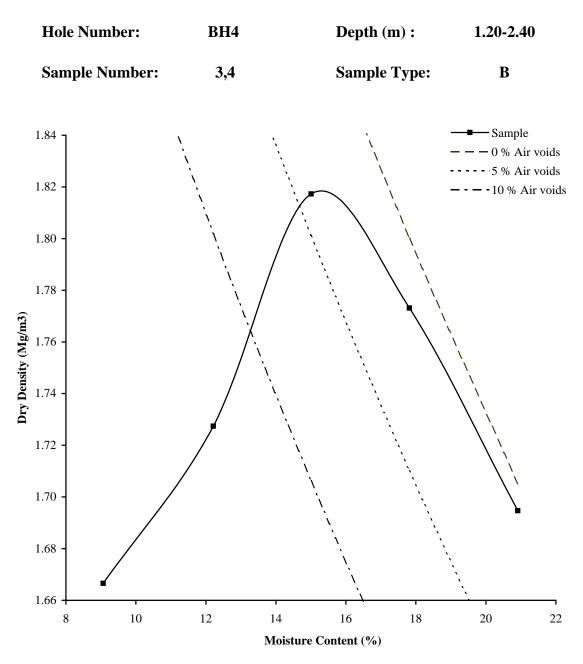




NORTH BIERLEY WWTW.

Dry Density/Moisture Content Relationship Test

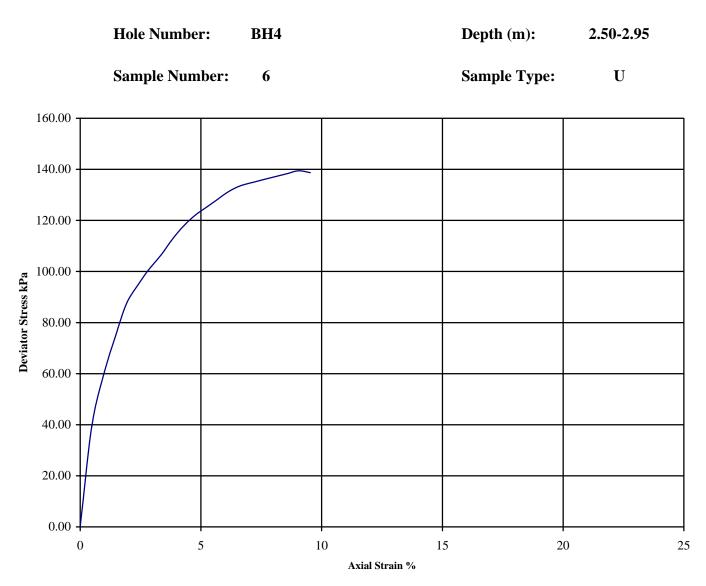
BS 1377 : Part 4 : 1990



| Initial Moisture Content: | 18 Method of Compaction 2.5kg / Separate Sample | | | | | |
|------------------------------|---|---------------|--|--|--|--|
| Particle Density (Mg/m3): | 2.65 | Assumed | Material Retained on 37.5 mm Test Sieve (%): | | | |
| Maximum Dry Density (Mg/m3 |): | 1.82 | Material Retained on 20.0 mm Test Sieve (%): 5 | | | |
| Optimum Moisture Content (%) | : | 15 | | | | |
| Remarks See | Summary of Soil | Descriptions. | | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | R | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 8 : 1990



| Diamete | er (mm): | 102.0 | Height (| mm): | 210.0 | Test: | 100 m | m Single | Stage. Undistu | rbed | | | |
|----------|---|---------|----------|------------|---------------------------|--|---------|----------|------------------------|--|-----------|--|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample taken from | ample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of strain $= 1.9$ | Rate of strain = 1.9 %/min | | | |
| | | | | | (kPa) | (kPa) | | | Latex Membrane us | ed 0.2 mm t | hickness, | | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Correction applied | Correction applied 0.36 kPa | | | |
| А | 20 | 2.09 | 1.74 | 25 | 139 | 70 | 9.0 | Brittle | Single stage due to e | Single stage due to early brittle failure. | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | Checked Date | Approved | Date | | |
| | | | | | | | | | <i>Re</i> 09/06/11 | R | 09/06/11 | | |
| Profes | PSL Professional Soils Laboratory | | | | ORTH B | BIERLEY | Y WWT | W. | | act No: 1/1223 | | | |

One Dimensional Consolidation Properties BS 1377: Part 5: 1990

Hole Number: BH4

9

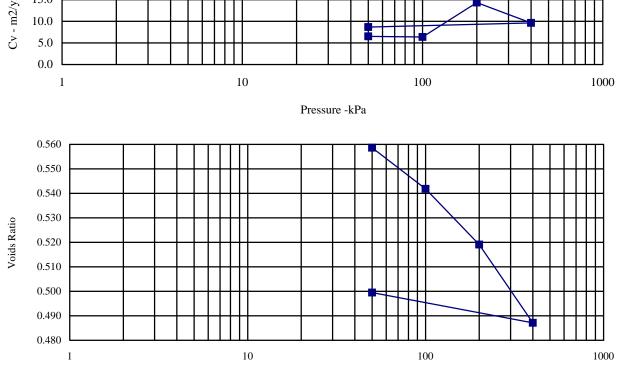
Sample Number:

Sample Type: U

4.50-4.95

Depth (m):

| Initial Conditions | | Pres | sure Ra | nge | Mv | Cv | Specimen location | |
|---------------------------|--------|------|---------|-----|-------|--------|-----------------------------|--------|
| Moisture Content (%): | 21 | | kPa | | m2/MN | m2/yr | within tube: | Тор |
| Bulk Density (Mg/m3): | 2.04 | 0 | - | 50 | 0.235 | 6.514 | Method used to | |
| Dry Density (Mg/m3): | 1.68 | 50 | - | 100 | 0.215 | 6.368 | determine CV: | t90 |
| Voids Ratio: | 0.5771 | 100 | - | 200 | 0.147 | 14.339 | Nominal temperature | |
| Degree of saturation: | 97.9 | 200 | - | 400 | 0.105 | 9.612 | during test ' C: | 20 |
| Height (mm): | 19.84 | 400 | - | 50 | 0.024 | 8.668 | Remarks: | |
| Diameter (mm) | 75.18 | | | | | | See summary of soils descri | ption. |
| Particle Density (Mg/m3): | 2.65 | | | | | | | |
| Assumed | | | | | | | | |
| 20.0 | | | | | | | | Π |
| 15.0 | | | | | | | | Ħ |

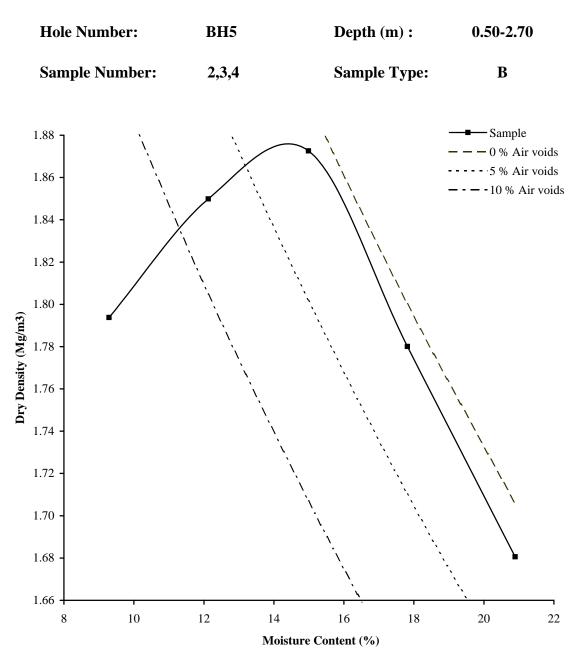


Pressure - kPa

| | | Checked by | Date | Approved by | Date |
|-------------------------------|-------------|------------|----------|-------------|----------|
| | | R | 11/03/11 | R | 11/03/11 |
| PSL | NODTH DIEDI | | 17 | Contract | t No. |
| Professional Soils Laboratory | NORTH BIERI | | V. | PSL11/1 | 223 |
| | | | | Page | of |

Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

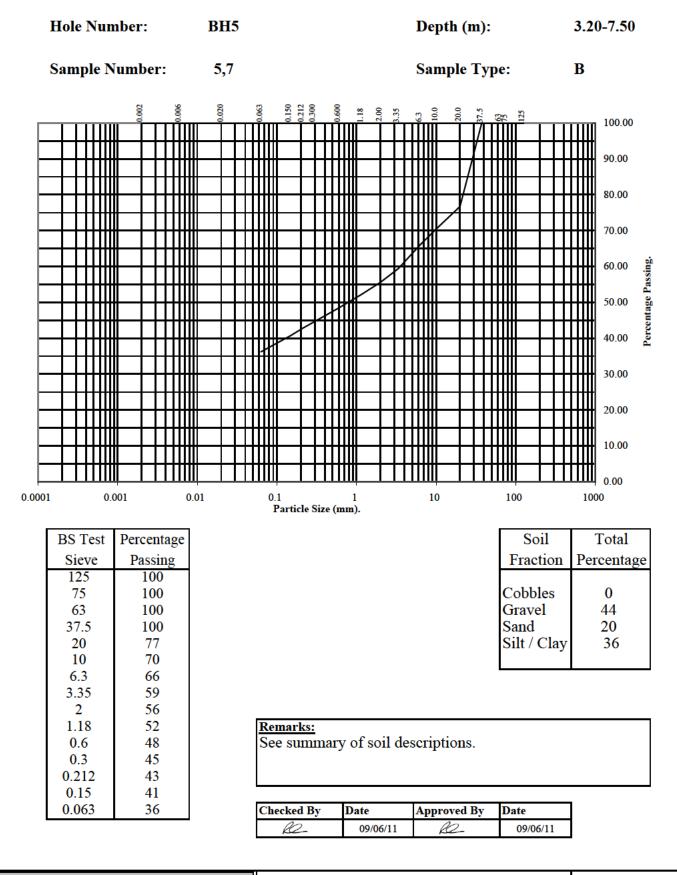


| Initial Moisture Content: | 15 | 15 Method of Compaction 2.5kg / Separate Sample | | 2.5kg / Separate Sample | |
|-------------------------------|-----------------|---|--|-------------------------|--|
| Particle Density (Mg/m3): | 2.65 | Assumed | Material F | 12 | |
| Maximum Dry Density (Mg/m3 |): | 1.87 | Material Retained on 20.0 mm Test Sieve (%): | | |
| Optimum Moisture Content (%): | | 14 | | | |
| Remarks See | Summary of Soil | Descriptions. | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | Re | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |

BS1377 : Part 2 : 1990

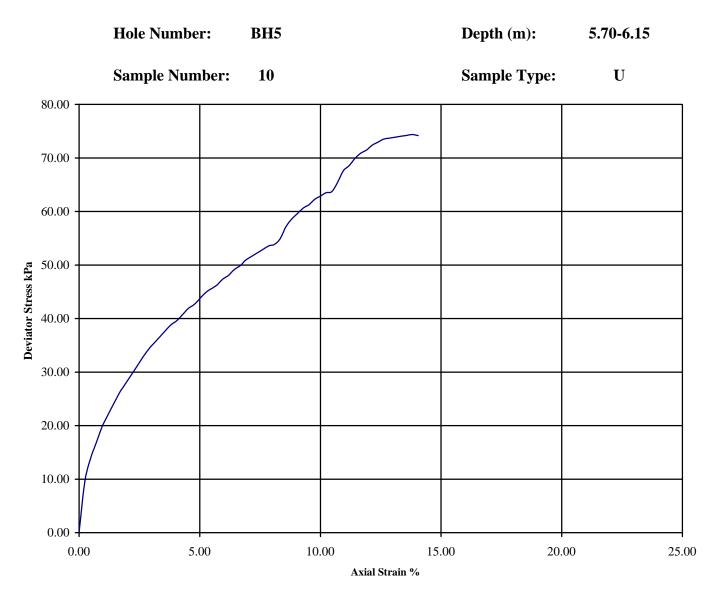
Wet Sieve, Clause 9.2





NORTH BIERLEY WWTW.

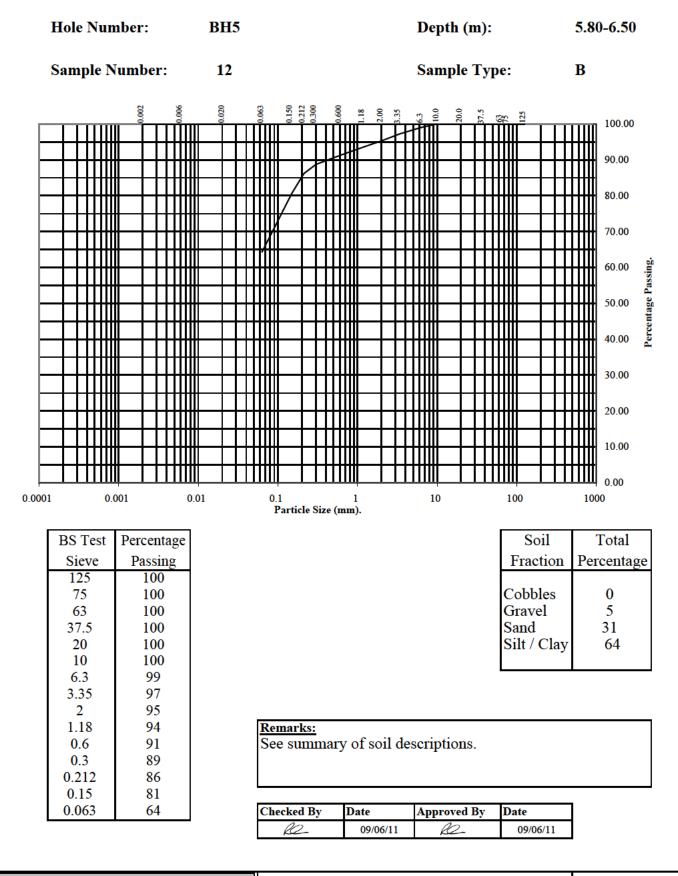
without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 9 : 1990



| Diamete | er (mm): | 102 | Height (| (mm): | 210 | Test: | 100 | mm Multis | tage | | | | |
|----------|---|---------|----------|---------------------|---------------------------|--|---------|-----------|-----------------------------------|-----------------------------------|-------------|----------|--|
| | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Ren | narks | | |
| Specimen | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tak | ample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of stra | Rate of strain = 1.9% /min | | | |
| | | | | | (kPa) | (kPa) | | | Latex Men | Latex Membrane used 0.2 mm thickr | | | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Membrane Correction applied (kPa) | | | kPa) | |
| А | 31 | 1.97 | 1.50 | 50 | 54 | 27 | 8.1 | Compound | 0.36 0.35 0.35 | | | | |
| | | | | 100 | 64 | 32 | 10.5 | | See summa | ary of soil | description | IS. | |
| | | | | 200 | 74 | 37 | 13.8 | | Checked | Date | Approved | Date | |
| | | | | | | | | | R | 09/06/11 | R | 09/06/11 | |
| Profes | PSL Professional Soils Laboratory | | | NORTH BIERLEY WWTW. | | | | | | Contract No: PSL11/1223 | | | |

