



**SHADBOLT**  
ENVIRONMENTAL



Newbottle Street, Houghton-le-Spring

Ground Investigation Interpretive Report and  
Groundwater Risk Assessment

Hellens Land

Issue V3

September 2022



**SHADBOLT**  
GROUP

# Newbottle Street Houghton-le-Spring

## Ground Investigation Interpretive Report and Groundwater Risk Assessment

Project Reference: 2585

Client	Hellens Land
Our Reference	2585 – Newbottle Street
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Submitted	Issue V3 – September 2022



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## APPENDICES

<b>Appendix A</b>	Report Conditions
<b>Appendix B</b>	Exploratory Hole Logs Falling Head Tests Drawing No. 2585/Newbottle Street/005 - Exploratory Hole Location Plan Geological Sections Conceptual Site Model Inferred Groundwater Level Contours
<b>Appendix C</b>	Shadbolt Environmental Soils Tier 1 Screening Values
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## 1.0 INTRODUCTION

Shadbolt Group (SG) were commissioned by the Client, **Hellens Land** to undertake intrusive site investigations in respect of the proposed development of a commercial development at Newbottle street, Houghton-le-Spring.

This report provides an assessment of the ground conditions encountered at the site with regards to the proposed development which is to include commercial developments with associated infrastructure.

### 1.1 Aims and Objectives

The purpose of the investigation was to determine the existing ground conditions and identify possible geotechnical and contamination related issues arising from past uses of the site which may provide constraints to the proposed development.

### 1.2 Scope of Works

The site investigation, designed by Shadbolt Group, comprised intrusive investigations including Cable Percussive Boreholes with falling head tests, Trial pits, hand pits, rotary open holes and rotary cored boreholes. The intrusive investigations were followed by post-siteworks Gas and Groundwater Monitoring and Geotechnical and Chemical Laboratory Testing.

### 1.3 Limitations

The recommendations and opinions expressed in this report are based on the strata observed in the borings and excavations; together with the results of the site and laboratory tests as detailed within the report. Shadbolt Group take no responsibility for ground conditions which occur between the exploratory hole positions.

Every effort has been made to interpret the conditions between investigation locations; however, such information is indicative. A detailed review of the extent of limitations of this report is included in the **Report Conditions** included in **Appendix A** and the standard terms and conditions of the agreement.

This report has been prepared in accordance with the letter of appointment, report conditions and the terms and conditions of the agreement.

The site is to be developed for 2 No. retail units, petrol filling station, access road, landscaping and associated parking and infrastructure.

The proposed development layout IBA Drawing 1485 (SP) 040 T1 is presented in **Appendix G**.

## 2.0 SITE INFORMATION

### 2.1 General

The site is located to the south of Newbottle Street (A182), north east of Houghton le Spring town centre. The site is an irregular, elongated plot orientated roughly north west to south east with an area in the order of 3.35ha. The approximate National Grid Reference (NGR) for the centre of the site is 433840,550400.

A general site location plan of the site is presented as Figure 1 and an aerial photograph as Figure 2.

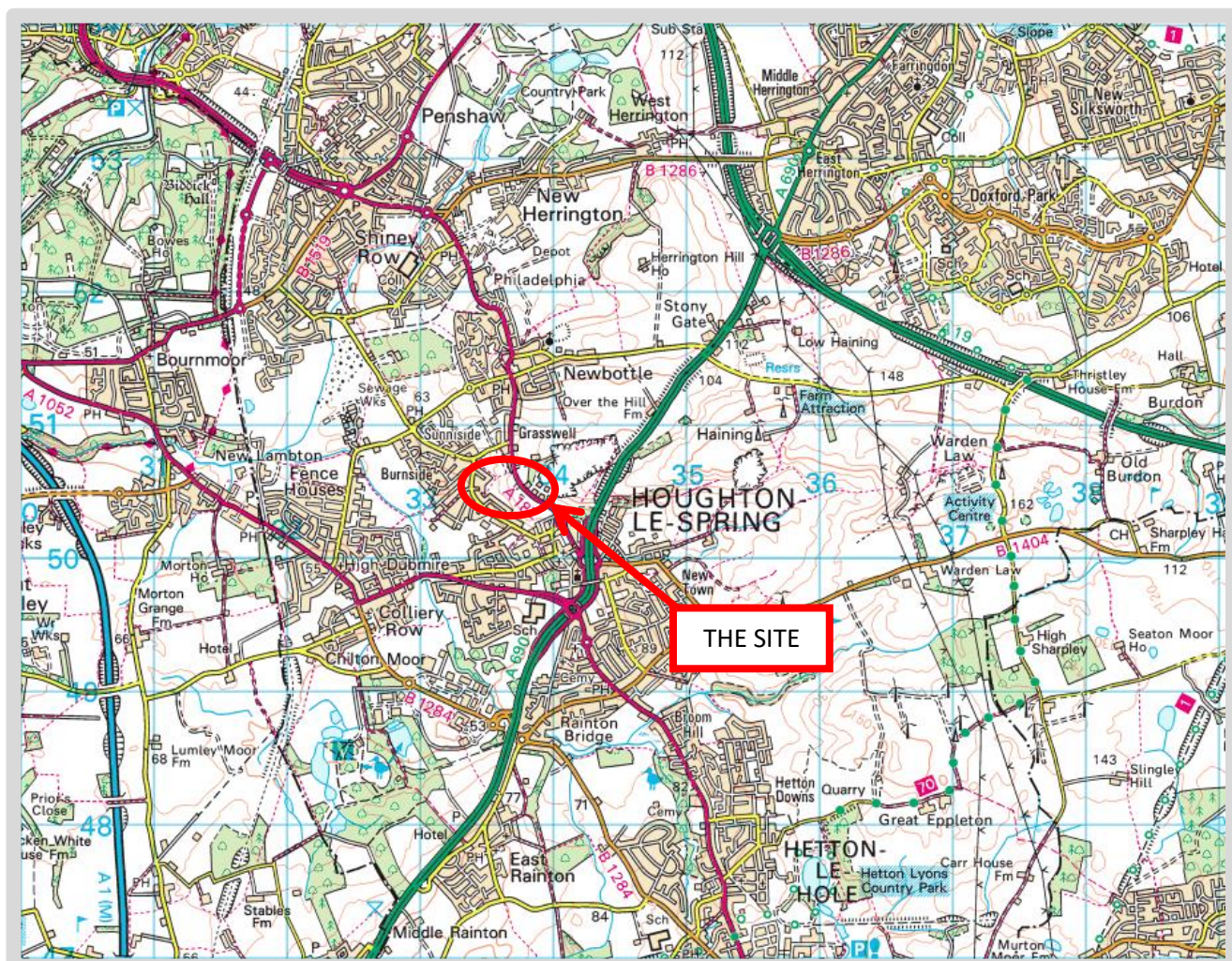


Fig. 1 – General Site Location Plan



## 2.2 Site Description

An initial site walkover was undertaken by TSG in March 2018.

The site comprises a large terrace of maintained grassland bound by slopes to the north east and south west. In the north of the site the slope up to Newbottle Street is taken up by a stone-faced retaining wall in the order of 4m tall along the boundary with a storage yard to the rear of the adjacent petrol filling station.

Stands of Japanese Knotweed were noted at the top of the northern end of the retaining wall and along the crest of the slope to the north.

The embankments at the fringes of the site are planted with small trees with the main body of the site comprising grass with a central ridge of rough grass / vegetation along the line of a former fence of which some components still remain. 2 No. roughly circular areas are not grassed, and concrete is visible; these broadly align with given location of shafts recorded by the Coal Authority which have been capped at the surface.

The boundary along Newbottle Street is fenced with close boarded timber fencing up to a pair of billboards adjacent to a van hire depot and petrol filling station at the northern end of the site.

Vehicular access is available via a track leaving a service road to the rear of the petrol filling station but is blocked by a boulder placed along the perimeter of additional grassland extending to the north of the site.



Fig.2 – Aerial Photograph Showing Development Area

## 3.0 HISTORICAL LAND USE

The site has been developed through much of the mapped history by the Houghton Colliery and associated infrastructure including railway sidings and reservoirs. Following the closure of the colliery in 1981 the site was cleared and has remained as grassed open space to the present day.

Many towns in the surrounding area were reasonably well established in the earliest mapping with the colliery and adjacent limestone quarry providing local employment opportunities. Residential areas were developed through the early 20th century with large developments in the 1940s and 1960s/70s. Extraction at the quarry has ceased and in recent times been repurposed as a landfill site and is now being considered for redevelopment.

### Key Areas of Concern

From earliest mapping in 1857 the on-site Houghton Colliery with the associated railway lines, gas works to the south and Houghton Quarry and the associated limekilns to the north are the most potentially contaminative historic activities.

Between 1857 and 1897 the tipping of spoil to the north and east of the site and the presence of mine shafts on-site cause potential concern.

Between 1897 and 1920 the labelled chimneys on-site are indicative of further potential pollution.

Between 1920 and 1939, the labelled tanks at the gas works pose a key area of concern.

Between 1958 and 1969 the mapped electrical substation at Houghton Quarry, the garage to the north and the disused tip to the north-west are key potential contaminative features.

Between 1970 and 1979 the garage developed ~20m to the east of the site poses some cause for concern. Tanks labelled within the southwest corner of the site.

1990s demolition of the former colliery, capping of the mineshafts and infilling of the railway sidings.

## 4.0 ENVIRONMENTAL SETTING

### 4.1 Geology, Mining, Ground Stability and Ground Workings

#### 4.1.1 Geology

Artificial deposits (Made Ground - Undivided) are indicated within the site boundary. These deposits are anticipated to comprise colliery spoil.

Superficial deposits are recorded on site to comprise Diamicton (Cohesive glacial till / boulder clay) comprising predominantly cohesive materials with varying proportions of granular materials; Glaciolacustrine deposits comprising interbedded clay and silt; and unclassified superficial strata which may be masked by the recorded artificial ground.

The solid geology beneath the site predominantly comprises Permian age sandstone of the Yellow Sands Formation in the north east of the site, stratigraphically overlying undifferentiated strata of the Pennine Middle Coal Measures comprising interbedded mudstone, siltstone and sandstone in the south west of the site.

BGS boreholes within the site boundary indicate Made Ground at the site to be ashy material with brick and demolition rubble with weathered limestone or sandstone bedrock encountered at 3-6m bgl through the main body of the site with colliery spoil recorded in excess of 12m thickness at the south western edge of the site and former tipping area.

No coal seams are indicated to outcrop within the site boundary; however 8 No. are recorded within 500m of the site.

4 No. faults are present within 500m of the site including 1 No. which runs through the site close to and parallel with the south eastern boundary on a bearing in the order of 070°. This fault is recorded as inferred with an unknown displacement. The inferred fault is unlikely to impact on the development proposals due to its location on the site boundary.

#### 4.1.2 Coal Mining

The site is located within an area where the effects of potential coal mining should be assessed as stated in the Groundsure report and verified by The Coal Authority's Gazetteer.

A Coal Authority Report for the site has been obtained has been reviewed as part of a Preliminary Coal Mining Risk Assessment by The Shadbolt Group which has been issued under separate cover. In brief the Coal Authority report states the following:

- *The site is within the zone of influence of workings of 7 No. seams recorded at depths of 122m to 313m bgl.*
- *No probable shallow mine workings are recorded on site.*
- *No records of spine roadways at shallow depth are recorded on site.*
- *3 No. shafts are recorded on site.*
- *There have been no damage claims within 50m of the site since 1994.*

The Coal Authority report confirms that workings have been undertaken at depth beneath the site. Although coal reserves are known to exist in the area the property is not considered to be in an area where the Coal Authority believe there is coal at or close to the surface, therefore shallow unrecorded mine workings undertaken for the extraction of coal are unlikely to be a risk factor at the site. 2 No shafts recorded at the site were originally capped in 1982 before being backfilled with washery wastes up to 1986 and then hardcore in 1987 and recapped in 1988; the third shaft was filled to an unknown specification.

Accordingly, the risk to developments at the site as a result of underground mine workings for the

extraction of coal is considered to be low but the backfilling of the shafts will need to be verified if development is to proceed within the zone of influence.

### **4.1.3 Non-Coal Mining and Natural Cavities**

There is no record of any non-coal mining activity on the site.

The Groundsure Geo-Insight report indicates the site is not within 1000m of an area of Brine Extraction, Gypsum Extraction, Tin Mining or Clay Mining.

**There is 1 No. record of natural cavities within 1000m.** This record relates to a Solution Widened Joint or Fissure 534m E of the site.

### **4.1.4 Ground Stability**

The BGS consider the overall risk to the site from natural ground subsidence to be Negligible to Moderate. This takes in to account the combined risks on site from Shrink-Swell Clays, Landslides, Soluble Rocks, Compressible Ground, Collapsible Rocks and Running Sands.

The most onerous of these risk factors has been applied to a low risk of landslides within slopes on the north eastern boundary and parallel with the south eastern boundary and a moderate risk of compressible deposits recorded in the same areas relating to the presence of unconsolidated colliery spoil and embankments.

### **4.1.5 Ground Workings**

**There are 32 No. historic surface ground workings features identified within 250m of the site including 16 No.** within the site boundary recorded on historic mapping. These records include a reservoirs, ponds, unspecified heaps and tips, workings, pits, a colliery, a sands pit, a limestone quarry, cuttings and an old clay pit.

**There are 3 No. records of Underground Workings Features on historical mapping within 1000m of the site.** These include a colliery / mine on site and an unspecified disused shaft 970m NW of the site.

**The BGS BRITPITS database contains 9 No. records relating to current ground workings within 1000m of the site.** These records relate to coal (deep), clay and shale, limestone, dolomite and sandstone extraction. Each of the recorded workings is noted to have ceased operations.

## **4.2 Radon**

Reference to the NRPB Report W26 '*Radon Atlas of England and Wales*,' 2002 and information contained in the EnviroInsight report indicates the following.

**The property is in a Radon Affected Area as defined by the Health Protection Agency (HPA) as between 1% and 3% of properties are above the Action Level.**

However, the property is not in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment.

## **4.3 Hydrogeology, Hydrology, Flood Risk and Drainage Issues**

### **4.3.1 Hydrogeology**

Information on the hydrogeological characteristics of the site has been obtained from the following:

- The Environment Agency Groundwater Vulnerability Maps
- The GroundSure Report

The site is located upon a Secondary (A) Aquifer and Principal Aquifer (The Yellow Sand Formation) and of these two aquifers the protection of the principal aquifer with associated groundwater protection zone is of paramount importance.

The superficial strata located beneath the site are designated as **Secondary (A), Secondary (Undifferentiated) and Unproductive aquifers**. Formerly classified as minor aquifers, Secondary (A) Aquifers comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The solid geology located beneath the site is designated as **Principal and Secondary (A) Aquifers**; Principal Aquifers comprise of high intergranular and fracture permeability, usually providing a high level of water storage and may support water supply to rivers on a strategic scale. This includes the Yellow Sand Formation which is designated as a Principal Aquifer by the Environment Agency. The site is situated at the geological base of the limestone classified as a Principal Aquifer and is considered the most sensitive receptor rather than the underlying Middle Coal Measures strata which is a secondary (A) aquifer.

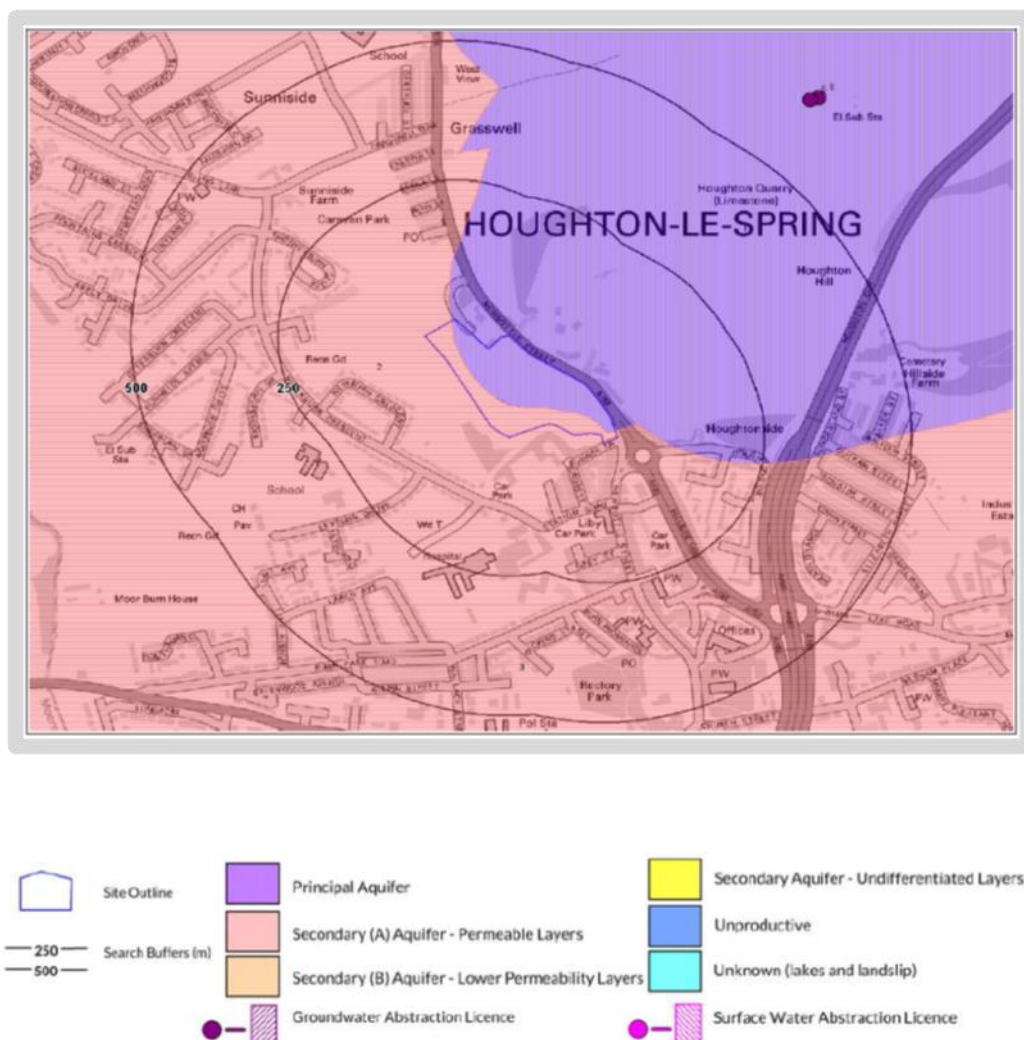


Fig.3 -Bedrock Aquifer Classification

The eastern edge of the site is located within a Source Protection Zone 3 – Total Catchment area as shown below.



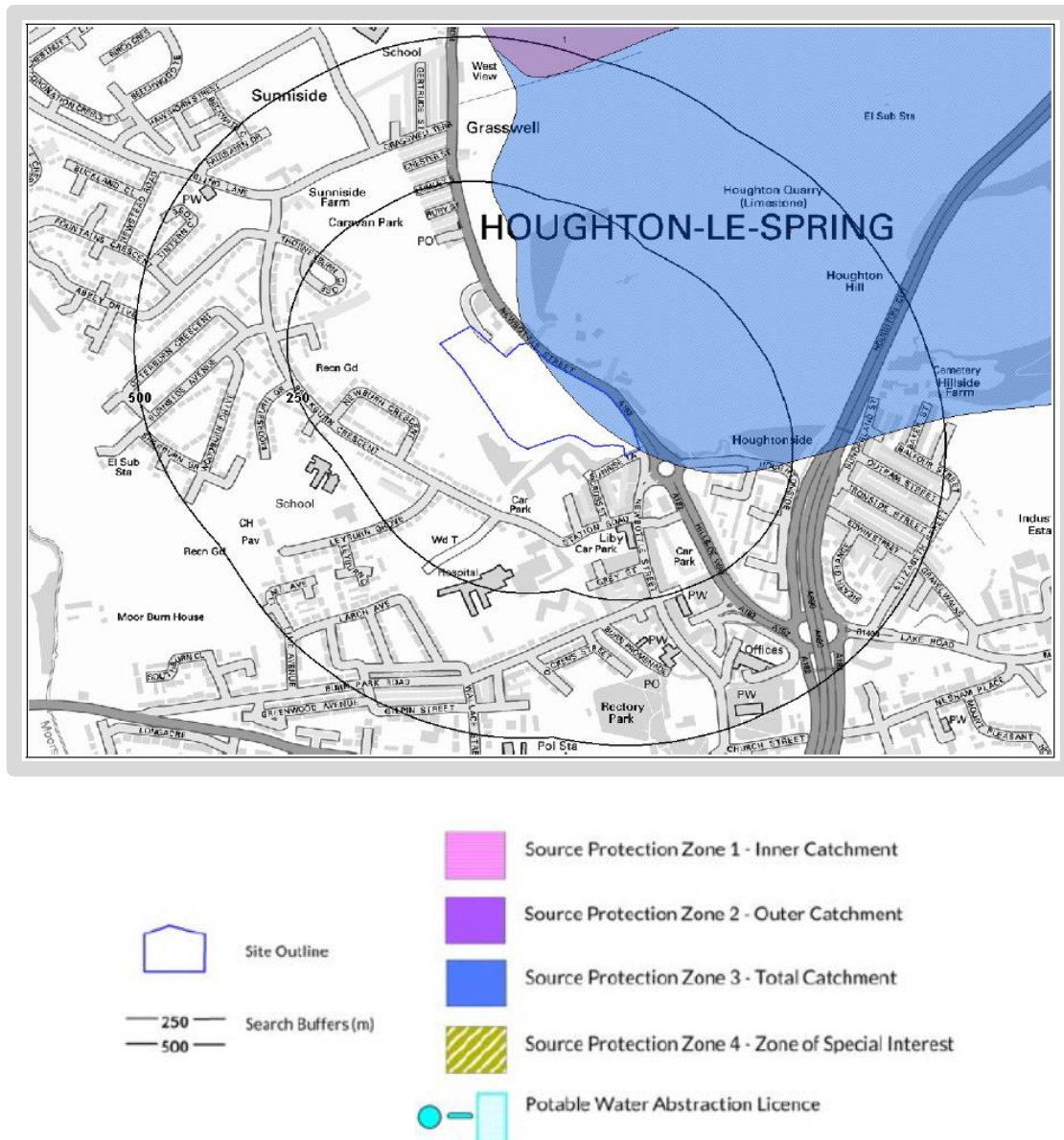


Figure 4 – Source Protection Zones

There are 2 No. Potable Water Abstraction Licences within 2000m of the site. These records are located 1953m NE of the site and relate to water supply.

The site sits approximately between 70.5m aOD and 73.5m aOD, with the northern extents sitting at approximately 70.5m aOD, the southern extents at approximately 71.5m aOD with the centre of the site at approximately 73.5m aOD.

At the time of writing there is no hydrogeology sheet available for this area, however it is understood that the regional hydraulic gradient is to the east (Younger 1994).

The surrounding land to the east of the site has an approximate elevation of 77m aOD increasing to over 100m aOD at High Haining Farm some 1.5km to the east with Moors Burn located 750m to the west, sitting at an elevation of 45m aOD, suggesting that the local shallow hydraulic gradient in the area may be from east to west towards Moors Burn.

Shallow groundwaters, where present, have the potential to migrate off-site to the west (following the natural topography of the area) and similarly shallow waters located to the east of the site have the potential to migrate towards the site. However, it is likely that shallow / perched ground waters at the site may have their downward vertical migration restricted by low permeability superficial deposits. However, where clay is absent shallow groundwaters are likely to migrate vertically downwards and potentially interact with the deeper groundwaters within the solid strata and flow towards the east following the perceived regional hydraulic gradient.

The nearest watercourse is the culverted Houghton Burn, located approximately 223m to the northeast, of the site. Although the overall regional hydraulic gradient is understood to be to the east, the watercourse is culverted and is likely to be at an elevation above the site and therefore it is unlikely that potential mobile contaminants, that may exist at the site, (impacted groundwater, leachate from soils contamination, dense / light non-aqueous phase liquids (DNAPL and LNAPL)) would have an impact on the watercourse.

#### 4.3.2 Hydrology and Flood Risk

Information from the Environment Agency (EA) indicates that the site does not lie within 250m of an indicated Environment Agency Zone 2 and Zone 3 flood plain.

Information from the Environment Agency RoFRaS (Risk of Flooding from Rivers and Sea) database indicates that the risk of flooding at the centre of the site is **Very Low** (less than 1 in 1000 chance of flooding in a given year).

Additionally, there are no Flood Defences or areas benefitting from Flood Defences or Flood Storage within 250m of the site.

The BGS indicate that the site lies within 50m of groundwater flooding susceptible areas. The BGS note that there is Potential at Surface relating to Superficial Deposits Flooding and their confidence in this classification is high.

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

#### 4.3.3 Watercourse Network, Surface Water Features and Groundwater Features

There are no Environment Agency river quality records within 1500m of the site.

**There are 3 No. river network features recorded within 500m of the site** the closest of which relates to a culvert 223m NE of the site (Houghton Burn) which appears to run through Houghton Quarry.

#### 4.3.4 Groundwater, Surface Water and Potable Water Abstraction Licences

**There are 4 No. Groundwater Abstraction Licenses within 2000m of the site.** The closest of these are located 636m and 648m NE of the site. Both licenses are for pollution remediation but while one has an active status the other is historical. Other active license uses include water supply at a point 1953m NE.

**There are 4 No. Surface Water Abstraction Licence within 2000m of the site.** These are located 1681m to 1880m W of the site and are historical permits for mineral washing and dust suppression.

**There are 2 No. Potable Water Abstraction Licences within 2000m of the site.** These records are located

1953m NE of the site ad relate to water supply.

### 4.3.5 Source protection Zones

There are 2 No. Source Protection Zones within 500m of the site including 1 No. on site. The record on site is Zone 3, Total Catchment and relates to the Yellow Sand Formation designated by the Environment Agency as a Principle Aquifer. The other record 442m N of the site is Zone 2, Outer Catchment.

Total Catchment area as shown below.

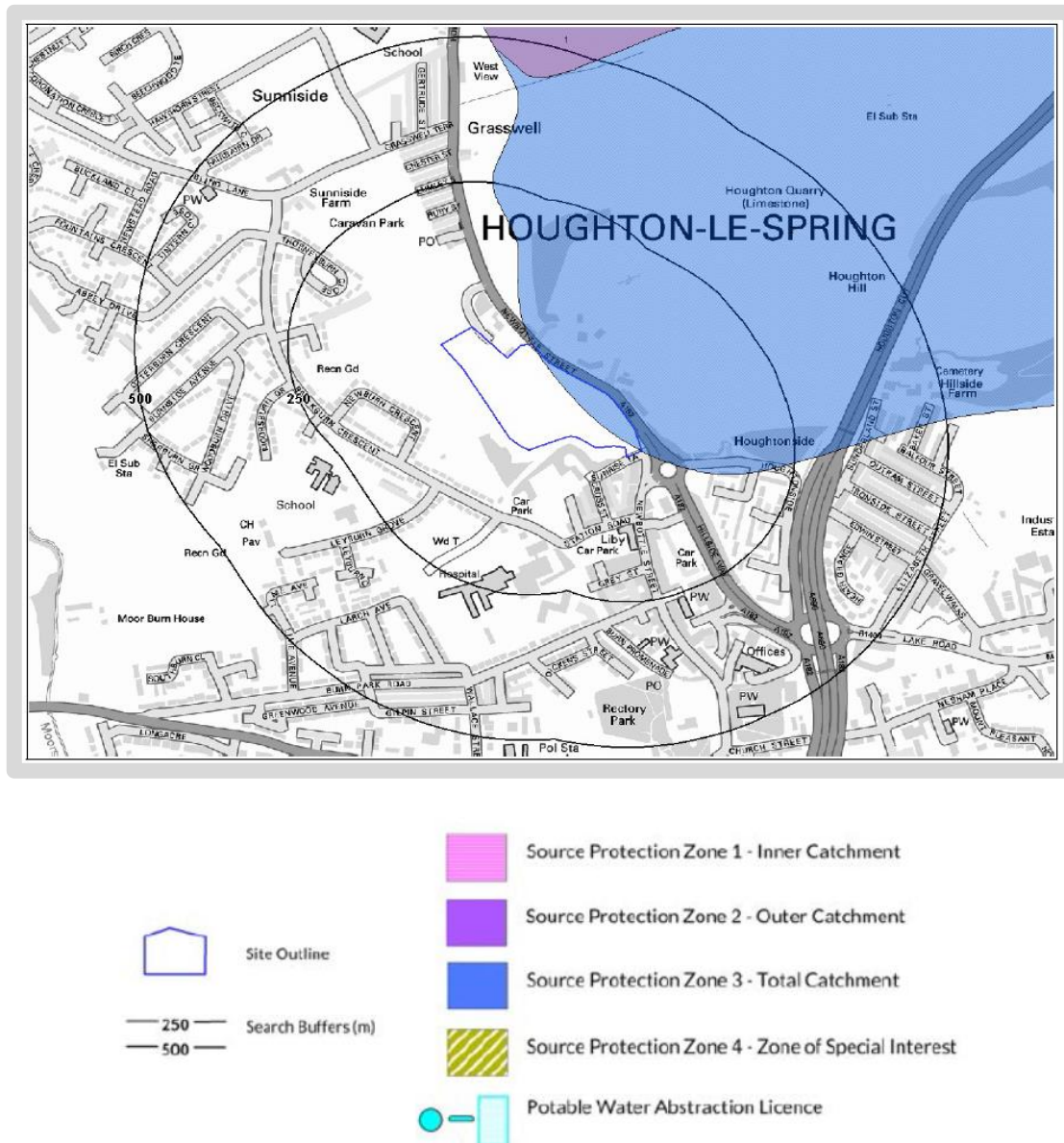


Figure 4 – Source Protection Zones

There are no Source Protection Zones within a Confined Aquifer within 500m of the site.

#### 4.3.6 Groundwater Vulnerability

Superficial and Bedrock Vulnerability on-site is classified as Low relating to the Secondary Aquifers present and soils on-site are deemed to have a Low Leaching Potential.

Superficial Permeability on site is deemed to comprise mixed flow types with a High maximum permeability and a Low minimum permeability.

Bedrock permeability on site is deemed to consist of a fracture flow type with a High maximum permeability and a Low minimum permeability.

### 4.4 Landfill and Other Waste Sites

#### 4.4.1 Landfill Sites

**There is 1 No. record of Environment Agency Registered Landfill Site Licenses Issued within 500m of the site.** This is located 33m NE of the site and relates to a waste landfill site operated by Biffa Waste Services Ltd.

**There are 3 No. records of Environment Agency Historic Landfill Site Licenses Issued within 500m of the site.** The closest relates to 3 landfill sites at Houghton Colliery located on-site. The license was issued on the 7<sup>th</sup> of September 1995 and surrendered on the 7<sup>th</sup> of April 1999. It is understood that the historic landfill sites on-site are associated with the reclamation of the former colliery,

The EA have confirmed that the three records relate to the same “landfill site” (License TW452SL) with one of the EA records stating the site is known as Houghton Colliery, which was operated by City of Sunderland, City Building Services.

The site was licensed to receive clean hardcore and brick and Category A Wastes i.e.

“Excavation Wastes only, containing no biodegradable or soluble chemical material. This category may include subsoil, sand, clay, shale or rock, provided they are not contaminated with any other materials”.

The landfill was licensed to receive 400 tonnes per day or 50 loads with a maximum capacity of 10,000m<sup>3</sup>

City Council have also been contacted regarding the landfill; however, no information has been forthcoming.

There are no records on the BGS / DoE Landfill Site Survey Database within 500m of the site relating to a site.

There are no records of Local Authority Landfill Sites within 500m of the site.

## 5.0 PREVIOUS INVESTIGATIONS

The Client has supplied a preliminary ground investigation undertaken by Allied Exploration and Geotechnics Ltd. For Sunderland City Council, in January 2006 comprising 12 No. mechanically excavated trial pits and limited environmental testing.

The trial pits identified mixed Made Ground across the site comprising predominantly colliery spoil with demolition wastes bound by cohesive soils ranging from 1.50m to in excess of 4.80m. Superficial deposits were found to comprise stiff clays of glacial origin and variably gravelly sands which likely represent weathered bedrock. Weathered sandstone bedrock was reported in 4 No. locations at depths ranging from 3.10m to 3.80m.

A number of boreholes have been undertaken on site and in the surrounding area. Some records are held by the BGS and made available via their data portal and have also been reviewed.

Records of a borehole undertaken in 1987 towards the southern corner of the site indicated colliery spoil to be present in excess of 12.00m bgl and limestone as shallow as 3.00m bgl in the northeast of the site.

Shaft records from Houghton Colliery indicate a number of thin seams from around 16m bgl with the first notable seam being recorded at 170 ft bgl (approximately 52m bgl) of 13 inches followed by another of 29 inches at 252 ft 7 in bgl (approximately 77m bgl).

## 6.0 SITE INVESTIGATION

The physical ground investigation work was carried out by Shadbolt Environmental during July 2019, December 2019, July 2020, November 2020 and most recently in July 2022.

Several phases of ground investigations have been undertaken due to site constraints and various Correspondence received from Sunderland City Council and the Environment Agency during the planning process.

### 6.1 Proposed Development

The site is proposed to be developed for commercial purpose (supermarket with mixed use) with associated infrastructure.

### 6.2 Scope of Investigation

The initial site works in July 2019 comprised the following:

- 20 No. trial pits to a maximum depth of 3.50m bgl (TP01 – TP20)
- 18 No Cable percussion boreholes to a maximum depth of 20m bgl (CP-01 to CP18)
- 3 No. Falling Head tests in the CP Boreholes.
- Gas and Groundwater monitoring visits.

Additional trial trenching to investigate the potential mineshaft located adjacent to the northern boundary was undertaken in December 2019 and is presented in **Appendix B**.

The second phase of ground investigation in April 2020 comprised the following;

- 6 No. rotary boreholes were undertaken to confirm the depth to rock head in the vicinity of the mineshafts (RO1 – RO6)
- 4 No. laboratory CBR (CBR1 – CBR4) tests were undertaken on samples retrieved from the Made Ground.

The third phase of investigation was undertaken in July 2020 following initial comments received from Sunderland City Council to undertake additional / confirmatory chemical analysis. The works comprised.

- 4 No. trial pits (TP206 – TP209)
- 7 No. hand pits (HP01 – HP07)

The fourth phase of investigations were undertaken at the site following correspondence received from the EA to retrieve shallow samples to assess the potential for BTEX and VOCs within the Made Ground and to undertake groundwater monitoring of the boreholes located at the site.

The most recent, and final phase of ground investigations were undertaken at the site in July and August 2022 and consisted of the following;

- 12 No. Rotary Cored Boreholes (RC01 – RC12) predominantly drilled to facilitate the groundwater monitoring of the underlying bed rock.

- 8 No. Trial Pits (TP301 – TP308)

Plans showing the approximate location of the exploratory holes and the extent of the areas of investigation are presented as **Drawing No. 2585/Newbottle street/005** in **Appendix C**.

The soils encountered during this investigation have been logged in accordance with BS5930:2015 “Code of Practice for Site Investigation”. During excavation, representative samples were taken at regular intervals from the exploratory holes to assist in the identification of the soils, and to allow geotechnical testing of selected samples to be programmed / scheduled.

19 No. ground gas and water monitoring installations were installed across the phases of these works to assess the potential risks to future site users and developments from ground gases and to provide an insight into the near surface and deeper groundwater regime and to provide information on the permeability of the fill materials.

It is known that the site has been subject to demolition, site clearance and infilling and the capping of mineshafts. The exploratory holes were positioned to provide an overview of the ground conditions at the site and target where possible potential structures are to be developed and enable the assessment of the shallow and deep Made Ground soils, the underlying glacial deposits and mudstone / sandstone rock.

### **6.3 In-Situ Testing**

Standard Penetration Tests were undertaken at regular intervals in Cable Percussive boreholes.

Results of the in-situ testing are presented on the relevant exploratory hole logs included in **Appendix B**.

### **6.4 Geotechnical Laboratory Testing**

Selected samples (scheduled by SG) were submitted to our nominated geotechnical testing laboratories. Results of the geotechnical testing are presented within **Appendix E**.

### **6.5 Chemical Laboratory Testing**

Selected samples (scheduled by SG) were submitted to our nominated chemical testing laboratories. Results of the chemical testing are presented within **Appendix D**.

### **6.6 Gas and Groundwater Monitoring**

Gas monitoring has been undertaken in wells across the site. 6 No. monitoring visits have been made of 6 No. in accordance with CIRIA C665.

Groundwater monitoring and sampling from the cable percussion boreholes and the rotary cored boreholes has been undertaken on 3 No. separate occasions. Groundwater levels are presented in **Appendix F**.

### **6.7 Limitations**

It should be noted that although every effort has been made to ensure the accuracy of the data obtained from the investigation, the possibility exists of variations in ground and groundwater conditions between and around the exploratory hole locations. In addition, groundwater levels and ground gas concentrations will vary seasonally and with changes in weather conditions.

## 7.0 GROUND CONDITIONS

Reference should be made to the individual exploratory hole logs presented in **Appendix B** for detailed descriptions of strata encountered at each location.

The ground conditions encountered at the site are summarised in the following sections.

### 7.1 Topsoil

No Topsoil was encountered on site.

### 7.2 Made Ground

Made Ground was encountered in all exploratory holes undertaken across the site to a depth of up to 11m and generally comprised of dark grey, reddish, brown, CLAY with varying amounts of sand, gravel and cobbles (slag, sandstone, shale, brick, concrete, mudstone). The soils have been interpreted as typical of colliery spoil / demolition materials encountered on former colliery sites. Made Ground was typically 3-10m in thickness.

### 7.3 Superficial Deposits

Superficial deposits were recorded in 16 No. of the exploratory holes and generally comprised Glacial Till comprising stiff, grey, brown gravelly Clay and laminated Clay. The gravel was typically fine to coarse angular sandstone. The deposit was typically 3-10m in thickness.

Superficial glacial clays were encountered within all rotary cored boreholes with the exception of RC01, RC02, RC11 and RC12 and was encountered at depths of between 6.4m bgl and 19.8m bgl.

### 7.4 Solid Deposits

Solid geology was encountered during the works within all 6 No. rotary open boreholes and 12 No. rotary cored boreholes as Red/Brown weathered Mudstone or Grey Yellow Sandstone / Mudstone. Whilst potential limestone bedrock was noted within the rotary open boreholes (drillers description) the rotary cored boreholes have confirmed that solid geology encountered beneath the site is Sandstone and Mudstone and no limestone was encountered.

Bedrock was encountered between 3.1m bgl and 14.8m bgl. Possible bedrock was encountered within the base of BH10 at 16.2m bgl. Bedrock was subsequently proven to the full depth of RO-02 at 21m bgl. Interbedded Limestone and Sandstone was encountered within RO-04 and RO-05 underlain by Mudstone and Sandstone respectively.

The rotary cored boreholes encountered sandstone, mudstone and siltstone from depths ranging from 5.39m bgl to 19.8m bgl and extended to a maximum depth of 25m bgl (where the majority of the rotary cored boreholes terminated).

As stated above, no deposits of limestone were encountered during the drilling of the rotary cored boreholes.

### 7.5 Groundwater

Groundwater strikes was encountered in 9 No. of the cable percussion boreholes (CP-01, CP-02, CP-03, CP-05, CP-06, CP-07, CP-11, CP-15 and CP-17) ranging in depth from 3.10m bgl to 10.6m bgl during drilling – considered to be isolated perched water within either the Made Ground or the Superficial deposits.



No groundwater was encountered during the drilling of the rotary open boreholes in April 2020., however the use of water flush inhibits the recoding of the water strikes / water table.

During the drilling of the rotary cored boreholes occasional perched water strikes were reported within the Made Ground and the shallow superficial deposits, with the water table being reported generally at 13-16m bgl at a level of 52-54m aOD. Groundwater has been recorded within all the shallow monitoring wells within the Made Ground / superficial (typically as a small volume collected with the base of the installation) with the highest groundwater level recorded at 4.50m bgl. It should be noted that groundwater levels will vary seasonally.

During the groundwater sampling visits limited groundwater was encountered within the cable percussion boreholes suggesting collection of water within the wells rather than a consisted perched water table (the boreholes were either purged dry during sampling or contained insufficient sample for testing).

Where shallow groundwater was encountered this was generally encountered as perched water above the underlying low permeability clays. The borehole logs and monitoring data suggest that the upper perched ground water is isolated from the lower deep groundwater within the underlying rock where the low permeability clays are present (the clays are absent towards the eastern part of the site in the vicinity of the proposed petrol filling station).

The more recently installed rotary cored boreholes have been monitored and sampled on 3 No. occasions.

The deep hydraulic gradient reported at the suggest that groundwater flow at the site appears to lie between 57.97maOD to 54.51m aOD. but with a general hydraulic gradient to the east from the west (broadly in line with the anticipated hydraulic gradient

Ground water strikes / levels were generally encountered during monitoring (of the deep boreholes) are summarised below.

Borehole with response zone with the underlying rock	Depth to standing water m aOD	Comments
RC01	57.23	Approximate Strike Similar to Monitoring Level
RC02	56.37	Approximate Strike Similar to Monitoring Level
RC04	54.51	Strike Similar to Monitoring Level
RC05	57.29	Strike Similar to Monitoring Level
RC06	56.40	Water Strike (rose to 60.59m aOD on monitoring – potential silting up of borehole)
RC07	56.27	Water Strike (rose to 63.96 m aOD on monitoring – potential silting up of borehole)
RC08	57.97	Water Strike (rose to 61.92m aOD on monitoring – potential silting up of borehole)
RC09	55.40	Strike Similar to Monitoring Level
RC12	55.28	Strike Similar to Monitoring Level

- RC03, RC10 and RC11 had response zones within the shallow soils.