BS1377 : Part 2 : 1990

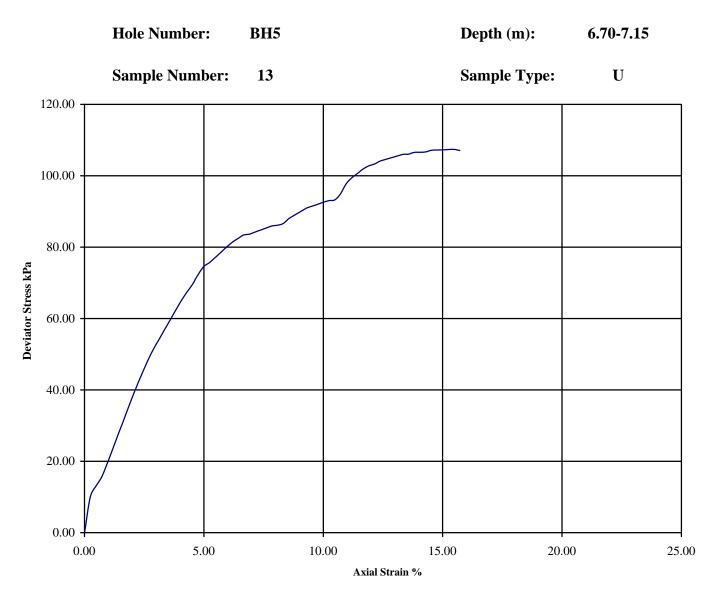
Wet Sieve, Clause 9.2





NORTH BIERLEY WWTW.

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 9 : 1990



| | psl | | | | | | | | | Contract No: | | |
|----------|----------|---------|----------|------------|---------------------------|--|---------|-----------|--------------------------------------|--------------|-------------|----------|
| | | | - | | | | | R | 09/06/11 | R | 09/06/11 | |
| | | | | 200 | 107 | 54 | 15.5 | | Checked | Date | Approved | Date |
| | | | | 100 | 93 | 47 | 10.5 | | See summa | ary of soil | description | s. |
| А | 22 | 2.08 | 1.70 | 50 | 86 | 43 | 8.1 | Plastic | 0.36 | 0.35 | 0.34 | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Membrane Correction applied (kPa) | | | kPa) |
| | | | | | (kPa) | (kPa) | | | Latex Membrane used 0.2 mm thickness | | | hickness |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of strain = 1.9% /min | | | |
| Specimen | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample taken from top of tube | | | |
| | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Remarks | | |
| Diamete | er (mm): | 102 | Height (| mm): | 210 | Test: | 1001 | nm Multis | stage | | | |

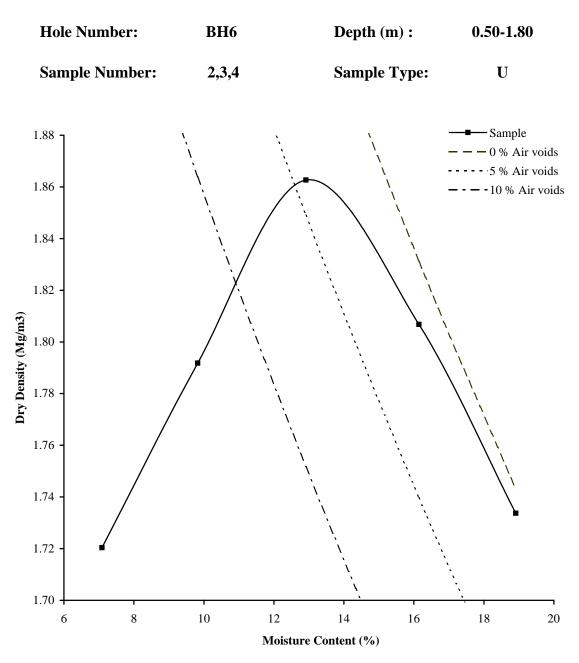
Professional Soils Laboratory

NORTH BIERLEY WWTW.

PSL11/1223

Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

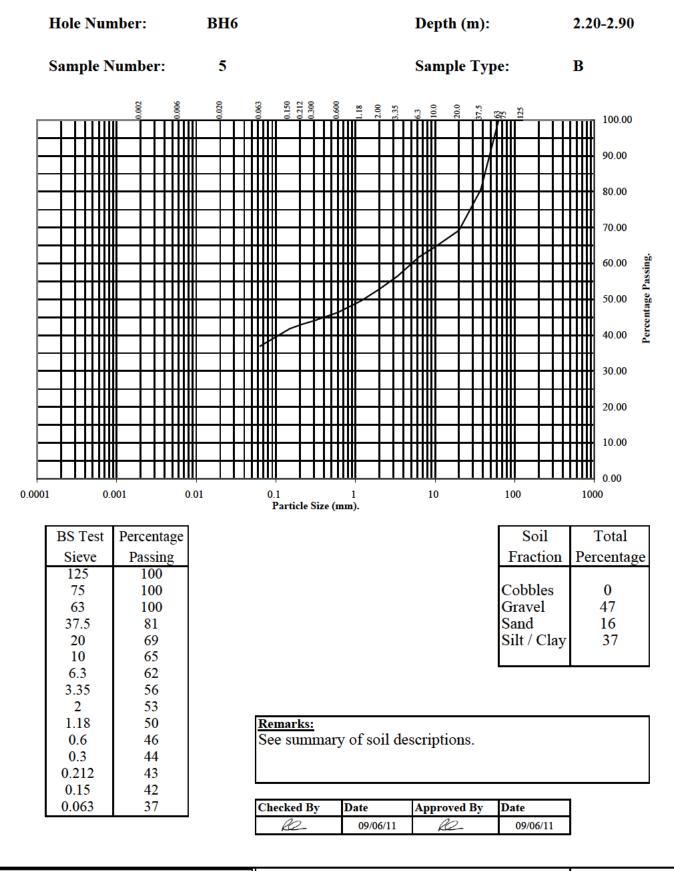


| Initial Moisture Content: | 13 | Method of Con | npaction | 2.5kg / Separate Sample | |
|------------------------------|-------------------------------|--|------------|-------------------------|--|
| Particle Density (Mg/m3): | 2.60 | Assumed | Material F | 4 | |
| Maximum Dry Density (Mg/m3) | 1.86 | Material Retained on 20.0 mm Test Sieve (%): | | | |
| Optimum Moisture Content (%) | Optimum Moisture Content (%): | | | | |
| Remarks See S | Summary of Soil | Descriptions. | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | R | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2

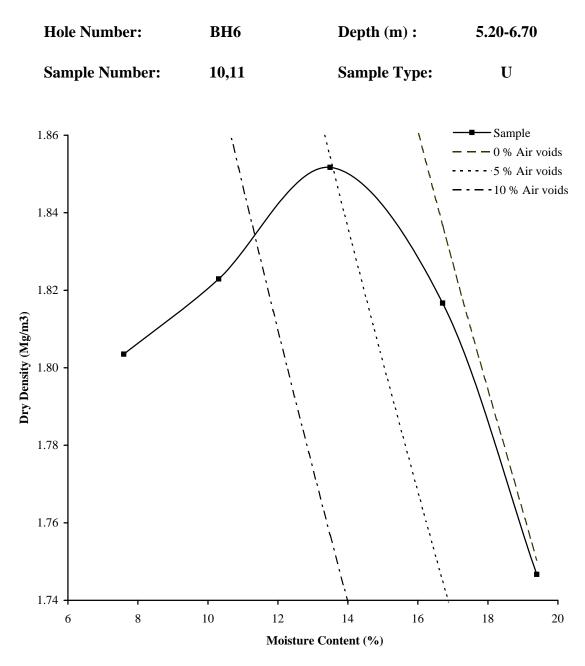




NORTH BIERLEY WWTW.

Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990

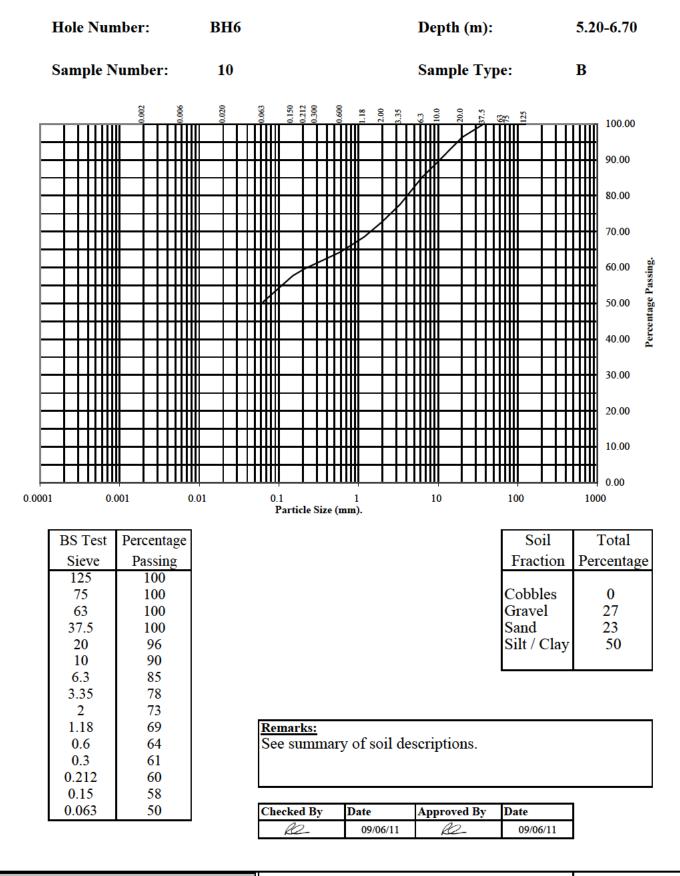


| Initial Moisture Content: | 17 | Method of Con | npaction | 2.5kg / Separate Sample | |
|------------------------------|-------------------------------|--|------------|-------------------------|--|
| Particle Density (Mg/m3): | 2.65 | Assumed | Material I | 18 | |
| Maximum Dry Density (Mg/m3 | 1.85 | Material Retained on 20.0 mm Test Sieve (%): | | | |
| Optimum Moisture Content (%) | Optimum Moisture Content (%): | | | | |
| Remarks See | Summary of Soil | Descriptions. | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | Re | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2





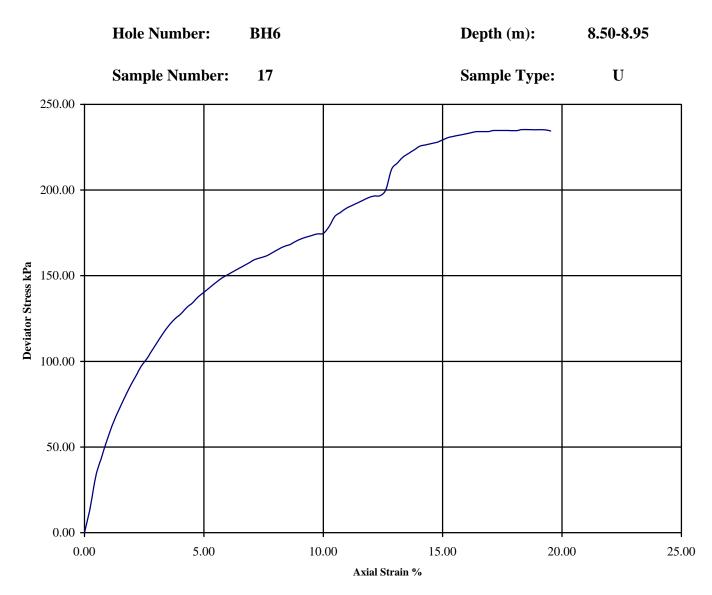
NORTH BIERLEY WWTW.

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 8 : 1990



| Diamete | er (mm): | 102.0 | Height (| mm): | 210.0 | Test: | 100 m | m Single | Stage. | Undistur | bed | | |
|---|----------|---------|----------|------------|---------------------------|--|---------|----------|--|--------------------------------|-------------------|-----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Remarks | | | |
| | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tak | Sample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of str | Rate of strain = 1.9% /min | | | |
| | | | | | (kPa) | (kPa) | | | Latex Men | nbrane use | ed 0.2 mm tl | hickness, | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Correction | applied | 0.35 | kPa | |
| А | 16 | 2.10 | 1.82 | 75 | 113 | 57 | 10.0 | Brittle | Single stage due to early brittle failure. | | | | |
| | | | | | | | | | | - | | | |
| | | | | | | | | | Checked | Date | Approved | Date | |
| | | | | | | | | | R | 09/06/11 | R | 09/06/11 | |
| PSL Professional Soils Laboratory | | | | N | ORTH B | BIERLEY | YWWT | W. | | | act No: 1/1223 | | |

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 9 : 1990



| Diamete | er (mm): | 102 | Height (| mm): | 210 | Test: | 1001 | nm Multis | stage | | | | |
|----------|----------|---------|----------|------------|---------------------------|--|---------|-----------|--------------------------------------|-------------|-------------|----------|--|
| | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | Remarks | | | | |
| Specimen | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample taken from top of tube | | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of strain = 1.9 %/min | | | | |
| | | | | | (kPa) | (kPa) | | | Latex Membrane used 0.2 mm thickness | | | hickness | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Membrane Correction applied (kPa) | | | kPa) | |
| А | 22 | 2.02 | 1.66 | 80 | 175 | 87 | 10.0 | Plastic | 0.35 | 0.35 | 0.34 | | |
| | | | | 160 | 197 | 98 | 12.4 | | See summ | ary of soil | description | s. | |
| | | | | 320 | 235 | 118 | 18.3 | | Checked | Date | Approved | Date | |
| | | | | | | | | | RC 09/06/11 RC 09/06/1 | | | | |
| | psl | | | | ORTH R | RIFRLEY | V WWT | W | | Contra | act No: | | |

Professional Soils Laboratory

One Dimensional Consolidation Properties BS 1377: Part 5: 1990

Hole Number: BH7

3

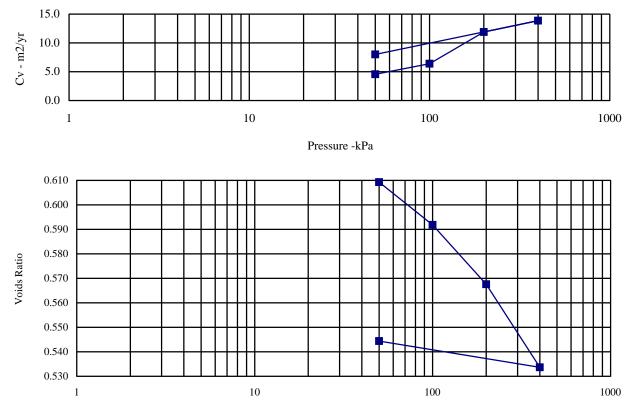
Sample Number:

Sample Type: U

1.20-1.65

Depth (m):

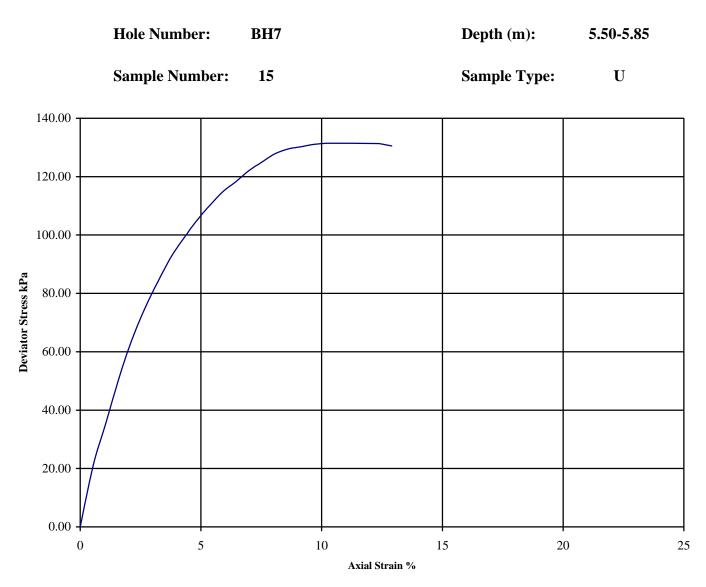
Initial Conditions Pressure Range Mv $\mathbf{C}\mathbf{v}$ Specimen location Moisture Content (%): m2/MN m2/yr within tube: 22 kPa Top Bulk Density (Mg/m3): 1.98 0 0.261 4.547 Method used to 50 -50 100 t90 Dry Density (Mg/m3): 1.63 0.217 determine CV: 6.387 _ Voids Ratio: 0.6306 100 200 0.152 11.887 Nominal temperature -90.9 Degree of saturation: 200 400 0.108 13.848 during test 'C: 20 _ Remarks: 19.9 400 0.020 7.990 Height (mm): 50 _ Diameter (mm) 75.19 See summary of soils description. Particle Density (Mg/m3): 2.65 Assumed



Pressure - kPa

| | | Checked by | Date | Approved by | Date |
|-------------------------------|-------------|------------|--------------|-----------------|----------|
| | | R | 11/03/11 | R | 11/03/11 |
| PSL | NORTH BIERI | V | Contract No. | | |
| Professional Soils Laboratory | | | v. | PSL11 /1 | 1223 |
| | | | | Page | of |

without measurement of Pore Pressure B.S. 1377 : Part7 : Clause 8 : 1990



| Diamete | eter (mm): 102.0 Height (mm): 1 | | | | | Test: | 100 m | m Single | Stage. | Undistur | bed | | |
|---|---------------------------------|---------|---------|------------|---------------------------|--|---------|----------|--|--------------------------------------|-------------------|----------|--|
| Specimen | Moisture | Bulk | Dry | Cell | Corr. Max. | Shear | Failure | Mode | | Remarks | | | |
| | Content | Density | Density | Pressure | Diviator | Strength | Strain | of | Sample tak | Sample taken from top of tube | | | |
| | (%) | (Mg/m3) | (Mg/m3) | (kPa) | Stress | Cu | (%) | Failure | Rate of str | Rate of strain = $2.1 $ %/min | | | |
| | | | | | (kPa) | (kPa) | | | Latex Men | Latex Membrane used 0.2 mm thickness | | | |
| | | | | θ_3 | $(\theta_1 - \theta_3)_f$ | $^{1}/_{2}(\theta_{1}-\theta_{3})_{f}$ | | | Correction | applied | 0.35 | kPa | |
| А | 19 | 2.04 | 1.71 | 50 | 131 | 66 | 10.2 | Brittle | Single stage due to early brittle failure. | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | Checked | Date | Approved | Date | |
| | | | | | | | | | R | 09/06/11 | R | 09/06/11 | |
| PSL Professional Soils Laboratory | | | | N | ORTH B | SIERLEY | YWWT | W. | | | act No: 1/1223 | | |

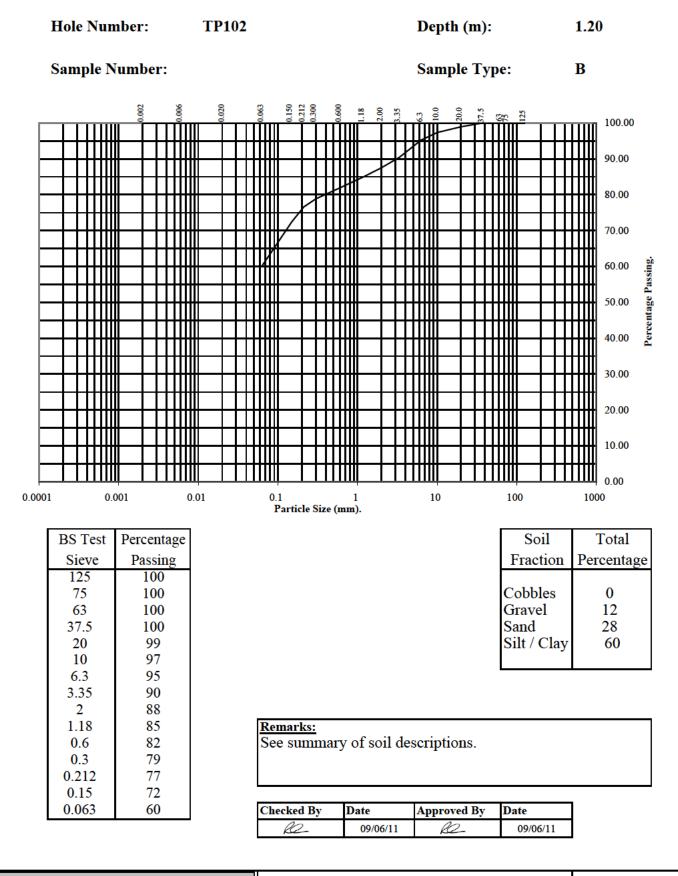
SUMMARY OF LABORATORY HAND VANE TESTS

| Hole Number | Sample Number | Sample Type | Depth m | Moisture Content % | Shear Strength kPa | Description |
|----------------|------------------|----------------|------------|--------------------------|--------------------------|---|
| BH4 | 12 | U | 6.50-6.95 | 23 | 84 | Stiff dark brown gravelly sandy CLAY. |
| BH6 | 20 | U | 9.50-9.85 | 15 | 57 | Firm brown very gravelly very sandy CLAY. |
| BH7 | 6 | U | 2.20-2.65 | 20 | | Brown mottled grey gravelly sandy CLAY. |
| | | | | | | |
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| | Compiled by | Date | Checked by | Date | Approved by | y | Date |
|-------------------------------|---------------|----------|---------------|----------|-------------|--------------|------------|
| est. | $\partial D $ | 09/06/11 | RC | 09/06/11 | R | 2 | 09/06/11 |
| Professional Soils Laboratory | | NODTU | BIERLEY WWTW. | | | Contract No: | PSL11/1223 |
| | | ΝΟΚΙΠ | | | | Client Ref: | SH10534 |

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2



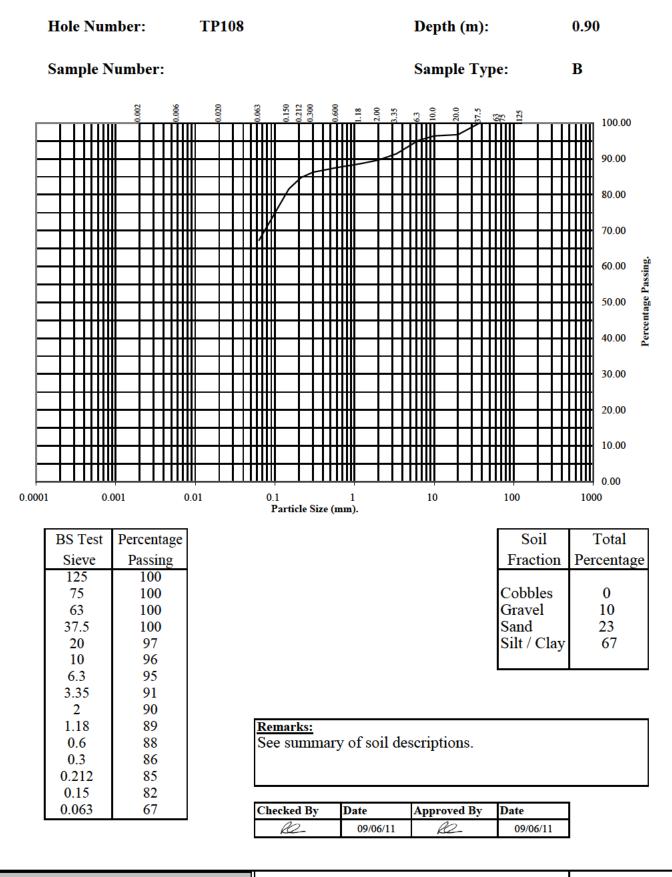


NORTH BIERLEY WWTW.

Particle Size Distribution Test

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2



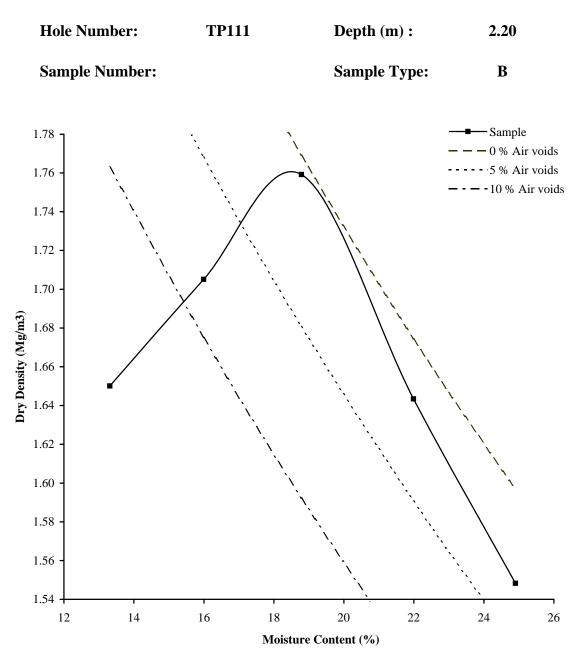


NORTH BIERLEY WWTW.

Contract No.: PSL11/1223

Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990



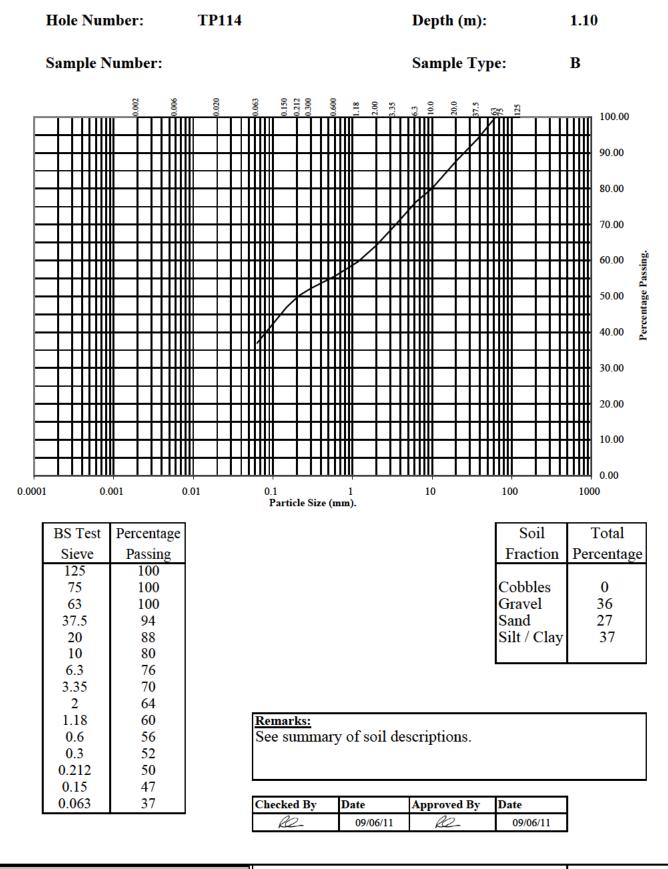
| Initial Moisture Content: | 19 | Method of Con | apaction 2.5kg / Separate Sample | | |
|-------------------------------------|------|---------------|--|--|--|
| Particle Density (Mg/m3): | 2.65 | Assumed | Material Retained on 37.5 mm Test Sieve (%): | | |
| Maximum Dry Density (Mg/m3): | | 1.76 | Material Retained on 20.0 mm Test Sieve (%): | | |
| Optimum Moisture Content (%): | | 19 | | | |
| Remarks See Summary of Soil Descrip | | Descriptions. | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | R | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |

Particle Size Distribution Test

BS1377 : Part 2 : 1990

Wet Sieve, Clause 9.2



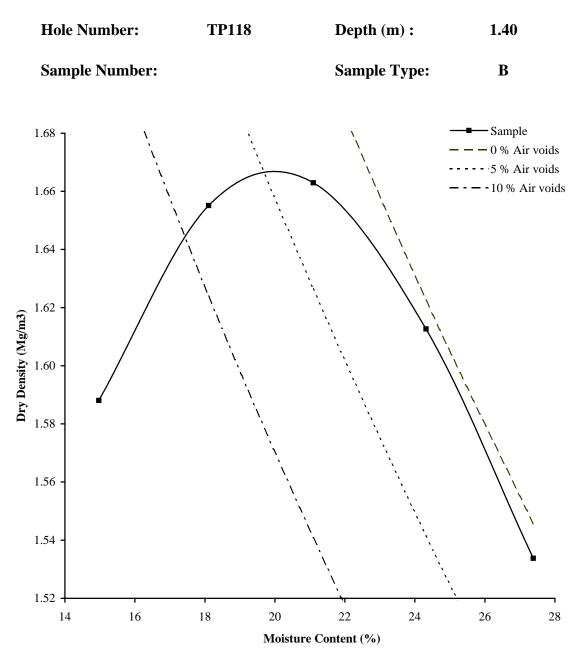


NORTH BIERLEY WWTW.