Geological Sections through the site and a groundwater level contour plan are presented in **Appendix B** with groundwater monitoring levels presented in **Appendix F**.

## 7.6 Ground Obstructions / No Recovery / Voids

9 No. cable percussion boreholes encountered obstructions from 1mbgl to 8.5m bgl in the form of buried boulders and concrete. (Please see the exploratory logs for further information).

Poor core recovery was noted within the majority of the Rotary Cored boreholes (no loss of flush) and a void was noted within RC04 at between 5.0 and 6.5m bgl.

Poor recover was considered to be a result of destructive weathering of the underlying bedrock.

## 7.7 Observed Contamination

No significant visual or olfactory evidence of contamination was recorded during the site investigation works with the exception of ash, brick and concrete fragments observed as part of the Made Ground clay matrix. A very faint hydrocarbon odour was noted from TP-19 (subsequent laboratory analysis did not reported elevated concentrations of contaminants). It should be noted that TP301 was excavated within the same location as TP-19 during the most recent ground investigation works and no evidence of hydrocarbon contamination was noted.

No mobile hydrocarbon contamination was observed or noted during any phase of the ground investigation works.

During the hand pitting exercise (HP01 – HP07) and groundwater water monitoring which reported low concentrations of BTEX, VOCs and SVOCs, all samples were also tested for potential SVOCs and VOC contaminates using a handheld Mini Rae Photoionization Detector (PID) and as would be expected, based on the chemical analysis results all samples reported no VOCs.

No Light Non-Aqueous Phase Liquids (LNAPL) or Dense Non Aqueous Phase Liquids (DNAPL) were observed / recorded during all phases of ground investigations works and groundwater monitoring.

## 7.8 In-Situ and Laboratory Geotechnical Analysis

The following in-situ and laboratory geotechnical testing has been undertaken, the results of which are summarised in Table 7.8 (below) and are presented on logs and laboratory reports in full in **Appendices B and E** respectively.

Method	Strata	Parameter	Comments
Particle Size Distribution	Made Ground Strata	Clay/Silt =12-57% Sand = 6-70% Gravel =13-50% Cobbles =3-47%	PSD analysis indicates cohesive materials in Class 2C.
Standard Penetration Test (SPT)	Made Ground 0.0 m-10.50m	SPT 'N-Values' in range N=3 to N=50 (Avg range N=23)	SPTs confirm the Made Ground to be Medium Dense.
	Cohesive Superficial	SPT 'N-Values' in range	SPTs confirm the Glacial Till to be

	Strata 0.50m-2.50m	N=21 to N=42 (Avg range N=34)	Hard.
Undrained Shear Strength (Triaxial)	Made Ground 3.00m to 3.45m	Shear Strength (Cu) value 27kpa	Testing indicates that Made Ground to be locally soft in paces.
	Cohesive Superficial Strata 9.50m to 9.95m	Shear Strength (Cu) value 21kpa	Testing indicates the Glacial Till to be locally soft in places
Compaction (Dry Density / Moisture Content)	Made Ground 0.50m-2.50m	Optimum MC 7.7 to 14% Natural MC 13 to 25%	Made Ground is generally wet of optimum for earthworks and some drying treatment (lime) may be required.
Laboratory CBR	Made Ground	CBR Values – 3.9% to 54.6%	Design CBR of 5% for Made Ground Cohesive  Design CBR of 15% for Made Ground Granular

**Table 7.8 – Summary of In-Situ and Laboratory Geotechnical Testing undertaken.**

3 No falling head tests were undertaken within CP01 (8.0m bgl) , CP04 (9m bgl) and CP16B (6.0m bgl) within the Made Ground. The ground conditions within the boreholes generally comprised Made Ground of dark grey, gravelly sandy Clay where the gravel includes fine to medium, angular coal, brick, sandstone, brick ash and slag (potentially colliery spoil). It is considered hat the ground conditions encountered within CP01, CP04 and CP16B are representative of the site Made Ground material (please see exploratory hole logs in **Appendix B** for confirmation).

All 3 No. falling head tests undertaken reported low coefficients of permeability in the order of  $k=1.78e-8$  m/s to  $k= 2.88e-8$ m/s (similar to a low permeable glacial till).

## 8.0 GROUND CONTAMINATION ASSESSMENT

### 8.1 Legislation

Part IIA of the Environmental Protection Act 1990 provides for the control of specific threats to health or the environment from existing land contamination. In accordance with the Act, the statutory guidance document and The Contaminated Land (England) Regulations 2000, the definition of contaminated land is intended to embody the concept of risk assessment. Therefore, land is only “contaminated land” where it appears to the regulatory authority, by reason of substances within, on, or under the land that:

**Significant harm** is being caused, or there is significant possibility of such harm being caused; or

**Pollution of controlled waters** is being, or is likely to be, caused.

The guidance defines “risk” as the combination of:

**Probability**, or frequency, of occurrence of a defined hazard (for example, exposure of a property to a substance with the potential to cause harm); and

**Magnitude** (including the seriousness) of the consequences.

For a risk of pollution or environmental harm to occur as a result of ground contamination, all of the following elements must be present:

**Source**, i.e. a substance that is capable of causing pollution or harm;

**Receptor** (or target), i.e. something which could be adversely affected by the contaminant; and

**Pathway**, i.e. a route by which the contaminant can reach the receptor.

If one of these elements is missing (source, pathway or receptor) there can be no significant risk. If all are present then the magnitude of the risk is a function of the magnitude and mobility of the source, the sensitivity of the receptor and the nature of the migration pathway.

### 8.2 Assessment Methodology

In order to assess the environmental risk posed by potential contaminants within the underlying soils and groundwater to controlled waters, Shadbolt Group undertook an initial screen of the laboratory results using Shadbolt Group Tier One Screening Values which include the Atkins ATRISK Values (Human Health) Environmental Quality Standards (EQS) and Drinking Water Standards (DWS).

Contaminant concentrations below the TSVs are considered not to warrant further risk assessment. Concentrations of potential contaminants above the TSVs require further consideration of the potential pollutant linkages. *It should be noted that exceedance of the TSVs does not necessarily require that the site be remediated.*

### 8.3 Derivation of Soils TSVs

A discussion on the development of Shadbolt Group Human Health TSVs is presented, along with the relevant values at the time of writing in **Appendix C**.

### 8.4 Derivation of Leachate and Groundwater TSVs

The majority of the criteria utilised in the assessment of the site is presented in Table 6.2.1 and Table 6.2.2 below and are representative of the values published within UK Drinking Water Standard Guidelines taken from the "The Water Supply (Water Quality) Regulations 2016" and "Environmental Quality Standard for Freshwater", published by the EA. Where no UK criteria exists Shadbolt Group have referenced SWR - The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 3001 and WHO – World Health Organization Guidelines.

Inorganics ug/l					
Analyte	Guideline Value	Guidance Source	Analyte	Guideline Value	Guidance Source
Arsenic	10	UKDWS	Mercury	1	UKDWS
Boron	1,000	UKDWS	Nickel	20	UKDWS
Cadmium	5	UKDWS	Sulphate	250,000	UKDWS
Chromium	50	UKDWS	Selenium	10	UKDWS
Copper	2000	UKDWS	Zinc	3000	SWR
Cyanide	50	UKDWS	pH	6.5-9.5	UKDWS
Lead	10	UKDWS			

EQS (f) – Environmental Quality Standard for Freshwater, EA

UKDWS – UK Drinking Water Standard Guidelines taken from the "The Water Supply (Water Quality) Regulations 2016"

SWR - The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 3001

**Table 6.2.1 – Inorganic Analytes**

Organics ug/l					
Analyte	Guideline Value	Guidance Source	Analyte	Guideline Value	Guidance Source
Benzo(a)pyrene	0.01	UKDWS	Fluoranthene	0.0063	EQS (f)
Naphthalene	2	EQS (f)	Benzene	1	UKDWS
Acenaphthylene	5.8	WRc plc (2002), R&D Technical Report	Toluene	74	EQS (f)
Sum of 4 PAH Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(g,h,i)perylene Indeno(1,2,3-cd)pyrene	0.1	UKDWS	Ethyl benzene	300	WHO
TPH (Hydrocarbons)	10	UKDWS	Xylene	30	EQS (f)
C5-C6 (Ali)	1.5x10 <sup>4</sup>	WHO	C5-C6 (Aro)	1	WHO
C6-C8 (Ali)	1.5x10 <sup>4</sup>	WHO	C6-C8 (Aro)	700	WHO
C8-C10 (Ali)	3x10 <sup>2</sup>	WHO	C8-C10 (Aro)	300 (ethylbenzne) 500 (xylene)	WHO
C10-C12 (Ali)	3x10 <sup>2</sup>	WHO	C10-C12 (Aro)	90	WHO
C12 – C16 (Ali)	3x10 <sup>2</sup>	WHO	C12 – C16 (Aro)	90	WHO
C16-C21 (Ali)	-	WHO	C16-C21 (Aro)	90	WHO
C21-C35 (Ali)	-	WHO	C21-C35 (Aro)	90	WHO

EQS (f) – Environmental Quality Standard for Freshwater, EA

UKDWS – UK Drinking Water Standard Guidelines taken from the “The Water Supply (Water Quality) Regulations 2016”

SWR - The Surface Waters (Abstraction for Drinking Water) (Classification) Regulations 1996 (as amended). SI 1996 / 2001

WHO – World Health Organization Guidelines

Table 6.2.2 Organic Analytes

## 8.5 Soil Contamination Assessment

In total 70 No. soil samples were submitted for testing for a suite of common contaminants during the several phases of Shadbolt Group ground investigations.

The laboratory chemical results have reported concentrations of potential contaminants to be within / below SE TSVs for a Commercial end use (human health criteria).

Soils analyses undertaken which reported concentrations above laboratory detection limit but beneath the human health criteria for a commercial enduse included heavy metals and metalloids, Cyanide, sulphate, Total

Petroleum Hydrocarbons, Polyaromatic Hydrocarbons, occasional VOCs and SVOCs.

The potential for soils contamination to impact groundwater resources is dictated by the leachability of the soils located at the site and the potential for the soils to come into contact with water.

Leachate contamination assessment is discussed in **Section 8.6**.

### 8.5.1 Soils Statistical Assessment

Statistical Assessment for human health is not required due to the low concentrations of contaminants reported.

## 8.6 Leachate Contamination Assessment

Leachate analysis undertaken on soils (17 No.) retrieved from the site has reported low concentrations of contaminants below the laboratory detection limits and compared to Threshold Values for Groundwater. However, several contaminants were reported to be slightly elevated when compared to Threshold Values as shown in the table below.

Analyte	Concentration ug/l	EQS Surface Water (ug/l)	Multiple of Threshold	UK Drinking Water Standards (ug/l)	Multiple of Threshold	Location / Strata
Fluoranthene	1.1	0.0063	x 174	N/A		TP209 @ 1.5m bgl (Made Ground)
	0.01		1.6			RC01@4.76-4.89mbgl (Made Ground)
	0.03		4.8			RC05 @ 9.4-9.5m bgl (Glacial Till)
	0.01		1.6			RC06 @ 5.0-5.2m bgl(Glacial Till)
Benzo (b)fluoranthene	0.6	N/A	N/A	0.1 (sum of 4)	x6	TP209 @ 1.5m bgl (Made Ground)
	0.13					1.3
Benzo(a)pyrene	1.8	0.0017	x1058	0.01	x180	TP209 @ 1.5m bgl (Made Ground)
	0.06					

**Table 8.6.1 - Leachate Analysis Above TSVs Summary Table**

Several contaminants were also reported to be above the laboratory detection limit and are as follows;

Analyte	Concentration (ug/l)	Lab' L.O.D (ug/l)	Location
EPH (C10-C40)	29	10	RC01 @ 4.76-4.89m bgl (Made Ground)
	69		RC02 @ 5.5-5.6m bgl (Made Ground)
	120		RC11@0.1-0.2m bgl (Made Ground)
	97		RC12@0.5-0.6m bgl (Made Ground)
	21		TP209 @ 1.5m bgl (Made Ground)
Acenaphthene	0.02	0.01	RC08 at 5.6-5.7m bgl (Made Ground)
	0.03		RC08 @ 6.5-6.6m bgl (Glacial Till)
	0.00.01		RC12@0.5-0.6m bgl (Made Ground)
Fluorene	0.04	0.01	RC01 @ 6.23m-6.4m bgl (Mudstone)
	0.02		RC02 @ 5.5 -5.6m bgl (Made Ground)
	0.01		RC08 at 5.6-5.7m bgl (Made Ground)
	0.02		RC08 @ 6.5-6.6m bgl (Glacial Till)
Phenanthrene	0.01	0.01	RC01 @4.76-4.89m bgl (Made Ground)
	0.02		RC05 @ 9.4-9.5m bgl (Glacial Till)
	0.02		RC08 at 5.6-5.7m bgl (Made Ground)
	0.09		RC08 @ 6.5-6.6m bgl (Glacial Till))
	0.01		RC11@0.1-0.2m bgl (Made Ground)
	0.02		RC12@0.5-0.6m bgl (Made Ground)
	0.4		TP209 @ 1.5m bgl (Made Ground)
Anthracene	0.03	0.01	RC08 @ 6.5-6.6m bgl (Glacial Till)
	0.01	0.01	RC11@0.1-0.2m bgl (Made Ground)
	0.01	0.01	RC12@0.5-0.6m bgl (Made Ground)
Fluoranthene	0.01	0.01	RC01 @4.76-4.89m bgl(Made Ground)
	0.03		RC05 @ 9.4-9.5m bgl (Glacial Till)
	0.01		RC06 @ 5.0-5.2m bgl (Glacial Till)
	0.01		RC11@0.1-0.2m bgl (Made Ground)
	0.02		RC12@0.5-0.6m bgl (Made Ground)
	1.1		TP209 @ 1.5m bgl (Made Ground)
Pyrene	0.02	0.01	RC05 @ 9.4-9.5m bgl (Glacial Till)
	0.01		RC11@0.1-0.2m bgl (Made Ground)
	0.02		RC12@0.5-0.6m bgl (Made Ground)
	0.9		TP209 @ 1.5m bgl (Made Ground)
Chrysene	0.01	0.01	RC05 @ 9.4-9.5m bgl (Glacial Till)
	0.4		TP209 @ 1.5m bgl (Made Ground)

**Table 8.5.2 -Leachate Analysis Above Laboratory Detection Limit Summary Table**

As can be seen several of the samples retrieved reported concentrations of PAH above laboratory detection limit but where no Shadbolt TSV currently exists.



## 8.6 Groundwater Contamination Assessment

No significant groundwater strikes were encountered during the initial ground investigations and insufficient groundwater was encountered initially within the cable percussions monitoring standpipes to retrieve representative samples.

However recent monitoring off the boreholes has enable the retrieval of water samples from BH01, BH02, BH03 and BH10 and RC01 to RC12. The remainder of the cable percussion boreholes remained dry.

Analyte	Concentration ug/l	EQS Surface Water (ug/l)	Multiple of Threshold	UK Drinking Water Standards (ug/l)	Multiple of Threshold	Location / Response Zone
Selenium	11.5 - 60.01	N/A	N/A	10	x1 – x6	BH01, BH04 and BH10 (all Made Ground / Glacial Till - Elevated concentrations reported during 3 No. monitoring visits)
Naphthalene	7.7	2	3.85	N/A	N/A	RC12 (Visit No.1) - Sandstone
Benzo(b)fluoranthene	7.7	N/A	N/A N/A N/A N/A	0.1	x77	RC12 (Visit No.1) - Sandstone
Benzo(k)fluoranthene	4.3	N/A	N/A	0.1	x43	RC12 (Visit No.1) - Sandstone
Benzo(ghi)perylene	3.0	N/A	N/A	0.1	x30	RC12 (Visit No.1) - Sandstone
Indendo(123CD) pyrene	3.8	N/A	N/A	0.1	x38	RC12 (Visit No.1) - Sandstone
Benzo(a)pyrene	0.4 0.04 7.2	0.00017	x 2352 x 235 x 42352	0.01	x40 x400	BH10 (1 <sup>st</sup> monitoring visit only) RC11 (Visit No. 2) – Sand RC12 (Visit No.1) - Sandstone
Fluoranthene	0.2-0.3 0.03 0.12, 0.07 15, 0.03 1.3	0.0063	x47 x33 x19 x5 x2380 x33 x206	N/A	N/A	BH01, BH02, BH03 (1 <sup>st</sup> monitoring visit) RC08 (visit No.3) RC11 (Visit No.2 and 3) – Sand / Sandstone RC12 (Visit No.1 and 3) – Sandstone RC07 (visit No.3)

**Table 8.6.1 - Groundwater Analysis Above TSVs Summary Table**

Analyte	Concentration (ug/l)	Lab' L.O.D (ug/l)	Location / Response Zone
EPH (C10-C40)	<20 to 410 <20 to 15,000	10	RC01 to RC12 (Visit No. 1) RC01 to RC12 (Visit No. 2)
Acenaphthene	0.04 0.04 0.01 2.8 0.02 0.02 0.66	0.01	RC01 (Visit No. 1) - Sandstone RC10 (Visit No. 1) - Made Ground RC11 (Visit No. 1) - Sand / Sandstone RC12 (Visit No. 1) - Sandstone RC11 (Visit No. 2) - Sand / Sandstone RC08 (Visit No.3) - Mudstone RC07 (Visit No.3) - Clay / Mudstone
Fluorene	0.02 4.0 0.02 0.02 0.88	0.01	RC10 (Visit No. 1) - Made Ground RC12 (Visit No. 1) - Sandstone RC11 (Visit No. 2) - Sand / Sandstone RC08 (Visit No.3) - Mudstone RC07 (Visit No.3) - Clay / Mudstone
Phenanthrene	0.02 0.02 0.04 0.06 0.06 0.04 27 0.03 0.06 0.03 0.06 0.02 0.3 0.2 0.03 0.02 0.04 0.02 1.3	0.01	RC01 (Visit No. 1) - Sandstone RC03 (Visit No. 1) - Made Ground RC04 (Visit No. 1) - Siltstone/ Sandstone RC05 (Visit No. 1) - Sandstone RC10 (Visit No. 1) - Made Ground RC11 (Visit No. 1) - Sand / Sandstone RC12 (Visit No. 1) - Sandstone RC01 (Visit No. 2) - Sandstone RC05 (Visit No. 2) - Sandstone RC10 (Visit No. 2) - Made Ground RC11 (Visit No. 2) - Sand / Sandstone RC12 (Visit No. 2) - Sandstone BH01 (Visit No.1) - Made Ground BH10 (Visit No.1) - Made Ground RC08 (Visit No. 3) - Mudstone RC09 (Visit No. 3) - Siltstone RC11 (Visit No. 3) - Sand / Sandstone RC12 (Visit No.3) Sandstone RC07 (Visit No.3) - Clay / Mudstone
Anthracene	0.01 2.9 0.03 0.03 0.02 0.88	0.01	RC11 (Visit No. 1) - Sand / Sandstone RC12 (Visit No. 1) - Sandstone RC11 (Visit No. 2) - Sand / Sandstone RC08 (Visit No.3) - Mudstone RC11 (Visit No. 3) - Sand / Sandstone RC07 (Visit No.3) - Clay / Mudstone
Fluoranthene	0.02 0.01 0.02 0.05 15 0.02 0.12 0.02 0.03 0.07 0.03 1.0	0.01	RC04 (Visit No. 1) - Siltstone/ Sandstone RC05 (Visit No. 1) - Sandstone RC10 (Visit No. 1) - Made Ground RC11 (Visit No. 1) - Sand / Sandstone RC12 (Visit No. 1) - Sandstone RC10 (Visit No. 2) - Made Ground RC11 (Visit No. 2) - Sand / Sandstone RC12 (Visit No. 2) - Sandstone RC08 (Visit No. 3) - Mudstone RC11 (Visit No. 3) - Sand / Sandstone RC12 (Visit No.3) Sandstone RC07 (Visit No.3) - Clay / Mudstone
Pyrene	0.02 0.03 0.08 20 0.02 0.3 0.2 0.3 0.06 0.1 0.03 2.8	0.01	RC05 (Visit No.1) - Sandstone RC10 (Visit No. 1) - Made Ground RC11 (Visit No. 1) - Sand / Sandstone RC12 (Visit No. 1) - Sandstone RC05 (Visit No.2) - Sandstone BH01 (Visit No. 1) - Made Ground BH02 (Visit No. 1) - Made Ground BH10 (Visit No. 1) - Made Ground RC08 (Visit No. 3) - Mudstone RC11 (Visit No. 3) - Sand / Sandstone RC12 (Visit No.3) Sandstone RC07 (Visit No.3) - Clay / Mudstone
Chrysene	7.6 0.06 0.2 0.03 0.02 0.78	0.01	RC12 (Visit No. 1) - Sandstone RC11 (Visit No. 2) - Sand / Sandstone BH10 (Visit No. 1) - Made Ground RC08 (Visit No. 3) - Mudstone RC11 (Visit No. 3) - Sand / Sandstone RC07 (Visit No.3) - Clay / Mudstone

**Table 8.6.2 - Groundwater Analysis Above Laboratory Detection Limit Summary Table**

All other chemical analysis results, including BTEX, VOCs, PCBs and PAHs were reported to be below the laboratory detection limits “with the exception of several VOC’s” i.e. di-n-butyl phthalate, bis(2-ethylhexyl)ester, bis(2-ethylhexyl)phthalate and chloroform.

The leachate analysis table and the groundwater analysis table show elevated leachable hydrocarbons in the soils whilst elevated selenium and hydrocarbons were recorded within the groundwaters.

As such, it appears that the deep groundwaters have been slightly impacted with dissolved phase PAH hydrocarbons, in places.

## 9.0 ENVIRONMENTAL RISK ASSESSMENT

All available data has been collated and evaluated to establish an initial conceptual model of the site in its current condition and post development identifying sources, pathways and receptors and pollutant linkages. The conceptual site model has been developed in accordance with BS10175: 2011. A pictorial representation of the Conceptual Site Model is presented in **Appendix B**.

The site is to be developed for a supermarket (Unit 1), retail unit (Unit 2) and petrol filling station and a Tier 1 risk assessment has been undertaken using the appropriate guidelines for a COMMERCIAL end use as this represents the most sensitive receptor in the proposed development.

It is understood that the main superstructures of the supermarket are to be piled to approximately 15m bgl with the foundations for the retail unit to be vibro replacement columns (typically 5m deep) with the Petrol Filling Station utilising a raft foundation. Please note that there are no below ground fuel tanks proposed within the development.

Formal drainage is to be adopted for the site as a whole and the fuel tanks associated with the petrol filling station are to be located above ground with appropriate pollution / drainage management system incorporated into the design. It is understood that the PFS is to be constructed utilising a raft foundation.

The superficial strata located beneath the site are designated as Secondary (A), Secondary (Undifferentiated) and Unproductive aquifers. Formerly classified as minor aquifers, Secondary (A) Aquifers comprise permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

The solid geology located beneath the site is designated as Principal and Secondary (A) Aquifers; Principal Aquifers comprise of high intergranular and fracture permeability, usually providing a high level of water storage and may support water supply to rivers on a strategic scale. This includes the Yellow Sand Formation which is designated as a Principal Aquifer by the Environment Agency. The easternmost part of the site is also located within a Zone 3, Total Catchment Source Protection Zone and relates to the Yellow Sand Formation.

As can be seen in figure 10.1 below the principal aquifer encroaches into the site and is partially located beneath Unit 1 and Unit 2. However, Unit 1 and Unit 2 are out with the groundwater source protection zone.

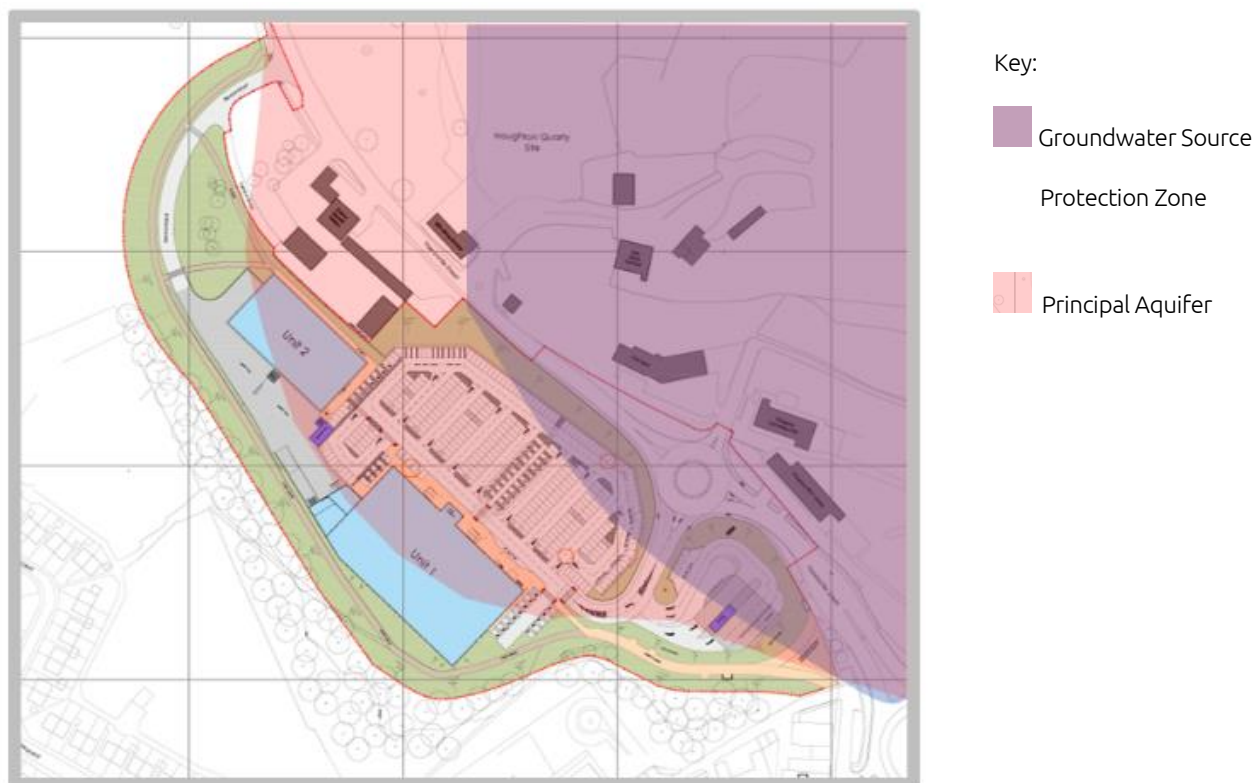


Figure 10.1 – Overlay of Development / Principal Aquifer and Groundwater Source Protection Zone

## 9.1 Contamination Sources

### Potential Sources

Given the site history and the current topography Made Ground is considered to be present across the site in deposits remaining from former spoil heaps, inert waste materials and potential buried former tanks.

The industrial legacy of the site and surrounding areas, give an increased potential for contaminants to be present in any Made Ground or within the fabric of the underlying bedrock. Considering the site and surrounding areas history, potential contaminants may include;

- Polyaromatic Hydrocarbons (PAHs)
- Phenols
- Total Petroleum Hydrocarbons (both aliphatic and aromatic)
- Volatile and semi-volatile organic compounds (VOS's and SVOCS)
- Benzene, Toluene, Ethyl-Benzene Xylene (BTEX Compounds)
- Methyl tert-butyl ether (MTBE)
- Polychlorinated biphenyls (PCBs)
- Asbestos,
- Heavy metals and metalloids
- Pesticides
- inorganic compounds (pH, sulphates, sulphur, cyanides)
- Coal Tars, Alcohols, glycols, chlorides, nitrogen, herbicides and pesticides.

The potential also exists for deeper Made Ground associated with the colliery and more recent landfilling of the mine shafts and railway cutting including potentially biodegradable materials or naturally occurring organic

material in adjacent superficial strata resulting in the potential for 'landfill' gas production by the burial and decomposition of organic material.

However, it should be noted that the site was previously an inert landfill and significant contamination is not anticipated within these fill materials.

### **Actual Sources**

In total, 70 No. soil samples, 17 No. leachate samples and 51 No. water samples were submitted for testing for a suite of common contaminants from the SG ground investigations. The majority of samples tested have either reported concentrations of contaminants below Shadbolt Group TSVs or below the laboratory detection limit.

The laboratory chemical results report all soil samples to be within the TSVs and therefore no further assessment is required.

Leachate analysis has reported low concentrations of contaminants except for slightly elevated, Fluoranthene, Benzo (b)fluoranthene and Benzo(a)pyrene reported within the Made Ground and superficial deposits

Ground water analysis has been undertaken on samples retrieved from 17 No. boreholes and has reported slightly elevated concentrations of Selenium and PAH's.

Considering the chemical testing undertaken to date and the prevailing ground conditions it is unlikely that any significant contamination will be encountered during foreseeable works or post-development occupation (Hardstanding's and building as part of the commercial development will effectively act as a barrier between future site users and the Made Ground beneath; however, it is possible that instances of contaminants may be present on site through made ground, leakages, spillages, localised historic importing of contaminants or soils or unrecorded fly-tipping of wastes.

## **9.2 Potential Contaminant Pathways**

The following potential contaminant pathways are proposed considering the proposed end-use(s).

- Inhalation of dust and volatile contaminants
- Direct contact (ingestion and dermal contact)
- Leaching of contaminants and migration through permeable soils
- Groundwater migration
- Migration through service conduits
- Migration through the local drainage network
- Leakage from site drainage
- Surface water run-off
- Ground gas migration
- Plant root up-take

## **9.3 Potential Contamination Receptors**

The potential receptors listed below are proposed considering the current status of the site and surrounding area, and the proposed development for commercial end use.

### *Human Health*

- Current site users.

### *Environmental*

- Future establishment of flora and fauna.

- Future site users.
- Site development workers.
- Buildings and underground services.
- Controlled waters and aquifers.

## 9.4 Qualitative Risk Assessment

By considering the sources, pathways and receptors, an assessment of the environmental risks is made with reference to the significance and degree of the risk to the development for current and future site users.

The qualitative risk assessment has been undertaken in accordance with BS10175:2011 and CIRIA Document C552: Contaminated Land Risk assessment, A Guide to Good Practice.

The risk assessment has been carried out by assessing the severity of the potential consequence, taking into account both the potential severity of the hazard and the sensitivity of the target, based on the categories given in Table 9.4.1 below.

<i>Category</i>	<i>Definition</i>
<b>Severe</b>	Acute risks to human health, catastrophic damage to buildings / property, major pollution of controlled waters
<b>Medium</b>	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures
<b>Mild</b>	Pollution of non-sensitive waters, minor damage to buildings or structures
<b>Minor</b>	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species

**Table 9.4.1 – Definition of Risk Severity**

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 10.4.2 below.

<i>Category</i>	<i>Definition</i>
<b>High Likelihood</b>	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor
<b>Likely</b>	Pollutant linkage may be present, and it is probable that the risk will occur over the long term
<b>Low Likelihood</b>	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so
<b>Unlikely</b>	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable

**Table 9.4.2 – Definition of Risk Probability**

The potential severity of the risk and the probability of the risk occurring have been combined in accordance

with the following matrix in order to give a level of risk for each potential hazard, given in Table 10.4.3 below.

		<i>Potential Severity</i>			
		<i>Severe</i>	<i>Medium</i>	<i>Mild</i>	<i>Minor</i>
<i>Probability of Risk</i>	<i>High Likelihood</i>	Very high	High	Moderate	Low/Moderate
	<i>Likely</i>	High	Moderate	Low/Moderate	Low
	<i>Low likelihood</i>	Moderate	Low/Moderate	Low	Very low
	<i>Unlikely</i>	Low/Moderate	Low	Very low	Very low

Table 9.4.3 – Risk Matrix of Potential Hazard



The contamination risk assessment for the site based on identified sources is presented in Table 10.4.4. Further discussion of the more significant pollutant linkages is provided in a discussion below for each receptor in turn.

Hazard / Pollutant	Source	Pathway	Receptor	Potential severity	Probability of risk	Level of risk		
<p>The site has been historically associated with industrial uses including Made Ground / Colliery / Inert Landfill History with associated railway land, on-site landfill sites and adjacent quarrying / landfill, tip, spoil heaps, garages, petrol station and former gas works.</p> <p>The ground investigations have identified the following contamination sources</p> <ul style="list-style-type: none"> <li>• Polyaromatic Hydrocarbons (PAHs)</li> </ul>	Potential Made Ground, former and current off-site and on-site sources.	Inhalation, Dermal contact and Ingestion	Future site users, future buildings and structures.	Medium	Unlikely	Low		
		Inhalation, Dermal contact and Ingestion	Development workers.	Medium	Low Likelihood	Low/Moderate		
		Root Uptake	Plants	Minor	Low likelihood	Very Low		
		Contaminated Groundwater Migration	Secondary (A) Aquifer	Mild	Low Likelihood	Low		
			Principle Aquifer (The Yellow Sand Formation)	Medium	Low Likelihood	Low/Moderate		
			Culvert / Water Course	Medium	Unlikely	Low		
		Leaching of Soil Contamination	Secondary (A) Aquifer	Mild	Low Likelihood	Low		
			Principle Aquifer (The Yellow Sand Formation),	Medium	Low Likelihood	Low/Moderate		
			Culvert / Water Course	Medium	Unlikely	Low/		
		Migration through service conduits, Foundations, drainage solutions	Secondary (A) Aquifer	Mild	Low Likelihood	Low		
			Principle Aquifer (The Yellow Sand Formation)	Medium	Low Likelihood	Low/Moderate		
			Culvert / Water Course	Medium	Unlikely	Low		
		Surface Run-off	Secondary (A) Aquifer	Mild	Low Likelihood	Low		
			Principle Aquifer (The Yellow Sand Formation)	Medium	Low Likelihood	Low/Moderate		
			Culvert / Water Course	Medium	Unlikely	Low		
		Volatilisation (vapour phase migration and partitioning into sorbed / dissolved phase).	Secondary (A) Aquifer	Mild	Low Likelihood	Low		
			Principle Aquifer (The Yellow Sand Formation)	Medium	Low Likelihood	Low/Moderate		
			Culvert / Water Course	Medium	Unlikely	Low		
		Hazardous gas and volatile compounds	Migration from possible Made Ground and buried organic soils	Inhalation, Explosion	Future site users, Structures	Medium	Low Likelihood	Low
					Site development workers	Medium	Unlikely	Low

Table 9.4.4 – Contamination Risk Assessment

### 9.4.1 Current and Future Site Users

Potential pathways considered significant to current and future site uses are dermal contact, ingestion of impacted soils and inhalation of dusts and vapours.

The site is currently well vegetated and used by dog walkers. No soils are exposed at the surface, and it is considered that the risk to existing site users is **LOW**.

The majority of the site is likely to be covered with hardstanding's and building which will effectively break the pathway from isolated potential contaminants and future site users.

Based on the chemical analysis data it is considered that the site presents a **LOW** risk to future site users from the soils located at the site, subject to a commercial hard standing end use being developed.

Whilst the Made Ground has reported low concentrations of contaminants, texturally the soils are not suitable to be located at near surface depths within landscaped areas and topsoil should be imported for grass verges etc.

### 9.4.2 Ground Excavation / Development Workers

It is considered that the risk to construction and/or maintenance workers during redevelopment works is **LOW / Moderate** owing to identified concentrations of contaminants. As the site is going to developed for commercial end use a major part of the ground will be hardstanding with the exception of landscaping areas which will locally require a clean cover layer. The made ground around future services should be replaced with clean soil to prevent contact with groundworkers.

Site development workers should remain vigilant for any evidence of potential contamination. Should any materials be suspected of being contaminated work should cease and specialist environmental advice obtained.

### 9.4.3 Controlled Waters

#### 9.4.3.1 Underlying Aquifer

The site is located upon a Secondary (A) Aquifer and Principal Aquifer (The Yellow Sand Formation) and of these two aquifers the protection of the principal aquifer with associated groundwater protection zone is of paramount importance. The geological and hydrogeological plans for the site suggest that the northeastern part of the site lies within the groundwater protection zone whilst the majority of the building's footprints appear to be located within the secondary aquifer (Coal Measures Strata).

Prior to the ground investigations being undertaken at the site it was not known if there is a competent thickness of low permeable superficial strata located beneath the site that would protect the groundwater protection zone and restrict the potential for potential mobile contamination (impacted groundwater, leachate from soils contamination, dense / light non-aqueous phase liquids (DNAPL and LNAPL)) and potentially volatilised hydrocarbons that may exist to migrate vertically downwards and impact the underlying principal aquifer.

The exploratory holes undertaken at the site have generally encountered Made Ground overlying, glacial till which in-turn was underlain Mudstone or Sandstone (Coal Measures Strata). Low permeability clay was encountered across much of the site but was absent in RC11 (no returns likely to be sand /clay) and RC12 which encountered Made Ground directly overlying bedrock within the centre of the site where future car

parking is to be constructed.

The majority of samples tested from the shallow perched waters and the deep waters within the underlying rock have reported low concentrations of contaminants with the significant majority reported to be below laboratory detection limits (PCB's, SVOCs, VOCs, BTEX and MTBE).

However, elevated concentrations of PAH contaminants above UKDWS have been reported within the underlying Coal Measures Strata within RC11 and RC12 (Sand) and elevated Selenium within BH10 within the Made Ground.

The initial groundwater sample retrieved from RC12 has reported significantly elevated concentrations of PAH (benzo(a)pyrene at 7.2ug/l for example) above UKDWS during the initial groundwater visit and this coincides with the absence of glacial till beneath the Made Ground, suggesting that mobile contaminants may have migrated vertically downwards through the Made Ground and into the underlying bedrock. The shallow / perched water table is separate and distinct from the deeper groundwater table where the low permeable glacial till exists and acts as a barrier to vertical migration. It should be noted, however, that the elevated concentrations have not been reported consistently across the monitoring visits indicating that the sources of the elevated concentrations of contaminants are limited in volume.

When the site is developed the majority of the site will be covered with hardstanding's, buildings with formal drainage and therefore the potential for rainwater to percolate through the site and for contaminants to leach into solution and impact on the underlying aquifers will be significantly reduced.

The underlying glacial till where encountered beneath the Made Ground will also act as a barrier to downward migration further restricting the potential for the underlying aquifers to be impacted by the soils located at the site (permeability reported to be of  $k=1.78e-8$  m/s to  $k=2.88e-8$  m/s). It should be noted that glacial till was not located towards the eastern part of the site and a low permeable barrier is not present across the entire site.

Whilst it is acknowledged that Unit 1 is to be piled and Unit 2 to be constructed using vibro stone columns and founded within the underlying clays and Mudstone / Sandstone, the units are not located within a groundwater protection zone and no limestone (SPZ) has been reported within the more detailed rotary cored boreholes. Groundwater monitoring of the boreholes within the footprint of the units have not reported elevated concentrations of contaminants within the groundwater and limited elevated concentrations of leachate have been reported within the above Made Ground.

Further assessment should be carried out should significant mobile contamination be encountered during the development works. However, no significant source of mobile contamination has been reported at the site and limited pathways exist to impact on the underlying aquifer and controlled waters.

The foundation solution of the future development of Unit 1 and Unit 2 has the potential to provide preferential pathways for potential mobile contaminants to migrate vertically downwards, however, the combined soils, leachate and groundwater analysis has shown that there are limited sources of mobile contamination located at the site which would impact the underlying aquifers.

Therefore, it is considered that there is a **low to moderate** risk of the underlying aquifers being impacted by mobile contamination at the site based on the following;

- the elevated concentrations of leachate and groundwater concentrations have been reported within isolated boreholes and the majority of potentially mobile contaminants have been reported below UKDWS and below laboratory detection limits.
- the thickness of low permeability clays reported beneath the site which will partially protect the underlying aquifer.
- the proposed hardstanding end use which will restrict infiltration from entering the site and minimise downward vertical migration of potential contaminants.

It is considered that during the piling / development works that groundwater monitoring is undertaken throughout the construction works and prior to occupation to confirm that no mobile contaminants have impacted the underlying aquifer.

#### 9.4.3.2 Water Courses

The exploratory holes undertaken at the site have generally encountered Made Ground overlying, glacial till which in-turn was underlain Mudstone or Sandstone (Coal measures Strata) and occasional elevated concentrations of PAHs within leachate and within groundwater analysis has been reported above EQS standards.

The nearest watercourse is the culverted Houghton Burn, located approximately 223m to the northeast, of the site. Although the overall regional hydraulic gradient is considered to be to the east, the watercourse is culverted and is likely to be at an elevation above the site and therefore it is unlikely that potential mobile contaminants, that may exist at the site, (impacted groundwater, leachate from soils contamination, unidentified dense / light non-aqueous phase liquids (DNAPL and LNAPL)) would have an impact on the watercourse.

The site is currently vacant and no surface water drainage and or service ducts are known to exist at the site and therefore it is unlikely that potential mobile contaminants could currently migrate and impact surface waters via service conduits and existing site drainage and surface run off.

When the site is developed most of the site will be covered with hardstanding's, buildings with formal drainage and therefore the potential for rainwater to percolate through the site and for contaminants to leach into solution and migrate towards local watercourses will be further significantly reduced.

It is considered that during the piling / development works that groundwater monitoring is undertaken throughout the construction works and prior to occupation to confirm that no mobile contaminants have impacted the underlying aquifer.

It is considered that there is a **LOW** risk of potential contamination migrating and impacting local water courses. Assuming the culverted watercourse is in a good state of repair this risk maybe reduced to **VERY LOW**.