Contract No.: PSL11/1223

Dry Density/Moisture Content Relationship Test

BS 1377 : Part 4 : 1990



| Initial Moisture Content: | 21 | Method of Con | paction 2.5kg / Separate Sample | | |
|--------------------------------------|------|---------------|--|---|--|
| Particle Density (Mg/m3): | 2.68 | Assumed | Material Retained on 37.5 mm Test Sieve (%): | | |
| Maximum Dry Density (Mg/m3): | | 1.66 | Material F | 2 | |
| Optimum Moisture Content (%): | | 20 | | | |
| Remarks See Summary of Soil Descript | | Descriptions. | | | |

| | | Checked By | Date | Approved By | Date |
|---|---------------|------------|----------|-----------------|----------|
| | | R | 09/06/11 | R | 09/06/11 |
| PSL Professional Soils Laboratory | NORTH BIERLEY | WWTW. | | Contra PSL11 | |



APPENDIX IX

Soakaway Results



SOAKAWAY RESULTS

Job Number: SH10534

Job Name: North Bierley WWTW

Assessor: M Kelly

Date: 23rd May 2011

| TP101 | | |
|---------------------|-----------|---------------|
| Time elapsed (mins) | Depth (m) | Reduction (m) |
| 1 | 2.45 | 0.00 |
| 2 | 2.5 | 0.05 |
| 3 | 2.6 | 0.15 |
| 4 | 2.69 | 0.24 |
| 5 | 2.77 | 0.32 |
| 6 | 2.84 | 0.39 |
| 7 | 2.9 | 0.45 |
| 8 | 2.95 | 0.50 |

| TP103 | | |
|---------------------|-----------|---------------|
| Time elapsed (mins) | Depth (m) | Reduction (m) |
| 1 | 2.45 | 0.00 |
| 2 | 2.52 | 0.07 |
| 3 | 2.59 | 0.14 |
| 4 | 2.65 | 0.20 |
| 5 | 2.71 | 0.26 |
| 6 | 2.77 | 0.32 |
| 7 | 2.82 | 0.37 |
| 8 | 2.87 | 0.42 |
| 9 | 2.92 | 0.47 |
| 10 | 2.95 | 0.50 |

| TP105 | | |
|---------------------|-----------|---------------|
| Time elapsed (mins) | Depth (m) | Reduction (m) |
| 1 | 1.55 | 0.00 |
| 5 | 1.55 | 0.00 |
| 10 | 1.55 | 0.00 |
| 30 | 1.55 | 0.00 |
| 60 | 1.55 | 0.00 |
| 90 | 1.55 | 0.00 |
| 120 | 1.55 | 0.00 |
| 150 | 1.55 | 0.00 |
| 180 | 1.55 | 0.00 |
| 210 | 1.55 | 0.00 |
| 240 | 1.55 | 0.00 |
| 270 | 1.55 | 0.00 |

| TP108 | | |
|---------------------|-----------|---------------|
| Time elapsed (mins) | Depth (m) | Reduction (m) |
| 1 | 1.05 | 0.00 |
| 5 | 1.05 | 0.00 |
| 10 | 1.05 | 0.00 |
| 30 | 1.05 | 0.00 |
| 60 | 1.05 | 0.00 |
| 90 | 1.05 | 0.00 |
| 120 | 1.05 | 0.00 |
| 150 | 1.05 | 0.00 |
| 180 | 1.05 | 0.00 |
| 210 | 1.05 | 0.00 |
| 240 | 1.05 | 0.00 |
| 270 | 1.05 | 0.00 |

| TP113 | | |
|---------------------|-----------|---------------|
| Time elapsed (mins) | Depth (m) | Reduction (m) |
| 1 | 0.65 | 0.00 |
| 5 | 0.65 | 0.00 |
| 10 | 0.65 | 0.00 |
| 30 | 0.65 | 0.00 |
| 60 | 0.65 | 0.00 |
| 90 | 0.65 | 0.00 |
| 120 | 0.65 | 0.00 |
| 150 | 0.65 | 0.00 |
| 180 | 0.65 | 0.00 |
| 210 | 0.65 | 0.00 |
| 240 | 0.65 | 0.00 |
| 270 | 0.65 | 0.00 |

| | Length | Width | Depth | Vp75-25 | ap50 | tp75-25 | Soil Infiltration Rate (m/s) |
|-------|--------|-------|-------|---------|------|---------|------------------------------|
| TP101 | 1.6 | 0.45 | 3.2 | 0.36 | 2.77 | 8 | 2.708E-04 |
| TP103 | 1.75 | 0.45 | 3.2 | 0.39 | 2.99 | 10 | 2.197E-04 |
| TP105 | 1.3 | 0.45 | 2.3 | 0.29 | 2.34 | n/a | FAILED |
| TP108 | 1.6 | 0.45 | 1.8 | 0.36 | 2.77 | n/a | FAILED |
| TP113 | 1.1 | 0.45 | 1.4 | 0.25 | 2.05 | n/a | FAILED |



APPENDIX X

Gas Monitoring Results



Client Name: KeyLand Developments

Date of Sampling: 19/05/2011

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ | CO₂ | 0 ₂ | Flow Rate | Sample Type | Barometric Pressure | Relative Pressure | Depth to Water |
|------------------|----------------|----------------|----------------|--------------|----------------|------------------------|----------------------|-------------------|
| Kei. | % by Volume | % by Volume | % by Volume | l/hr | | (mb) | (mb) | (m bgl) |
| WS110 | 0.0 | 0.3 | 8.1 | -0.1 | Acc. | 1005 | -0.17 | 3.01 |
| WS102 | 0.0 | 0.6 | 18.0 | +0.1 | Acc. | 1005 | -0.32 | 4.58 |
| WS107 | 0.0 | 0.3 | 18.2 | -0.2 | Acc. | 1005 | -0.28 | Dry |
| BH01 | 0.0 | 0.0 | 18.7 | 0.0 | Acc. | 1005 | -0.16 | Dry |
| WS104 | 0.0 | 0.0 | 18.5 | +0.4 | Acc. | 1005 | -0.26 | Dry |
| WS105 | 0.0 | 1.3 | 14.6 | +0.1 | Acc. | 1005 | -0.29 | 2.17 |
| | | | | | Acc. | | | |
| | | | | | Acc. | | | |
| | | | | | Acc. | | | |
| | | | | | Acc. | | | |
| | | | | | Acc. | | | |

Atmospheric Pressure: As indicated

Instrument Used: Infrared GA 2000

Pressure Trend: Steady

Sample Type: As indicated

Operator: J Lymer

Weather: Dry, overcast, warm

| Notes: | |
|--------|--|
| | |
| | |



Client Name: KeyLand Developments

Date of Sampling: 01/06/2011

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ % by Volume | CO₂ % by Volume | O₂ % by Volume | Flow Rate I/hr | Sample Type | Barometric Pressure (mb) | Relative Pressure (mb) | Depth to Water (m bgl) |
|------------------|-----------------------|-----------------------|----------------------|----------------------|----------------|--------------------------------|------------------------------|------------------------------|
| BH1 | 0.0 | 0.0 | 18.5 | -0.7 | Acc. | 1014 | -0.01 | DRY |
| BH5 | 0.0 | 0.2 | 18.5 | -0.3 | Acc. | 1014 | -0.04 | 8.42 |
| BH6 | 0.0 | 0.3 | 18.6 | 0.0 | Acc. | 1014 | -0.29 | 9.56 |
| BH7 | 0.0 | 0.0 | 19.3 | -0.2 | Acc. | 1013 | -0.05 | DRY |
| WS102 | 0.0 | 0.1 | 18.4 | 0.1 | Acc. | 1014 | -0.07 | 4.90 |
| WS104 | 0.0 | 2.0 | 16.5 | -0.4 | Acc. | 1014 | -0.01 | DRY |
| WS105 | 0.0 | 0.0 | 19.2 | -0.5 | Acc. | 1014 | -0.01 | 2.24 |
| WS107 | 0.0 | 0.0 | 18.6 | -0.5 | Acc. | 1014 | -0.07 | DRY |
| WS110 | 0.0 | 0.0 | 18.5 | -0.1 | Acc. | 1015 | -0.13 | 4.5 |