No significant mobile contamination has been reported at the site and it is considered that the risk of mobile contamination migrating onto the site from the historical gasworks area to the southeast is LOW (local hydraulic gradient to the east). Whilst the potential does exist for hydrocarbons to migrate onto the site from the adjacent petrol filling station no evidence has been reported during the ground investigations and it is likely that the petrol station is fitted with appropriate leakage alarm system. It is considered that the risk of mobile contamination migrating onto the site from the adjacent petrol filling

station is LOW

#### **9.4.4 Flora**

Low contaminant concentrations have been reported at shallow depth across the site and it is therefore considered that there is **LOW** risk to the establishment of flora at the site. The natural materials present on site are considered suitable for reuse in any proposed soft landscaping or private gardens at the site. Before work commences any topsoil should be removed and stockpiled for reuse.

#### **9.4.5 Future Developments including Buried Structures and Services**

The risk to encountering buried structures and services (i.e. possible migration of contamination within service corridors) is considered to be **MODERATE** due to the sites industrial history.

## 10.0 GROUND GAS

### 10.1 Gas Monitoring

Ground gas and water monitoring wells have been monitored in accordance with CIRIA C665 and BS8576:2013.

### 10.2 Gas Risk Assessment

CIRIA have developed a characterisation system for all buildings except for low-rise housing developments with a clear ventilated sub-floor void. Low-rise housing developments are generally covered by the NHBC's "Guidance on Evaluation of Development Proposals on Sites where Methane and Carbon Dioxide are Present".

The CIRIA system as detailed in CIRIA Report C659, is a risk-based system which compares gas emission rates to generic Characteristic Situations (CS) derived and expanded on from CIRIA 149. The NHBC guidance uses a concept of 'Traffic Lights' developed by Boyle and Witherington for the assessment of gas emission rates for a residential development.

Each methodology utilises 'Typical Maximum Concentrations' for initial screening purposes and the development of risk-based Gas Screening Values (GSVs) for consideration when the Typical Maximum Concentrations are exceeded. The GSVs are calculated by multiplying the borehole flow rate by the concentration in the air stream of the particular gas being considered.

The Traffic Light and Characteristic Situation systems have been designed for both methane and carbon dioxide, with the worst-case value adopted for assessment. The relevant assessment tables from each methodology referenced below are presented in Appendix F for clarity.

#### Ground Gas Monitoring Data

6 No. of the scheduled 6 No. monitoring visits have been undertaken and monitoring is considered to be complete. The gas monitoring results are presented in **Appendix F**.

The maximum Methane and Carbon Dioxide emissions, which are representative of the Typical Maximum Concentrations, were as follows:

<b>Methane:</b>	<b>0.0% v/v</b>
<b>Carbon Dioxide:</b>	<b>8.4% v/v</b>

The maximum recorded concentration of methane was 0.0% v/v, however 0.1% v/v will be used for calculations as this is the limit of detection of the instrument.

The maximum recorded concentration of carbon dioxide was 8.4% (peak and steady). Carbon dioxide concentrations at this location (CP-10) and the associated reduced oxygen concentrations may be related to microbial aerobic respiration within the borehole following the increase in available oxygen.

The maximum recorded positive flow rate in the boreholes was 0.0 l/hr, however 0.1 l/hr will be used for calculations as this is the limit of detection of the instrument.

The calculated GSVs for Methane and Carbon Dioxide are as follows:

**Methane:**  $(0.1/100) \times 0.1 = 0.0001 \text{ l/hr}$

**Carbon Dioxide:**  $(8.4/100) \times 0.1 = 0.0084 \text{ l/hr}$

When monitoring data to date is compared to the values in Table 8.5 in CIRIA Report C659, the site is classified as: Characteristic Situation 2 (CS2).

Gas monitoring results are presented within **Appendix F**.

### **10.3 Gas Protection Measures**

BS8485:2015, "Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings" sets out a methodology for determining an appropriate level of protection against ground gases in respect of the Characteristic Situation classification and the proposed building type.

For any non-residential properties the methodology in BS8485 should be followed through Tables 3 to 7 inclusive which are presented in Appendix F for reference. In working through the tables the development is categorised by Building Type; a Minimum Gas Protection Score is determined by Characteristic Situation of the site under C665 and Building Type; and Gas Protection Scores are calculated based on proposed/required structural barrier, ventilation details and gas resistant membrane.

The proposed development is predominantly Type-C commercial buildings spread throughout the site.

For a Type C building on a site with a CS2 gas regime a **Gas Protection Score of 2.5** is required, i.e. gas protection measures are required with respect to carbon dioxide.

## 10.4 Discussion

Using calculated GSVs for Carbon Dioxide, both of the assessment methods classify the site as low risk classification, e.g. CS2 with a proposed Type C development.

Specific ground gas protection measures are required for developments at the site with respect to Carbon Dioxide.

The risk from Carbon Dioxide affecting the property (Type C Building) with characteristic Situation 'CS2' is assessed as 'Low Risk'. The development requires a 2.5 gas protection score according to the 'Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings'.

This can be achieved by a cast in situ ground bearing floor slab to give a score of '0.5' and a gas resistant membrane to give a score of '2' which gives a total score of '2.5'.

The assessment with respect to Methane and Carbon Dioxide will be reviewed on completion of the scheduled monitoring.



## 11.0 ENGINEERING CONSIDERATIONS

### 11.1 Proposed Development

The site is to be developed for a commercial (supermarket and mixed use) end use with associated infrastructure.

### 11.2 Ground Obstructions

3 No. mining shafts were known to be located on site. 2 No. of the shafts are located clearly on the site and their positions have been recorded and their treatment is known. However, the third mine shaft is located within dense vegetation along the northeast boundary and has been investigated and believed to have been encountered (see **Appendix H**).

During the ground investigations works 9 No. boreholes (of the 30 No. drilled) encountered obstructions in the form of buried boulders, concrete, and concrete posts which may impact on future piling works.

Obstructions may also preclude the use of vibro-stone columns as a viable foundation solution as columns may be required to be pre-bored in order for the development to proceed on a more assured basis. It is recommended that a specialist vibro stone column contractor is contacted to confirm if a vibro stone column solution is viable.

### 11.3 Coal Mining

The Coal Authority report obtained for the site confirms that workings have been undertaken at depth beneath the site and that 3 No. shafts are recorded within the site boundary. 2 No. shafts have been treated and capped and third has been backfilled to an unknown specification.

From initial consultation with the Coal Authority any development undertaken close to or over the existing shafts would depend on confirmatory investigation of the shafts but otherwise the risk to developments at the site because of underground mine workings for the extraction of coal is considered to be negligible. Development undertaken within 20m of the mine entry should be in agreement with the Coal Authority.

All 3 No. shafts have been investigated with the findings included within **Appendix H**. It is considered that the 2 No. shaft located within the centre of the site are in good condition and no further significant works maybe required (subject to Coal Authority agreement). The third shaft located within the trees adjacent to the northern boundary appears to have a very thin cap installed and will require treatment in the same manner as the two central shafts and a new cap constructed.

The following table (**Table 8.1**) represents the coal mining risk assessment based on published data including the Coal Authority Mining Report obtained for the site, BGS mapping and the Coal Authority's online map viewing system and ground investigations undertaken at the site.

Coal Mining Issue	Risk Factor?	Risk Assessment
Past Underground Mining	No	<p>Coal Authority data and geological plans indicate that no <u>shallow</u> mine workings have been undertaken within the site boundary.</p> <p>Risk to developments at the site from recorded shallow mine workings is considered to be NEGLIGIBLE.</p>
Underground Coal Mining (probable unrecorded shallow workings)	No	<p>The Coal Authority do not consider the site to be within an area where unrecorded shallow mine workings may be present.</p> <p>Risk to developments at the site from unrecorded shallow mine workings is considered to be NEGLIGIBLE.</p>
Recorded Workings	Yes	<p>There are 37 records of underground mining within the zone of influence of the site. These range in depth from 122m bgl to 313m bgl within seams including the Main, Yard, Maudlin, Low Main, Harvey, Hutton and Busty.</p> <p>These workings are all recorded at sufficient depth to mitigate against and related ground instability.</p>
Spine Roadways at Shallow Depth	No	<p>The Coal Authority have no records of spine roadways at shallow depth.</p> <p>The risk to developments at the site from recorded roadways is NEGLIGIBLE.</p>
Mine entries	Yes	<p>Coal Authority Mining Report and geological plans confirms that 3 No. known mine entries exist at the site. 2 No. shafts along the centre line of the site are recorded to have been reinstated to NCB specifications in 1988. The third shaft located in the wooded area adjacent to Newbottle Street has been filled to an unknown specification.</p> <p>The risk to developments at the site from known mine entries is considered to be LOW.</p>

Opencast Mines	No	Coal Authority data and geological plans indicate that no opencast workings are known within 500m of the site.  The risk to developments at the site from known opencast workings at the site is considered to be NEGLIGIBLE.
Recorded coal mining subsidence	No	The Coal Authority has not received a damage notice or any claim for the site. A fault is recorded running close and parallel to the south eastern boundary but is not expected to impact on the development due to its location.  The risk to developments at the site from coal mining subsidence is considered to be NEGLIGIBLE
Record of past mine gas emissions	No	There is no reported history of past mine gas emissions in the area.  The risk to developments at the site from mine gas emissions is considered to be VERY LOW.

Table 8.1: Potential Risk Factors arising from Coal Mining (Preliminary Risk Assessment).

## 11.4 Foundations and Settlement Issues

Based on the ground conditions encountered pile foundations formed within natural Glacial Till / underlying bedrock are considered the most appropriate/ financially viable foundation solutions for Unit 2, as thickness of made ground encountered varies from 8m to 11m.

Vibro stone columns solution is anticipated for Unit 1, however columns maybe required to be pre-bored for Unit 1

While earthworks could be undertaken, the proximity of the site boundary may preclude full depth treatment beneath proposed structures.

It should be note that due to the site being a former landfill that a Waste Recovery Plan and Environmental Permit is likely to be required as part of any earthworks undertaken at the site.

## 11.5 Earthworks

As the majority of the site will be hardstanding and a clean cover layer is not considered to be required.

The Made Ground “as dug” has been generally reported to be wet of optimum moisture content and some degree of drying / treatment may be required to undertake significant earthworks to provide a suitable development platform. The Calorific Values of the Made Ground has been reported to be between 4,000 – 4,500 kJ/kg.

There is no statutory guidance for the assessment of potential combustibility of in-situ material, however guidance given in ICRCL Guidance note 61/84 ‘Notes on the fire hazards of contaminated land’ states that material with calorific values in excess of 10 MJ/kg are likely to ignite, and there is an unacceptable risk of smouldering when the calorific value of soils exceeds 7 MJ/kg. Therefore, it is considered that no further action is required. Confirmatory combustibility testing should be undertaken on earthworks materials during the development works.

## 11.6 Chemical Attack on Buried Structures

The water-soluble sulphate test results generally recorded concentrations between 13mg/l and 2440mg/l. The soil pH was generally between 7.5 and 11 indicating slightly acidic to slightly alkali but generally neutral conditions.

The results have been assessed in accordance with the guidance given in BRE Special Digest 1:2005. Assuming a greenfield site with static groundwater the **Design Sulphate Class** across site is **DS-3, ACEC Class AC-2**.

## 11.7 Drainage and Infrastructure

3 No falling head tests were undertaken within CP01, CP04 and CP16B within the Made Ground. The ground conditions within the boreholes generally comprised Made Ground of dark grey, gravelly sandy CLAY where the gravel includes fine to medium, angular coal, brick, sandstone, brick ash and slag (potentially colliery spoil).

All 3 No. falling head tests undertaken reported comparatively low coefficients of permeability in the order of  $k=1.78e-8$  m/s to  $k=2.88e-8$  m/s.

The permeability test report is included within **Appendix B**.

## 11.8 Historic Landfill and Waste Issues

The site is located within a former inert landfill and the use of a Materials Management Pan to enable the movement of materials will not be appropriate and it is likely that a waste recovery plan (WRP) and bespoke deposit for recovery environmental permit is likely to be required to facilitate the development of the site.

## 12.0 CONCLUSIONS

Shadbolt Group were commissioned by the Client, Hellens Land to undertake intrusive site investigations in respect of the proposed commercial development at the Newbottle Street, Houghton-le-Spring.

Ground investigations comprising 18 No. Cable Percussion Boreholes, 35 No. Trial pits, 7 No. hand pits, 4 No. CBR tests, 6 No. rotary open holes, 3 No. soak away tests and 12 No. rotary cored boreholes have been undertaken at the site and encountered a thick layer of Made Ground overlying Glacial Till underlain by Coal Measures Strata.

Chemical analysis of soil retrieved from the exploratory holes have reported low concentrations of contaminants beneath the TSVs (Human Health) for a commercial development.

The majority of samples tested from the shallow perched waters and the deep waters within the underlying rock have reported low concentrations of contaminants, with the significant majority reported to be below laboratory detection limits (PCB,s SVOCs, VOCs, BTEX and MTBE).

However, elevated concentrations of PAH contaminants above UKDWS have been reported within the underlying Coal Measures Strata within RC11 and RC12 (Sand) and elevated Selenium within BH10 within the Made Ground.

The initial groundwater sample retrieved from RC12 has reported significantly elevated concentrations of PAH (benzo(a)pyrene at 7.2ug/l for example) above UKDWS during the initial groundwater visit and this coincides with the absence of glacial till beneath the Made Ground, suggesting that mobile contaminants may have migrated vertically downwards through the Made Ground and into the underlying bedrock. It would appear that the shallow / perched water table is separate and distinct from the deeper groundwater table where low permeable glacial till exists.

It should be noted, however, that the elevated concentrations have not been reported consistently across the monitoring visits indicating that the sources of the elevated concentrations of contaminants are limited in volume.

When the site is developed the majority of the site will be covered with hardstanding's, buildings with formal drainage and therefore the potential for rainwater to percolate through the site and for contaminants to leach into solution and impact on the underlying aquifers will be significantly reduced and the risk to future site users and the environment is considered to be **Low to Moderate**.

The nearest watercourse is the culverted Houghton Burn, located approximately 223m to the northeast, of the site. Although the overall regional hydraulic gradient is understood to be to the east, the watercourse is culverted and is likely to be at an elevation above the site and therefore it is unlikely that potential mobile contaminants, that may exist at the site, (impacted groundwater, leachate from soils contamination, unidentified dense / light non-aqueous phase liquids (DNAPL and LNAPL)) would have an impact on the watercourse.

The site is currently vacant and no surface water drainage and or service ducts are known to exist at the site and therefore it is unlikely that potential mobile contaminants could currently migrate and impact surface waters via service conduits and existing site drainage and surface run off.

When the site is developed most of the site will be covered with hardstanding's, buildings with formal

drainage and therefore the potential for rainwater to percolate through the site and for contaminants to leach into solution and migrate towards local watercourses will be further significantly reduced. All soils placed at the site would be to an end product specification to achieve at least 95% of maximum dry density and less than 5% air voids thus reducing the potential for PAHs to leach into solution.

It is considered that there is a **LOW** risk of potential contamination migrating and impacting local water courses. Assuming the culverted watercourse is in a good state of repair this risk maybe reduced to **VERY LOW**.

Based on the ground conditions encountered pile foundations formed within natural Glacial Till / underlying bedrock are considered the most appropriate/ financially viable foundation solutions for Unit 2, as thickness of made ground encountered varies from 8m to 11m. A vibro stone columns solution is anticipated for Unit 1, however columns maybe required to be pre-bored for Unit 1

It is recommended that formal drainage is adopted for the development.

Gas monitoring completed to date indicates **gas protection measures are necessary with respect to Carbon Dioxide (CS-2)**.

The site has been assessed in accordance with guidance given in BRE special digest 1:2005 assuming brownfield site with static groundwater the **Design Sulphate Class** across site is **DS-3, ACEC Class AC-2** although the majority of testing across the area indicates a DS-2/AC-1s may be more appropriate.

As the majority of the site will be hardstanding and clean cover layer is not necessary. The made ground around landscaping and services will have to be replaced with a clean cover to prevent contact with groundworkers.

It is considered that a waste recovery plan (WRP) and bespoke deposit for recovery environmental permit is likely to be required to facilitate the development of the site.

Although it is considered that the existing ground conditions at the site does not pose a significant risk to future site users and the environment it is considered that a remediation strategy and foundation work risk assessment should be undertaken at the site to ensure that the site can be developed on a more assured basis. As part of these works, all existing and new boreholes as part of the potential/remediation works, should be decommissioned.

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- Keynetix Holebase SI (including connected data sources)

# APPENDIX A

## REPORT CONDITIONS



## REPORT CONDITIONS

### GEO-ENVIRONMENTAL GROUND INVESTIGATION

*This report is produced for the benefit of **Hellens Land** in accordance with the terms of the appointment.*

*This report has been prepared in accordance with the terms and conditions of the appointment and relates to the condition of the site at the time of ground investigations. No warranty is provided as to the possibility of future changes in the condition of the site.*

*Shadbolt Environmental takes no responsibility for conditions which occur between the individual exploratory holes. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative.*

*Whilst the contamination assessment detailed within this report reflects our view, because there are no exact UK definitions of these matters, being subject to risk analysis, Shadbolt Environmental are unable to give categoric assurances that they will be accepted by authorities or funds without question. This report is prepared and written for the purposed uses stated in the report and should not be used in a different context without reference to Shadbolt Environmental. In time, improved practices or amended legislation may necessitate a re-assessment.*

*The report is limited to the geotechnical and environmental aspects detailed within the report, and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents.*

## APPENDIX B

EXPLORATORY HOLE LOGS

FALLING HEAD TESTS

DRAWING NO. 2585/NEWBOTTLE STREET/005 - EXPLORATORY HOLE LOCATION PLAN

GEOLOGICAL SECTIONS

CONCEPTUAL SITE MODEL



# Borehole Log

Borehole No.

**CP-01**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433958E - 550322N	Hole Type	CP
Location:	Houghton le Spring			Level:	71.35	Scale	1:50
Client:	Hellens Group			Dates:	15/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.10 - 0.60	B				Grass over, dark grey, cobbly CLAY. Cobbles include angular brick, concrete, plastic and sandstone. MADE GROUND	
		1.00	D					
		1.20 - 1.70	B	N=8 (1,7/2,2,2,2)				
		1.20	SPT					
		1.90	D					
		2.00 - 2.50	B	N=6 (1,1/1,2,1,2)				
		2.00	SPT					
		2.80	D					
		3.00 - 3.50	B	N=13 (2,3/2,3,4,4)				
		3.00	SPT					
	3.80	D						
	4.00 - 4.50	B	N=17 (2,2/3,9,2,3)					
	4.00	SPT		4.50	66.85			
	4.80	D						
	5.00 - 5.50	B	N=15 (3,4/3,4,4,4)				Soft, dark grey, boulder CLAY. Boulders include angular brick, concrete, plastic and sandstone. MADE GROUND	
	5.00	SPT						
	6.00	D						
	6.50 - 7.00	B	N=37 (4,6/6,17,7,7)	6.50	64.85		Brown, gravelly SAND. Gravel includes fine to coarse, angular SAND. MADE GROUND	
	6.50	SPT						
	7.50							
	8.00 - 8.45	U		8.00	63.35		Firm, grey, brown, laminated CLAY. GLACIAL TILL	
	8.50	D						
	9.00 - 9.50	B						
	9.50 - 10.00	B	N=24 (3,5/5,6,6,7)	9.50	61.85		Brown, gravelly SAND. Gravel includes fine to coarse, angular SANDSTONE. SAND AND GRAVEL	
	9.50	SPT						
				10.00	61.35		End of Borehole at 10.00m	

Remarks  
Groundwater encountered at 6.50m bgl and 9.00m bgl.





# Borehole Log

Borehole No.

**CP-02**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433938E - 550329N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.00	Scale	1:50
Client:	Hellens Group			Dates:	15/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.80	B				Grass over, dark grey, boulder CLAY. Boulders include angular, concrete and plastic. MADE GROUND	
		1.10 1.20 - 1.70 1.20	D B SPT	N=11 (1,3/3,2,3,3)				
		1.90 2.00 - 2.50 2.00	D B SPT	N=20 (2,3/5,5,6,4)				
		2.80 3.00 - 3.50 3.00	D B SPT	N=15 (4,4/4,3,4,4)				
		3.80 4.00 - 4.50 4.00	D B SPT	N=16 (3,3/3,4,4,5)				
		4.80 5.00 - 5.50 5.00	D B SPT	N=36 (4,7/9,9,9,9)	5.00	67.00	Soft, dark grey, boulder CLAY. Boulders include mudstone and plastic. MADE GROUND	
		6.00	D					
		6.50 - 7.00	B					
		7.50	D					
		8.00 - 8.50 8.00	B SPT	N=21 (3,4/5,5,5,6)	8.00	64.00	Brown, gravelly SAND. Gravel includes fine to coarse, angular SANDSTONE. SAND AND GRAVEL	
	9.00	D						
	10.00	B		10.00	62.00	End of Borehole at 10.00m		

Remarks  
Groundwater encountered at 8.20m bgl.





# Borehole Log

Borehole No.

**CP-03**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433890E - 550339N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.65	Scale	1:50
Client:	Hellens Group			Dates:	16/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.80	B				Grass over, dark grey, boulder CLAY. Boulders include angular, sandstone and brick. MADE GROUND	
		1.00	D					
		1.20 - 1.70	B	N=31 (3,5/7,7,8,9)				
		1.20	SPT					
		1.80	D					
		2.00 - 2.50	B	N=7 (1,0/1,1,2,3)				
		2.00	SPT					
		2.80	D					
		3.00 - 3.50	B	N=22 (3,7/5,7,7,3)				
		3.00	SPT					
		3.80	D					
		4.00 - 4.50	B	N=14 (1,2/3,3,3,5)				
		4.00	SPT					
		4.80	D					
		5.00 - 5.50	B	N=20 (5,4/5,4,6,5)				
		5.00	SPT					
		6.00	D					
		6.50 - 7.00	B	N=22 (4,5/5,5,6,6)				
		6.50	SPT					
		7.50	D					
		8.00 - 8.50	B	N=33 (4,7/8,8,8,9)	8.00	64.65	Firm, brown, grey, sandy gravelly CLAY. Gravel includes fine to coarse, angular, sandstone. GLACIAL TILL	
		8.00	SPT					
		9.00	D					
		9.50 - 10.00	B	N=39 (3,5/10,10,9,10)				
		9.50	SPT					
					10.00	62.65		
End of Borehole at 10.00m								

Remarks  
Groundwater encountered at 9.20m bgl.





# Borehole Log

Borehole No.

**CP-04**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433859E - 550329N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.80	Scale	1:50
Client:	Hellens Group			Dates:	25/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20 - 0.70	B				Soft to firm, dark grey, red, cobbly CLAY. Cobbles include angular brick and slag. MADE GROUND	
		1.00	D					
		1.20 - 1.70	B	N=11 (1,3/2,3,2,4)				
		1.20	SPT					
		1.90	D					
		2.00 - 2.50	B	N=16 (2,2/3,4,4,5)				
		2.00	SPT					
		2.80	D					
		3.00 - 3.50	B	N=20 (3,4/5,5,5,5)				
		3.00	SPT					
		3.80	D					
		4.00 - 4.50	B	N=13 (1,3/3,3,4,3)				
		4.00	SPT					
	4.80	D						
	5.00 - 5.50	B	N=21 (3,4/4,5,6,6)					
	5.00	SPT						
	6.00	D						
	6.50 - 7.00	B	N=23 (10,5/3,7,4,9)					
	6.50	SPT						
	7.50	D						
	8.00 - 8.50	B	N=15 (1,3/3,4,4,4)					
	8.00	SPT						
	9.00	D		8.80	64.00		Firm to stiff, grey brow, laminated CLAY. GLACIAL TILL	
	9.50 - 9.95	U						
	10.00	D		10.00	62.80		End of Borehole at 10.00m	

Remarks  
No Groundwater encountered.





# Borehole Log

Borehole No.

**CP-05**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433853E - 550362N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.15	Scale	1:50
Client:	Hellens Group			Dates:	16/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Grass over, dark grey, brown, red, cobbly CLAY. Cobbles include angular sandstone and brick. MADE GROUND		
		1.00	D					1	
		1.20 - 1.70	B	N=20 (1,1/3,3,5,9)					
		1.20	SPT						
		1.90	D					2	
		2.00 - 2.50	B	N=36 (3,7/20,4,6,6)					
		2.00	SPT						
		2.80	D					3	
		3.00 - 3.50	B	N=28 (3,5/5,5,7,11)					
		3.00	SPT						
		3.80	D				4		
		4.00 - 4.50	B	50 (7,15/39,4,7,)					
		4.00	SPT						
		4.80	D				5		
		5.00 - 5.50	B	N=19 (3,4/4,5,5,5)					
		5.00	SPT						
		6.00	D				6		
		6.50 - 7.00	B	N=16 (3,7/3,4,4,5)	6.50	65.65	Soft, dark grey, brown, sandy gravelly CLAY. Gravel include fine to coarse, angular brick, sandstone and mudstone. MADE GROUND	7	
		6.50	SPT						
		7.50	D						
		8.00 - 8.50	B	N=21 (3,5/5,5,5,6)				8	
		8.00	SPT						
		9.00	D				9		
		9.50 - 10.00	B	N=24 (2,4/5,6,6,7)					
		9.50	SPT						
					10.00	62.15	End of Borehole at 10.00m	10	

Remarks  
Groundwater encountered at 6.5m bgl.





# Borehole Log

Borehole No.

**CP-06**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433829E - 550339N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.00	Scale	1:50
Client:	Hellens Group			Dates:	16/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.80	B				Grass over, dark grey, gravelly CLAY with high cobble content. Gravel /cobble include brick, sandstone, shale and plastic. MADE GROUND		
		1.00	D					1	
		1.20 - 1.65	B	N=28 (3,5/5,7,7,9)					
		1.20	SPT						
		1.90	D					2	
		2.00 - 2.50	B	N=27 (4,7/7,7,6,7)					
		2.00	SPT						
		2.80	D					3	
		3.00 - 3.50	B	N=14 (9,12/4,3,3,4)					
		3.00	SPT						
		3.80	D				4		
		4.00 - 4.50	B	N=15 (1,1/3,3,3,6)					
		4.00	SPT						
		4.80	D				5		
		5.00 - 5.50	B	N=17 (1,3/6,6,2,3)					
		5.00	SPT						
		6.00	D				6		
	▼	6.50 - 7.00	B	N=7 (1,1/2,1,2,2)	6.50	66.50	Soft, brown, sandy gravelly CLAY. Gravel includes fine to coarse, angular to subangular sandstone. MADE GROUND	7	
		6.50	SPT						
		7.50	D						
		8.00 - 8.50	B	N=11 (4,7/2,3,3,3)				8	
		8.00	SPT						
		9.00	D				9		
		9.50 - 10.00	B	N=20 (1,5/5,4,5,6)					
		9.50	SPT						
					10.00	63.00	End of Borehole at 10.00m	10	

Remarks  
Groundwater encountered at 6.60m bgl.







# Borehole Log

Borehole No.

**CP-07**

Sheet 1 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433803E - 550328N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.70	Scale	1:50
Client:	Hellens Group			Dates:	23/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.70	B				Grass over, dark grey, red gravelly CLAY. Gravel includes, coarse, angular brick and ash fill. MADE GROUND		
		1.00	D					1	
		1.20 - 1.70	B						
		1.20	SPT	N=19 (3,3/4,4,5,6)					
		1.80	D						
		2.00 - 2.50	B		2.00	70.70		2	
		2.00	SPT	N=25 (1,3/5,6,6,8)			Friable, red, dark grey gravelly CLAY. Gravel includes fine to coarse, angular burnt shale. Ash was encountered. MADE GROUND		
		2.80	D						
		3.00 - 3.50	B					3	
		3.00	SPT	N=19 (3,3/4,5,5,5)					
		3.80	D						
		4.00 - 4.50	B					4	
		4.00	SPT	N=36 (1,5/7,7,9,13)					
		4.80	D						
		5.00 - 5.50	B					5	
		5.00	SPT	N=41 (10,15/5,7,12,17)					
		6.00	D						
		6.50 - 7.00	B					7	
		6.50	SPT	N=23 (3,4/4,5,7,7)					
		7.50	D						
		8.00 - 8.50	B		8.00	64.70		8	
		8.00	SPT	N=14 (2,3/3,4,3,4)			Dark grey ASH. MADE GROUND		
		9.00	D					9	
		9.50 - 10.00	B						
		9.50	SPT	N=10 (2,3/2,2,3,3)				10	

Continued on Next Sheet

Remarks  
Groundwater encountered at 10.60m bgl.





# Borehole Log

Borehole No.

**CP-07**

Sheet 2 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433803E - 550328N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.70	Scale	1:50
Client:	Hellens Group			Dates:	23/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		10.50	D	N=26 (2,3/4,6,8,8)	10.50	62.20		Dark grey ASH. MADE GROUND		
		11.00 - 11.45	U					Firm, grey, brown, laminated CLAY. GLACIAL TILL		
		11.50	D							
		12.00 - 12.50	B							
		12.50 - 13.00 12.50	B SPT							
		13.50	D							
		14.00 - 14.45 14.00 - 14.50	U B							
		15.00	D							
		15.50 - 16.00 15.50	B SPT				N=37 (2,3/7,8,8,14)			Stiff, grey, brown, laminated CLAY. Occasional occurrence of cobbles. GLACIAL TILL
		16.50	D							
		17.00 - 17.45 17.00 - 17.50	U B							
		18.00	D							
		18.50 - 19.00 18.50	B SPT				N=46 (5,7/9,11,12,14)			
19.50	D									
20.00	D		20.00	52.70			End of Borehole at 20.00m	20		

Remarks  
Groundwater encountered at 10.60m bgl.





# Borehole Log

Borehole No.

**CP-08**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433813E - 550348N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.00	Scale	1:50
Client:	Hellens Group			Dates:	26/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.10 - 0.70	B				Soft, dark brown, gravelly CLAY. Gravel includes fine to coarse, sandstone, brick and slag. MADE GROUND		
		1.00	D					1	
		1.20 - 1.70	B	N=10 (10,2/3,2,2,3)	1.20	71.80	Dark grey, sandy gravelly COBBLES. Gravel/cobbles include brick, ash and concrete. MADE GROUND		
		1.20	SPT						
		1.90	D					2	
		2.00 - 2.50	B	N=9 (1,2/1,2,2,4)					
		2.00	SPT						
		2.80	D					3	
		3.00 - 3.50	B	N=6 (1,0/1,2,1,2)					
		3.00	SPT						
		3.80	D					4	
		4.00 - 4.50	B	N=17 (3,4/3,4,4,6)					
		4.00	SPT						
		4.80	D					5	
		5.00 - 5.50	B	N=18 (2,3/4,4,5,5)					
		5.00	SPT						
		6.00	D					6	
		6.50 - 7.00	B						
		7.50	D					7	
		8.00	D		7.90	65.10	CONCRETE OBSTRUCTION	8	
					8.00	65.00	MADE GROUND		
End of Borehole at 8.00m									

Remarks  
No Groundwater encountered .





# Borehole Log

Borehole No.

**CP-09**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433809E - 550366N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.00	Scale	1:50
Client:	Hellens Group			Dates:	18/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B					Grass over, gravelly CLAY. Gravel includes fine to coarse, angular brick and mudstone. Ash was encountered <b>MADE GROUND</b>	
		1.10	D						1
		1.20 - 1.70	B						
		1.20	SPT	N=50 (3,7/9,15,15,11)					
		1.80	D						
		2.00 - 2.50	B						
		2.00	SPT	N=46 (4,4/8,9,12,17)					
		2.80	D						
	3.00 - 3.50	B					3		
	3.00	SPT	50 (2,7/34,16,,)						
	3.80	D							
	4.00 - 4.50	B						4	
	4.00	SPT	N=32 (3,4/8,8,8,8)						
	4.80	D							
	5.00 - 5.50	B						5	
	6.00	D						6	
					6.50	66.50			
					6.70	66.30		Concrete Block <b>MADE GROUND</b>	
								End of Borehole at 6.70m	7
									8
									9
									10

Remarks  
No Groundwater encountered.





# Borehole Log

Borehole No.

**CP-10**

Sheet 1 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433831E - 550382N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.05	Scale	1:50
Client:	Hellens Group			Dates:	29/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Grass over, dark grey, brown, reddish gravelly CLAY. Gravel includes fine to coarse, angular to subangular brick, concrete and mudstone. Ash was encountered. MADE GROUND		
		1.10	D					1	
		1.20 - 1.70	B						
		1.20	SPT	N=50 (5,7/11,15,17,7)					
		1.90	D						
		2.00 - 2.50	B					2	
		2.00	SPT	N=22 (3,4/5,5,5,7)					
		2.80	D						
		3.00 - 3.50	B					3	
		3.00	SPT	N=22 (1,3/4,4,6,8)					
		3.80	D						
		4.00 - 4.50	B				4		
		4.00	SPT	N=9 (1,1/2,2,2,3)					
		4.80	D						
		5.00 - 5.50	B				5		
		5.00	SPT	N=4 (1,0/1,1,1,1)					
		6.00	D						
		6.50 - 7.00	B				7		
		6.50	SPT	50 (25 for 85mm/50 for 85mm)	7.00	66.05	Yellow, SAND. MADE GROUND		
		7.50	D						
		8.00 - 8.50	B				8		
		8.00	SPT	N=21 (4,4/3,6,6,6)					
		8.50	D		8.50	64.55	Soft, grey, boulder CLAY. GLACIAL TILL		
		9.00	D						
		9.50 - 9.95	U	90					
		10.00	D						

Continued on Next Sheet

**Remarks**

Very damp at 7.10m bgl.





# Borehole Log

Borehole No.

**CP-10**

Sheet 2 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433831E - 550382N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.05	Scale	1:50
Client:	Hellens Group			Dates:	29/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50 - 10.80	B		16.40	56.65		Soft, grey, boulder CLAY. GLACIAL TILL	
		11.00 - 11.50 11.00	B SPT	N=38 (4,5/6,6,9,17)					11
		12.00 12.00 - 12.50 12.00	D B SPT	N=42 (4,4/9,9,9,15)					12
		13.00 - 13.95	U	22					13
		14.00	D						14
		14.50 - 14.80	B						
		15.00 - 15.50 15.00	B SPT	N=42 (3,5/7,9,10,16)					15
		16.00 16.20 16.40 16.40	D SPT D SPT	50 (25 for 10mm/50 for 235mm) 50 (25 for 0mm/50 for 0mm)					16
					17	End of Borehole at 16.40m			
								18	
								19	
								20	

Remarks  
Very damp at 7.10m bgl.





# Borehole Log

Borehole No.

**CP-11**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433811E - 550390N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.00	Scale	1:50
Client:	Hellens Group			Dates:	22/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
		Depth (m)	Type	Results									
		0.10 - 0.80	B		2.70	70.30		Grass over, dark grey, brown, reddish gravelly CLAY. Gravel includes fine to coarse, angular to subangular brick, concrete and mudstone. Ash was encountered. MADE GROUND	1				
		1.00	D										
		1.20 - 1.70	B										
		1.20	SPT	50 (5,20/50 for 235mm)								Sandstone boulder	
		1.80	D										
		2.00 - 2.50	B										
		2.00	SPT	N=5 (1,0/1,1,1,2)									2
		2.80	D										
		3.00 - 3.50	B										
		3.00	SPT	N=12 (1,1/2,2,3,5)								Brown, very sandy bouldery CLAY. Boulders include angular concrete sandstone and concrete. MADE GROUND	3
3.80	D												
4.00 - 4.50	B												
4.00	SPT	N=28 (3,7/7,7,7,7)					4						
4.80	D												
5.00 - 5.50	B												
5.00	SPT	50 (25 for 50mm/50 for 235mm)	5.00	68.00		SANDSTONE BOULDERS MADE GROUND	5						
6.00	D												
6.50 - 7.00	B												
6.50	SPT	50 (25 for 10mm/50 for 25mm)					6						
7.00	SPT	50 (25 for 20mm/50 for 20mm)	7.10	65.90			7						
End of Borehole at 7.10m								8					
								9					
								10					

Remarks  
Groundwater encountered at 3.10m bgl.





# Borehole Log

Borehole No.

**CP-12**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433783E - 550363N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.60	Scale	1:50
Client:	Hellens Group			Dates:	17/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
		Depth (m)	Type	Results									
		0.20 - 0.80	B		2.80	69.80		Grass over, dark grey, boulder CLAY. Boulders include angular brick and concrete. MADE GROUND	1				
		1.00	D							2			
		1.20 - 1.70	B	N=50 (5,10/13,13,17,7)							3		
		1.20	SPT										
		1.90	D									4	
		2.00 - 2.50	B	N=27 (1,5/7,4,7,9)									
		2.00	SPT										
		2.80	D										5
		3.00 - 3.50	B	20 (25 for 20mm/20 for 20mm)									
		3.00	SPT										
3.80	D		6										
4.00 - 4.50	B	50 (25 for 0mm/50 for 0mm)											
4.00	SPT												
4.80	D			7									
5.00 - 5.50	B	N=41 (10,15/21,6,7,7)											
5.00	SPT												
6.00	D				8								
6.50 - 7.00	B	50 (3,9/50 for 150mm)											
6.50	SPT												
7.50	D					9							
8.00 - 8.50	B	50 (7,10/50 for 150mm)											
8.00	SPT												
8.50	SPT	50 (25 for 0mm/50 for 0mm)	8.30				64.30		SANDSTONE/CONCRETE OBSTRUCTION MADE GROUND	10			
			8.50	64.10									
End of Borehole at 8.50m													

Remarks  
No Groundwater encountered.







# Borehole Log

Borehole No.

**CP-13**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433777E - 550350N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.45	Scale	1:50
Client:	Hellens Group			Dates:	17/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
Well	Water Strikes	0.10 - 0.70	B				Legend	Grass over, dark grey, boulder CLAY. Boulders include angular brick, sandstone and concrete. MADE GROUND
		1.00	D					
		1.20 - 1.70	B	N=8 (1,2/1,2,2,3)				
		1.20	SPT					
		1.80	D					
		2.00 - 2.50	B	N=26 (2,3/5,7,7,7)				
		2.00	SPT					
		2.80	D					
		3.00 - 3.50	B	N=50 (7,9/39,4,4,3)				
		3.00	SPT					
		3.80	D					
		4.00 - 4.50	B	N=18 (4,3/4,3,4,7)				
		4.00	SPT					
4.80	D							
5.00 - 5.50	B	N=14 (2,1/2,3,4,5)						
5.00	SPT							
6.00	D							
6.50 - 7.00	B	N=41 (3,7/7,8,11,15)						
6.50	SPT							
7.50	D							
8.00 - 8.50	B	N=32 (3,3/5,9,9,9)						
8.00	SPT							
9.00	D							
9.50 - 10.00	B	N=12 (2,2/2,3,3,4)						
9.50	SPT							
	▼			9.50	62.95	Legend	Firm, brown, grey, slightly sandy CLAY. GLACIAL TILL	
				10.00	62.45	Legend	End of Borehole at 10.00m	

Remarks  
Groundwater encountered at 9.50m bgl.





# Borehole Log

Borehole No.

**CP-14**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433785E - 550387N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.90	Scale	1:50
Client:	Hellens Group			Dates:	22/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
Well		0.20 - 0.70	B				Legend	Grass over, soft, dark grey, green, gravelly CLAY. Gravel includes medium to coarse, angular brick, ash and concrete. MADE GROUND			
		1.00	D							1	
		1.20 - 1.70	B	N=46 (4,7/9,9,11,17)							
		1.20	SPT								
		1.90	D		2.00	70.90					2
		2.00 - 2.50	B	N=5 (3,2/1,1,2,1)							
		2.00	SPT								
		2.80	D								3
		3.00 - 3.45	U								
		3.50	D								
		3.70 - 3.90	B								
		4.00 - 4.50	B	N=47 (3,5/5,7,12,23)							4
		4.00	SPT								
	4.80	D						5			
	5.00 - 5.50	B									
	6.00	D						6			
	6.50 - 7.00	B	N=9 (2,3/2,2,3,2)								
	6.50	SPT									
	7.50	D						7			
	7.80	SPT	50 (25 for 75mm/50 for 20mm)	7.80	65.10						
	8.00	SPT	50 (25 for 0mm/50 for 0mm)	8.00	64.90						
							OBSTRUCTION MADE GROUND	8			
							End of Borehole at 8.00m				

Remarks  
Very damp at 6.80m bgl.





# Borehole Log

Borehole No.

**CP-15**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433757E - 550390N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.20	Scale	1:50
Client:	Hellens Group			Dates:	18/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
Well		0.20 - 0.80	B		2.00	70.20	Legend	Grass over, soft, dark grey, brown gravelly CLAY. Gravel includes fine to coarse, angular brick and ash. MADE GROUND	1
		1.10 1.20 - 1.70 1.20	D B SPT	N=20 (4,4/4,5,5,6)					
		1.90 2.00 - 2.50 2.00	D B SPT	N=4 (1,0/1,1,1,1)					2
		2.90 3.00 - 3.50 3.00	D B SPT	N=7 (1,2/1,2,2,2)					3
		3.80 4.00 - 4.50 4.00	D B SPT	N=10 (2,2/2,3,2,3)					4
		4.80 5.00 - 5.50 5.00	D B SPT	N=20 (3,4/4,5,5,6)					5
		6.00	D						6
		6.50 - 7.00 6.50	B SPT	N=25 (4,4/5,5,7,8)					7
		7.50	D						8
		8.00 - 8.50 8.00	B SPT	N=18 (4,4/5,4,5,4)					9
	9.00	D		10					
	9.50 - 10.00 9.50	B SPT	N=20 (3,3/4,5,5,6)	10					
				10.00	62.20		End of Borehole at 10.00m		

**Remarks**  
Groundwater encountered at 7.50m bgl.





# Borehole Log

Borehole No.

**CP-16**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433775E - 550417N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.65	Scale	1:50
Client:	Hellens Group			Dates:	26/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Grass over, dark grey, gravely CLAY. Gravel includes fine to coarse, angular, brick and sandstone. MADE GROUND		
		1.00	D		0.90	71.75			
		1.00	D		1.00	71.65	CONCRETE OBSTRUCTION	1	
		1.00	SPT	50 (25 for 0mm/50 for 0mm)			MADE GROUND End of Borehole at 1.00m		
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks  
No Groundwater encountered.





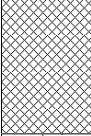

# Borehole Log

Borehole No.

**CP-16A**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433777E - 550414N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.65	Scale	1:50
Client:	Hellens Group			Dates:	26/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		1.00	SPT	50 (25 for 0mm/50 for 0mm)	0.90 1.00	71.75 71.65	 Grass over, dark grey, gravely CLAY. Gravel includes fine to coarse, angular, brick and sandstone. MADE GROUND		
							 CONCRETE OBSTRUCTION MADE GROUND End of Borehole at 1.00m	1	
								2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks  
No Groundwater encountered.





# Borehole Log

Borehole No.

**CP-16B**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433768E - 550411N	Hole Type	CP
Location:	Houghton le Spring			Level:	72.65	Scale	1:50
Client:	Hellens Group			Dates:	30/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Grass over, dark grey, gravelly sandy CLAY. Gravel includes fine to medium, angular coal, brick, sandstone and brick. MADE GROUND		
		1.10	D					1	
		1.20 - 1.70	B						
		1.20	SPT	N=17 (3,4/4,4,4,5)					
		1.80	D						
		2.00 - 2.50	B					2	
		2.00	SPT	N=13 (2,3/3,3,3,4)					
		2.80	D						
		3.00 - 3.50	B					3	
		3.00	SPT	N=7 (1,1/2,1,2,2)					
		3.80	D						
		4.00 - 4.50	B					4	
		4.00	SPT	N=30 (4,4/5,7,7,11)					
		4.80	D						
		5.00 - 5.50	B				5		
		5.00	SPT	N=18 (2,3/3,3,4,8)					
		6.00	D				6		
		6.50 - 7.00	B						
		6.50	SPT	N=23 (3,3/4,4,6,9)			7		
		7.50	D						
		8.00 - 8.50	B				8		
		8.00	SPT	N=31 (3,3/5,6,9,11)					
		9.00	D		9.00	63.65	9		
		9.50 - 10.00	B						
		9.50 - 9.95	U						
					10.00	62.65	10		
End of Borehole at 10.00m									

Remarks  
No Groundwater encountered.





# Borehole Log

Borehole No.

**CP-17**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433720E - 550471N	Hole Type	CP
Location:	Houghton le Spring			Level:	71.15	Scale	1:50
Client:	Hellens Group			Dates:	25/07/2019	Logged By	EB

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.20 - 0.80	B		2.00	69.15		Grass over, dark grey, gravelly CLAY. Gravel includes fine to coarse, angular, brick and ash. MADE GROUND	1			
		1.00	D									
		1.20 - 1.70	B	N=6 (1,0/1,1,2,2)								
		1.20	SPT									
		1.90	D									
		2.00 - 2.50	B	N=16 (3,4/3,4,4,5)								
		2.00	SPT									
		2.80	D									
		3.00 - 3.50	B	N=17 (2,2/3,4,5,5)								
		3.00	SPT									
	3.80	D										
	4.00 - 4.50	B	N=16 (3,4/3,4,4,5)									
	4.00	SPT										
	4.80	D										
	5.00 - 5.50	B	N=14 (2,3/2,3,4,5)									
	5.00	SPT										
	6.00	D										
	6.50 - 7.00	B	N=31 (3,4/10,9,5,7)									
	6.50	SPT										
	7.50	D										
	8.00 - 8.50	B	N=23 (2,4/6,6,5,6)									
	8.00	SPT										
	9.00	D										
	9.50 - 10.00	B		9.40	61.75		Firm to stiff, brown, grey laminated CLAY. GLACIAL TILL					
	9.50 - 9.95	U		10.00	61.15							
							End of Borehole at 10.00m	10				

Remarks  
No Groundwater encountered.





# Borehole Log

Borehole No.

**CP-18**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433852E - 550404N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.25	Scale	1:50
Client:	Hellens Group			Dates:	31/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Grass over. Brick concrete fill. MADE GROUND		
		1.00	D					1	
		1.20 - 1.65	D						
		1.20 - 1.70	B						
		1.20	SPT	N=50 (5,10/31,5,9,5)					
		1.90	D						
		2.00 - 2.45	D		2.00	71.25		2	
		2.00 - 2.50	B				Yellow Sand with Sandstone cobbles. MADE GROUND		
		2.00 - 2.50	D						
		2.00	SPT	N=39 (3,4/4,8,8,19)	2.50	70.75			
		2.50	SPT	N=50 (25 for 0mm/50 for 75mm)	2.60	70.65			
		2.60	D				Concrete obstruction. MADE GROUND		
							End of Borehole at 2.50m	3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	

Remarks  
No Groundwater encountered.







# Borehole Log

Borehole No.

**CP-18A**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433846E - 550407N	Hole Type	CP
Location:	Houghton le Spring			Level:	73.25	Scale	1:50
Client:	Hellens Group			Dates:	31/07/2019	Logged By	RP

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20 - 0.80	B				Brick Concrete Ash fill. MADE GROUND		
		1.00	D						1
		1.20 - 1.65	D	N=9 (1,0/1,2,3,3)					
		1.20 - 1.70	B						
		1.20	SPT						
		1.90	D						
		2.00	D		2.00	71.25	Concrete obstruction. MADE GROUND	2	
		2.00 - 2.20	D						
		2.00	SPT	N=50 (25 for 0mm/50,0,0,0) N=50 (25 for 0mm/50,0,0,0)	2.20	71.05		End of Borehole at 2.20m	
		2.20	SPT						

Remarks  
No Groundwater encountered.





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433768.79 - 550426.10  
Level: 72.45

Date  
16/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Brown, gravelly SAND. Gravel/cobbles includes angular sandstone and concrete. MADE GROUND
	1.00	D					
	2.00	B					
				3.50	68.95		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433908.86 - 550329.19  
Level: 72.25

Date  
15/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, friable, dark grey, sandy very gravelly CLAY. Gravel includes fine to coarse, angular, wood, coal, brick, metal pipes, cement pipes, metal wire. A small quantity of concrete cobbles were encountered. MADE GROUND
	0.80	B					
	1.20	D					
	1.50	B					
	1.90	D					
				3.50	68.75		Occasional pockets of light brown damp gravelly CLAY
							End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433904.17 - 550357.00  
Level: 72.70

Date  
16/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Brown, grey, sandy COBBLES. Cobbles include concrete slabs and bricks. MADE GROUND
	1.50	B					
	2.00	D					
				3.50	69.20		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: **Newbottle Street, Houghton le Spring**

Project No.  
**2585**

Co-ords: **433874.75 - 550329.62**  
Level: **72.65**

Date  
**15/07/2019**

Location: **Houghton le Spring**

Dimensions (m): **3.00**  
Depth **3.50**

Scale  
**1:20**

Logged  
**EB**

Client: **Hellens Group**

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D		0.40	72.25		Grass over, firm, brown, silty sandy gravelly CLAY. Gravel includes fine to coarse, angular to subrounded mudstone and sandstone. MADE GROUND
	0.50	B					Dark brown, dark grey, friable, gravelly CLAY. Gravel includes fine to coarse, angular to subangular sandstone, mudstone, brick, concrete coal and wood. MADE GROUND
	1.00	D					
	1.50	D					
	2.00	B					<i>Cobbles encountered below 1.9m bgl.</i>
				3.50	69.15		End of Pit at 3.50m

Remarks: **No Groundwater encountered.**

Stability: **Stable**  
Plant: **JCB 3CX**





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433882.47 - 550380.29  
Level: 73.35

Date  
16/07/2019

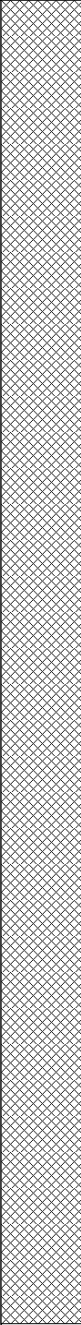
Location: Houghton le Spring

Dimensions (m): 3.00  
0.60   
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Brown, cobbly clayey SAND. Cobbles include angular brick and sandstone. MADE GROUND
	0.80	D					
	1.50	D					
	2.00	D					
	2.20	B					
				3.50	69.85		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433859.11 - 550394.47  
Level: 73.35

Date  
16/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, brown, clayey gravelly SAND. Gravel includes fine to coarse brick, tar, plastic, concrete post. MADE GROUND
	0.50	B					
	1.00	D					
				2.00	71.35		Light brown SAND. MADE GROUND
	2.30	D					
	2.50	B					
				3.50	69.85		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433826.25 - 550366.38  
Level: 73.30

Date  
15/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50 0.60

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D				0.60	Grass over, firm, brown, silty sandy gravelly CLAY. Gavel includes fine to coarse, angular to subrounded mudstone and sandstone. MADE GROUND	
	0.50	D					0.7m Boulder encountered	
	1.00	B		0.80	72.50	0.60	Friable, brown, red, sandy COBBLES. Cobbles include coarse, angular bricks. MADE GROUND	1
	1.50	B						
	1.60	D						
				1.80	71.50	0.60	Grey, red, slightly gravelly SAND. Gravel includes fine to coarse, angular sandstone. MADE GROUND	2
				3.50	69.80	0.60	End of Pit at 3.50m	3
								4

Remarks: No Groundwater encountered. Obstruction at 2.7m bgl.

Stability: Collapse below 1.2m bgl.

Plant: JCB 3CX







# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433815.96 - 550314.75  
Level: 72.65

Date  
15/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 2.70 0.60

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D				[Cross-hatched pattern]	Dark grey, sandy COBBLY CLAY. Gravel includes fine to coarse, angular, brick, mudstone and shale. MADE GROUND
	0.50	B					
	1.20	D		1.00	71.65		Red GRAVEL. Gravel includes medium to coarse angular shale. MADE GROUND
	2.00	B					
				2.70	69.95		End of Pit at 2.70m

Remarks: No Groundwater encountered.

Stability: Collapse below 1.3m bgl

Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433759.72 - 550371.73  
Level: 72.25

Date  
15/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50 0.60

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D				[Cross-hatched pattern]	Grass over, friable, dark grey, sandy very gravelly CLAY. Gravel includes fine to coarse, angular, wood, coal, brick, metal pipes, cement pipes, metal wire. A small quantity of concrete cobbles were encountered. MADE GROUND	
	0.60	D						
	1.00	B		1.10	71.15			Dark grey, sandy cobbly CLAY. Gravel includes fine to coarse, angular, wood, coal, brick, metal pipes, cement pipes, metal wire. MADE GROUND
	1.40	D						
				1.80	70.45		Friable, red, sandy GRAVEL. Gravel includes fine to coarse, angular shale. MADE GROUND	
				3.50	68.75		End of Pit at 3.50m	

Remarks: No Groundwater encountered.

Stability: Collapse below 2.3m bgl

Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433833.49 - 550411.81  
Level: 73.15

Date  
16/07/2019

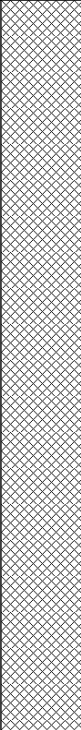
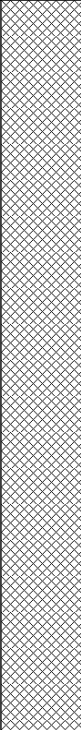
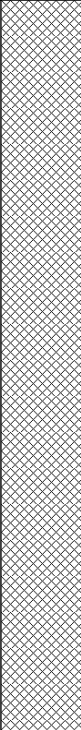
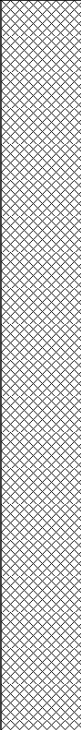
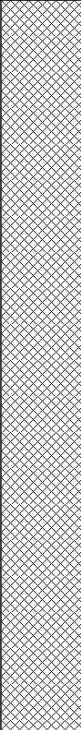


Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50 0.60

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	D					Friable, brown, gravelly sandy cobbly CLAY. Gravel/ cobbles includes fine to coarse, angular bricks and concrete slabs. MADE GROUND	
	1.00	B						1
	1.50	D						
				1.95	71.20		Soft, dark green, grey, brown, gravelly CLAY. Gravel includes fine to coarse, angular mudstone, wood and coal. MADE GROUND	2
	2.20	D						
				2.30	70.85		Stiff, fissured, light brown, grey, CLAY. GLACIAL TILL	
	2.50	D						3
				3.50	69.65		End of Pit at 3.50m	4

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433799.20 - 550435.95  
Level: 72.50

Date  
16/07/2019

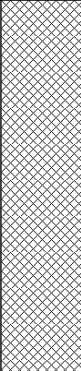
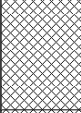
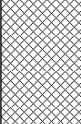


Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, sandy gravelly COBBLES. Cobbles/gravel include angular bricks, concrete poles, reinforcement bar, cement slabs and wood.  MADE GROUND
	1.20 1.20	B D		1.00	71.50		Friable, Light brown, gravelly CLAY. Cobbles include angular bricks. MADE GROUND
	1.50	D		1.30	71.20		Dark grey, sandy GRAVEL . Gravel includes fine to coarse , angular shale and ash. MADE GROUND
	1.80	D		1.70	70.80		Light brown, damp gravelly SAND. Gravel includes fine to medium angular mudstone and sandstone. MADE GROUND
	2.50	D		1.90	70.60		Firm to stiff, light grey, light brown CLAY. GLACIAL TILL
				3.50	69.00		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433788.04 - 550408.72  
Level: 72.60

Date  
16/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, brown, gravelly cobbly SAND. Cobbles/gravel include angular brick and concrete posts. MADE GROUND
	0.80	D		0.55	72.05		Dark grey, brown, gravelly sandy CLAY. Gravel include fine to coarse, angular coal, brick and sandstone. MADE GROUND
	1.50	B					
	2.00	D					
	2.20	B					
				3.50	69.10		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433780.45 - 550456.09  
Level: 71.40

Date  
15/07/2019

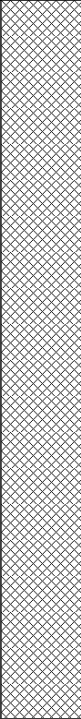

Location: Houghton le Spring

Dimensions (m): 3.00  
0.60   
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, sandy gravelly COBBLES. Cobbles/gravel include angular concrete poles, bricks, mudstone and slag. MADE GROUND
	0.80	D					
	1.00	B					
	2.00	D		1.90	69.50		Firm, light brown, light grey, banded CLAY. GLACIAL TILL
				3.50	67.90		
	End of Pit at 3.50m						

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433763.11 - 550471.08  
Level: 71.30

Date  
15/07/2019

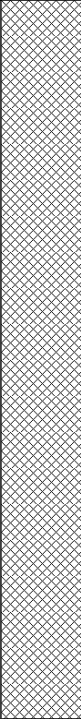
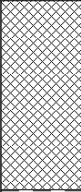
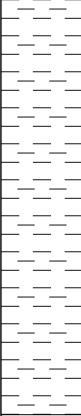
Location: Houghton le Spring

Dimensions (m): 3.00  
0.50   
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, dark brown, sandy COBBLES. Cobbles includes bricks, mudstone and slag. Few slag boulders encountered. MADE GROUND
	0.70	D					
	1.00	B					
				1.90	69.40		Dark grey, GRAVEL. Gravel includes fine to coarse, angular coal. MADE GROUND
	2.20	D					
				2.40	68.90		Firm, laminated, light brown, light grey, CLAY. GLACIAL TILL
	2.50	D					
				3.50	67.80		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433732.92 - 550454.36  
Level: 71.40

Date  
15/07/2019

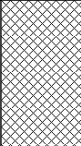
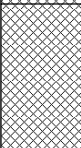

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50 0.60

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D		0.40	71.00		Firm, brown, gravelly CLAY. Gravel includes fine to coarse, angular to subrounded sandstone and mudstone. MADE GROUND
	0.50	D					Dark brown, sandy gravelly CLAY. Gravel includes fine to coarse, angular, coal, mudstone, shale and metal wire cables. MADE GROUND
	1.50	B		1.70	69.70		Firm, light to dark brown, slightly gravelly sandy CLAY. Gravel includes fine to coarse, angular to subrounded mudstone, brick, and sandstone.  MADE GROUND
	2.50	B					
				3.50	67.90		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX







# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433729.47 - 550501.08  
Level: 70.70

Date  
15/06/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.00

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D					Grass over, friable, dark brown, sandy gravelly CLAY. Gavel includes fine to coarse, angular to subrounded mudstone, slag, shale and sandstone.  MADE GROUND
	0.60	B		0.70	70.00		Friable, dark grey ASH. MADE GROUND
	0.80	D		0.90	69.80		Dark brown, sandy clayey GRAVEL. Gravel includes fine to coarse mudstone, and brick. MADE GROUND
	2.00 2.00	B D					
▼				3.00	67.70		End of Pit at 3.00m

Remarks: No groundwater encountered.

Stability: Collapse below 2.2m bgl.

Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433702.00 - 550490.22  
Level: 70.65

Date  
15/07/2019

Location: Houghton le Spring

Dimensions (m): 3.00  
Depth 3.50

Scale  
1:20

Logged  
EB

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	D		0.40	70.25		Grass over, firm, brown, silty sandy gravelly CLAY. Gavel includes fine to coarse, angular to subrounded mudstone and sandstone.  MADE GROUND
	0.70	D					Firm, brown, silty sandy gravelly COBBLES. Gavel includes fine to coarse, angular to subrounded mudstone and sandstone.  MADE GROUND
	1.50	D		3.50	67.15		End of Pit at 3.50m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433765.00 - 550445.00  
Level: 72.20

Date  
31/07/2020

Location: Houghton le Spring

Dimensions (m): 3.20  
Depth 2.30

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05 - 0.15 0.05 - 0.50	D B		0.15	72.05		MADE GROUND Turf over light brown sandy slightly gravelly clay with rootlets. Gravel is angular, fine to medium sandstone, ash and limestone.
	0.20 - 0.80 0.20 - 0.80	B D					MADE GROUND brown sandy gravelly clay with some cobbles. Gravel is angular, fine to medium sandstone and some brick. Cobbles of sandstone and brick.
	1.00 - 1.30 1.00 - 1.30	B D		0.90	71.30		MADE GROUND Dark grey sandy gravel. Gravel is angular, fine to medium occasionally coarse coal, ask and clinker and brick.
	1.50 - 2.00	B		1.40	70.80		MADE GROUND Light brown sandy gravel of limestone with cobbles of limestone. Possible weathered rockhead.
	2.30	D		2.30	69.90		End of Pit at 2.30m

Remarks: No groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433783.00 - 550376.00  
Level: 72.50

Date  
31/07/2020

Location: Houghton le Spring

Dimensions (m): 3.00  
8.00  
Depth 2.50

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05 - 0.10 0.05 - 0.10	B D		0.10	72.40		MADE GROUND Turf over sandy gravelly silty clay with rootlets. Gravel is angular, fine to medium sandstone and limestone.
	0.20 - 0.60 0.20 - 0.60	B D					MADE GROUND Brown and dark brown dessicated clayey sandy gravel with cobbles and boulders. Gravel is angular, fine to coarse brick, sandstone, concrete and ash. rare wire fragments noted and whole bricks.
	1.00	D					... concrete boulder encountered at 1.00mbgl
	1.30 - 2.00	B					... many brick and difficult to excavate from 1.20mbgl
	2.30	D					
				2.50	70.00		End of Pit at 2.50m

Remarks: No groundwater encountered.

Stability: Unstable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433831.00 - 550341.00  
Level: 73.05

Date  
31/07/2020

Location: Houghton le Spring

Dimensions (m): 2.80  
Depth 3.00

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.00 - 0.15	B		0.20	72.85		MADE GROUND Turf over friable sandy gravelly silt with rootlets. Gravel is angular, fine to medium sandstone and limestone.
	0.00 - 0.15	D					MADE GROUND Dark brown sandy gravel. Gravel is angular, fine to medium ash and clinker
	0.30 - 0.50	B		0.50	72.55		MADE GROUND Light brown sandy gravel of clinker.
	0.50 - 0.60	B					MADE GROUND Dark grey sandy gravel. Gravel is angular, fine to medium occasionally coarse mudstone and brick and ash.
	1.00 - 1.50	B		1.00 - 1.50	72.45		
	1.00 - 1.50	D					
	2.00	D					
2.50	B						
				3.00	70.05		End of Pit at 3.00m

Remarks: No groundwater encountered.

Stability: Stable  
Plant: JCB 3CX





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433921.00 - 550353.00  
Level: 72.35

Date  
31/07/2020

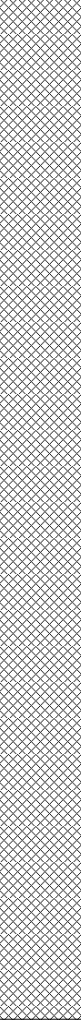
Location: Houghton le Spring

Dimensions (m): 3.20  
0.80   
Depth 2.70

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.30	D					MADE GROUND Turf over brown sandy gravel with cobbles and boulders. Gravel is angular, fine to coarse brick, concrete, ash, tarmacadam and limestone. Occasional wire fragments, whole bricks and concrete paving slabs noted.
	1.00	B					
	1.50	D					
	2.00 - 2.50 2.00 - 2.50	B D					
				2.70	69.65		End of Pit at 2.70m

Remarks: No groundwater encountered.

Stability: Unstable  
Plant: JCB 3CX





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring	Project No. 2585	Co-ords: 433733.00 - 550495.00 Level:	Date 03/05/2022
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Location: Houghton le Spring	Dimensions (m): 3.00	Scale 1:20
Client: Hellens Group	Depth 3.70	Logged RK

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
▼	0.15	D		0.35		[Cross-hatch pattern]	Tree chippings over friable dark brown slightly sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to sub-angular sandstone, brick fragments, clinker, slag and mudstone.  MADE GROUND
	0.50 - 0.60 0.50 - 0.60	B D		0.80		[Cross-hatch pattern]	Light brown and partly dark grey sandy GRAVEL with cobbles. Gravel is fine to coarse angular to sub angular sandstone, whole bricks, clinker, slag, concrete. MADE GROUND <i>Angular Boulders of concrete encountered.</i>
	1.00 - 1.20 1.00 - 1.20	B D		1.30		[Cross-hatch pattern]	Brown/Dark grey clayey gravelly SAND. Gravel is fine to coarse angular to subangular sandstone, ash, brick and plastic.  MADE GROUND
	1.50 - 1.60	D		2.80		[Cross-hatch pattern]	Light brown slightly clayey very gravelly SAND. Gravel is fine to coarse subangular to subrounded sandstone, mudstone, brick, clinker and coal. MADE GROUND
	2.00 - 2.20	B		3.60		[Cross-hatch pattern]	
	3.00 - 3.20 3.00 - 3.20	B D		3.70		[Cross-hatch pattern]	Stiff Pinkish brown slightly sandy silty laminated CLAY with occasional cobbles and boulders of angular Sandstone. GLACIAL TILL
						[Dotted pattern]	Possible weathered light yellowish SANDSTONE rockhead. <i>Difficult to excavate due to hard strata.</i> End of Pit at 3.70m

Remarks: Slight groundwater seepage from 2.60m bgl. Pit terminated at 3.70 m bgl due to hard strata.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log

Project Name: **Newbottle Street, Houghton le Spring**

Project No.  
**2585**

Co-ords: **433768.00 - 550452.00**  
Level:

Date  
**03/05/2022**

Location: **Houghton le Spring**

Dimensions (m): 3.00  
1.20   
Depth  
**2.50**

Scale  
**1:20**

Logged  
**RK**

Client: **Hellens Group**

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D		0.25			Grassover friable brown slightly sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular to subangular sandstone, limestone and ash.
	0.60 - 0.70 0.60 - 0.70	B D		0.80			MADE GROUND Brown slightly sandy very gravelly CLAY with cobbles. Gravel is fine to coarse angular sandstone, whole bricks, wood, plastic, concrete and clinker. MADE GROUND
	1.00 - 1.20 1.00 - 1.20	B D		1.40			Dark grey sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular coal, brick, ash and clinker. MADE GROUND
	1.50 - 1.60 1.50 - 1.60	B D		2.50			Light brown sandy GRAVEL with angular coarse cobbles and boulders of limestone. Possible weathered rockhead. MADE GROUND
	2.50	D		2.50			End of Pit at 2.50m

Remarks: Obstruction at 2.50m bgl due to boulders.

Stability: **Stable**  
Plant: **Komatsu 910**







# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring	Project No. 2585	Co-ords: 433812.00 - 550457.00 Level:	Date 03/05/2022
--	------------------	--	-----------------

Location: Houghton le Spring	Dimensions (m): 3.00 Depth 4.00	Scale 1:20 Logged RK
------------------------------	------------------------------------	-------------------------

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D		0.30			Grassover with tree stumps and chippings brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, sandstone and mudstone.
	0.60 - 0.80 0.60 - 0.80	B D					MADE GROUND Dark grey sandy GRAVEL. Gravel is fine to coarse angular to subangular whole bricks, coal, sandstone, concrete, clinker and plastic.
	1.40 - 1.50	D		2.60			MADE GROUND <i>Cobbles/ Boulders of angular coarse limestone / sandstone.</i>
	2.00 - 2.30	D					Light brown /yellow sandy GRAVEL. Gravel is fine to coarse angular to subangular limestone/ sandstone.
	2.80 - 3.00 2.80 - 3.00	B D		4.00			MADE GROUND <i>Cobbles/ Boulders of angular coarse limestone / sandstone noted. Possible weathered rockhead.</i>
	3.50 - 3.60	D					End of Pit at 4.00m
	4.00	B					

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433847.00 - 550447.00  
Level:

Date  
03/05/2022

Location: Houghton le Spring

Dimensions (m): 3.00  
1.20  
Depth 4.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.15 - 0.20	D		0.40			Grassover with tree stumps and chippings brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular brick, sandstone and mudstone.  MADE GROUND
	0.60 - 0.70	D					Dark grey sandy GRAVEL. Gravel is fine to coarse angular to subangular brick, concrete, clinker, ash and shale. MADE GROUND
	1.40 - 1.50 1.40 - 1.50	B D		1.30			Dark grey sandy GRAVEL with cobbles. Gravel is fine to coarse angular to subangular of laminated shale/ mudstone.  MADE GROUND <i>Cobbles and boulder of angular coarse LIMESTONE noted from 1.3m bgl.</i>
	2.00	D					
	2.50	B					
	3.20 - 3.50	D		3.00			Light brown sandy GRAVEL. Gravel is fine to coarse angular LIMESTONE. Possible weathered bedrock. MADE GROUND

Continued on Next Sheet

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433847.00 - 550447.00  
Level:

Date  
03/05/2022

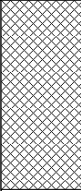
Location: Houghton le Spring

Dimensions (m): 3.00  
  
Depth  
4.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	4.50	B		4.50			Light brown sandy GRAVEL. Gravel is fine to coarse angular LIMESTONE. Possible weathered bedrock. MADE GROUND
							End of Pit at 4.50m

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log

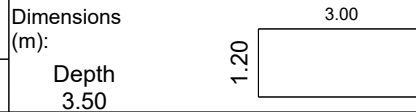
Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433883.00 - 550429.00  
Level:

Date  
03/05/2022

Location: Houghton le Spring



Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D		0.40			Grassover with tree stumps and wood chippings: Brown slightly sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular to subangular of brick, plastic, timber, and sandstone.  MADE GROUND
	0.80 - 1.00 0.80 - 1.00	B D					Dark brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to subangular sandstone, limestone, coal and brick fragments.  MADE GROUND
	1.50 1.50	B D		1.40			Dark grey/ black sandy GRAVEL. Gravel is fine to coarse angular to subangular shale, coal, tiles, ash, whole bricks, metal rods, pvc pipes, plastic, concrete slabs and a steel girder structure.  MADE GROUND
	2.30 - 2.50	D					
	3.50	D		3.50			End of Pit at 3.50m

Remarks: Made Ground obstruction at 3.5m bgl.

Stability: Stable

Plant: Komatsu 910





# Trial Pit Log

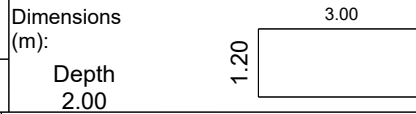
Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433910.00 - 550413.00  
Level:

Date  
02/05/2022

Location: Houghton le Spring



Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D					Grassover with tree stumps and wood chippings: Brown slightly sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular to subangular of brick, plastic, timber, and sandstone.
	0.50 - 0.70 0.50 - 0.70	B D		0.30			MADE GROUND Stiff light brown slightly sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, limestone, mudstone, coal, concrete slabs, slag, wood and clinker.
				0.90			MADE GROUND <i>Boulders of angular limestone noted with increasing depth.</i>
	1.50 - 1.60	D					Dark grey sandy GRAVEL with cobbles. Cobbles include coarse, angular whole bricks. MADE GROUND
				1.90 2.00			Concrete Obstruction. MADE GROUND
							End of Pit at 2.00m

Remarks: No Groundwater encountered. Pit stopped at 2m bgl due to Made ground obstruction.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log

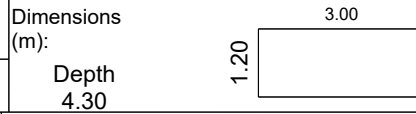
Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433906.00 - 550386.00  
Level:

Date  
03/05/2022

Location: Houghton le Spring



Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10 - 0.15	D		0.40			Grassover brown sandy gravelly CLAY with rootlets. Gravel is fine to coarse angular to subangular brick, clinker, coal and sandstone.  MADE GROUND	
	0.50 - 0.60 0.50 - 0.60	B D					Dark grey/ black sandy GRAVEL. Gravel is fine to coarse angular to subangular brick, coal, ash, clinker, slag, concrete, limestone, sandstone and mudstone.  MADE GROUND	
	1.20 - 1.30	D		1.40			Light brown sandy GRAVEL with cobbles.. Gravel is fine to coarse angular of brick, sandstone, limestone . Cobbles include coarse, angular limestone.  MADE GROUND	
	1.80 - 1.90 1.80 - 1.90	B D					Reddish brown slightly gravelly clayey fine to coarse grained SAND. Gravel is fine to medium angular to subangular sandstone, limestone and mudstone.  MADE GROUND	
	2.20 - 2.30 2.20 - 2.30	B D		2.80			Light yellowish brown sandy GRAVEL with cobbles. Gravel is fine to coarse angular sandstone. Cobbles include coarse , angular sandstone.  SANDSTONE	
	3.10 3.10	B D					Light yellowish brown silty fine to medium grained SAND.	
	3.70 3.70	B D		3.60				

Continued on Next Sheet

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433906.00 - 550386.00  
Level:

Date  
03/05/2022


Location: Houghton le Spring

Dimensions (m): 3.00  
  
 Depth  
4.30

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
				4.30			Light yellowish brown silty fine to medium grained SAND.
							End of Pit at 4.30m

Remarks: No Groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433962.00 - 550347.00  
Level:

Date  
03/05/2022

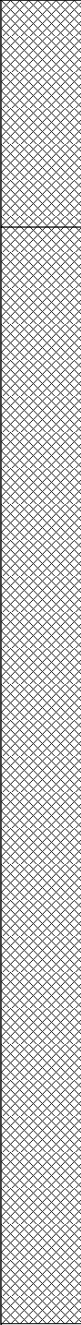
Location: Houghton le Spring

Dimensions (m):   
Depth  
3.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D					Grassover friable brown slightly sandy gravelly CLAY with high root content. Gravel is fine to coarse angular to subangular brick, tarmacadam, coal, slag, sandstone and tree stumps.  MADE GROUND
	0.60 - 0.70 0.60 - 0.70	B D		0.60			Friable brown very sandy very gravelly cobby CLAY. Gravel is fine to coarse angular to subangular of brick, concrete, clinker, slag, ash, metal wires, plastic, styrofoam and pvc pipings. MADE GROUND
	1.20 - 1.30	D					
	2.00 - 2.20 2.00 - 2.20	B D					<i>Boulder of angular concrete slabs and limestone noted. Large structure of concrete encountered within strata.</i>
	2.80 - 3.00	D					
	3.50	D		3.50			End of Pit at 3.50m

Remarks: No groundwater encountered.

Stability: Stable

Plant: Komatsu 910







# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433845.00 - 550347.00  
Level:

Date  
03/05/2022

Location: Houghton le Spring

Dimensions (m): 3.00  
1.20  
Depth 4.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D		0.30			Grassover Light brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub rounded of brick, mudstone and sandstone.
	0.60 - 0.70 0.60 - 0.70	B D					MADE GROUND Friable dark grey/ black slightly clayey very sandy GRAVEL. Gravel is fine to coarse angular to sub angular brick, sandstone, mudstone, slag, clinker and coal.
	1.20 - 1.30 1.20 - 1.30	B D		1.10			Friable red sandy GRAVEL. Gravel is fine to coarse angular brick, coal, sandstone, clinker, slag and mudstone. MADE GROUND <i>Occasional boulders of angular limestone noted in strata.</i>
	2.00 - 2.20 2.00 - 2.20	B D		1.70			Light grey thinly laminated MUDSTONE. Recovered as angular gravels. <i>Cobbles of angular coarse sandstone also noted within strata.</i>
	2.80 - 3.00	D					

Continued on Next Sheet

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433845.00 - 550347.00  
Level:

Date  
03/05/2022


Location: Houghton le Spring

Dimensions (m): 3.00  
  
 Depth  
4.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	4.20 4.20	B D		4.50			Light grey thinly laminated MUDSTONE. Recovered as angular gravels.
							End of Pit at 4.50m

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log


Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433804.00 - 550371.00  
Level:

Date  
03/05/2022

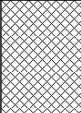
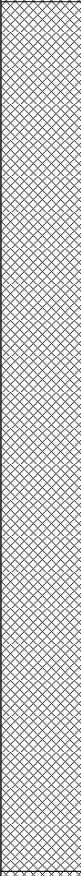
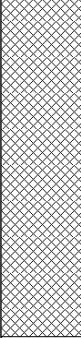
Location: Houghton le Spring

Dimensions (m):   
Depth  
3.50

Scale  
1:20

Logged  
RK

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10 - 0.15	D		0.30			Grassover Light brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub rounded of brick, mudstone and sandstone.
	0.60 - 0.70 0.60 - 0.70	D D					MADE GROUND Friable Dark brown very sandy very gravelly CLAY. Gravel is fine to coarse angular to subangular brick, sandstone, mudstone, coal, limestone and concrete.
	1.20 - 1.50 1.20 - 1.50	B D		2.60			MADE GROUND <i>Angular boulders of sandstone noted with strata.</i>
	2.60	D					Dark brown/ Red slightly clayey sandy COBBLES. Cobbles are angular coarse of whole red bricks in a dark brown sandy clayey matrix with occasional cobbles of angular coarse concrete and sandstone.
	3.50	D		3.50			MADE GROUND
							End of Pit at 3.50m

Remarks: No groundwater encountered.

Stability: Stable  
Plant: Komatsu 910





# Trial Pit Log

Trial Pit No  
**HP01**  
Sheet 1 of 1

Project Name: **Newbottle Street, Houghton le Spring**

Project No.  
**2585**

Co-ords: **433942.00 - 550341.00**  
Level: **72.05**

Date  
**02/11/2020**

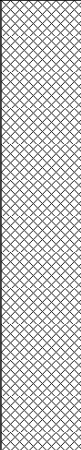
Location: **Houghton le Spring**

Dimensions (m): 0.30  
Depth **1.20** 0.30 0.30

Scale  
**1:20**

Logged  
**TS**

Client: **Hellens Group**

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60 - 1.20	D		1.20	70.85		MADE GROUND Turf over dark brown sandy gravel. Gravel is angular fine to medium of ash sandstone and coal.
							End of Pit at 1.20m

Remarks: **No groundwater encountered**

Stability: **stable**  
Plant: **Hand excavated**





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring


Project No.  
2585

Co-ords: 433874.00 - 550374.00  
Level: 73.30

Date  
02/11/2020

Location: Houghton le Spring

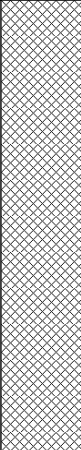
Dimensions (m): 0.40  
Depth 1.20



Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60	D		1.20	72.10		MADE GROUND Turf over dark brown sandy gravel. Gravel is angular, fine to medium ash, brick and concrete.
							End of Pit at 1.20m

Remarks: No groundwater encountered

Stability: stable  
Plant: hand excavated

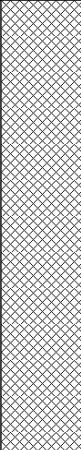




# Trial Pit Log

Project Name: <b>Newbottle Street, Houghton le Spring</b>	Project No. <b>2585</b>	Co-ords: <b>433820.00 - 550352.00</b> Level: <b>73.30</b>	Date <b>02/11/2020</b>
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Location: <b>Houghton le Spring</b>	Dimensions (m): 0.40	Scale <b>1:20</b>
Client: <b>Hellens Group</b>	Depth <b>1.20</b>	Logged <b>TS</b>

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50 - 1.20	D		1.20	72.10		MADE GROUND Turf over brown sandy clay and cobbles. Gravel is angular, fine to coarse brick, concrete, ash, tarmacadam, limestone and with occasional wire fragments.
							End of Pit at 1.20m

Remarks: No groundwater encountered

Stability: stable

Plant: Hand excavated





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433826.00 - 550401.00  
Level: 73.15

Date  
02/11/2020

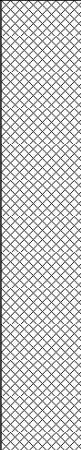
Location: Houghton le Spring

Dimensions (m): 0.40  
Depth 1.20 0.40

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60 - 0.80	D		1.20	71.95		MADE GROUND Turf over brown sandy clay and cobbles. Gravel is angular, fine to coarse brick, concrete, ash, tarmacadam, limestone and with occasional wire fragments.
							End of Pit at 1.20m

Remarks: No groundwater encountered

Stability: Stable  
Plant: Hand excavated





# Trial Pit Log

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433773.00 - 550448.00  
Level: 72.20

Date  
02/11/2020

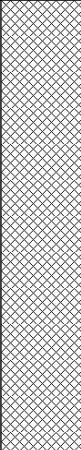
Location: Houghton le Spring

Dimensions (m): 0.40  
Depth 1.20

Scale  
1:20

Logged  
TS

Client: Hellens Group

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.60 - 1.20	D		1.20	71.00		MADE GROUND Turf over dark brown sandy gravel. Gravel is angular fine to medium of ash sandstone and coal.
							End of Pit at 1.20m

Remarks: No groundwater encountered

Stability: stable  
Plant: Hand excavated







# Trial Pit Log

Trial Pit No  
**HP06**  
Sheet 1 of 1

Project Name: **Newbottle Street, Houghton le Spring**

Project No.  
**2585**

Co-ords: **433731.00 - 550421.00**  
Level: **71.67**

Date  
**02/11/2020**

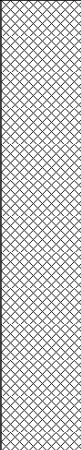
Location: **Houghton le Spring**

Dimensions (m): **0.40**  
Depth **1.20**

Scale  
**1:20**

Logged  
**TS**

Client: **Hellens Group**

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	D		1.20	70.47		MADE GROUND Turf over dark brown sandy gravel. Gravel is angular, fine to medium ash, brick, coal and concrete.
							End of Pit at 1.20m

Remarks: **No groundwater encountered**

Stability: **stable**  
Plant: **Hand excavated**





# Trial Pit Log

Project Name: **Newbottle Street, Houghton le Spring**

Project No.  
**2585**

Co-ords: **433756.00 - 550466.00**  
Level: **71.35**

Date  
**02/11/2020**

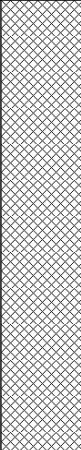
Location: **Houghton le Spring**

Dimensions (m): **0.40**  
Depth **1.20**

Scale  
**1:20**

Logged  
**TS**

Client: **Hellens Group**

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50 - 1.00	D		1.20	70.15		MADE GROUND Turf over dark brown sandy gravel. Gravel is angular, fine to medium ash, coal, brick and concrete.
							End of Pit at 1.20m

Remarks: **No groundwater encountered**

Stability: **stable**  
Plant: **Hand excavated**





# Borehole Log

Borehole No.

**RO-01**

Sheet 1 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433799E - 550396N	Hole Type	RO
Location:	Houghton le Spring			Level:	72.85	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	DRILLER

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
								Brown sandy gravelly CLAY. Gravel consists of sandstone . Sandstone boulders also encountered.	1		
											2
											3
											4
											5
											6
											7
											8
											9
											10
											11
											12
											13
											14
					14.80	58.05					Red/Brown weathered MUDSTONE.
									16		
									17		
									18		
									19		
									20		
Continued on Next Sheet											

Remarks  
No groundwater encountered.





# Borehole Log

Borehole No.

**RO-01**

Sheet 2 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433799E - 550396N	Hole Type	RO
Location:	Houghton le Spring			Level:	72.85	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	DRILLER

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Red/Brown weathered MUDSTONE.	21
									22
					27.30	45.55			23
									24
									25
									26
									27
								Brown SANDSTONE.	28
									29
					30.00	42.85			30
								End of Borehole at 30.00m	31
									32
									33
									34
									35
									36
									37
									38
									39
									40

Remarks  
No groundwater encountered.





# Borehole Log

Borehole No.