Atmospheric Pressure: As indicated

Pressure Trend: Fluctuating

Weather: Warm and sunny

Instrument Used: Infrared GA 2000

Sample Type: As indicated

Operator: J A Shaw



Client Name: KeyLand Developments

Date of Sampling: 22/07/2011

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ % by Volume | CO₂ % by Volume | O₂ % by Volume | Flow Rate I/hr | Sample Type | Barometric Pressure (mb) | Relative Pressure (mb) | Depth to Water (m bgl) |
|------------------|-----------------------|-----------------------|----------------------|----------------------|----------------|--------------------------------|------------------------------|------------------------------|
| BH1 | 0.0 | 0.3 | 19.7 | 0.0 | Acc. | 1007 | +0.01 | DRY |
| BH5 | 0.0 | 1.1 | 17.4 | 0.0 | Acc. | 1007 | +0.12 | 8.942 |
| BH6 | 0.0 | 2.3 | 16.5 | 0.1 | Acc. | 1007 | +0.16 | 9.600 |
| BH7 | 0.0 | 1.4 | 17.1 | 0.0 | Acc. | 1007 | +0.10 | DRY |
| WS102 | 0.0 | 0.4 | 19.7 | 0.0 | Acc. | 1007 | +0.04 | 4.800 |
| WS104 | 0.0 | 3.7 | 15.5 | 0.1 | Acc. | 1008 | +0.05 | DRY |
| WS105 | 0.0 | 1.5 | 11.8 | 0.0 | Acc. | 1008 | +0.06 | 2.095 |
| WS107 | 0.0 | 0.9 | 19.3 | 0.1 | Acc. | 1007 | +0.01 | DRY |
| WS110 | 0.0 | 1.3 | 18.4 | 0.1 | Acc. | 1007 | +0.02 | 3.21 |

Atmospheric Pressure: As indicated

Pressure Trend: Fluctuating

Weather: Cloudy and warm

Instrument Used: Infrared GA 2000

Sample Type: As indicated

Operator: M Kelly



Client Name: KeyLand Developments

Date of Sampling: 03/04/2012

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ | CO₂ | O2 | Flow Rate | Sample Type | Barometric Pressure | Relative Pressure | Depth to Water (Depth to Base) | |
|------------------|------------------|----------------|----------------|--------------|----------------|------------------------|----------------------|---|--|
| | % by Volume | % by Volume | % by Volume | l/hr | | (mb) | (mb) | (m bgl) | |
| BH1 | 0.0 | 3.4 | 11.0 | 0.0 | Acc. | 989 | +0.19 | DRY (6.02) | |
| BH5 | 12.5 | 0.6 | 13.0 | 0.0 | Acc. | 990 | -0.14 | 7.727 (9.99) | |
| BH6 | 0.0 | 3.4 | 13.5 | 0.1 | Acc. | 990 | -0.07 | 9.070 (10.04) | |
| BH7 | 1.6 | 0.0 | 19.8 | 0.1 | Acc. | 987 | -0.04 | DRY (6.97) | |
| WS102 | 0.0 | 1.2 | 19.0 | 0.0 | Acc. | 989 | -0.17 | DRY (4.91) | |
| WS104 | 0.0 | 2.6 | 14.7 | 0.1 | Acc. | 990 | -0.08 | DRY (4.87) | |
| WS105 | 0.0 | 2.4 | 14.1 | 0.0 | Acc. | 991 | -0.01 | 1.608 (3.92) | |
| WS107 | 0.0 | 1.6 | 17.7 | 0.0 | Acc. | 987 | -0.06 | DRY (4.90) | |
| WS110 | UNABLE TO ACCESS | | | | | | | | |

Atmospheric Pressure: As indicated

Instrument Used: Infrared GA 2000

Pressure Trend: Fluctuating

Sample Type: As indicated

Operator: M Kelly

Weather: Cloudy and warm

| Notes: | |
|--------|--|
| | |



Client Name: KeyLand Developments

Date of Sampling: 20/04/2012

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ % by Volume | CO₂ % by Volume | O ₂ % by Volume | Flow Rate I/hr | Sample Type | Barometric Pressure (mb) | Relative Pressure (mb) | Depth to Water (m bgl) |
|------------------|-----------------------|-----------------------|----------------------------------|----------------------|----------------|--------------------------------|------------------------------|------------------------------|
| BH1 | 0.0 | 3.1 | 11.9 | 0.2 | Acc. | 980 | -0.03 | DRY |
| BH5 | 34.6 | 1.2 | 4.3 | 0.2 | Acc. | 981 | -0.05 | 7.49 |
| BH6 | 0.0 | 1.0 | 19.8 | 0.1 | Acc. | 981 | -0.05 | 8.50 |
| BH7 | 0.0 | 0.2 | 20.3 | 0.3 | Acc. | 978 | -0.07 | 5.13 |
| WS102 | 0.0 | 0.2 | 19.8 | 0.0 | Acc. | 980 | -0.03 | 2.04 |
| WS104 | 0.0 | 0.2 | 8.1 | -0.2 | Acc. | 981 | -0.05 | DRY |
| WS105 | 0.0 | 1.3 | 12.8 | -0.2 | Acc. | 981 | -0.05 | DRY |
| WS107 | 0.0 | 0.8 | 15.6 | 0.3 | Acc. | 980 | -0.03 | 3.50 |
| WS110 | UNABLE TO ACCESS | | | | | | | |

Atmospheric Pressure: As indicated

Pressure Trend: Fluctuating

Weather: Windy, slight rain

Sample Type: As indicated

Instrument Used: Infrared GA 2000

Operator: J A Shaw



Client Name: KeyLand Developments

Date of Sampling: 17/05/2012

Site Name: North Bierley

Job Number: SH10534

| Borehole Ref. | CH₄ | CO₂ | O ₂ | Flow Rate | Sample Type | Barometric Pressure | Relative Pressure | Depth to Water (Depth to Base) | |
|------------------|------------------|----------------|----------------|--------------|----------------|------------------------|----------------------|---|--|
| | % by Volume | % by Volume | % by Volume | l/hr | | (mb) | (mb) | (m bgl) | |
| BH1 | 0.0 | 1.3 | 19.0 | 0.1 | Acc. | 1008 | +1.08 | DRY | |
| BH5 | 20.3 | 3.0 | 0.0 | 0.0 | Acc. | 1009 | -0.27 | 7.406 | |
| BH6 | 0.0. | 3.3 | 13.7 | 0.0 | Acc. | 1009 | -0.55 | <mark>8.695</mark> | |
| BH7 | 0.0 | 0.7 | 19.1 | 0.1 | Acc. | 1006 | -0.10 | 5.373 | |
| WS102 | 0.0 | 1.4 | 18.5 | 0.1 | Acc. | 1008 | -0.32 | DRY | |
| WS104 | 0.0 | 2.7 | 14.5 | 0.1 | Acc. | 1008 | -0.24 | DRY | |
| WS105 | 0.0 | 2.2 | 14.7 | 0.0 | Acc. | 1009 | -0.08 | 1.481 | |
| WS107 | 0.0 | 2.0 | 17.0 | 0.1 | Acc. | 1009 | -0.16 | DRY | |
| WS110 | UNABLE TO ACCESS | | | | | | | | |

Atmospheric Pressure: As indicated

Pressure Trend: Falling

Weather: Light rain, cool

Instrument Used: Infrared GA 2000

Sample Type: As indicated

Operator: M Kelly



DRAWINGS