**RO-02**

Sheet 1 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433808E - 550403N	Hole Type	RO
Location:	Houghton le Spring			Level:	73.00	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	DRILLER

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
[REDACTED]					2.10	70.90		Brown gravelly CLAY. Gravel consists of coarse sandstone.	1
								Brown coarse sandstone GRAVEL. Sandstone boulders also encountered.	2
					7.60	65.40		Brown gravelly CLAY. Gravel consists of coarse sandstone.	3
									4
					13.10	59.90		Red/Brown weathered MUDSTONE.	5
					16.70	56.30		Grey MUDSTONE.	6
			17.50	55.50		Yellow/Grey weathered SANDSTONE.	7		
							Continued on Next Sheet	8	

Remarks  
No groundwater encountered.





# Borehole Log

Borehole No.

**RO-02**

Sheet 2 of 2

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433808E - 550403N	Hole Type	RO
Location:	Houghton le Spring			Level:	73.00	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	DRILLER

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					21.00	52.00	.....	Yellow/Grey weathered SANDSTONE.	21
								End of Borehole at 21.00m	22
									23
									24
									25
									26
									27
									28
									29
									30
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40

Remarks  
No groundwater encountered.





# Borehole Log

Borehole No.

**RO-03**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433873E - 550352N	Hole Type	RO
Location:	Houghton le Spring			Level:	72.95	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.40	71.55		Brown gravelly CLAY. Gravel consists of coarse brick.	1
								Black SHALE / ASH.	2
					5.80	67.15		Brown gravelly CLAY. Gravel consists of coarse sandstone.	6
					7.40	65.55		Red/Brown MUDSTONE.	8
					10.70	62.25		Yellow/Grey SANDSTONE.	11
					12.40	60.55		End of Borehole at 12.40m	12
									13
									14
									15
									16
									17
									18
									19
									20

Remarks  
No groundwater encountered.





# Borehole Log

Borehole No.

**RO-04**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433878E - 550364N	Hole Type	RO
Location:	Houghton le Spring			Level:	73.00	Scale	1:100
Client:	Hellens Group			Dates:	21/04/2020	Logged By	Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
					1.40	71.60		Brown gravelly CLAY.	1	
					1.90	71.10			Yellow GRAVEL. Gravel consists of coarse sandstone and limestone. Black ASH/SLAG	2
										3
										4
						4.90	68.10		Yellow weathered SANDSTONE and LIMESTONE.	5
								6		
								7		
								8		
								9		
								10		
				10.80	62.20		Grey MUDSTONE.	11		
								12		
								13		
								14		
								15		
								16		
				17.00	56.00		End of Borehole at 17.00m	17		
								18		
								19		
								20		

Remarks  
No groundwater encountered.







# Borehole Log

Borehole No.

**RO-05**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433888E - 550384N	Hole Type	RO
Location:	Houghton le Spring			Level:	73.40	Scale	1:100
Client:	Hellens Group			Dates:	20/04/2020	Logged By	Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					3.10	70.30		Brown gravelly CLAY. Gravel consists of ash/slag.	1
								Yellow weathered LIMESTONE/SANDSTONE.	2
								Light grey weathered SANDSTONE.	3
					12.40	61.00		End of Borehole at 15.00m	4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
					15.00	58.40			16
									17
									18
									19
									20

Remarks  
No groundwater encountered.





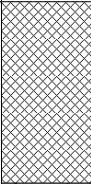
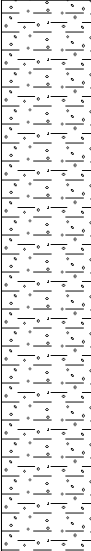
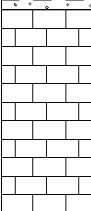
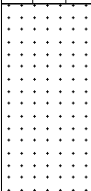
# Borehole Log

Borehole No.

**RO-06**

Sheet 1 of 1

Project Name:	Newbottle Street, Houghton le Spring	Project No.	2585	Co-ords:	433795E - 550406N	Hole Type	RO
Location:	Houghton le Spring			Level:	72.80	Scale	1:100
Client:	Hellens Group			Dates:	21/04/2020	Logged By	Driller

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					2.40	70.40		Brown gravelly CLAY. Gravel consists of brick/ash.	1
								Brown gravelly CLAY. Gravel consists of coarse sandstone.	2
					9.80	63.00		Yellow weathered LIMESTONE/SANDSTONE.	3
								Grey weathered SANDSTONE.	4
					15.00	57.80		End of Borehole at 15.00m	5

Remarks  
No groundwater encountered.





# Rotary Core Log

Borehole No.

**RC01**

Sheet 1 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433745.00 - 550470.00

Location: Houghton le Spring

Level: 71.73

Scale  
1:25

Client: Hellens Group

Dates: 20/06/2022 - 20/07/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	ES				0.30	71.43		Scrub grass over TOPSOIL: Stiff brown sandy gravelly CLAY with high root content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick and mudstone	
							0.50	71.23		MADE GROUND: Stiff yellowish brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone and brick. Cobbles are angular small to large of brick and sandstone.	
		1.00 - 1.20	ES							MADE GROUND: Yellowish brown clayey SAND and GRAVEL with moderate cobble content. Sand is fine to coarse. Gravel is angular to sub-round fine to coarse and includes brick, coal, sandstone and mudstone. Cobbles are angular small to large of brick, sandstone and mudstone.	1
		1.20 - 2.00									
		2.00 - 3.50									2
		3.50 - 5.00									3
		4.76 - 4.89	ES							Sandstone boulders with firm to stiff thin (0.10m) clay bands between 3.50m and 5.39m bgl.	4
											5

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.20m bgl. Depth to groundwater not identified due to drilling flush. Drilling run 11 (15.50m to 17.00m bgl) became stuck in the core barrel due to the presence of sand resulting in the extensive drilling fractures below 15.88m bgl.





# Rotary Core Log

Borehole No.

**RC01**

Sheet 2 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433745.00 - 550470.00

Location: Houghton le Spring

Level: 71.73

Scale  
1:25

Client: Hellens Group

Dates: 20/06/2022 - 20/07/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50	15	42	42	15	5.39	66.34		MADE GROUND: Yellowish brown clayey SAND and GRAVEL with moderate cobble content. Sand is fine to coarse. Gravel is angular to sub-round fine to coarse and includes brick, coal, sandstone and mudstone. Cobbles are angular small to large of brick, sandstone and mudstone.	
		6.23 - 6.40	ES							Weak to moderately strong reddish brown distinctly to destructively weathered MUDSTONE. <i>Horizontal to vertical very close to closely spaced planar rough to smooth very tight to open clean.</i>	6
		6.80 - 7.00	ES				6.68	65.05		<i>Horizontal to sub-horizontal (10°) closely to medium spaced planar to undulating smooth to rough very tight to open clean.</i>	
		6.50 - 8.00	4	100	90	80				Strong reddish brown fine to medium SANDSTONE. <i>Horizontal to vertical medium spaced planar smooth to rough tight to open clean.</i>	7
		8.00 - 9.50	11							<i>Horizontal to oblique (50°) closely to medium spaced planar to stepped rough tight to partly open clean.</i> <u>Grey below 8.00m bgl</u>	8
			4	93	82	71				<i>Horizontal to vertical very close to medium spaced undulating to stepped rough tight to partly open clean.</i>	9
										<i>Horizontal to oblique (30°) closely to medium spaced undulating to stepped rough partly open to open clean.</i>	10

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.20m bgl. Depth to groundwater not identified due to drilling flush. Drilling run 11 (15.50m to 17.00m bgl) became stuck in the core barrel due to the presence of sand resulting in the extensive drilling fractures below 15.88m bgl.





# Rotary Core Log

Borehole No.

**RC01**

Sheet 3 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433745.00 - 550470.00

Location: Houghton le Spring

Level: 71.73

Scale  
1:25

Client: Hellens Group

Dates: 20/06/2022 - 20/07/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00	3	95	87	83				Strong reddish brown fine to medium SANDSTONE.	
		11.00 - 12.50	3	97	97	91				Horizontal to sub-horizontal (10°) closely to medium spaced undulating rough tight to partly open clean. Thinly laminated between 11.13m and 11.50m bgl	11
		12.50 - 14.00	9 12	97	61	41	12.50	59.23		Weak to strong reddish brown fine to medium SANDSTONE. Horizontal to oblique (80°) closely spaced undulating to stepped rough partly open clean.  Horizontal to vertical very closely to closely spaced undulating to stepped rough partly open to open clean.	13
		14.00 - 15.50	5	90	85	79	14.00	57.73		Destructively weathered between 13.70 and 13.90m bgl.  Strong yellowish brown fine to coarse SANDSTONE. Horizontal to oblique (45°) closely to medium spaced planar to undulating rough tight to partly open clean to soft clay infill with surface staining.	14
										Continued on Next Sheet	15

**Remarks**

Inspection pit dug to 1.20m bgl. Depth to groundwater not identified due to drilling flush. Drilling run 11 (15.50m to 17.00m bgl) became stuck in the core barrel due to the presence of sand resulting in the extensive drilling fractures below 15.88m bgl.





# Rotary Core Log

Borehole No.

**RC01**

Sheet 4 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433745.00 - 550470.00

Location: Houghton le Spring

Level: 71.73

Scale  
1:25

Client: Hellens Group

Dates: 20/06/2022 - 20/07/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
	▼						15.50	56.23		Strong yellowish brown fine to coarse SANDSTONE.	
			9							Weak to moderately strong reddish brown fine to medium SANDSTONE <i>Horizontal to vertical closely spaced stepped to undulating rough tight to partly open clean.</i>	16
		15.50 - 17.00		65	21	12					
							17.00	54.73		End of Borehole at 17.00m	17
											18
											19
											20

**Remarks**

Inspection pit dug to 1.20m bgl. Depth to groundwater not identified due to drilling flush. Drilling run 11 (15.50m to 17.00m bgl) became stuck in the core barrel due to the presence of sand resulting in the extensive drilling fractures below 15.88m bgl.





# Rotary Core Log

Borehole No.

**RC02**

Sheet 1 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433749.00 - 550448.00

Location: Houghton le Spring

Level: 71.92

Scale  
1:25

Client: Hellens Group

Dates: 21/06/2022 - 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	ES				0.30	71.62		Scrub grass over TOPSOIL: Stiff brown sandy gravelly CLAY with moderate root content. Gravel is angular to sub-round fine to coarse and includes brick, coal, sandstone and mudstone.	
		0.80 - 0.90	ES							MADE GROUND: Stiff brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-round fine to coarse and includes brick, concrete, coal, mudstone and sandstone. Cobbles are angular to sub-angular small to large of concrete, brick and sandstone.	1
		1.50 - 1.60 1.20 - 2.00	ES								2
		2.00 - 3.50									3
		3.50 - 5.00									4
											5

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.20m bgl. No recovery below 12.50m bgl due to destructive weathering of sandstone bedrock. Depth to groundwater not identified due to drilling flush.





# Rotary Core Log

Borehole No.

**RC02**

Sheet 2 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433749.00 - 550448.00

Location: Houghton le Spring

Level: 71.92

Scale  
1:25

Client: Hellens Group

Dates: 21/06/2022 - 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.50 - 5.60	ES							MADE GROUND: Stiff brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-round fine to coarse and includes brick, concrete, coal, mudstone and sandstone. Cobbles are angular to sub-angular small to large of concrete, brick and sandstone.	6
		5.00 - 6.50									
		6.50 - 8.00	ES				7.80	64.12		Weak reddish brown partly weathered MUDSTONE.	8
		7.53 - 7.64									
		8.00 - 9.50	6	91	47	37	8.23	63.69		Strong greyish brown fine to coarse SANDSTONE. <i>Horizontal to sub-horizontal (10°) very closely spaced undulating to stepped rough partly open to moderately wide clean to soft clay infill.</i> <i>Sub-horizontal (10°) to vertical closely to moderately spaced planar smooth to rough tight to open clean.</i>	9
		10									
			11							<i>Horizontal to oblique (40° to 65°) closely to medium spaced planar to undulating smooth to rough partly open to open clean.</i> <i>Yellowish brown below 9.70m bgl.</i>	10

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.20m bgl. No recovery below 12.50m bgl due to destructive weathering of sandstone bedrock. Depth to groundwater not identified due to drilling flush.







# Rotary Core Log

Borehole No.

**RC02**

Sheet 3 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433749.00 - 550448.00

Location: Houghton le Spring

Level: 71.92

Scale  
1:25

Client: Hellens Group

Dates: 21/06/2022 - 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00	3	91	83	77	12.50	59.42		Strong greyish brown fine to coarse SANDSTONE. <i>Sub-horizontal (10°) to oblique (20° to 70°) closely to medium spaced planar to stepped rough very tight to partly open clean.</i>	11
		11.00 - 12.50	5	96	34	18				<i>Horizontal to sub-horizontal (10°) very close to closely spaced planar to stepped rough tight to partly open clean with occasional black surface staining.</i>	
			10							<i>Horizontal to oblique (50°) very close to closely spaced planar to stepped rough very tight to open clean.</i>	12
		12.50 - 14.00								Weak reddish brown fine to coarse destructively weathered SANDSTONE with ~0.50m thick bands of sand.	
	14.00 - 15.50								14		
										Continued on Next Sheet	15

**Remarks**

Inspection pit dug to 1.20m bgl. No recovery below 12.50m bgl due to destructive weathering of sandstone bedrock. Depth to groundwater not identified due to drilling flush.





# Rotary Core Log

Borehole No.

**RC02**

Sheet 4 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433749.00 - 550448.00

Location: Houghton le Spring

Level: 71.92

Scale  
1:25

Client: Hellens Group

Dates: 21/06/2022 - 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00								Weak reddish brown fine to coarse destructively weathered SANDSTONE with ~0.50m thick bands of sand.	16
							17.00	54.92		End of Borehole at 17.00m	17
											18
											19
											20

**Remarks**

Inspection pit dug to 1.20m bgl. No recovery below 12.50m bgl due to destructive weathering of sandstone bedrock. Depth to groundwater not identified due to drilling flush.





# Rotary Core Log

Borehole No.

**RC03**

Sheet 1 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433770.00 - 550470.00

Location: Houghton le Spring

Level: 71.99

Scale  
1:25

Client: Hellens Group

Dates: 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.30					71.69		Scrub grass over TOPSOIL: Stiff brown sandy slightly gravelly CLAY with high root content. Gravel is angular to sun-angular fine to medium and includes coal, mudstone and chert.		
		1.30 - 1.40	ES						MADE GROUND: Stiff greyish brown sandy gravelly CLAY with bands of clayey sand and gravel with moderate cobble content. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse and includes tarmacadam, concrete, brick and coal. Cobbles are angular to sub-round small to large of sandstone.	1	
		1.20 - 2.00									
		2.00 - 3.50									
		3.50 - 5.00									
		5.00					66.99				

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.20m bgl. Groundwater encountered at 7.00m bgl.







# Rotary Core Log

Borehole No.

**RC03**

Sheet 3 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433770.00 - 550470.00

Location: Houghton le Spring

Level: 71.99

Scale  
1:25

Client: Hellens Group

Dates: 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00		100	25	25				Weak pinky grey fine to medium distinctly to destructively weathered SANDSTONE.	
		11.17 - 11.27	5 ES							<i>Horizontal closely spaced planar smooth tight clean.</i>	11
		11.00 - 12.50	9	100	43	37				<i>Horizontal closely undulating smooth tight clean.</i>	12
		12.50 - 14.00	10	27	12	7				<i>Horizontal closely planar smooth tight clean.</i>	13
		14.00 - 15.50	15	13	7					<i>Horizontal very closely undulating rough open clean.</i>	14
										Continued on Next Sheet	15

Remarks  
Inspection pit dug to 1.20m bgl. Groundwater encountered at 7.00m bgl.





# Rotary Core Log

Borehole No.

**RC03**

Sheet 4 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433770.00 - 550470.00

Location: Houghton le Spring

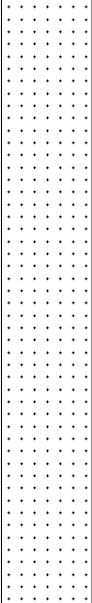
Level: 71.99

Scale  
1:25

Client: Hellens Group

Dates: 22/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00	8	89	75	63	17.00	54.99		Weak pinky grey fine to medium distinctly to destructively weathered SANDSTONE.  <i>Horizontal to vertical very closely to medium planar to undulating smooth tight to open clean. Reddish brown below 15.5m bgl.</i>	16
										End of Borehole at 17.00m	17
											18
											19
											20

Remarks

Inspection pit dug to 1.20m bgl. Groundwater encountered at 7.00m bgl.





# Rotary Core Log

Borehole No.

**RC04**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433795.00 - 550400.00

Location: Houghton le Spring

Level: 73.03

Scale  
1:25

Client: Hellens Group

Dates: 23/06/2022 - 24/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.30	72.73		Scrub grass over TOPSOIL: Stiff brown sandy slightly gravelly CLAY with high root content. Gravel is angular to sun-round fine to medium and includes brick, concrete and sandstone.	
		1.20 - 2.00								MADE GROUND: Grey mottle pink clayey SANDY and GRAVEL with high cobble content and low metal content. Sand is fine to coarse. Gavel is angular to sub-angular fine to coarse and includes brick and concrete. Cobbles are angular small to large of brick and concrete.	1
		2.00 - 3.50									2
		3.50 - 5.00									3
							5.00	68.03			4
										Continued on Next Sheet	5

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 17.9m bgl.





# Rotary Core Log

Borehole No.

**RC04**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433795.00 - 550400.00

Location: Houghton le Spring

Level: 73.03

Scale  
1:25

Client: Hellens Group

Dates: 23/06/2022 - 24/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50								VOID	6
		6.50 - 8.00				6.50	66.53			Stiff brown slightly sandy slightly gravelly CLAY. Gravel is angular to sub-round fine to coarse and includes coal and mudstone.	7
		8.00 - 9.50								No Recovery	8
											9
											10

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 17.9m bgl.







# Rotary Core Log

Borehole No.

**RC04**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433795.00 - 550400.00

Location: Houghton le Spring

Level: 73.03

Scale  
1:25

Client: Hellens Group

Dates: 23/06/2022 - 24/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00								Stiff brown slightly sandy slightly gravelly CLAY. Gravel is angular to sub-round fine to coarse and includes coal and mudstone.	11
		11.00 - 12.50	12	67	52	31	11.60	61.43		Weak reddish brown partly weathered SILTSTONE. <i>Horizontal oblique (45°) closely spaced planar to undulating rough tight to open clean to stiff reddish brown clay.</i> <i>Incipient fractures</i>	12
		12.50 - 14.00								<i>Incipient fractures</i>	13
		14.00 - 15.50	9	100	21	8	14.00	59.03		<i>Sub-horizontal (5°-10°) very closely to closely spaced undulating rough tight to partly open clean.</i>	14
				53						Weak to mod strong reddish fine to coarse partly weathered SANDSTONE	15
										Continued on Next Sheet	

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 17.9m bgl.





# Rotary Core Log

Borehole No.

**RC04**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433795.00 - 550400.00

Location: Houghton le Spring

Level: 73.03

Scale  
1:25

Client: Hellens Group

Dates: 23/06/2022 - 24/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00		27					Weak to mod strong reddish fine to coarse partly weathered SANDSTONE		
									<i>Yellowish brown below 15.5m bgl.</i>	16	
		17.00 - 18.50	9	80	20	9			<i>Horizontal closely planar to undulating smooth to rough partly open to open clean.</i>	17	
		18.50 - 20.00	9	61	29	19			<i>Horizontal closely spaced planar to undulating rough partly open clean.</i>	18	
										19	
										20	

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 17.9m bgl.





# Rotary Core Log

Borehole No.

**RC04**

Sheet 5 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433795.00 - 550400.00

Location: Houghton le Spring

Level: 73.03

Scale  
1:25

Client: Hellens Group

Dates: 23/06/2022 - 24/06/2022

Logged By  
TJS

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description				
				TCR	SCR	RQD								
1		20.00 - 21.50	14	90	48	45	21.43 21.50	51.60 51.53		Weak to mod strong reddish fine to coarse partly weathered SANDSTONE <i>Horizontal to vertical closely to medium spaced planar to undulating smooth to rough very tight to partly open clean.</i>	21			
1		21.50 - 23.00		44					COAL Weak to moderate strong grey MUDSTONE.		22			
1		23.00 - 24.50	7	100	93	71			<i>Horizontal to oblique (30°) very closely to medium planar to stepped rough very tight to partly open clean.</i>		23			
							24.50	48.53		End of Borehole at 24.50m	24			
											25			

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 17.9m bgl.





# Rotary Core Log

Borehole No.

**RC05**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433780.00 - 550362.00

Location: Houghton le Spring

Level: 72.59

Scale  
1:25

Client: Hellens Group

Dates: 24/06/2022 - 27/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	D				0.30	72.29		Scrub grass over TOPSOIL: Stiff brown sandy slightly gravelly CLAY with high root content. Gravel is angular to sun-round fine to medium and includes brick, concrete and sandstone.	
		1.00 - 1.20	D							MADE GROUND: Dark grey clayey SAND and GRAVEL with high cobble content and low metal content. Sand is fine to coarse. Gavel is angular to sub-angular fine to coarse and includes brick and concrete. Cobbles are angular small to large of brick and concrete.	1
		1.20 - 2.00									
		2.00 - 3.50								No Recovery	2
		3.50 - 5.00								No Recovery	3
											4
											5

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 15.70m bgl.





# Rotary Core Log

Borehole No.

**RC05**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433780.00 - 550362.00

Location: Houghton le Spring

Level: 72.59

Scale  
1:25

Client: Hellens Group

Dates: 24/06/2022 - 27/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50							MADE GROUND: Dark grey clayey SAND and GRAVEL with high cobble content and low metal content. Sand is fine to coarse. Gavel is angular to sub-angular fine to coarse and includes brick and concrete. Cobbles are angular small to large of brick and concrete.	6	
		6.50 - 8.00								7	
		8.50 - 8.70	D				8.50	64.09	Firm to Stiff brown sandy gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone, siltstone and mudstone.	8	
		8.00 - 9.50								9	
		9.40 - 9.50	D							10	
Continued on Next Sheet											

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 15.70m bgl.





# Rotary Core Log

Borehole No.

**RC05**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433780.00 - 550362.00

Location: Houghton le Spring

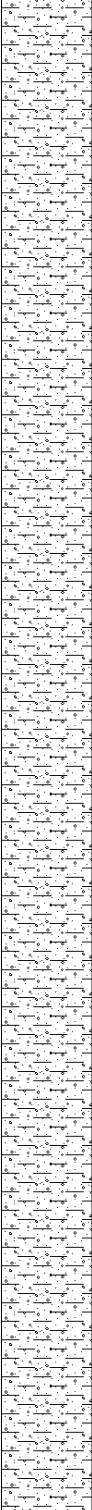
Level: 72.59

Scale  
1:25

Client: Hellens Group

Dates: 24/06/2022 - 27/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00								Firm to Stiff brown sandy gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone, siltstone and mudstone.	11
		11.00 - 12.50						12			
		12.50 - 14.00						13			
		14.00 - 15.50						14			
											15

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 15.70m bgl.





# Rotary Core Log

Borehole No.

**RC05**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433780.00 - 550362.00

Location: Houghton le Spring

Level: 72.59

Scale  
1:25

Client: Hellens Group

Dates: 24/06/2022 - 27/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							15.90	56.69			
	▼	15.50 - 17.00		40	39	35	16.10	56.49			16
		17.00 - 18.50	2								17
			7	98	98	95					18
		18.50 - 20.00	5	90	43	31	18.40	54.19			19
			2								20
Continued on Next Sheet											

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 15.70m bgl.





# Rotary Core Log

Borehole No.

**RC05**

Sheet 5 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433780.00 - 550362.00

Location: Houghton le Spring

Level: 72.59

Scale  
1:25

Client: Hellens Group

Dates: 24/06/2022 - 27/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		20.00 - 21.50	8	95	92	80	21.50	51.09	.....	Weak to moderately strong yellowish brown fine to coarse grained SANDSTONE.	21
		21.50 - 23.00	5	97	73	70	21.50	51.09	xxxxxxx	Weak to moderately strong greyish brown SILTSTONE.  <i>Horizontal to vertical closely spaced stepped to undulating rough tight to partly open clean.</i>	22
			2						xxxxxxx		23
		23.00 - 24.50	10	94	82	77	24.50	48.09	xxxxxxx		24
							24.50	48.09	xxxxxxx		25
										End of Borehole at 25.00m	25

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 15.70m bgl.







# Rotary Core Log

Borehole No.

**RC06**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433826.00 - 550371.00

Location: Houghton le Spring

Level: 73.34

Scale  
1:25

Client: Hellens Group

Dates: 28/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	D							Scrub grass over TOPSOIL: Stiff brown sandy gravelly CLAY with moderate root content. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick and mudstone.	
		0.40 - 0.50	D				0.40	72.94		Dark grey/black clayey SAND and GRAVEL with low cobble content. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse and includes brick, coal, sandstone, terram, plastic and mudstone. Cobbles are angular small to large of brick, sandstone and mudstone. MADE GROUND	1
		1.00 - 1.20	D							<i>Recovered as angular cobbles of brick, concrete and sandstone.</i>	
		1.20 - 2.00									
		2.00 - 2.20	D				2.00	71.34		Reddish brown silty gravelly SAND with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, and siltstone. MADE GROUND	2
		2.00 - 3.50									
		3.50 - 5.00					3.50 3.60	69.84 69.74		Weak light grey SILTSTONE. (destructively weathered) MADE GROUND Weak grey SANDSTONE. (destructively weathered) MADE GROUND <i>Recovered as angular gravels in a sandy clay matrix.</i> <i>Recovered as angular coarse cobbles of sandstone with plastic.</i>	4
		5.00 - 5.20	D				5.00	68.34			5

Continued on Next Sheet

Remarks

Inspection pit dug to 1.2m bgl .Groundwater encountered at 19.4m bgl.





# Rotary Core Log

Borehole No.

**RC06**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433826.00 - 550371.00

Location: Houghton le Spring

Level: 73.34

Scale  
1:25

Client: Hellens Group

Dates: 28/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50				6.40	66.94		Firm light brown/ grey very sandy gravelly CLAY with low cobble content. Gravel is angular to sub-angular fine to medium and includes coal, mudstone and coal. Cobbles are angular small to large of sandstone	6	
		6.50 - 8.00							Weak yellowish brown fine to coarse grained SANDSTONE. (Highly weathered) <i>Recovered as angular cobbles of sandstone.</i>	7	
		8.00 - 9.50				8.00	65.34		Yellowish brown silty fine to medium grained SAND. <i>No Recovery</i>	8	
										9	
										10	

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl .Groundwater encountered at 19.4m bgl.





# Rotary Core Log

Borehole No.

**RC06**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433826.00 - 550371.00

Location: Houghton le Spring

Level: 73.34

Scale  
1:25

Client: Hellens Group

Dates: 28/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00								Yellowish brown silty fine to medium grained SAND.	
		11.00 - 12.50				11.00	62.34			Stiff greyish brown slightly sandy gravelly clay with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, mudstone and coal. Cobbles are angular small to large of sandstone.	11
		12.50 - 14.00									12
		14.00 - 15.50									13
						14.20	59.14			COAL	
						14.30	59.04			Stiff grey sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone. Cobbles are angular small to large sandstone.	
						14.70	58.64			Stiff reddish brown slightly gravelly sandy CLAY. Gravel is angular to sub-angular fine to medium and includes sandstone.	
						15.00	58.34				14
										Continued on Next Sheet	15

Remarks

Inspection pit dug to 1.2m bgl .Groundwater encountered at 19.4m bgl.





# Rotary Core Log

Borehole No.

**RC06**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433826.00 - 550371.00

Location: Houghton le Spring

Level: 73.34

Scale  
1:25

Client: Hellens Group

Dates: 28/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description			
				TCR	SCR	RQD							
[Well Diagram]	[Water Strikes Diagram]	15.50 - 17.00	5	50	33	23	15.20	58.14	[Symbol]	Light brown fine to coarse grained silty SAND.	16		
							15.50	57.84	[Symbol]	Moderately strong to strong yellow SANDSTONE (partly weathered) <i>Horizontal oblique (45°) closely spaced planar to undulating rough tight to open clean to silty sand.</i>			
									16.50	56.84	[Symbol]	Weak yellow fine to coarse grained SANDSTONE. Recovered as angular coarse gravels in a sandy clay matrix. GLACIAL TILL <i>No recovery</i>	17
									16.70	56.64	[Symbol]	Weak thinly laminated partly weathered MUDSTONE. <i>Horizontal to sub-horizontal (10°) closely to medium spaced planar to undulating smooth to rough very tight to open clean.</i>	
									17.00	56.34	[Symbol]	COAL	18
									17.18	56.16	[Symbol]	Weak black destructively weathered MUDSTONE.	
				17.00 - 18.50	7	96	76	66			[Symbol]	Weak greyish brown highly weathered SILTSTONE. <i>Sub-horizontal (5°-10°) very closely to closely spaced undulating rough tight to partly open clean.</i>	19
				18.50 - 20.00	8	98	80	64			[Symbol]		
													20

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl .Groundwater encountered at 19.4m bgl.







# Rotary Core Log

Borehole No.

**RC07**

Sheet 1 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433799.00 - 550344.00

Location: Houghton le Spring

Level: 72.87

Scale  
1:25

Client: Hellens Group

Dates: 29/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.30					72.57		Scrub grass over TOPSOIL: Stiff brown sandy gravelly CLAY with moderate root content. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick, mudstone and concrete.		
		1.20 - 2.00							Soft to Firm brown sandy very gravelly CLAY. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick, mudstone and concrete.	1	
		2.00 - 3.50							MADE GROUND	2	
		3.50 - 5.00								3	
										4	
										5	

No Recovery  
No Recovery.

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 16.6m bgl.





# Rotary Core Log

Borehole No.

**RC07**

Sheet 2 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433799.00 - 550344.00

Location: Houghton le Spring

Level: 72.87

Scale  
1:25

Client: Hellens Group

Dates: 29/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50					6.50	66.37		Soft to Firm brown sandy very gravelly CLAY. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick, mudstone and concrete. MADE GROUND	6
		6.50 - 8.00								Black slightly clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to sub-angular fine to coarse and includes brick, sandstone and coal. MADE GROUND <i>Poor Recovery</i>	7
		8.00 - 9.50					8.00	64.87		Yellowish brown fine to coarse COBBLES with low gravel content. Gravels are cobbles are angular of weak sandstone. MADE GROUND	8
										<i>Poor recovery</i>	9
											10

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 16.6m bgl.





# Rotary Core Log

Borehole No.

**RC07**

Sheet 3 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433799.00 - 550344.00

Location: Houghton le Spring

Level: 72.87

Scale  
1:25

Client: Hellens Group

Dates: 29/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00					11.00	61.87		Yellowish brown fine to coarse COBBLES with low gravel content. Gravels are cobbles are angular of weak sandstone. MADE GROUND	
		11.00 - 12.50								Firm to stiff dark brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone. Cobbles are angular small to large of sandstone. <i>Poor recovery</i>	11
		12.50 - 14.00									12
		14.00 - 15.50									13
											14
											15

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 16.6m bgl.







# Rotary Core Log

Borehole No.

**RC07**

Sheet 4 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433799.00 - 550344.00

Location: Houghton le Spring

Level: 72.87

Scale  
1:25

Client: Hellens Group

Dates: 29/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00								Firm to stiff dark brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone. Cobbles are angular small to large of sandstone.	16
	▼	17.00 - 18.50		46	32	10	17.80	55.07		Weak dark grey destructively weathered MUDSTONE. <i>Horizontal to vertical very close to closely spaced planar rough to smooth very tight to open clean.</i>	18
			4				18.30	54.57		Weak light brown destructively weathered SILTSTONE.	
							18.50	54.37		End of Borehole at 18.50m	19
											20

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 16.6m bgl.





# Rotary Core Log

Borehole No.

**RC08**

Sheet 1 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433847.00 - 550351.00

Location: Houghton le Spring

Level: 73.17

Scale  
1:25

Client: Hellens Group

Dates: 30/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	D				0.30	72.87		Scrub grass over TOPSOIL: Stiff brown sandy gravelly silty CLAY with moderate root content. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick, mudstone and concrete.	
		1.00 - 1.10	D				1.10	72.07		Dark grey/ black clayey very sandy GRAVEL with low cobble content. Gravel is angular to sub-angular fine to coarse and incudes sandstone, brick, mudstone, clinker and coal. MADE GROUND	1
		1.20 - 2.00								Grey/Reddish brown fine to coarse gravel with low cobble content. Gravel and cobbles are angular to sub-rounded of sandstone, clinker and mudstone. MADE GROUND	
		2.00 - 3.50					2.00	71.17		Dark grey gravelly COBBLES. Gravel is fine to coarse, angular to subangular of sandstone, clinker, slag, mudstone and coal. Cobbles are angular and includes sandstone. MADE GROUND	2
										No Recovery	
		3.50 - 5.00									
							4.80	68.37		Weak grey weathered SANDSTONE (destructively weathered)	
										Continued on Next Sheet	5

Remarks

Inspection pit dug to 1.2m bgl. Groundwater encountered at 2.90m bgl and 15.2m bgl.





# Rotary Core Log

Borehole No.

**RC08**

Sheet 2 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433847.00 - 550351.00

Location: Houghton le Spring

Level: 73.17

Scale  
1:25

Client: Hellens Group

Dates: 30/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.60 - 5.70 5.00 - 6.50	D				5.45	67.72		Weak grey weathered SANDSTONE (destructively weathered) MADE GROUND	
		6.50 - 6.60	D				6.50	66.67		Weak black MUDSTONE (completely deteriorated) MADE GROUND	6
		6.50 - 8.00								Soft to firm greyish brown silty sandy very gravelly CLAY with high cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone. Cobbles are angular small to large of sandstone.	7
		8.00 - 9.50									8
										No recovery	9
											10

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 2.90m bgl and 15.2m bgl.





# Rotary Core Log

Borehole No.

**RC08**

Sheet 3 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433847.00 - 550351.00

Location: Houghton le Spring

Level: 73.17

Scale  
1:25

Client: Hellens Group

Dates: 30/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00								Soft to firm greyish brown silty sandy very gravelly CLAY with high cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone. Cobbles are angular small to large of sandstone.	11
		11.00 - 12.50									12
		12.50 - 14.00	2	76	43	40	12.85	60.32		Weak reddish brown fine to coarse SANDSTONE. (distinctly to destructively weathered)  <i>Horizontal closely spaced planar smooth tight clean.</i>	13
			2								14
		14.00 - 15.50		56	53	33	14.60	58.57		Weak dark grey/black thinly laminated MUDSTONE (destructively weathered)	15

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 2.90m bgl and 15.2m bgl.





# Rotary Core Log

Borehole No.

**RC08**

Sheet 4 of 4

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433847.00 - 550351.00

Location: Houghton le Spring

Level: 73.17

Scale  
1:25

Client: Hellens Group

Dates: 30/06/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description		
				TCR	SCR	RQD						
1	▼	15.50 - 17.00	2							Weak dark grey/black thinly laminated MUDSTONE (destructively weathered)	16	
			5				16.00	57.17		Horizontal to vertical very close to closely spaced planar rough to smooth very tight to open clean.		
		17.00 - 18.50	3				16.10	57.07	COAL	Weak dark grey/black thinly laminated MUDSTONE (destructively weathered)	17	
			5	98	96	83	16.35	56.82		Weak light greyish brown SILTSTONE (highly weathered)		
		18.50 - 20.00	3							Horizontal to vertical closely to medium spaced planar to undulating smooth to rough very tight to partly open clean.	18	
			5	96	76	63						
		18.50 - 20.00	4							Horizontal to oblique (30°) very closely to medium planar to stepped rough very tight to partly open clean.	19	
			4	98	60	52						
												20
									20.00	53.17		End of Borehole at 20.00m

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 2.90m bgl and 15.2m bgl.





# Rotary Core Log

Borehole No.

**RC09**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433822.00 - 550323.00

Location: Houghton le Spring

Level: 72.85

Scale  
1:25

Client: Hellens Group

Dates: 01/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	D				0.30	72.55		Scrub grass over TOPSOIL: Firm to Stiff friable brown sandy gravelly CLAY with high root content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick, glass and mudstone.	
		0.60 - 0.70	D				0.80	72.05		Stiff brown sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone and brick. Cobbles are angular small to large of brick and sandstone.	1
		1.20 - 2.00								Reddish brown sandy GRAVEL. Gravel is angular to sub-angular fine to coarse and includes sandstone and brick	
		2.00 - 3.50					2.00	70.85		Very weak black destructively weathered MUDSTONE. Recovered as angular gravels and cobbles in a sandy clay matrix.	2
		3.50 - 5.00									3
											4
											5

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 19.5m bgl.





# Rotary Core Log

Borehole No.

**RC09**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No.  
2585

Co-ords: 433822.00 - 550323.00

Location: Houghton le Spring

Level: 72.85

Scale  
1:25

Client: Hellens Group

Dates: 01/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50								Very weak black destructively weathered MUDSTONE. Recovered as angular gravels and cobbles in a sandy clay matrix.	6
		6.50 - 8.00						7			
		8.00 - 9.50				8.00	64.85	8			Dark grey gravelly COBBLES. Cobbles are angular small to large of sandstone and mudstone.
						9.50	63.35			Weak dark grey distinctly to destructively weathered MUDSTONE. Recovered in a clayey matrix.	9
										Continued on Next Sheet	10

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 19.5m bgl.





# Rotary Core Log

Borehole No.

**RC09**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433822.00 - 550323.00

Location: Houghton le Spring

Level: 72.85

Scale  
1:25

Client: Hellens Group

Dates: 01/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00				10.80	62.05		Weak dark grey distinctly to destructively weathered MUDSTONE. Recovered in a clayey matrix.		
		11.00 - 12.50							Firm to stiff greyish brown slightly sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, mudstone and coal.	11	
		12.50 - 14.00								12	
		14.00 - 15.50								13	
										14	
										15	

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 19.5m bgl.







# Rotary Core Log

Borehole No.

**RC09**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433822.00 - 550323.00

Location: Houghton le Spring

Level: 72.85

Scale  
1:25

Client: Hellens Group

Dates: 01/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00								Firm to stiff greyish brown slightly sandy gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, mudstone and coal.	16
		17.00 - 18.50						17			
		18.50 - 20.00						18			
	▼					19.80	53.05	19			
									Weak yellowish brown and grey brown distinctly to destructively weathered	20	

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 19.5m bgl.







# Rotary Core Log

Borehole No.

**RC10**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433952.00 - 550330.00

Location: Houghton le Spring

Level: 72.89

Scale  
1:25

Client: Hellens Group

Dates: 04/07/2022 - 05/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		0.10 - 0.20	D				0.30	72.59		Scrub grass over TOPSOIL: Soft to Firm friable brown sandy gravelly CLAY with high root content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick, concrete and mudstone.	
		0.60 - 0.70	D							Soft to Firm dark grey/ black sandy gravelly CLAY with low cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick, coal, concrete, plastic and mudstone. Cobbles are angular small to large of brick and sandstone.	1
		1.20 - 2.00									
		2.00 - 3.50									
		3.30 - 3.50	D								3
	▼	3.50 - 5.00									4
		5.00 - 5.20	D				5.00	67.89			5

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 3.5m bgl and 13.6m bgl. Barrel jammed inside of casing due to running sands.





# Rotary Core Log

Borehole No.

**RC10**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433952.00 - 550330.00

Location: Houghton le Spring

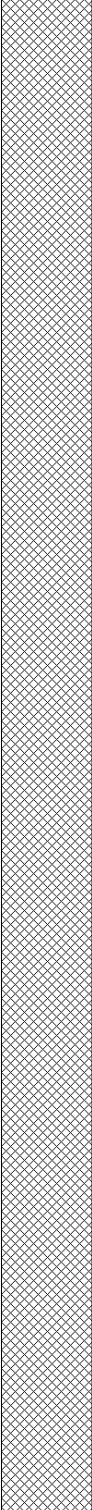
Level: 72.89

Scale  
1:25

Client: Hellens Group

Dates: 04/07/2022 - 05/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50								Soft black slightly sandy silty gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick, plastic and metal. Cobbles are angular small to large of brick and sandstone.	6
		6.50 - 8.00						No Recovery		7	
		8.00 - 9.50						No recovery		8	
								No recovery		9	
										Continued on Next Sheet	10

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 3.5m bgl and 13.6m bgl. Barrel jammed inside of casing due to running sands.





# Rotary Core Log

Borehole No.

**RC10**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433952.00 - 550330.00

Location: Houghton le Spring

Level: 72.89

Scale  
1:25

Client: Hellens Group

Dates: 04/07/2022 - 05/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00					11.00	61.89		Soft black slightly sandy silty gravelly CLAY with moderate cobble content. Gravel is angular to sub-angular fine to coarse and includes sandstone, brick, plastic and metal. Cobbles are angular small to large of brick and sandstone.	
		11.00 - 12.50								Firm to Stiff greyish brown sandy gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone and mudstone	11
		12.50 - 14.00									12
		14.00 - 15.50									13
											14
											15
Continued on Next Sheet											

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 3.5m bgl and 13.6m bgl. Barrel jammed inside of casing due to running sands.





# Rotary Core Log

Borehole No.

**RC10**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433952.00 - 550330.00

Location: Houghton le Spring

Level: 72.89

Scale  
1:25

Client: Hellens Group

Dates: 04/07/2022 - 05/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		15.50 - 17.00					17.00	55.89		Firm to Stiff greyish brown sandy gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone and mudstone	16
		17.00 - 18.50					18.20	54.69		Brown silty fine to medium grained SAND.	17
							18.40	54.49		Soft to firm sandy gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone and siltstone.	
			3							Weak yellowish brown distinctly to destructively weathered SANDSTONE.	19
		18.50 - 20.00		97	73	56	19.30	53.59		Weak dark grey destructively weathered thinly laminated MUDSTONE.	20
			10								
Continued on Next Sheet											

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 3.5m bgl and 13.6m bgl. Barrel jammed inside of casing due to running sands.





# Rotary Core Log

Borehole No.

**RC10**

Sheet 5 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433952.00 - 550330.00

Location: Houghton le Spring

Level: 72.89

Scale  
1:25

Client: Hellens Group

Dates: 04/07/2022 - 05/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		20.00 - 21.50	9	66	46	13				Weak dark grey destructively weathered thinly laminated MUDSTONE.	21
		21.50 - 23.00	6	66	33	20				Horizontal to oblique (30°) very closely to medium planar to stepped rough very tight to partly open clean. Horizontal to oblique (30°) very closely to medium planar to stepped rough very tight to partly open clean.	22
		23.00 - 24.50	5	64	35	30				Horizontal to vertical very close to closely spaced planar rough to smooth very tight to open clean.	23
							24.50	48.39			24
										End of Borehole at 25.00m	25

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 3.5m bgl and 13.6m bgl. Barrel jammed inside of casing due to running sands.





# Rotary Core Log

Borehole No.

**RC11**

Sheet 1 of 3

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433877.00 - 550383.00

Location: Houghton le Spring

Level: 73.40

Scale  
1:25

Client: Hellens Group

Dates: 06/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.20	73.20		Soft friable brown sandy gravelly clayey TOPSOIL. Gravel is angular to sub-angular fine to coarse and includes brick, sandstone, mudstone and coal.	
		1.20 - 2.00				1.30	72.10		Soft to firm friable brown sandy very gravelly CLAY. Gravel is angular to sub-angular fine to coarse and includes sandstone, bricks, metal, plastic and concrete.	1	
										Brown/Red coarse slightly clayey fine to coarse gravel with high cobble content. Gravel and cobbles are angular to subrounded of weak to strong brick, concrete, sandstone, clinker and tarmacadam.	
		2.00 - 3.50								<i>Poor Recovery</i>	2
		3.50 - 5.00								<i>Poor Recovery</i>	3
						5.00	68.40				4
										Continued on Next Sheet	5

**Remarks**

Inspection pit dug to 1.2m bgl. Depth to groundwater not identified due to drilling flush.







# Rotary Core Log

Borehole No.

**RC11**

Sheet 2 of 3

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433877.00 - 550383.00

Location: Houghton le Spring

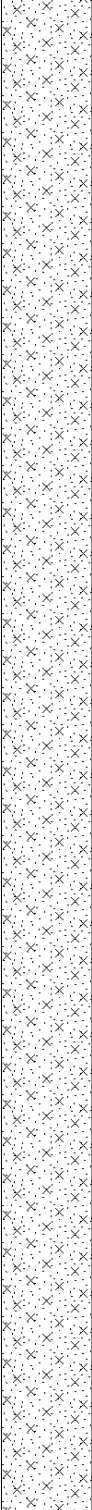
Level: 73.40

Scale  
1:25

Client: Hellens Group

Dates: 06/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50								Brown silty fine to medium grained SAND. <i>No Recovery</i>	6
		6.50 - 8.00						<i>No Recovery</i>		7	
		8.00 - 9.50						<i>No Recovery</i>		8	
											9
											10

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Depth to groundwater not identified due to drilling flush.





# Rotary Core Log

Borehole No.

**RC11**

Sheet 3 of 3

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433877.00 - 550383.00

Location: Houghton le Spring

Level: 73.40

Scale  
1:25

Client: Hellens Group

Dates: 06/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00								Brown silty fine to medium grained SAND.	
		11.00 - 12.50						No Recovery			11
		12.50 - 14.00						No Recovery			12
							14.00	59.40		End of Borehole at 14.00m	13
											14
											15

**Remarks**

Inspection pit dug to 1.2m bgl. Depth to groundwater not identified due to drilling flush.





# Rotary Core Log

Borehole No.

**RC12**

Sheet 1 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433816.00 - 550423.00

Location: Houghton le Spring

Level: 73.19

Scale  
1:25

Client: Hellens Group

Dates: 07/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							0.20	72.99		Soft friable brown sandy gravelly TOPSOIL with root content. Gravel is angular to sub-round fine to coarse and includes , sandstone, brick, concrete and metal.	
		1.20 - 2.00				1.60	71.59		Soft to firm brown sandy gravelly CLAY with occasional cobble content. Gravel is angular to sub-round fine to coarse and includes bricks, concrete, sandstone, chert and flint.	1	
						2.00	71.19		Brown slightly clayey sandy GRAVELS with moderate cobble content. Gravel is angular to sub-round fine to coarse and includes brick, sandstone, limestone and coal.	2	
		2.00 - 3.50							Weak light greyish brown/ pinkish brown MUDSTONE. (destructively weathered) Recovered as angular gravels in a clayey matrix.	3	
		3.50 - 5.00								4	
										5	

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 18.0m bgl.





# Rotary Core Log

Borehole No.

**RC12**

Sheet 2 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433816.00 - 550423.00

Location: Houghton le Spring

Level: 73.19

Scale  
1:25

Client: Hellens Group

Dates: 07/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		5.00 - 6.50		60	10	6	5.60 5.70	67.59 67.49		Weak light greyish brown/ pinkish brown MUDSTONE. (destructively weathered) Recovered as angular gravels in a clayey matrix.	
										COAL	
		6.50 - 8.00	8	98	80	70				Weak to very weak dark grey thinly laminated MUDSTONE ( destructively weathered)	6
										<i>Horizontal to vertical very close to closely spaced planar rough to smooth very tight to open clean</i>	7
		8.00 - 9.50	6	93	90	80					8
							9.75	63.44		Weak to moderately strong reddish brown SANDSTONE with quartzite veins.	9
											10

Continued on Next Sheet

Remarks  
Inspection pit dug to 1.2m bgl. Groundwater encountered at 18.0m bgl.





# Rotary Core Log

Borehole No.

**RC12**

Sheet 3 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433816.00 - 550423.00

Location: Houghton le Spring

Level: 73.19

Scale  
1:25

Client: Hellens Group

Dates: 07/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		9.50 - 11.00	7	98	94	86				Weak to moderately strong reddish brown SANDSTONE with quartzite veins. <i>Horizontal to sub-horizontal (10°) closely to medium spaced planar to undulating smooth to rough very tight to open clean.</i>	11
		11.00 - 12.50	13	98	90	84	11.80	61.39			
		12.50 - 14.00	8	94	78	62				Weak reddish brown MUDSTONE (destructively weathered) <i>Horizontal to vertical very close to medium spaced undulating to stepped rough tight to partly open clean.</i>	12
		14.00 - 15.50	10	100	93	80	14.00	59.19		Moderately strong to strong reddish brown SANDSTONE.	14
										Continued on Next Sheet	15

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 18.0m bgl.





# Rotary Core Log

Borehole No.

**RC12**

Sheet 4 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433816.00 - 550423.00

Location: Houghton le Spring

Level: 73.19

Scale  
1:25

Client: Hellens Group

Dates: 07/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
							15.50	57.69		Moderately strong to strong reddish brown SANDSTONE.	
		15.50 - 17.00	6	100	90	83				Moderately to strong light yellowish brown SANDSTONE.	16
										<i>Horizontal to vertical medium spaced planar smooth to rough tight to open clean</i>	17
	▼	17.00 - 18.50	5	98	94	88					18
		18.50 - 20.00	6	100	96	84				<i>Horizontal to vertical very closely to closely spaced undulating to stepped rough partly open to open clean.</i>	19
											20

Continued on Next Sheet

**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 18.0m bgl.





# Rotary Core Log

Borehole No.

**RC12**

Sheet 5 of 5

Hole Type  
RC

Project Name: Newbottle Street, Houghton le Spring

Project No. 2585

Co-ords: 433816.00 - 550423.00

Location: Houghton le Spring

Level: 73.19

Scale  
1:25

Client: Hellens Group

Dates: 07/07/2022

Logged By  
RK

Well	Water Strikes	Depth (m)	Type /FI	Coring			Depth (m)	Level (m)	Legend	Stratum Description	
				TCR	SCR	RQD					
		20.00 - 21.50	3	100	95	90	21.50	51.69	<p>Moderately to strong light yellowish brown SANDSTONE.</p> <p><i>Horizontal to oblique (45°) closely to medium spaced planar to undulating rough tight to partly open clean to soft clay infill with surface staining.</i></p>	21	
									End of Borehole at 21.50m	22	
										23	
										24	
										25	

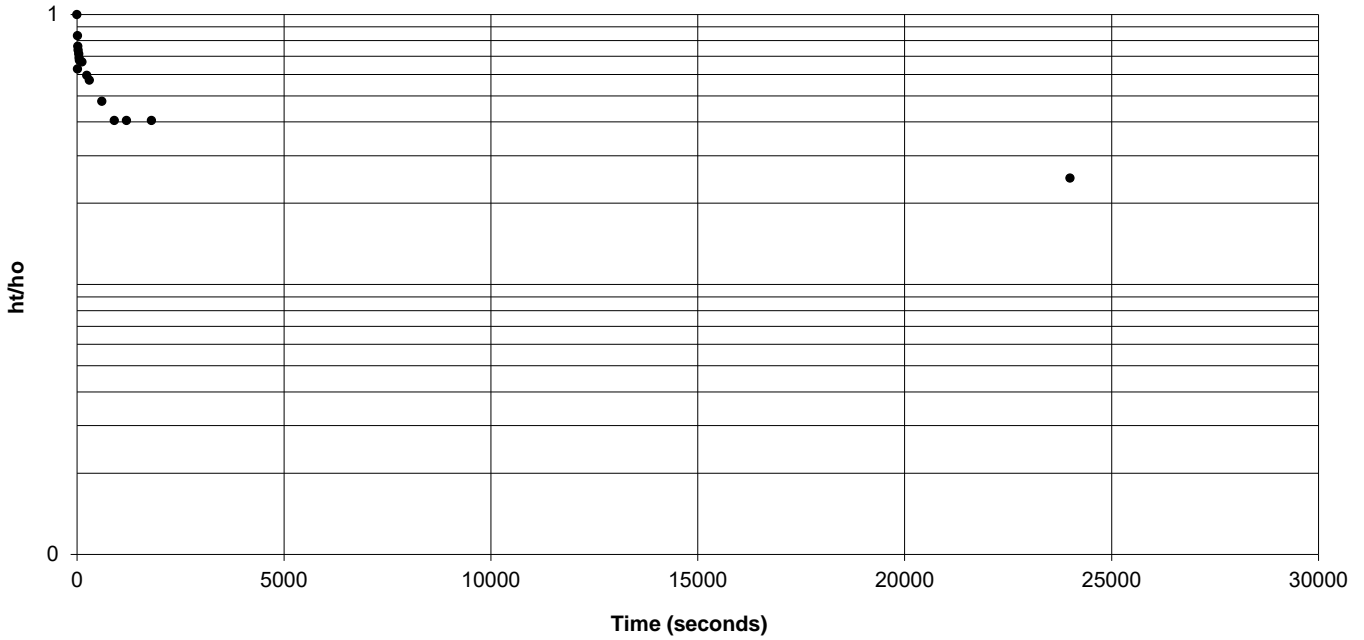
**Remarks**

Inspection pit dug to 1.2m bgl. Groundwater encountered at 18.0m bgl.



# VARIABLE HEAD PERMEABILITY TEST

BOREHOLE No.: CP-01	TEST No.: 1
FALLING HEAD TEST IN BOREHOLE	DEPTH (m) 8.00 DATE 07/08/2019 SHEET 1



Time Elapsed (secs)	Depth of water below Top of Casing d <sub>t</sub> (m)	h (m) (d <sub>i</sub> -d <sub>t</sub> )	h <sub>t</sub> /h <sub>0</sub>	
0	2.500	2.1	1.00	Depth of Test Section 2.50m to 8.00m
10	2.850	1.750	0.83	Borehole Depth 8.00m Borehole Diameter 86mm
20	3.000	1.600	0.76	Casing Depth .00m
30	3.050	1.550	0.74	Depth to Standing Water Level bgl (d <sub>1</sub> ) 4.60m
40	3.100	1.500	0.71	Height of casing agl (h <sub>c</sub> ) .00m
50	3.150	1.450	0.69	Height of top of casing above water table 4.60m
60	3.180	1.420	0.68	Depth to Water at Start of Test below casing level (d <sub>0</sub> ) 2.50m
120	3.200	1.400	0.67	Depth to Water at End of Test below casing level 3.750
10	3.280	1.320	0.63	Depth to Filter at Start of Test
240	3.350	1.250	0.60	Depth to Filter at End of Test
300	3.400	1.200	0.57	Response Zone (L) = 5.50m
600	3.600	1.000	0.48	Borehole Diameter in Test Section (D) = 0.09m
900	3.750	0.850	0.40	Cross-sectional Area of Borehole (A) = 0.0058m <sup>2</sup>
1200	3.750	0.850	0.40	Intake factor (BS5930 p50): Figure D (F) = 7.123257815
1800	3.750	0.850	0.40	Basic Time Lag = (T) s or t <sub>1</sub> = 30 s. h <sub>1</sub> = 1.750m
				t <sub>2</sub> = 24000 s. h <sub>2</sub> = 4.080m
24000	4.080	0.520	0.25	Coefficient of Permeability (k) ms <sup>-1</sup> =
				$k = \frac{A}{F(t_2 - t_1)} \quad \log_e \frac{h_1}{h_2} = 2.88E-08$
				Remarks Rate extrapolated to derive t2 value.
				Geology of Test Section Colliery Spoil

Compiled By IM Date 10/08/2019  
 Checked By RP Date 10/08/2019



**SHADBOLT**  
ENVIRONMENTAL

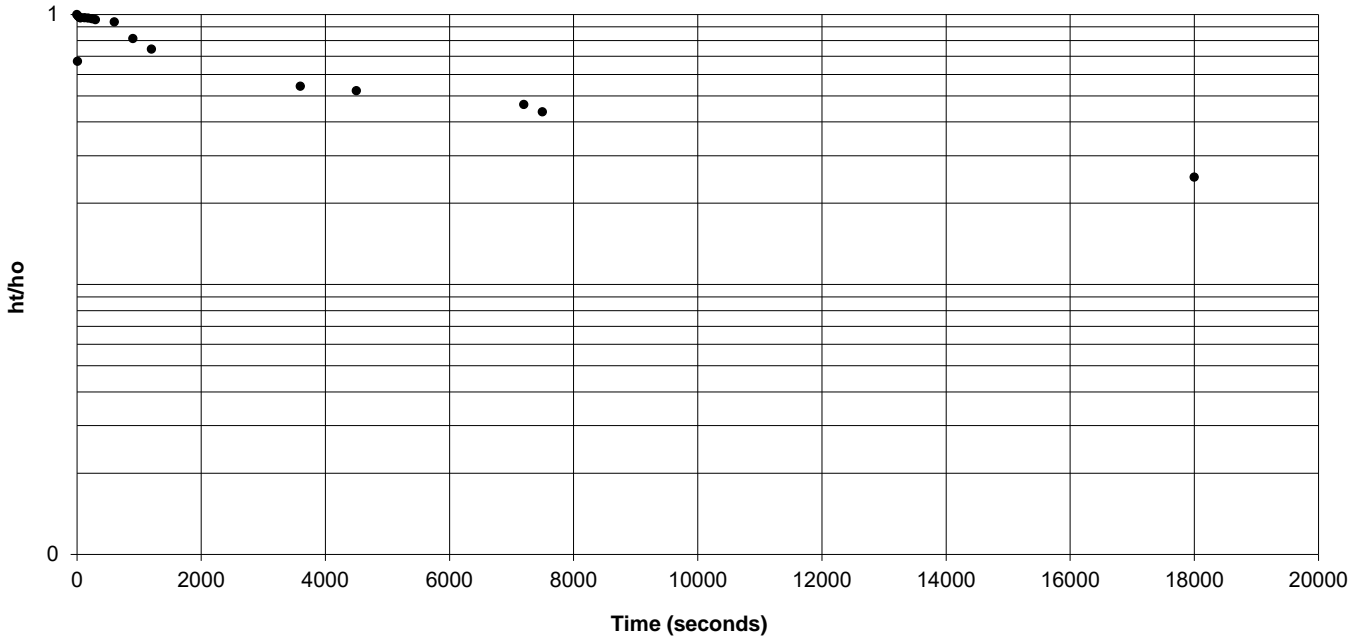
18 Bewick Road, Gateshead, NE8 4DP - www.shadboltgroup.net

PROJECT No.:	2585
PROJECT NAME:	Houghton le Spring Colliery
CLIENT:	Hellens Group
FIGURE No.:	



# VARIABLE HEAD PERMEABILITY TEST

BOREHOLE No.: CP-16B	TEST No.: 1
FALLING HEAD TEST IN BOREHOLE	DEPTH (m) 6.00 DATE 07/08/2019 SHEET 1



Time Elapsed (secs)	Depth of water below Top of Casing d <sub>t</sub> (m)	h (m) (d <sub>1</sub> -d <sub>t</sub> )	h <sub>t</sub> /h <sub>0</sub>	
0	2.000	7.000	1.00	Depth of Test Section 2.00m to 9.00m
10	2.100	4.700	0.67	Borehole Depth 9.00m Borehole Diameter 86mm
20	2.100	6.900	0.99	Casing Depth .00m
30		9.000	1.29	Depth to Standing Water Level bgl (d <sub>1</sub> ) 9.00m
40	2.160	6.840	0.98	Height of casing agl (h <sub>c</sub> ) .00m
50	2.200	6.800	0.97	Height of top of casing above water table 9.00m
60	2.200	6.800	0.97	Depth to Water at Start of Test below casing level (d <sub>0</sub> ) 2.000
120	2.200	6.800	0.97	Depth to Water at End of Test below casing level 5.950
180	2.220	6.780	0.97	Depth to Filter at Start of Test
240	2.250	6.750	0.96	Depth to Filter at End of Test
300	2.310	6.690	0.96	Response Zone (L) = 7.00m
600	2.440	6.560	0.94	Borehole Diameter in Test Section (D) = 0.086
900	3.300	5.700	0.81	Cross-sectional Area of Borehole (A) = 0.0058m <sup>2</sup>
1200	3.790	5.210	0.74	Intake factor (BS5930 p50): Figure D (F) = 8.636675671
3600	5.200	3.800	0.54	Basic Time Lag = (T) s or t <sub>1</sub> = 1150 s. h <sub>1</sub> 3.750m t <sub>2</sub> = 18000 s. h <sub>2</sub> 7.250m
4500	5.350	3.650	0.52	
7200	5.750	3.250	0.46	Coefficient of Permeability (k) ms <sup>-1</sup> = k = $\frac{A}{F(t_2-t_1)}$ log <sub>e</sub> $\frac{h_1}{h_2}$ = <b>2.631E-08</b>
7500	5.950	3.050	0.44	
18000	7.250	1.750	0.25	
				Remarks Rate extrapolated to derive t <sub>2</sub> value.
				Geology of Test Section Colliery Spoil

Compiled By IM Date 10/08/2019  
 Checked By RP Date 10/08/2019

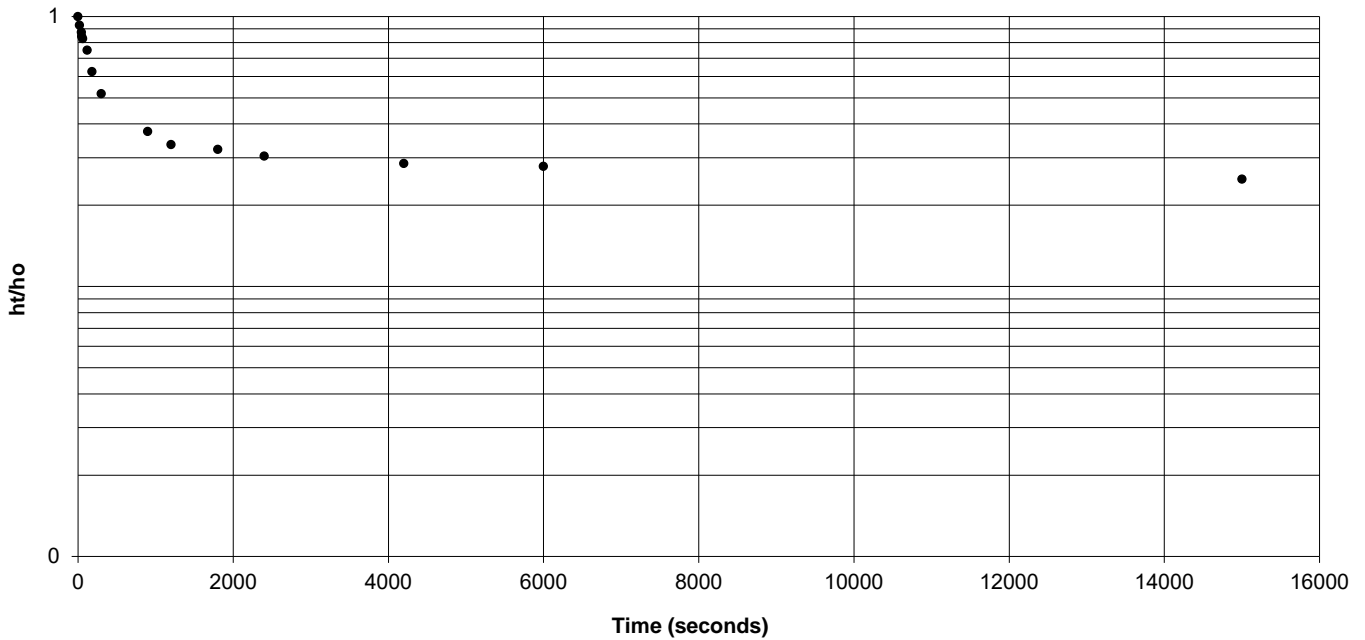


18 Bewick Road, Gateshead, NE8 4DP - www.shadboltgroup.net

PROJECT No.:	2585
PROJECT NAME:	Houghton le Spring Colliery
CLIENT:	Hellens Group
FIGURE No.:	

# VARIABLE HEAD PERMEABILITY TEST

BOREHOLE No.: CP-04	TEST No.: 1
FALLING HEAD TEST IN BOREHOLE	DEPTH (m) 9.00 DATE 07/08/2019 SHEET 1



Time Elapsed (secs)	Depth of water below Top of Casing $d_t$ (m)	$h$ (m) ( $d_1 - d_t$ )	$h_t/h_0$	
0	5.900	2.800	1.00	Depth of Test Section 5.90m to 8.70m
10	6.000	2.700		Borehole Depth 8.70m Borehole Diameter 86mm
20	6.100	2.600	0.93	Casing Depth .00m
30	6.200	2.500		Depth to Standing Water Level bgl ( $d_1$ ) (Assumed) 8.70m
45	6.250	2.450	0.88	Height of casing agl ( $h_c$ ) .00m
50	6.340	2.360	0.84	Height of top of casing above water table 8.70m
60	6.380	2.320	0.83	Depth to Water at Start of Test below casing level ( $d_0$ ) 5.90m
120	6.600	2.100	0.75	Depth to Water at End of Test below casing level 7.920
180	6.950	1.750	0.63	Depth to Filter at Start of Test
240	7.150	1.550		Depth to Filter at End of Test
300	7.250	1.450	0.52	Response Zone (L) = 2.80m
600	7.500	1.200		Borehole Diameter in Test Section (D) = 0.09m
900	7.650	1.050	0.38	Cross-sectional Area of Borehole (A) = 0.0058m <sup>2</sup>
1200	7.760	0.940	0.34	Intake factor (BS5930 p50): Figure D (F) = 4.212449791
1800	7.800	0.900	0.32	Basic Time Lag = (T) s or $t_1 = 120$ s. $h_1 = 6.600$ m
2400	7.850	0.850	0.30	$t_2 = 15000$ s. $h_2 = 8.000$ m
4200	7.900	0.800	0.29	Coefficient of Permeability ( $k$ ) ms <sup>-1</sup> = $k = \frac{A}{F(t_2 - t_1)}$ $\log_e \frac{h_1}{h_2} = 1.783E-08$
6000	7.920	0.780	0.28	
15000	8.000	0.700	0.25	
				Remarks Rate extrapolated to derive $t_2$ value.
				Geology of Test Section Colliery Spoil

Compiled By IM Date 10/08/2019  
 Checked By RP Date 10/08/2019







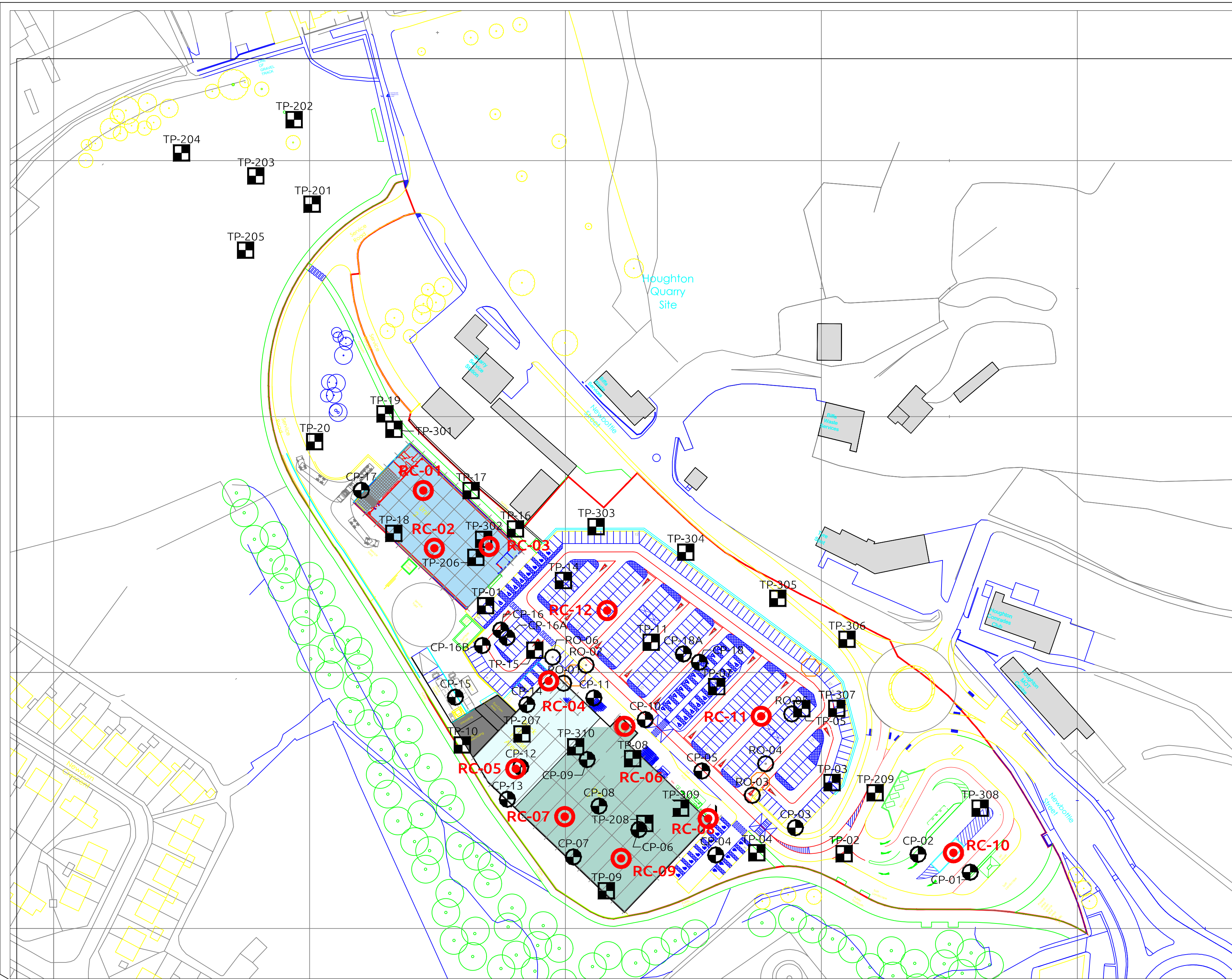
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PROJECT No.:	2585
PROJECT NAME:	Houghton le Spring Colliery
CLIENT:	Hellens Group
FIGURE No.:	

DO NOT SCALE

GENERAL NOTES

-  Proposed Rotary Borehole
-  Trial Pit
-  Cable Percussive Borehole
-  Rotary Borehole



Rev	Description	By	Ckd	Date
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Drawing Status: **PRELIMINARY**

Client: **Hellens Group**

Project: **Houghton Colliery  
Houghton le Spring**

Drawing Title: **Exploratory Hole Location Plan  
Supplemental Ground Investigation**

Drawing No: **2585 - 205** Rev: **-**

Scale: **1:1000 @ A2** By: **IM** Ckd: **MJT** Date: **May '22**

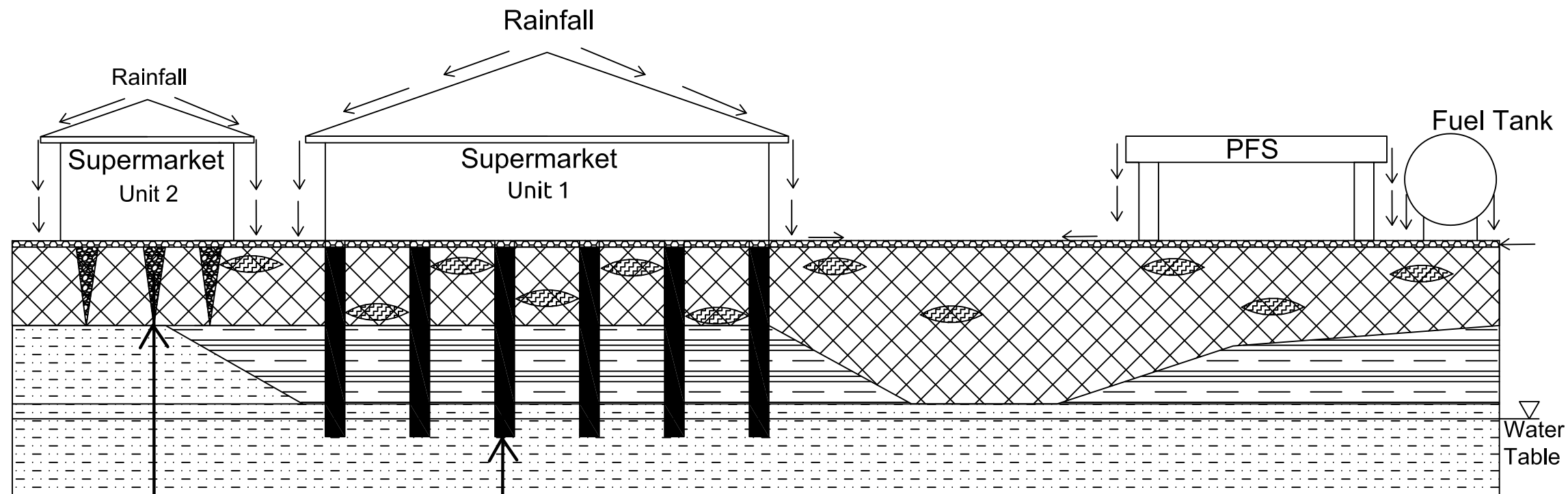
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**DO NOT SCALE**






**GENERAL NOTES**

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER INFORMATION BY RELEVANT PARTIES CLASSED AS DESIGNERS UNDER THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015.
2. ONLY FIGURED DIMENSIONS ARE TO BE WORKED FROM. THE CONTRACTOR IS TO CHECK ALL DIMENSIONS ON SITE AND REPORT ANY DISCREPANCIES TO THE ENGINEER.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



Stone Column Foundations into Underlying Clay/Rock

Piled Foundations into Underlying Rock

-  Hard Standing
-  Made Ground
-  Low Permeability Clay
-  Mudstone / Sandstone
-  Pockets of Leachate / Soil Contamination

Typical Stone Column Length 6m  
 Typical Pile Length 15 m  
 Typical Depth to Water Table 13 - 18m Below Ground Level

B	Updated Following further Information	TJS	MT	22/09/22
A	Updated Following further Investigation	GH	MT	25/08/22
Rev	Description	By	Ckd	Date

Project Id: 2585

Project Title: Newbottle Street, Houghton le Spring

Location: Houghton le Spring

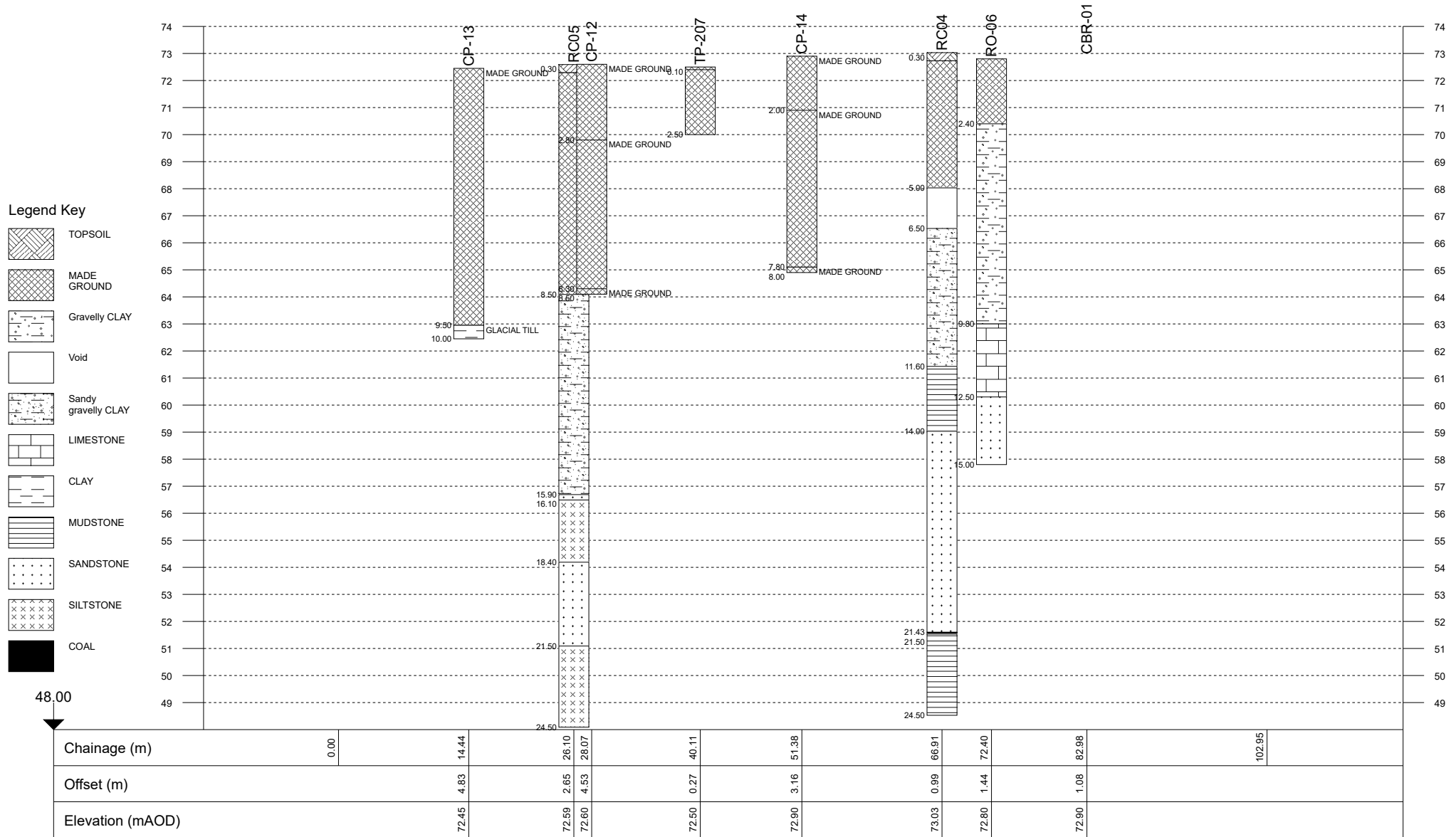
Client: Hellens Group

Title: Section line 1

Vertical Scale: 1:199

Horizontal Scale: 1:597

Engineer: Shadbolt Group












Project Id: 2585  
Project Title: Newbottle Street, Houghton le Spring  
Location: Houghton le Spring  
Client: Hellens Group

Title: Site Plan  
Scale: 1:2500  
Engineer: Shadbolt Group  
Contractor:



Legend Key

-  Sections - Section line 1
-  Locations By Type - Empty
-  Locations By Type - CBR
-  Locations By Type - CP
-  Locations By Type - RC
-  Locations By Type - RO
-  Locations By Type - TP





Project Id: 2585

Project Title: Newbottle Street, Houghton le Spring

Location: Houghton le Spring

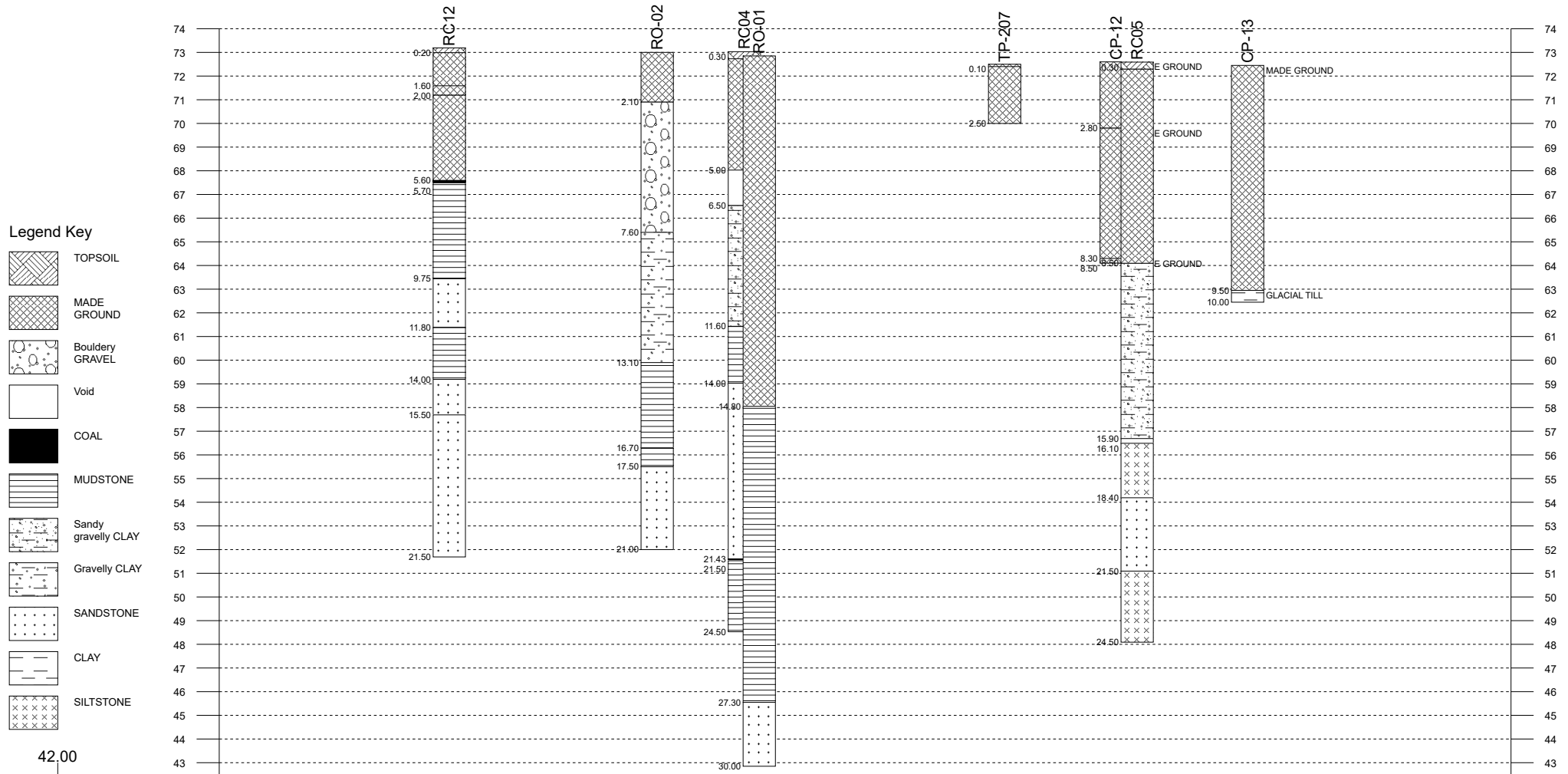
Client: Hellens Group

Title: Section line 2

Vertical Scale: 1:245

Horizontal Scale: 1:597

Engineer: Shadbolt Group



Chainage (m)	0.00	8.72	30.13	39.11	40.64	65.90	77.39	79.55	90.92	102.93
Offset (m)		2.28	5.33	4.56	1.19	3.09	2.91	1.24	4.59	
Elevation (mAOD)		73.19	73.00	73.03	72.85	72.50	72.60	72.59	72.45	










Project Id: 2585  
Project Title: Newbottle Street, Houghton le Spring  
Location: Houghton le Spring  
Client: Hellens Group

Title: Site Plan  
Scale: 1:2500  
Engineer: Shadbolt Group  
Contractor:



Legend Key

-  Sections - Section line 2
-  Locations By Type - Empty
-  Locations By Type - CBR
-  Locations By Type - CP
-  Locations By Type - RC
-  Locations By Type - RO
-  Locations By Type - TP





Project Id: 2585

Project Title: Newbottle Street, Houghton le Spring

Location: Houghton le Spring

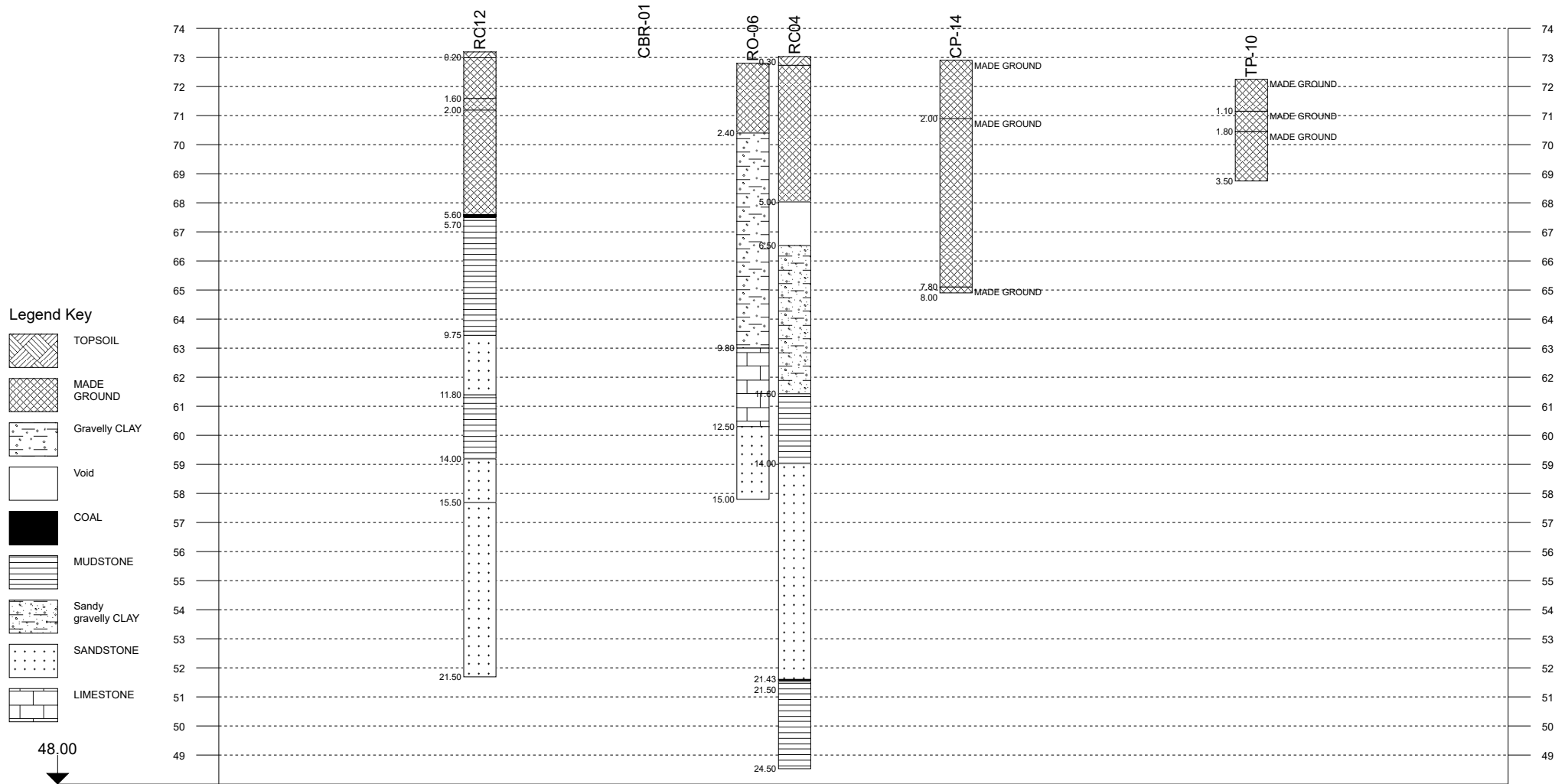
Client: Hellens Group

Title: Section line 3

Vertical Scale: 1:199

Horizontal Scale: 1:571

Engineer: Shadbolt Group



**Legend Key**

- TOPSOIL
- MADE GROUND
- Gravelly CLAY
- Void
- COAL
- MUDSTONE
- Sandy gravelly CLAY
- SANDSTONE
- LIMESTONE

Chainage (m)	8.99		11.45		27.66		38.39	42.50		58.43		87.57		98.47
Offset (m)			1.10		2.70		0.90	3.47		5.70		0.10		
Elevation (mAOD)			73.19		72.90		72.80	73.03		72.90		72.25		










Project Id: 2585  
Project Title: Newbottle Street, Houghton le Spring  
Location: Houghton le Spring  
Client: Hellens Group

Title: Site Plan  
Scale: 1:2500  
Engineer: Shadbolt Group  
Contractor:



Legend Key

-  Sections - Section line 3
-  Locations By Type - Empty
-  Locations By Type - CBR
-  Locations By Type - CP
-  Locations By Type - RC
-  Locations By Type - RO
-  Locations By Type - TP





Project Id: 2585

Project Title: Newbottle Street, Houghton le Spring

Location: Houghton le Spring

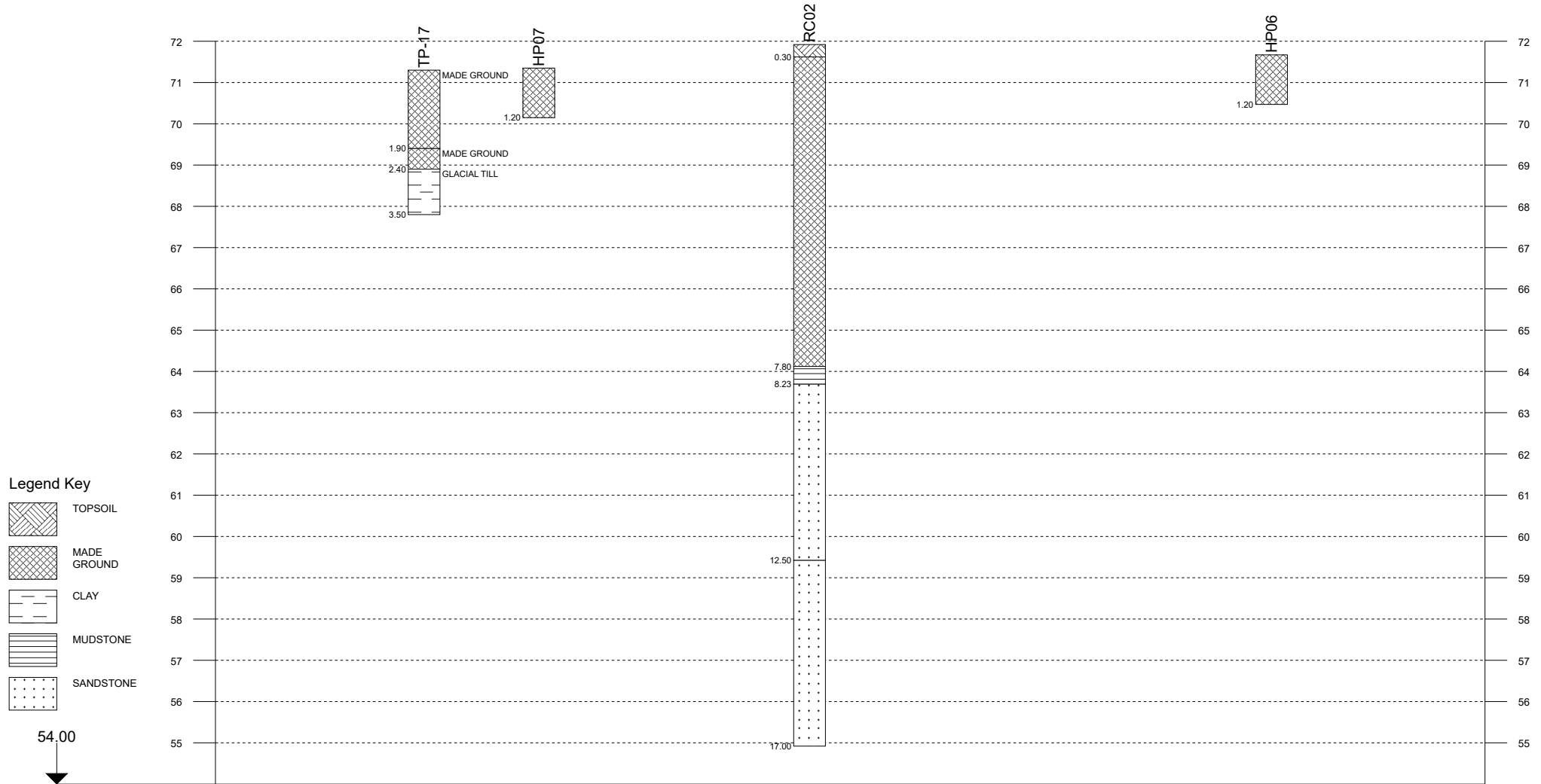
Client: Hellens Group

Title: Section line 4






Vertical Scale: 1:138

Horizontal Scale: 1:400

Engineer: Shadbolt Group



Legend Key

-  TOPSOIL
-  MADE GROUND
-  CLAY
-  MUDSTONE
-  SANDSTONE

54.00








Chainage (m)	0.00	4.62	12.67	31.68	64.10	69.05
Offset (m)		0.86	2.55	0.89	0.35	
Elevation (mAOD)		71.30	71.35	71.92	71.67	



Project Id: 2585  
Project Title: Newbottle Street, Houghton le Spring  
Location: Houghton le Spring  
Client: Hellens Group

Title: Site Plan  
Scale: 1:2500  
Engineer: Shadbolt Group  
Contractor:

Legend Key

-  Sections - Section line 4
-  Locations By Type - Empty
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-  Locations By Type - CP
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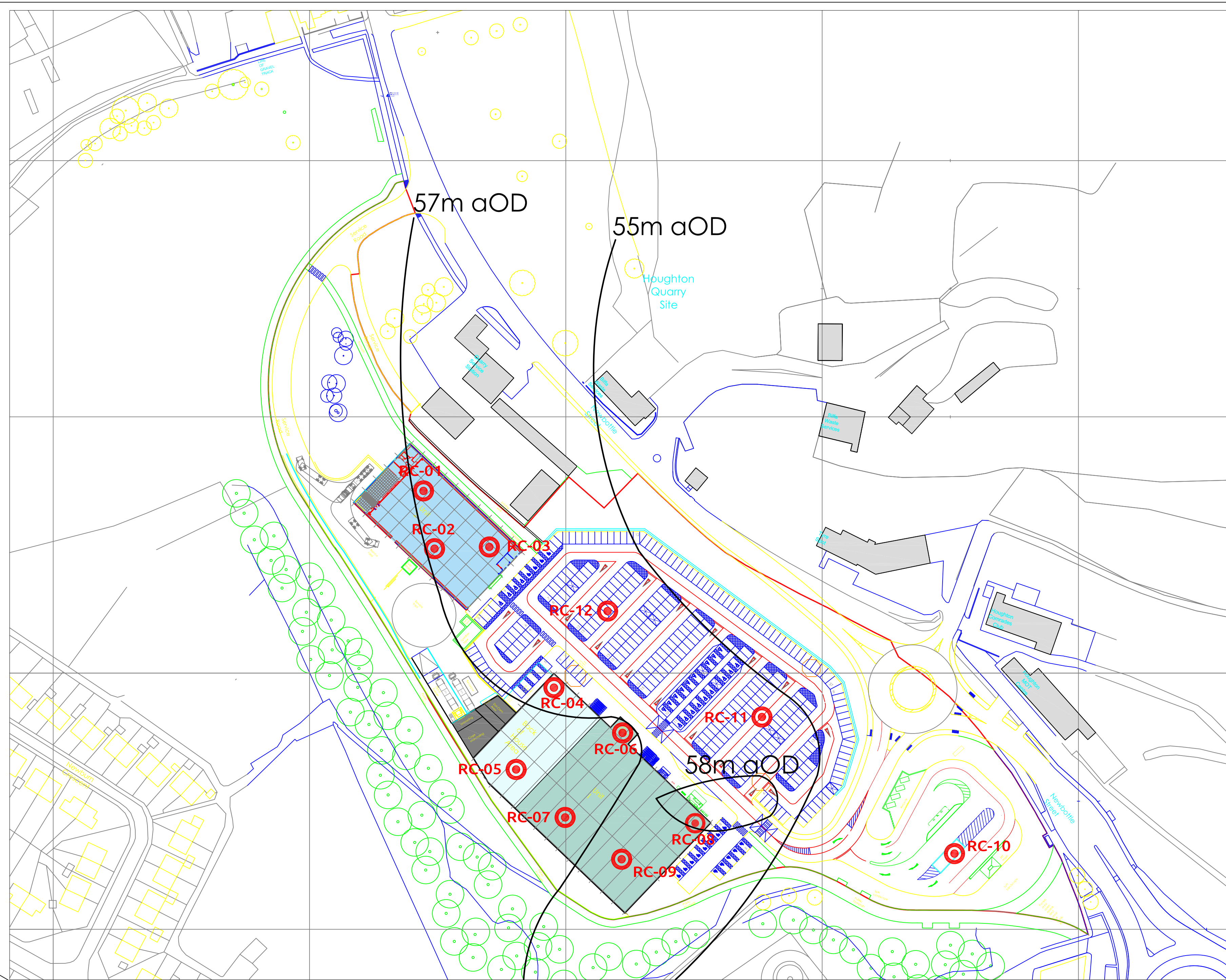


DO NOT SCALE

GENERAL NOTES

 Proposed Rotary Borehole

 Groundwater Level (m aOD)



Rev	Description	By	Ckd	Date
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Drawing Status: **PRELIMINARY**

Client: **Hellens Group**

Project: **Houghton Colliery  
Houghton le Spring**

Drawing Title: **GROUNDWATER LEVEL  
CONTOURS**

Drawing No: **2585 - 206** Rev: -

Scale: 1:1000 @ A2 By: TJS Ckd: MJT Date: Sept 22

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## APPENDIX C

### SHADBOLT ENVIRONMENTAL TIER 1 SCREENING VALUES

PLEASE NOTE: These values are provided exclusively for the use of subscribers to [www.atrisksoil.co.uk](http://www.atrisksoil.co.uk). In accordance with the terms and conditions of the atrisksoil website the information is for the sole use of the user and by receiving or obtaining any information contained herein the user agrees that at all times they will keep secret and confidential and shall procure and safeguard that their directors and employees keep secret and confidential all business and trade secrets and any information of a confidential nature relating to the processes, affairs, methods and data belonging to Atkins Limited which they may have received or obtained in the performance of or otherwise as a direct or indirect result of entering into any agreement with Atkins Limited.

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**Before using Atkins ATRISK SSVs users should read the accompanying Notes for Use.**

Commercial				
Contaminant	1% SOM Sand		6% SOM Sandy Loam	
	SSV (mg/kg)	Saturation Limit (mg/kg)	SSV (mg/kg)	Saturation Limit (mg/kg)
<b>Metals &amp; Metalloids</b>				
Antimony	4650		4650	
Arsenic (C4SL)	635		635	
Barium	22000		22000	
Beryllium	14		14	
Cadmium (C4SL)	410		410	
Chromium III	208000		208000	
Chromium VI (C4SL)	49.1		49.1	
Chromium VI (MRL)	19.7		19.7	
Copper	106000		106000	
Lead (C4SL)	2310		2310	
Mercury, elemental	-		-	
Mercury, inorganic	-		-	
Mercury, methyl	-		-	
Molybdenum	17600		17600	
Nickel	1770		1770	
Selenium	13000		13000	
Vanadium	7490		7490	
Zinc	1100000		1100000	
<b>Polycyclic Aromatic Hydrocarbons</b>				
Acenaphthene	83600	156.80 (sol)	106000	
Anthracene	535000		544000	
Fluoranthene	72200		72600	
Fluorene	66500		72000	
Naphthalene	90.1	75.0 (sol)	1050	432 (sol)
Pyrene	54100		54400	
Benzo[a]pyrene (C4SL)	76.3		76.3	
Benzo[a]pyrene (MRL)	26.1		26.2	
<b>Total Petroleum Hydrocarbons</b>				
TPH aromatic C5-C7 (Benzene)	12.5		98	
TPH aromatic C7-C8 (Toluene)	27900	834 (vap)	183000	4360 (vap)
TPH aromatic C8-C10	2210	613 (sol)	20800	3600 (sol)
TPH aromatic C10-C12	12300	369 (sol)	53800	2190 (sol)
TPH aromatic C12-C16	41300	155 (vap)	65400	
TPH aromatic C16-C21	28400		28400	
TPH aromatic C21-C35	28400		28400	
TPH aliphatic C5-C6	4490	327 (vap)	29400	1100 (vap)
TPH aliphatic C6-C8	10400	157 (vap)	98200	769 (vap)
TPH aliphatic C8-C10	1370	82.4 (sol)	14800	476 (sol)
TPH aliphatic C10-C12	7900	49.9 (sol)	69500	297 (sol)
TPH aliphatic C12-C16	34000	20.9 (vap)	139000	126 (vap)
TPH aliphatic C16-C35	3620000		3620000	
<b>BTEX</b>				
Benzene (C4SL)	12.5		98	
Toluene	27900	834 (vap)	183000	4360 (vap)
Ethylbenzene	7660	507 (vap)	63100	2840 (vap)
Xylene, o-	3030	467 (sol)	32700	2620 (sol)
Xylene, m-	2830	612 (vap)	30900	3460 (vap)
Xylene, p-	2720	564 (sol)	29700	3170 (sol)
Methyl tert-butyl ether	3140		22400	

**Notes**

1. The benzo(a)pyrene C4SL has been published in lieu of other genotoxic PAH constituents based on the adoption of the surrogate marker approach. Users should confirm that their PAH profile falls within the upper and lower ratio's as published by the Defra C4SL Project Methodology.
2. Where the combined indoor and outdoor vapour pathway exceeds 10% of the total exposure, the respective saturation limit has been reported and annotated as '(sol)' if limited by solubility or '(vap)' if limited vapour saturation. Users should confirm that free product if not observed where measured concentrations exceed this value.
3. To account for conservatism in the partitioning of hydrocarbons from soil into vapour phase, a soil to indoor air correction factor of 10 has been applied to TPH aromatic >C5-C16 aromatic and >C5-C16 aliphatic fractions, benzene, ethylbenzene, toluene, and xylenes.
4. The sum of all xylene isomers in soil should be compared against the lower xylene SSV or the relevant isomer for the xylene source as per the SGV documentation.

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Before using Atkins ATRISK SSVs users should read the accompanying Notes for Use.

Commercial				
Contaminant	1% SOM Sand		6 % SOM Sandy Loam	
	SSV (mg/kg)	Saturation Limit (mg/kg)	SSV (mg/kg)	Saturation Limit (mg/kg)
<b>VOCS</b>				
Chlorobenzene (mono)	502		5460	
Chloroform	45.2		357	
1,1,2-Trichloroethane	40.1		382	
1,1-Dichloroethane	115		803	
1,1-Dichloroethene	11.9		86.6	
1,2-Dichloropropane	1.34		11.1	
2,4-Dimethylphenol	11800	1327 (vap)	29800	7184 (vap)
2,4-Dinitrotoluene	3730		3760	
2,6-Dinitrotoluene	1840		1880	
2-Chloronaphthalene	176	112 (vap)	2090	667 (vap)
2-Methylphenol	155000	14166 (sol)	182000	
4-Methylphenol	156000	25771 (sol)	182000	
3-Methylphenol	166000	25259 (sol)	184000	
Bromobenzene	42.1		485	
Bromoform	327		2970	
Butyl benzyl phthalate	940000		945000	
Chloroethane	436		1970	
Chloromethane	0.452		1.49	
Cis 1,2 Dichloroethene	6		44.4	
Dichloromethane	109		526	
Bromodichloromethane	0.854		7.12	
Diethyl Phthalate	108000	12.8 (vap)	280000	65 (vap)
Di-n-butyl phthalate	70800		15400	
Di-n-octyl phthalate	89000		89000	
Hexachloroethane	9.41	8.13 (vap)	110	48.0 (vap)
Trans 1,2 Dichloroethene	9.51		76.1	
Bis (2-ethylhexyl) phthalate	85100		86000	
Trichloroethene	0.149		1.49	
Vinyl chloride	0.0309		0.117	
1,1,1,2-Tetrachloroethane	204		1930	
1,1,2,2-Tetrachloroethanes	426		3910	
Tetrachloroethene	71.4		777	
1,1,1-trichloroethane	306		2950	
1,2-dichloroethane	0.854		5.09	
Carbon tetrachloride	14.8		152	
Carbon disulphide	10.9		94.5	
Trichloromethylbenzene	0.025		0.247	
Formaldehyde	436		1350	
2,6-bis(1,1-dimethyl)-4-(1-methylpropyl)-phenol	2160		2240	
Iso-propylbenzene	5760	387 (sol)	53500	2254 (sol)
Propylbenzene	16200	399 (sol)	103000	2332 (sol)
Styrene	9670	607(sol)	20400	3347 (sol)
Biphenyl	42400	34.1 (vap)	67900	
1,2,4-Trimethylbenzene	165		1030	
2,4-Dichloro-o-cresol	54700		58600	
Dibromochloromethane	9.27		92.1	
Phenol	685		3170	

#### Notes

- For phenol the SSV presented is protective of localised dermal contact in sensitised individuals as per the methodology set out in the Environment Agency SGV for phenol.
- For methylphenols (cresols) the sum of 2-,3- and 4-methylphenol isomers in soil should be compared against the lower of 2-, 3-, and 4-methylphenol SSVs as per the CL:AIRE-EIC GAC documentation.
- To account for conservatism in the partitioning of hydrocarbons from soil into vapour phase, a soil to indoor air correction factor of 10 has been applied to isopropylbenzene, propylbenzene, styrene, biphenyl, and 1,2,4-trimethylbenzene.



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**Before using Atkins ATRISK SSVs users should read the accompanying Notes for Use.**

Commercial				
Contaminant	1% SOM Sand		6 % SOM Sandy Loam	
	SSV (mg/kg)	Saturation Limit (mg/kg)	SSV (mg/kg)	Saturation Limit (mg/kg)
<b>Pesticides</b>				
Dinoseb	7.1		68.7	
Prochloraz	12400		12500	
DDD	983		988	
<b>PCBs</b>				
Total PCDDs, PCDFs and dioxin-like PCBs	0.184		0.184	
<b>Other Contaminants</b>				
Nicotine	855		860	
Tributyl tin oxide	119		199	
Free Cyanide	373		373	

**Notes**

8. The SSV for Total PCDDs, PCDFs and dioxin-like PCBs is based on the distribution of these congeners from the UK Soil Herbage Survey (SHS) data as set out in the Environment Agency SGV methodology. Users should not use this value where their specific source of PCBs could differ from that of the UK SHS.

9. The SSV for free cyanide is based on a predicted acute exposure scenario involving a 16-65 year old adult who may ingest a bolus of contaminated soil.

## Derivation of Screening Values

In assessing risks to human health arising from materials present on site, environmental testing results are compared to Shadbolt Group Tier 1 Screening Values (TSVs).

These screening values are drawn from a range of sources including government guidance, research bodies, industry publications and modelling software.

On-going research by the Environment Agency (EA) is being undertaken to produce toxicology reports (TOX series) for each of the contaminants identified within the CLR framework and then to produce published Soil Guideline Values (SGVs) using the Contaminated Land Exposure Assessment (CLEA) Model. Parallel to the work being undertaken by the EA is research being undertaken by Land Quality Management Limited and the Chartered Institute of Environmental Health (CIEH) to produce similar General Assessment Criteria (GAC) using the CLEA Model. To date, SGVs and GACs have been published for over 80 No. contaminants with SGVs / GACs derived for each contaminant for three different land use scenarios namely:

- a) Residential
- b) Allotment
- c) Commercial

In addition, Shadbolt Environmental (The Shadbolt Group) have derived screening values for **Parks, Playing Fields** and **Open Spaces** based on current guidance.

Shadbolt Environmental TSV's are based on the SGVs and GACs which are scientifically based generic assessment criteria that can be used to simplify the assessment of human health risks arising from long-term and on-site exposure to chemical contamination in soil.

SGVs and GACs are a screening tool for the generic quantitative risk assessment of land contamination (Defra and Environment Agency, 2004). They are not (unless clearly stated otherwise) relevant for assessing risks to human health from short-term exposure to chemicals in soil including injury arising from direct bodily contact and do not take account of other types of risks to humans such as explosion or suffocation risks (associated with the build-up of gases such as methane and carbon dioxide) or aesthetic issues such as odour or colour. SGVs and GACs do not take account of other non-soil based sources of contamination such as contamination in groundwater, surface waters or drinking waters. They cannot be used to evaluate risks to non-human receptors such as controlled waters, ecosystems, buildings and services, domestic pets or garden plants. Where, for example, phytotoxic effects are an important consideration in the current or future intended land use further investigation should be undertaken.

SGVs are guidelines on the level of long-term human exposure to individual chemicals in soil that, unless stated otherwise, are tolerable or pose a minimal risk to human health. They represent "trigger values" – indicators to a risk assessor that soil concentrations above this level **may** pose a possibility of *significant harm* to human health (Defra, 2008b).

*Significance* is linked to:

- a) **Margin** of exceedance;
- b) **Duration** and frequency of exposure;
- c) **Other site-specific factors** that the enforcing authority may wish to take into account.

SGVs do not of themselves represent the threshold at which there is a *significant possibility of significant harm* (SPOSH). Nor do they automatically represent an unacceptable intake in the context of Part 2A of the Environmental Protection Act 1990. However, they can be a useful starting point for such an assessment.

In order to assess the soil analyses results with regard to potential human health risks, Shadbolt Environmental TSVs have been derived in accordance with the UK framework set out in the most recent CLR (Contaminated Land Report) documents (EA/DEFRA, 2009) and LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2<sup>nd</sup> Edition 2009 and are “in line” with industry standards.

### Assessment Framework

The CLEA model states that, ‘the contamination is assumed to be at or within 1m of the surface’. It is considered that at depths greater than 1.00m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway.

### Statistical Analysis

The CLEA guidelines also state that for each contaminant, the upper 95<sup>th</sup> percentile of the mean measured concentration (95%UCL) should be calculated and this value should be compared to the TSV.

The objective of maximum value tests is to decide whether the maximum concentration observed should be treated as an outlier or whether it can reasonably be considered to come from the same underlying population as the other samples.

It is known that contaminant concentrations often demonstrate lognormal or other distribution forms. Therefore, in order to calculate what are considered to be more representative 95%UCL values, the contaminant concentrations have first been assessed to determine if each contaminant distribution is closer to a normal or lognormal distribution.

If a dataset was found to be log normally distributed, the geometric mean was used to calculate the 95%UCL, for those that were found to be normally distributed; the arithmetic mean was used to calculate the 95%UCL. Constituent non-detects were assigned a value equal to the reported analytical laboratory limit of detection, considered reasonably conservative. Any identified outliers are excluded from the datasets used in calculation of the 95%UCL value.

Shadbolt Group’s Tier 1 Screening Values used in the production of this report are presented below.

APPENDIX D  
CHEMICAL LABORATORY  
RESULTS



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**Analytical Report Number : 19-51682**

<b>Project / Site name:</b>	Newbottle Street, Houghton le Spring	<b>Samples received on:</b>	25/07/2019
<b>Your job number:</b>	2585	<b>Samples instructed on:</b>	25/07/2019
<b>Your order number:</b>		<b>Analysis completed by:</b>	01/08/2019
<b>Report Issue Number:</b>	1	<b>Report issued on:</b>	01/08/2019
<b>Samples Analysed:</b>	24 soil samples		

**Signed:** 

Rexona Rahman  
 Head of Customer Services  
**For & on behalf of i2 Analytical Ltd.**

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

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

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

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

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276910		1276911		1276912		1276913		1276914	
Sample Reference	TP-14		TP-17		TP-19		TP-20		TP-18	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	1.50		2.20		2.00		0.70		0.50	
Date Sampled	16/07/2019		16/07/2019		16/07/2019		16/07/2019		16/07/2019	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	18	11	9.5	7.5		
Total mass of sample received	kg	0.001	NONE	0.66	0.65	1.0	0.80	0.67		

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7	7.9	7.7	8.6	7.8
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.18	0.061	0.26	0.54	0.99
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	182	61.1	261	540	993

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	3.2	0.38	0.55	1.4	1.5
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.28	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.30	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	4.9	0.96	1.7	2.5	1.3
Anthracene	mg/kg	0.05	MCERTS	0.32	< 0.05	0.26	0.34	0.26
Fluoranthene	mg/kg	0.05	MCERTS	1.5	0.22	2.1	2.7	1.1
Pyrene	mg/kg	0.05	MCERTS	1.3	0.21	1.7	2.3	0.96
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.89	< 0.05	0.97	1.4	0.76
Chrysene	mg/kg	0.05	MCERTS	0.98	< 0.05	0.90	0.94	0.71
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.84	< 0.05	0.78	0.94	0.66
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.47	0.42	0.31
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.49	< 0.05	0.78	0.76	0.55
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.25	< 0.05	0.34	0.31	0.23
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43	< 0.05	0.57	0.54	0.37

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	15.3	1.77	11.7	14.6	8.76
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	22	41	4.2	25	14
Boron (water soluble)	mg/kg	0.2	MCERTS	2.2	1.6	0.4	2.6	2.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.7	< 0.2	< 0.2	0.5	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	15	15	28	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	180	50	15	71	59
Lead (aqua regia extractable)	mg/kg	1	MCERTS	120	53	26	98	69
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	< 0.3	< 0.3	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	55	26	16	48	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.7	< 1.0	2.6	2.7
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	310	40	55	190	160

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276910				1276911	1276912	1276913	1276914
Sample Reference	TP-14				TP-17	TP-19	TP-20	TP-18
Sample Number	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.50				2.20	2.00	0.70	0.50
Date Sampled	16/07/2019				16/07/2019	16/07/2019	16/07/2019	16/07/2019
Time Taken	None Supplied				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

**Monoaromatics & Oxygenates**

Compound	Units	Limit of detection	Accreditation Status	1276910	1276911	1276912	1276913	1276914
Benzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Toluene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
o-xylene	µg/kg	1	MCERTS	-	-	< 1.0	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	< 1.0	-	-

**Petroleum Hydrocarbons**

Parameter	Units	Limit of detection	Accreditation Status	1276910	1276911	1276912	1276913	1276914
TPH C10 - C40	mg/kg	10	MCERTS	260	< 10	71	250	87
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	0.48	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	0.26	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	< 2.0	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	< 8.0	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	< 8.0	-	-
<b>TPH-CWG - Aliphatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	< 10	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	< 0.001	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	< 1.0	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	8.2	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	16	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	36	-	-
<b>TPH-CWG - Aromatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	61	-	-



Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276915		1276916		1276917		1276918		1276919	
Sample Reference	TP-10		TP-02		TP-08		TP-04		TP-11	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	2.00		1.20		0.50		1.50		2.20	
Date Sampled	16/07/2019		16/07/2019		16/07/2019		16/07/2019		16/07/2019	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.7	9.8	9.1	12	12	12	12
Total mass of sample received	kg	0.001	NONE	0.87	0.81	0.72	0.72	0.72	0.85	0.85

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.5	8.1	8.0	7.9	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	2.1	0.050	0.038	2.4	0.13
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	2070	49.8	38.2	2440	129

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	2.1	1.0	0.81	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.34	< 0.05	0.29
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.34	< 0.05	0.33
Phenanthrene	mg/kg	0.05	MCERTS	0.45	1.7	3.8	1.9	2.4
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.62	0.30	0.42
Fluoranthene	mg/kg	0.05	MCERTS	0.50	< 0.05	4.2	2.4	2.5
Pyrene	mg/kg	0.05	MCERTS	0.48	< 0.05	3.3	2.0	2.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.35	< 0.05	2.8	2.1	1.1
Chrysene	mg/kg	0.05	MCERTS	0.27	< 0.05	2.1	1.5	0.79
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.28	< 0.05	2.8	1.9	0.98
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.20	< 0.05	0.95	0.87	0.56
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.27	< 0.05	2.0	1.5	1.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.91	0.67	0.49
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.42	0.34	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	1.4	1.1	0.81

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	2.80	3.75	26.9	17.3	13.6

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	15	14	19	28	6.1
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	1.2	1.4	2.6	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	0.5	1.8	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	19	17	19	18	30
Copper (aqua regia extractable)	mg/kg	1	MCERTS	51	67	120	92	26
Lead (aqua regia extractable)	mg/kg	1	MCERTS	38	86	220	180	30
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.5	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	34	29	32	42	29
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.2
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	54	83	260	400	68

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276915			1276916		1276917		1276918		1276919	
Sample Reference	TP-10			TP-02		TP-08		TP-04		TP-11	
Sample Number	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	2.00			1.20		0.50		1.50		2.20	
Date Sampled	16/07/2019			16/07/2019		16/07/2019		16/07/2019		16/07/2019	
Time Taken	None Supplied			None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status								

**Monoaromatics & Oxygenates**

Compound	Units	Limit of detection	Accreditation Status	1276915	1276916	1276917	1276918	1276919
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

**Petroleum Hydrocarbons**

TPH C10 - C40	Units	Limit of detection	Accreditation Status	1276915	1276916	1276917	1276918	1276919
TPH C10 - C40	mg/kg	10	MCERTS	< 10	< 10	290	210	190

TPH-CWG - Aliphatic >EC5 - EC6	Units	Limit of detection	Accreditation Status	1276915	1276916	1276917	1276918	1276919
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aliphatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-

TPH-CWG - Aromatic >EC5 - EC7	Units	Limit of detection	Accreditation Status	1276915	1276916	1276917	1276918	1276919
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aromatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276920				1276921		1276922		1276923		1276924	
Sample Reference	TP-01				TP-07		TP-17		TP-04		TP-14	
Sample Number	None Supplied				None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	1.00				2.30		0.20		0.20		0.20	
Date Sampled	16/07/2019				16/07/2019		16/07/2019		16/07/2019		16/07/2019	
Time Taken	None Supplied				None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status									
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	8.0	6.4	6.8	12	7.9				
Total mass of sample received	kg	0.001	NONE	0.77	0.82	0.75	0.69	0.73				

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	9.3	8.7	11.0	7.9	7.9
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.34	0.076	0.097	0.13	0.019
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	344	75.9	96.8	127	18.9

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	1.3	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	7.5	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	11	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	130	0.30	0.35	0.31	0.38
Anthracene	mg/kg	0.05	MCERTS	30	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	160	0.51	0.41	0.25	0.48
Pyrene	mg/kg	0.05	MCERTS	130	0.49	0.33	0.25	0.44
Benzo(a)anthracene	mg/kg	0.05	MCERTS	69	0.34	0.28	< 0.05	0.41
Chrysene	mg/kg	0.05	MCERTS	44	0.25	0.26	< 0.05	0.34
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	49	0.40	0.30	< 0.05	0.38
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	15	0.13	0.11	< 0.05	0.24
Benzo(a)pyrene	mg/kg	0.05	MCERTS	40	0.33	0.21	< 0.05	0.34
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	20	0.20	< 0.05	< 0.05	0.16
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	6.4	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	21	0.27	< 0.05	< 0.05	0.26

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	742	3.22	2.25	0.81	3.43

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	2.1	8.2	8.3	5.8
Boron (water soluble)	mg/kg	0.2	MCERTS	1.4	0.5	1.0	1.0	1.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	23	4.5	21	26	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	40	14	28	29	31
Lead (aqua regia extractable)	mg/kg	1	MCERTS	77	25	38	27	48
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	19	11	21	30	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.3	1.8	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	100	30	82	69	93

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276920			1276921			1276922			1276923			1276924		
Sample Reference	TP-01			TP-07			TP-17			TP-04			TP-14		
Sample Number	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Depth (m)	1.00			2.30			0.20			0.20			0.20		
Date Sampled	16/07/2019			16/07/2019			16/07/2019			16/07/2019			16/07/2019		
Time Taken	None Supplied			None Supplied			None Supplied			None Supplied			None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status												

**Monoaromatics & Oxygenates**

Parameter	Units	Limit of detection	Accreditation Status	1276920	1276921	1276922	1276923	1276924
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

**Petroleum Hydrocarbons**

Parameter	Units	Limit of detection	Accreditation Status	1276920	1276921	1276922	1276923	1276924
TPH C10 - C40	mg/kg	10	MCERTS	2800	48	49	44	85

Parameter	Units	Limit of detection	Accreditation Status	1276920	1276921	1276922	1276923	1276924
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aliphatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-

Parameter	Units	Limit of detection	Accreditation Status	1276920	1276921	1276922	1276923	1276924
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aromatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-

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Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276925		1276926		1276927		1276928		1276929	
Sample Reference	TP-02		TP-18		TP-09		TP-08		TP-16	
Sample Number	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Depth (m)	0.20		0.20		0.20		0.20		0.20	
Date Sampled	16/07/2019		16/07/2019		16/07/2019		16/07/2019		16/07/2019	
Time Taken	None Supplied		None Supplied		None Supplied		None Supplied		None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status							
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	8.6	9.5	13	8.4	7.4	7.4	7.4
Total mass of sample received	kg	0.001	NONE	0.73	0.73	0.76	0.77	0.81	0.81	0.81

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected

#### General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	7.8	7.7	7.7	7.7
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.017	0.013	0.032	0.014	0.039
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	17.3	12.6	32.2	14.4	38.5

#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.24	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.47	< 0.05	0.61	< 0.05	0.55
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.11	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	0.60	< 0.05	1.2	< 0.05	0.88
Pyrene	mg/kg	0.05	MCERTS	0.53	< 0.05	0.97	< 0.05	0.80
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.52	< 0.05	0.62	< 0.05	0.52
Chrysene	mg/kg	0.05	MCERTS	0.39	< 0.05	0.64	< 0.05	0.54
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.49	< 0.05	0.64	< 0.05	0.66
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39	< 0.05	0.38	< 0.05	0.27
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.56	< 0.05	0.51	< 0.05	0.50
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.24	< 0.05	0.24	< 0.05	0.23
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.39	< 0.05	0.26	< 0.05	0.27

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.82	< 0.80	6.15	< 0.80	5.22

#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.3	4.8	10	3.9	6.7
Boron (water soluble)	mg/kg	0.2	MCERTS	1.2	0.6	1.5	0.7	1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	26	26	25	24
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	25	39	27	29
Lead (aqua regia extractable)	mg/kg	1	MCERTS	43	25	46	21	52
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	29	28	27	22
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	2.3
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	85	62	110	87	88

Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number	1276925	1276926	1276927	1276928	1276929
Sample Reference	TP-02	TP-18	TP-09	TP-08	TP-16
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	0.20	0.20	0.20
Date Sampled	16/07/2019	16/07/2019	16/07/2019	16/07/2019	16/07/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

**Monoaromatics & Oxygenates**

Parameter	Units	Limit of detection	Accreditation Status	1276925	1276926	1276927	1276928	1276929
Benzene	µg/kg	1	MCERTS	-	-	-	-	-
Toluene	µg/kg	1	MCERTS	-	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	-
o-xylene	µg/kg	1	MCERTS	-	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	-

**Petroleum Hydrocarbons**

Parameter	Units	Limit of detection	Accreditation Status	1276925	1276926	1276927	1276928	1276929
TPH C10 - C40	mg/kg	10	MCERTS	100	< 10	43	41	77
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aliphatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	-
<b>TPH-CWG - Aromatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	-

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Project / Site name: Newbottle Street, Houghton le Spring

Lab Sample Number				1276930	1276931	1276932	1276933	
Sample Reference				TP-20	TP-19	TP-10	TP-01	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.20	0.20	0.20	0.20	
Date Sampled				16/07/2019	16/07/2019	16/07/2019	16/07/2019	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
				Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	N/A	NONE	7.6	14	12	12	
Total mass of sample received	kg	0.001	NONE	0.81	0.92	0.81	0.70	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
<b>General Inorganics</b>								
pH - Automated	pH Units	N/A	MCERTS	7.9	7.6	7.8	7.5	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.014	0.055	0.021	0.019	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	14.1	55.2	21.4	18.7	
<b>Speciated PAHs</b>								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.25	0.23	0.20	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.55	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.74	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	0.40	8.3	0.40	1.4	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	1.6	< 0.05	0.26	
Fluoranthene	mg/kg	0.05	MCERTS	0.65	13	0.62	2.2	
Pyrene	mg/kg	0.05	MCERTS	0.54	11	0.51	1.8	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.37	5.7	0.37	1.3	
Chrysene	mg/kg	0.05	MCERTS	0.36	5.5	0.36	0.99	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.42	6.0	0.51	1.5	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.26	3.3	0.15	0.49	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.38	5.2	0.39	1.2	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.18	2.2	0.17	0.53	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.74	< 0.05	0.19	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.21	2.5	0.21	0.61	
<b>Total PAH</b>								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	3.77	66.9	3.92	12.6	
<b>Heavy Metals / Metalloids</b>								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	7.7	11	6.2	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	2.5	1.5	0.9	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	25	39	43	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	22	43	41	32	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	26	57	74	31	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.6	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	27	22	29	41	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	97	92	72	



Analytical Report Number: 19-51682

Project / Site name: Newbottle Street, Houghton le Spring

<b>Lab Sample Number</b>	1276930	1276931	1276932	1276933	
<b>Sample Reference</b>	TP-20	TP-19	TP-10	TP-01	
<b>Sample Number</b>	None Supplied	None Supplied	None Supplied	None Supplied	
<b>Depth (m)</b>	0.20	0.20	0.20	0.20	
<b>Date Sampled</b>	16/07/2019	16/07/2019	16/07/2019	16/07/2019	
<b>Time Taken</b>	None Supplied	None Supplied	None Supplied	None Supplied	
<b>Analytical Parameter (Soil Analysis)</b>	<b>Units</b>	<b>Limit of detection</b>	<b>Accreditation Status</b>		

**Monoaromatics & Oxygenates**

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

**Petroleum Hydrocarbons**

TPH C10 - C40	mg/kg	10	MCERTS	29	350	55	100	
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TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	
<b>TPH-CWG - Aliphatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	
<b>TPH-CWG - Aromatic (EC5 - EC35)</b>	mg/kg	10	MCERTS	-	-	-	-	



**Analytical Report Number : 19-51682**

**Project / Site name: Newbottle Street, Houghton le Spring**

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

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1276910	TP-14	None Supplied	1.50	Black clay and sand with coal.
1276911	TP-17	None Supplied	2.20	Brown clay and sand with gravel.
1276912	TP-19	None Supplied	2.00	Grey clay and sand with gravel.
1276913	TP-20	None Supplied	0.70	Brown loam and sand with gravel and brick.
1276914	TP-18	None Supplied	0.50	Brown clay and sand with gravel and coal.
1276915	TP-10	None Supplied	2.00	Brown loam and clay with gravel.
1276916	TP-02	None Supplied	1.20	Brown loam and clay with gravel.
1276917	TP-08	None Supplied	0.50	Brown loam and clay with gravel.
1276918	TP-04	None Supplied	1.50	Brown loam and clay with gravel.
1276919	TP-11	None Supplied	2.20	Brown clay and sand with gravel and vegetation.
1276920	TP-01	None Supplied	1.00	Brown clay and sand with gravel and vegetation.
1276921	TP-07	None Supplied	2.30	Brown sandy gravel. **
1276922	TP-17	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276923	TP-04	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276924	TP-14	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276925	TP-02	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276926	TP-18	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276927	TP-09	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276928	TP-08	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276929	TP-16	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276930	TP-20	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276931	TP-19	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276932	TP-10	None Supplied	0.20	Brown loam and clay with gravel and vegetation.
1276933	TP-01	None Supplied	0.20	Brown loam and clay with gravel and vegetation.

\*\* Non MCerts Matrix

**Analytical Report Number : 19-51682**

**Project / Site name: Newbottle Street, Houghton le Spring**

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Banding in Soil by FID	Determination of hexane extractable hydrocarbons in soil by GC-FID.	In-house method, TPH with carbon banding and silica gel split/cleanup.	L076-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/cleanup.	L088/76-PL	W	MCERTS

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.**

Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
TP-01		S	19-51682	1276920	c	Total cyanide in soil	L080-PL	c
TP-01		S	19-51682	1276933	c	Total cyanide in soil	L080-PL	c
TP-02		S	19-51682	1276916	c	Total cyanide in soil	L080-PL	c
TP-02		S	19-51682	1276925	c	Total cyanide in soil	L080-PL	c
TP-04		S	19-51682	1276918	c	Total cyanide in soil	L080-PL	c
TP-04		S	19-51682	1276923	c	Total cyanide in soil	L080-PL	c
TP-07		S	19-51682	1276921	c	Total cyanide in soil	L080-PL	c
TP-08		S	19-51682	1276917	c	Total cyanide in soil	L080-PL	c
TP-08		S	19-51682	1276928	c	Total cyanide in soil	L080-PL	c
TP-09		S	19-51682	1276927	c	Total cyanide in soil	L080-PL	c
TP-10		S	19-51682	1276915	c	Total cyanide in soil	L080-PL	c
TP-10		S	19-51682	1276932	c	Total cyanide in soil	L080-PL	c
TP-11		S	19-51682	1276919	c	Total cyanide in soil	L080-PL	c
TP-14		S	19-51682	1276910	c	Total cyanide in soil	L080-PL	c
TP-14		S	19-51682	1276924	c	Total cyanide in soil	L080-PL	c
TP-16		S	19-51682	1276929	c	Total cyanide in soil	L080-PL	c
TP-17		S	19-51682	1276911	c	Total cyanide in soil	L080-PL	c
TP-17		S	19-51682	1276922	c	Total cyanide in soil	L080-PL	c
TP-18		S	19-51682	1276914	c	Total cyanide in soil	L080-PL	c
TP-18		S	19-51682	1276926	c	Total cyanide in soil	L080-PL	c
TP-19		S	19-51682	1276912	bc	BTEX and MTBE in soil (Monoaromatics)	L073B-PL	b
TP-19		S	19-51682	1276912	bc	TPHCWG (Soil)	L088/76-PL	b
TP-19		S	19-51682	1276912	bc	Total cyanide in soil	L080-PL	c
TP-19		S	19-51682	1276931	c	Total cyanide in soil	L080-PL	c
TP-20		S	19-51682	1276913	c	Total cyanide in soil	L080-PL	c
TP-20		S	19-51682	1276930	c	Total cyanide in soil	L080-PL	c



## ANALYTICAL TEST REPORT

Contract no: 88051  
Contract name: Houghton-le-Spring  
Client reference: 2585  
Clients name: Shadbolt Consulting  
Clients address: 18 Bewick Road  
Gateshead  
Tyne and Wear  
NE8 4DP  
  
Samples received: 04 August 2020  
Analysis started: 04 August 2020  
Analysis completed: 11 August 2020  
Report issued: 11 August 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.  
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.  
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.  
Methods, procedures and performance data are available on request.  
Results reported herein relate only to the material supplied to the laboratory.  
This report shall not be reproduced except in full, without prior written approval.  
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

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

Approved by:

John Campbell  
Director

# Chemtech Environmental Limited

## SAMPLE INFORMATION

### MCERTS (Soils):

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

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

Analytical results are inclusive of stones.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
88051-1	TP201	1.20	Clayey Sand With Gravel	-	-	12.3
88051-2	TP202	0.10	Clayey Sand With Gravel & roots	-	-	12.3
88051-3	TP202	2.00	Clayey Sand With Gravel	-	-	14.2
88051-4	TP203	2.50	Clayey Sand With Gravel	-	-	14.0
88051-5	TP204	0.50-1.00	Clayey Sand With Gravel	-	-	10.6
88051-6	TP204	1.90-2.20	Sandy Clay with Gravel	-	-	14.9
88051-7	TP205	0.05-0.15	Clayey Sand With Gravel & roots	-	-	9.0
88051-9	TP206	1.00-1.30	Clayey Sand With Gravel	-	-	11.9
88051-10	TP207	0.20-0.60	Clayey Sand With Gravel	-	-	11.9
88051-12	TP208	1.00-1.50	Clayey Sand With Gravel	-	-	10.9
88051-13	TP208	2.50-3.00	Clayey Sand With Gravel	-	-	11.5

# Chemtech Environmental Limited

## SOILS

Lab number			88051-1	88051-2	88051-3	88051-4	88051-5	88051-6
Sample id			TP201	TP202	TP202	TP203	TP204	TP204
Depth (m)			1.20	0.10	2.00	2.50	0.50-1.00	1.90-2.20
Date sampled			31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020
Test	Method	Units						
Arsenic (total)	CE127 <sup>M</sup>	mg/kg As	16	9.5	17	20	12	-
Boron (water soluble)	CE063 <sup>M</sup>	mg/kg B	1.1	1.0	1.2	1.3	<0.5	-
Cadmium (total)	CE127 <sup>M</sup>	mg/kg Cd	0.4	0.4	0.5	<0.2	0.3	-
Chromium (total)	CE127 <sup>M</sup>	mg/kg Cr	26	16	30	17	20	-
Copper (total)	CE127 <sup>M</sup>	mg/kg Cu	44	27	55	69	58	-
Lead (total)	CE127 <sup>M</sup>	mg/kg Pb	140	114	173	48	52	-
Mercury (total)	CE127 <sup>M</sup>	mg/kg Hg	<0.5	<0.5	<0.5	<0.5	<0.5	-
Nickel (total)	CE127 <sup>M</sup>	mg/kg Ni	29	21	37	22	33	-
Selenium (total)	CE127 <sup>M</sup>	mg/kg Se	2.0	1.9	2.7	2.9	2.2	-
Zinc (total)	CE127 <sup>M</sup>	mg/kg Zn	140	91	175	61	100	-
pH	CE004 <sup>M</sup>	units	8.6	8.0	8.4	7.8	6.3	-
Sulphate (2:1 water soluble)	CE061 <sup>M</sup>	mg/l SO <sub>4</sub>	85	97	243	233	101	-
Cyanide (total)	CE077	mg/kg CN	<1	<1	<1	<1	<1	-
Calorific value	CE069	kJ/kg	-	-	-	-	-	-
PAH								
Naphthalene	CE087 <sup>M</sup>	mg/kg	<0.02	<0.02	0.33	0.92	1.91	-
Acenaphthylene	CE087 <sup>M</sup>	mg/kg	<0.02	<0.02	0.37	<0.02	<0.02	-
Acenaphthene	CE087 <sup>M</sup>	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	-
Fluorene	CE087 <sup>U</sup>	mg/kg	0.29	<0.02	<0.02	<0.02	<0.02	-
Phenanthrene	CE087 <sup>M</sup>	mg/kg	3.91	0.66	2.28	2.26	2.86	-
Anthracene	CE087 <sup>U</sup>	mg/kg	1.31	<0.02	0.73	0.79	0.24	-
Fluoranthene	CE087 <sup>M</sup>	mg/kg	9.70	2.03	7.43	2.35	1.87	-
Pyrene	CE087 <sup>M</sup>	mg/kg	7.05	1.79	6.22	1.72	1.71	-
Benzo(a)anthracene	CE087 <sup>U</sup>	mg/kg	4.07	1.12	3.71	0.91	0.93	-
Chrysene	CE087 <sup>M</sup>	mg/kg	4.01	1.23	3.95	1.03	1.16	-
Benzo(b)fluoranthene	CE087 <sup>M</sup>	mg/kg	5.19	2.04	5.66	1.21	1.54	-
Benzo(k)fluoranthene	CE087 <sup>M</sup>	mg/kg	2.08	0.87	2.52	0.50	0.66	-
Benzo(a)pyrene	CE087 <sup>U</sup>	mg/kg	3.60	1.49	4.22	0.81	1.09	-
Indeno(123cd)pyrene	CE087 <sup>M</sup>	mg/kg	1.89	0.80	2.07	0.36	0.66	-
Dibenz(ah)anthracene	CE087 <sup>M</sup>	mg/kg	0.61	0.26	0.68	<0.02	<0.02	-
Benzo(ghi)perylene	CE087 <sup>M</sup>	mg/kg	1.70	0.76	2.01	0.34	0.70	-
PAH (total of USEPA 16)	CE087	mg/kg	45.4	13.1	42.2	13.2	15.3	-
TPH								
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	-	-	-	-	-	<0.01
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	-	-	-	-	-	<0.01
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	-	-	-	-	-	<0.01
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	-	-	-	-	-	3
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	-	-	-	-	-	5
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	-	-	-	-	-	11
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	-	-	-	-	-	4
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	-	-	-	-	-	<1



# Chemtech Environmental Limited

## SOILS

Lab number			88051-1	88051-2	88051-3	88051-4	88051-5	88051-6
Sample id			TP201	TP202	TP202	TP203	TP204	TP204
Depth (m)			1.20	0.10	2.00	2.50	0.50-1.00	1.90-2.20
Date sampled			31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020
Test	Method	Units						
VPH Aliphatic (>C5-C6)	CE067	mg/kg	-	-	-	-	-	<0.1
VPH Aliphatic (>C6-C8)	CE067	mg/kg	-	-	-	-	-	<0.1
VPH Aliphatic (>C8-C10)	CE067	mg/kg	-	-	-	-	-	<0.1
EPH Aliphatic (>C10-C12)	CE068	mg/kg	-	-	-	-	-	<4
EPH Aliphatic (>C12-C16)	CE068	mg/kg	-	-	-	-	-	43
EPH Aliphatic (>C16-C35)	CE068	mg/kg	-	-	-	-	-	219
EPH Aliphatic (>C35-C44)	CE068	mg/kg	-	-	-	-	-	30
EPH (>C10-C40)	CE033 <sup>M</sup>	mg/kg	87	155	289	191	3188	-
Subcontracted analysis								
Asbestos (qualitative)	\$	-	NAD	NAD	NAD	NAD	NAD	-

# Chemtech Environmental Limited

## SOILS

Lab number			88051-7	88051-9	88051-10	88051-12	88051-13
Sample id			TP205	TP206	TP207	TP208	TP208
Depth (m)			0.05-0.15	1.00-1.30	0.20-0.60	1.00-1.50	2.50-3.00
Date sampled			31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020
Test	Method	Units					
Arsenic (total)	CE127 <sup>M</sup>	mg/kg As	17	-	-	-	-
Boron (water soluble)	CE063 <sup>M</sup>	mg/kg B	1.0	-	-	-	-
Cadmium (total)	CE127 <sup>M</sup>	mg/kg Cd	0.5	-	-	-	-
Chromium (total)	CE127 <sup>M</sup>	mg/kg Cr	22	-	-	-	-
Copper (total)	CE127 <sup>M</sup>	mg/kg Cu	72	-	-	-	-
Lead (total)	CE127 <sup>M</sup>	mg/kg Pb	90	-	-	-	-
Mercury (total)	CE127 <sup>M</sup>	mg/kg Hg	<0.5	-	-	-	-
Nickel (total)	CE127 <sup>M</sup>	mg/kg Ni	37	-	-	-	-
Selenium (total)	CE127 <sup>M</sup>	mg/kg Se	2.2	-	-	-	-
Zinc (total)	CE127 <sup>M</sup>	mg/kg Zn	154	-	-	-	-
pH	CE004 <sup>M</sup>	units	7.0	-	-	-	-
Sulphate (2:1 water soluble)	CE061 <sup>M</sup>	mg/l SO <sub>4</sub>	55	-	-	-	-
Cyanide (total)	CE077	mg/kg CN	<1	-	-	-	-
Calorific value	CE069	kJ/kg	-	4560	-	-	4096
PAH							
Naphthalene	CE087 <sup>M</sup>	mg/kg	1.05	-	-	-	-
Acenaphthylene	CE087 <sup>M</sup>	mg/kg	<0.02	-	-	-	-
Acenaphthene	CE087 <sup>M</sup>	mg/kg	<0.02	-	-	-	-
Fluorene	CE087 <sup>U</sup>	mg/kg	0.25	-	-	-	-
Phenanthrene	CE087 <sup>M</sup>	mg/kg	2.57	-	-	-	-
Anthracene	CE087 <sup>U</sup>	mg/kg	1.16	-	-	-	-
Fluoranthene	CE087 <sup>M</sup>	mg/kg	4.28	-	-	-	-
Pyrene	CE087 <sup>M</sup>	mg/kg	6.01	-	-	-	-
Benzo(a)anthracene	CE087 <sup>U</sup>	mg/kg	4.62	-	-	-	-
Chrysene	CE087 <sup>M</sup>	mg/kg	8.96	-	-	-	-
Benzo(b)fluoranthene	CE087 <sup>M</sup>	mg/kg	9.06	-	-	-	-
Benzo(k)fluoranthene	CE087 <sup>M</sup>	mg/kg	3.14	-	-	-	-
Benzo(a)pyrene	CE087 <sup>U</sup>	mg/kg	3.57	-	-	-	-
Indeno(123cd)pyrene	CE087 <sup>M</sup>	mg/kg	1.26	-	-	-	-
Dibenz(ah)anthracene	CE087 <sup>M</sup>	mg/kg	0.51	-	-	-	-
Benzo(ghi)perylene	CE087 <sup>M</sup>	mg/kg	1.07	-	-	-	-
PAH (total of USEPA 16)	CE087	mg/kg	47.5	-	-	-	-
TPH							
VPH Aromatic (>EC5-EC7)	CE067	mg/kg	-	<0.01	<0.01	<0.01	-
VPH Aromatic (>EC7-EC8)	CE067	mg/kg	-	<0.01	<0.01	<0.01	-
VPH Aromatic (>EC8-EC10)	CE067	mg/kg	-	<0.01	<0.01	<0.01	-
EPH Aromatic (>EC10-EC12)	CE068	mg/kg	-	<1	<1	<1	-
EPH Aromatic (>EC12-EC16)	CE068	mg/kg	-	1	1	2	-
EPH Aromatic (>EC16-EC21)	CE068	mg/kg	-	6	1	3	-
EPH Aromatic (>EC21-EC35)	CE068	mg/kg	-	5	1	2	-
EPH Aromatic (>EC35-EC44)	CE068	mg/kg	-	<1	<1	<1	-

# Chemtech Environmental Limited

## SOILS

Lab number			88051-7	88051-9	88051-10	88051-12	88051-13
Sample id			TP205	TP206	TP207	TP208	TP208
Depth (m)			0.05-0.15	1.00-1.30	0.20-0.60	1.00-1.50	2.50-3.00
Date sampled			31/07/2020	31/07/2020	31/07/2020	31/07/2020	31/07/2020
Test	Method	Units					
VPH Aliphatic (>C5-C6)	CE067	mg/kg	-	<0.1	<0.1	<0.1	-
VPH Aliphatic (>C6-C8)	CE067	mg/kg	-	<0.1	<0.1	<0.1	-
VPH Aliphatic (>C8-C10)	CE067	mg/kg	-	<0.1	<0.1	<0.1	-
EPH Aliphatic (>C10-C12)	CE068	mg/kg	-	<4	<4	<4	-
EPH Aliphatic (>C12-C16)	CE068	mg/kg	-	10	10	20	-
EPH Aliphatic (>C16-C35)	CE068	mg/kg	-	116	194	53	-
EPH Aliphatic (>C35-C44)	CE068	mg/kg	-	23	43	<10	-
EPH (>C10-C40)	CE033 <sup>M</sup>	mg/kg	751	-	-	-	-
Subcontracted analysis							
Asbestos (qualitative)	\$	-	NAD	-	-	-	-

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## PREPARED LEACHATES

Lab number			88051-8L	88051-11L	88051-14L	88051-15L
Sample id			TP205	TP208	TP209	TP209
Depth (m)			2.50	0.30-0.50	1.50	2.00-2.50
Test	Method	Units				
Arsenic (dissolved)	CE128 <sup>u</sup>	µg/l As	0.09	0.17	2.76	3.21
Boron (dissolved)	CE128 <sup>u</sup>	µg/l B	41	67	31	24
Cadmium (dissolved)	CE128 <sup>u</sup>	µg/l Cd	<0.07	<0.07	<0.07	<0.07
Chromium (dissolved)	CE128 <sup>u</sup>	µg/l Cr	0.3	<0.2	2.0	2.2
Copper (dissolved)	CE128 <sup>u</sup>	µg/l Cu	0.4	0.8	2.7	3.1
Lead (dissolved)	CE128 <sup>u</sup>	µg/l Pb	<0.2	<0.2	0.4	0.7
Mercury (dissolved)	CE128 <sup>u</sup>	µg/l Hg	<0.008	<0.008	<0.008	<0.008
Nickel (dissolved)	CE128 <sup>u</sup>	µg/l Ni	0.9	0.5	<0.5	<0.5
Selenium (dissolved)	CE128 <sup>u</sup>	µg/l Se	7.64	0.79	0.87	0.91
Zinc (dissolved)	CE128 <sup>u</sup>	µg/l Zn	<1	4	<1	<1
pH	CE213 <sup>u</sup>	units	7.7	7.7	8.0	7.9
Ammonia	CE012 <sup>u</sup>	µg/l N	<10	29	>10	<10
Sulphate	CE049 <sup>u</sup>	mg/l SO <sub>4</sub>	13	233	32	14
Sulphur (dissolved)	CE128 <sup>u</sup>	mg/l S	5.1	79.7	8.2	5.7
Cyanide (total)	CE147	µg/l CN	<20	<20	<20	<20
PAH						
Naphthalene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1
Acenaphthene	CE051	µg/l	<0.1	<0.1	0.2	<0.1
Fluorene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1
Phenanthrene	CE051	µg/l	<0.1	<0.1	0.4	<0.1
Anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1
Fluoranthene	CE051	µg/l	<0.1	<0.1	1.1	<0.1
Pyrene	CE051	µg/l	<0.1	<0.1	0.9	<0.1
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1	0.3	<0.1
Chrysene	CE051	µg/l	<0.1	<0.1	0.4	<0.1
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1	0.6	<0.1
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1	0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1	0.3	<0.1
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1	0.3	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1	0.2	<0.1
PAH (total of USEPA 16)	CE051	µg/l	<1.6	<1.6	4.8	<1.6
TPH						
EPH (>C10-C40)	CE052	µg/l	<10	<10	21	<10

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## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE063	Boron (water soluble)	Hot water extract, ICP-OES	Dry	M	0.5	mg/kg B
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	M	10	mg/l SO <sub>4</sub>
CE077	Cyanide (total)	Extraction, Continuous Flow Colorimetry	As received		1	mg/kg CN
CE069	Calorific value	Combustion, Carbon analyser	Dry		100	kJ/kg
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg
CE067	VPH Aromatic (>EC5-EC7)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC7-EC8)	Headspace GC-FID	As received		0.01	mg/kg
CE067	VPH Aromatic (>EC8-EC10)	Headspace GC-FID	As received		0.01	mg/kg
CE068	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID	As received		1	mg/kg
CE068	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID	As received		1	mg/kg
CE067	VPH Aliphatic (>C5-C6)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C6-C8)	Headspace GC-FID	As received		0.1	mg/kg
CE067	VPH Aliphatic (>C8-C10)	Headspace GC-FID	As received		0.1	mg/kg
CE068	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID	As received		4	mg/kg

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## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE068	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID	As received		4	mg/kg
CE068	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID	As received		10	mg/kg
CE033	EPH (>C10-C40)	Solvent extraction, GC-FID	As received	M	10	mg/kg
\$	Asbestos (qualitative)	HSG 248, Microscopy	Dry	U	-	-

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	PREPARED LEACHATES	METHOD SUMMARY	STATUS	LOD	UNITS
CE002	Leachate preparation (EA)	L:S 10:1		-	-
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Boron (dissolved)	ICP-MS	U	8	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
CE128	Chromium (dissolved)	ICP-MS	U	0.2	µg/l Cr
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE213	pH	Based on BS 1377, pH Meter	U	-	units
CE012	Ammonia	Colorimetry	U	10	µg/l N
CE049	Sulphate	Ion Chromatography	U	1.7	mg/l SO <sub>4</sub>
CE128	Sulphur (dissolved)	ICP-MS	U	0.2	mg/l S
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE051	Naphthalene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluorene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Phenanthrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Chrysene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(b)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(k)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Indeno(123cd)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Dibenz(ah)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(ghi)perylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l
CE052	EPH (>C10-C40)	Solvent extraction, GC-FID		10	µg/l

# Chemtech Environmental Limited

## DEVIATING SAMPLE INFORMATION

### Comments

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

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

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

### Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
88051-1	TP201	1.20	N	
88051-2	TP202	0.10	N	
88051-3	TP202	2.00	N	
88051-4	TP203	2.50	N	
88051-5	TP204	0.50-1.00	N	
88051-6	TP204	1.90-2.20	N	
88051-7	TP205	0.05-0.15	N	
88051-8	TP205	2.50	N	
88051-9	TP206	1.00-1.30	N	
88051-10	TP207	0.20-0.60	N	
88051-11	TP208	0.30-0.50	N	
88051-12	TP208	1.00-1.50	N	
88051-13	TP208	2.50-3.00	N	
88051-14	TP209	1.50	N	
88051-15	TP209	2.00-2.50	N	





2531



## ANALYTICAL TEST REPORT

Contract no: 90731  
Contract name: Houghton-le-Spring  
Client reference: 2585  
Clients name: Shadbolt Group  
Clients address: 18 Bewick Road  
Gateshead  
Tyne & Wear  
NE8 4DP  
  
Samples received: 02 November 2020  
Analysis started: 03 November 2020  
Analysis completed: 10 November 2020  
Report issued: 10 November 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.  
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.  
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.  
Methods, procedures and performance data are available on request.  
Results reported herein relate only to the material supplied to the laboratory.  
This report shall not be reproduced except in full, without prior written approval.  
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.  
  
BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

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

Approved by:

John Campbell  
Director

# Chemtech Environmental Limited

## SOILS

Lab number			90731-3	90731-4	90731-5	90731-6	90731-7	90731-8
Sample id			HP01	HP02	HP03	HP04	HP05	HP06
Depth (m)			0.60-1.20	0.60	0.50-1.20	0.60-0.80	0.60-1.20	0.50
Date sampled			02/11/2020	02/11/2020	02/11/2020	02/11/2020	02/11/2020	02/11/2020
Test	Method	Units						
BTEX								
Benzene	CE192 <sup>u</sup>	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	CE192 <sup>u</sup>	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	CE192 <sup>u</sup>	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
m & p-Xylene	CE192 <sup>u</sup>	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
o-Xylene	CE192 <sup>u</sup>	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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## SOILS

Lab number	90731-9		
Sample id	HP07		
Depth (m)	0.50-1.00		
Date sampled	02/11/2020		
Test	Method	Units	
BTEX			
Benzene	CE192 <sup>u</sup>	mg/kg	<0.01
Toluene	CE192 <sup>u</sup>	mg/kg	<0.01
Ethylbenzene	CE192 <sup>u</sup>	mg/kg	<0.01
m & p-Xylene	CE192 <sup>u</sup>	mg/kg	<0.02
o-Xylene	CE192 <sup>u</sup>	mg/kg	<0.01

# Chemtech Environmental Limited

## WATERS

Lab number			90731-1	90731-2
Sample id			BH03	BH04
Depth (m)			-	-
Date sampled			02/11/2020	02/11/2020
Time sampled			-	-
Test	Method	Units		
Arsenic (dissolved)	CE128 <sup>u</sup>	µg/l As	1.97	2.41
Boron (dissolved)	CE128 <sup>u</sup>	µg/l B	709	1563
Cadmium (dissolved)	CE128 <sup>u</sup>	µg/l Cd	<0.07	0.13
Chromium (dissolved)	CE128 <sup>u</sup>	µg/l Cr	1.4	<0.2
Copper (dissolved)	CE128 <sup>u</sup>	µg/l Cu	0.4	0.9
Lead (dissolved)	CE128 <sup>u</sup>	µg/l Pb	<0.2	<0.2
Mercury (dissolved)	CE128 <sup>u</sup>	µg/l Hg	0.037	0.031
Nickel (dissolved)	CE128 <sup>u</sup>	µg/l Ni	16.8	6.3
Selenium (dissolved)	CE128 <sup>u</sup>	µg/l Se	11.50	60.01
Zinc (dissolved)	CE128 <sup>u</sup>	µg/l Zn	9	16
pH	CE213 <sup>u</sup>	units	7.1	7.1
Ammonia	CE012 <sup>u</sup>	µg/l N	47	47
Sulphate	CE049 <sup>u</sup>	mg/l SO <sub>4</sub>	370	1175
Sulphur (dissolved)	CE128 <sup>u</sup>	mg/l S	156.8	501.2
Cyanide (total)	CE147	µg/l CN	<20	<20
PAH				
Naphthalene	CE051	µg/l	<0.1	<0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1
Acenaphthene	CE051	µg/l	<0.1	<0.1
Fluorene	CE051	µg/l	<0.1	<0.1
Phenanthrene	CE051	µg/l	<0.1	<0.1
Anthracene	CE051	µg/l	<0.1	<0.1
Fluoranthene	CE051	µg/l	<0.1	<0.1
Pyrene	CE051	µg/l	<0.1	<0.1
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1
Chrysene	CE051	µg/l	<0.1	<0.1
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1
PAH (total of USEPA 16)	CE051	µg/l	<1.6	<1.6
BTEX & TPH				
MTBE	CE057 <sup>u</sup>	µg/l	<2	<2
Benzene	CE057 <sup>u</sup>	µg/l	<1	<1
Toluene	CE057 <sup>u</sup>	µg/l	<1	<1
Ethylbenzene	CE057 <sup>u</sup>	µg/l	<1	<1
m & p-Xylene	CE057 <sup>u</sup>	µg/l	<2	<2
o-Xylene	CE057 <sup>u</sup>	µg/l	<1	<1

# Chemtech Environmental Limited

## WATERS

Lab number			90731-1	90731-2
Sample id			BH03	BH04
Depth (m)			-	-
Date sampled			02/11/2020	02/11/2020
Time sampled			-	-
Test	Method	Units		
VPH Aromatic (>EC5-EC7)	CE175	µg/l	<1	<1
VPH Aromatic (>EC7-EC8)	CE175	µg/l	<1	<1
VPH Aromatic (>EC8-EC10)	CE175	µg/l	<1	<1
EPH Aromatic (>EC10-EC12)	CE161	µg/l	<1	<1
EPH Aromatic (>EC12-EC16)	CE161	µg/l	<1	<1
EPH Aromatic (>EC16-EC21)	CE161	µg/l	<1	<1
EPH Aromatic (>EC21-EC35)	CE161	µg/l	<1	<1
EPH Aromatic (>EC35-EC44)	CE161	µg/l	<1	<1
VPH Aliphatic (>C5-C6)	CE175	µg/l	<1	<1
VPH Aliphatic (>C6-C8)	CE175	µg/l	<1	<1
VPH Aliphatic (>C8-C10)	CE175	µg/l	<1	<1
EPH Aliphatic (>C10-C12)	CE161	µg/l	<1	<1
EPH Aliphatic (>C12-C16)	CE161	µg/l	<1	<1
EPH Aliphatic (>C16-C35)	CE161	µg/l	<1	3
EPH Aliphatic (>C35-C44)	CE161	µg/l	<1	<1
EPH (>C10-C40)	CE052	µg/l	<10	<10
Volatiles				
Dichlorodifluoromethane	CE066	µg/l	<1	<1
Chloromethane	CE066	µg/l	<1	<1
Vinyl chloride	CE066	µg/l	<1	<1
Bromomethane	CE066	µg/l	<3	<3
Chloroethane	CE066	µg/l	<1	<1
Trichlorofluoromethane	CE066	µg/l	<1	<1
1,1-Dichloroethene	CE066	µg/l	<1	<1
Trans-1,2-Dichloroethene	CE066	µg/l	<1	<1
1,1-Dichloroethane	CE066	µg/l	<1	<1
2,2-Dichloropropane	CE066	µg/l	<1	<1
Cis-1,2-Dichloroethene	CE066	µg/l	<1	<1
Bromochloromethane	CE066	µg/l	<1	<1
Chloroform	CE066	µg/l	<1	<1
1,1,1-Trichloroethane	CE066	µg/l	<1	<1
Carbon tetrachloride	CE066	µg/l	<1	<1
1,1-Dichloro-1-propene	CE066	µg/l	<1	<1
1,2-Dichloroethane	CE066	µg/l	<1	<1
Trichloroethene	CE066	µg/l	<1	<1
1,2-Dichloropropane	CE066	µg/l	<1	<1
Dibromomethane	CE066	µg/l	<1	<1
Bromodichloromethane	CE066	µg/l	<1	<1
cis-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1
trans-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1

# Chemtech Environmental Limited

## WATERS

Lab number			90731-1	90731-2
Sample id			BH03	BH04
Depth (m)			-	-
Date sampled			02/11/2020	02/11/2020
Time sampled			-	-
Test	Method	Units		
1,1,2-Trichloroethane	CE066	µg/l	<1	<1
Tetrachloroethene	CE066	µg/l	<1	<1
1,3-Dichloropropane	CE066	µg/l	<1	<1
Dibromochloromethane	CE066	µg/l	<1	<1
1,2-Dibromoethane	CE066	µg/l	<1	<1
Chlorobenzene	CE066	µg/l	<1	<1
1,1,1,2-Tetrachloroethane	CE066	µg/l	<1	<1
Styrene	CE066	µg/l	<1	<1
Tribromomethane	CE066	µg/l	<1	<1
Isopropylbenzene	CE066	µg/l	<1	<1
Bromobenzene	CE066	µg/l	<1	<1
1,1,2,2-Tetrachloroethane	CE066	µg/l	<1	<1
1,2,3-Trichloropropane	CE066	µg/l	<1	<1
Propylbenzene	CE066	µg/l	<1	<1
2-Chlorotoluene	CE066	µg/l	<1	<1
4-Chlorotoluene	CE066	µg/l	<1	<1
1,3,5-Trimethylbenzene	CE066	µg/l	<1	<1
tert-Butylbenzene	CE066	µg/l	<1	<1
1,2,4-Trimethylbenzene	CE066	µg/l	<1	<1
sec-Butylbenzene	CE066	µg/l	<1	<1
1,3-Dichlorobenzene	CE066	µg/l	<1	<1
4-Isopropyltoluene	CE066	µg/l	<1	<1
1,4-Dichlorobenzene	CE066	µg/l	<1	<1
1,2-Dichlorobenzene	CE066	µg/l	<1	<1
Butylbenzene	CE066	µg/l	<1	<1
1,2-Dibromo-3-chloropropane	CE066	µg/l	<1	<1
1,2,4-Trichlorobenzene	CE066	µg/l	<1	<1
Hexachloro-1,3-butadiene	CE066	µg/l	<1	<1
1,2,3-Trichlorobenzene	CE066	µg/l	<1	<1

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## METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE192	Benzene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	Toluene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	Ethylbenzene	Headspace GC-FID	As received	U	0.01	mg/kg
CE192	m & p-Xylene	Headspace GC-FID	As received	U	0.02	mg/kg
CE192	o-Xylene	Headspace GC-FID	As received	U	0.01	mg/kg

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Boron (dissolved)	ICP-MS	U	8	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
CE128	Chromium (dissolved)	ICP-MS	U	0.2	µg/l Cr
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE213	pH	Based on BS 1377, pH Meter	U	-	units
CE012	Ammonia	Colorimetry	U	10	µg/l N
CE049	Sulphate	Ion Chromatography	U	1.7	mg/l SO <sub>4</sub>
CE128	Sulphur (dissolved)	ICP-MS	U	0.2	mg/l S
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE051	Naphthalene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluorene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Phenanthrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Chrysene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(b)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(k)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Indeno(123cd)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Dibenz(ah)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(ghi)perylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l
CE057	MTBE	Headspace GC-FID	U	2	µg/l
CE057	Benzene	Headspace GC-FID	U	1	µg/l
CE057	Toluene	Headspace GC-FID	U	1	µg/l
CE057	Ethylbenzene	Headspace GC-FID	U	1	µg/l
CE057	m & p-Xylene	Headspace GC-FID	U	2	µg/l
CE057	o-Xylene	Headspace GC-FID	U	1	µg/l
CE175	VPH Aromatic (>EC5-EC7)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC7-EC8)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC8-EC10)	Headspace GC-FID		1	µg/l
CE161	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID		1	µg/l



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## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE161	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID		1	µg/l
CE175	VPH Aliphatic (>C5-C6)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C6-C8)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C8-C10)	Headspace GC-FID		1	µg/l
CE161	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID		1	µg/l
CE052	EPH (>C10-C40)	Solvent extraction, GC-FID		10	µg/l
CE066	Dichlorodifluoromethane	Headspace GC-MS		1	µg/l
CE066	Chloromethane	Headspace GC-MS		1	µg/l
CE066	Vinyl chloride	Headspace GC-MS		1	µg/l
CE066	Bromomethane	Headspace GC-MS		3	µg/l
CE066	Chloroethane	Headspace GC-MS		1	µg/l
CE066	Trichlorofluoromethane	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Trans-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	2,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Cis-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Bromochloromethane	Headspace GC-MS		1	µg/l
CE066	Chloroform	Headspace GC-MS		1	µg/l
CE066	1,1,1-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Carbon tetrachloride	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	Trichloroethene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromomethane	Headspace GC-MS		1	µg/l
CE066	Bromodichloromethane	Headspace GC-MS		1	µg/l
CE066	cis-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	trans-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,1,2-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Tetrachloroethene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromochloromethane	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromoethane	Headspace GC-MS		1	µg/l
CE066	Chlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,1,1,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	Styrene	Headspace GC-MS		1	µg/l
CE066	Tribromomethane	Headspace GC-MS		1	µg/l
CE066	Isopropylbenzene	Headspace GC-MS		1	µg/l
CE066	Bromobenzene	Headspace GC-MS		1	µg/l

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE066	1,1,2,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichloropropane	Headspace GC-MS		1	µg/l
CE066	Propylbenzene	Headspace GC-MS		1	µg/l
CE066	2-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	4-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	1,3,5-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	tert-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	sec-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	4-Isopropyltoluene	Headspace GC-MS		1	µg/l
CE066	1,4-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromo-3-chloropropane	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Hexachloro-1,3-butadiene	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichlorobenzene	Headspace GC-MS		1	µg/l

# Chemtech Environmental Limited

## DEVIATING SAMPLE INFORMATION

### Comments

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

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

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

### Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
90731-1	BH03	-	N	
90731-2	BH04	-	N	
90731-3	HP01	0.60-1.20	N	
90731-4	HP02	0.60	N	
90731-5	HP03	0.50-1.20	N	
90731-6	HP04	0.60-0.80	N	
90731-7	HP05	0.60-1.20	N	
90731-8	HP06	0.50	N	
90731-9	HP07	0.50-1.00	N	



2531



## ANALYTICAL TEST REPORT

Contract no: 90765  
Contract name: Houghton-le-Spring  
Client reference: 2585  
Clients name: Shadbolt Group  
Clients address: 18 Bewick Road  
Gateshead  
Tyne & Wear  
NE8 4DP  
  
Samples received: 03 November 2020  
Analysis started: 03 November 2020  
Analysis completed: 10 November 2020  
Report issued: 10 November 2020

Notes: Opinions and interpretations expressed herein are outside the UKAS accreditation scope.  
Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.  
All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.  
Methods, procedures and performance data are available on request.  
Results reported herein relate only to the material supplied to the laboratory.  
This report shall not be reproduced except in full, without prior written approval.  
Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.  
  
BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.

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

Approved by:

John Campbell  
Director

# Chemtech Environmental Limited

## WATERS

Lab number			90765-1	90765-2	90765-3
Sample id			BH01	BH02	BH10
Depth (m)			-	-	-
Date sampled			03/11/2020	03/11/2020	03/11/2020
Time sampled			-	-	-
Test	Method	Units			
Arsenic (dissolved)	CE128 <sup>u</sup>	µg/l As	0.88	1.38	0.26
Boron (dissolved)	CE128 <sup>u</sup>	µg/l B	622	572	399
Cadmium (dissolved)	CE128 <sup>u</sup>	µg/l Cd	<0.07	<0.07	<0.07
Chromium (dissolved)	CE128 <sup>u</sup>	µg/l Cr	2.9	2.8	1.2
Copper (dissolved)	CE128 <sup>u</sup>	µg/l Cu	2.3	0.6	0.6
Lead (dissolved)	CE128 <sup>u</sup>	µg/l Pb	<0.2	<0.2	<0.2
Mercury (dissolved)	CE128 <sup>u</sup>	µg/l Hg	<0.008	<0.008	<0.008
Nickel (dissolved)	CE128 <sup>u</sup>	µg/l Ni	5.4	9.2	2.0
Selenium (dissolved)	CE128 <sup>u</sup>	µg/l Se	5.93	1.24	0.95
Zinc (dissolved)	CE128 <sup>u</sup>	µg/l Zn	11	9	7
pH	CE213 <sup>u</sup>	units	7.3	7.2	7.3
Ammonia	CE012 <sup>u</sup>	µg/l N	311	79	47
Sulphate	CE049 <sup>u</sup>	mg/l SO <sub>4</sub>	504	239	262
Sulphur (dissolved)	CE128 <sup>u</sup>	mg/l S	133.5	85.7	93.1
Cyanide (total)	CE147	µg/l CN	<20	<20	<20
PAH					
Naphthalene	CE051	µg/l	<0.1	<0.1	0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1	<0.1
Acenaphthene	CE051	µg/l	<0.1	<0.1	<0.1
Fluorene	CE051	µg/l	<0.1	<0.1	<0.1
Phenanthrene	CE051	µg/l	0.3	<0.1	0.2
Anthracene	CE051	µg/l	0.1	<0.1	<0.1
Fluoranthene	CE051	µg/l	0.3	0.2	0.3
Pyrene	CE051	µg/l	0.2	0.2	0.2
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1	0.2
Chrysene	CE051	µg/l	<0.1	<0.1	0.2
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1	0.2
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1	0.4
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1	<0.1
PAH (total of USEPA 16)	CE051	µg/l	<1.6	<1.6	1.8
BTEX & TPH					
MTBE	CE057 <sup>u</sup>	µg/l	<2	<2	<2
Benzene	CE057 <sup>u</sup>	µg/l	<1	<1	<1
Toluene	CE057 <sup>u</sup>	µg/l	<1	<1	<1
Ethylbenzene	CE057 <sup>u</sup>	µg/l	<1	<1	<1
m & p-Xylene	CE057 <sup>u</sup>	µg/l	<2	<2	<2
o-Xylene	CE057 <sup>u</sup>	µg/l	<1	<1	<1

# Chemtech Environmental Limited

## WATERS

Lab number			90765-1	90765-2	90765-3
Sample id			BH01	BH02	BH10
Depth (m)			-	-	-
Date sampled			03/11/2020	03/11/2020	03/11/2020
Time sampled			-	-	-
Test	Method	Units			
VPH Aromatic (>EC5-EC7)	CE175	µg/l	<1	<1	<1
VPH Aromatic (>EC7-EC8)	CE175	µg/l	<1	<1	<1
VPH Aromatic (>EC8-EC10)	CE175	µg/l	<1	<1	<1
EPH Aromatic (>EC10-EC12)	CE161	µg/l	<1	<1	<1
EPH Aromatic (>EC12-EC16)	CE161	µg/l	<1	<1	<1
EPH Aromatic (>EC16-EC21)	CE161	µg/l	<1	<1	<1
EPH Aromatic (>EC21-EC35)	CE161	µg/l	<1	<1	<1
EPH Aromatic (>EC35-EC44)	CE161	µg/l	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE175	µg/l	<1	<1	<1
VPH Aliphatic (>C6-C8)	CE175	µg/l	<1	<1	<1
VPH Aliphatic (>C8-C10)	CE175	µg/l	<1	<1	<1
EPH Aliphatic (>C10-C12)	CE161	µg/l	<1	<1	<1
EPH Aliphatic (>C12-C16)	CE161	µg/l	<1	1	2
EPH Aliphatic (>C16-C35)	CE161	µg/l	<1	2	2
EPH Aliphatic (>C35-C44)	CE161	µg/l	<1	<1	<1
EPH (>C10-C40)	CE052	µg/l	<10	<10	<10
Volatiles					
Dichlorodifluoromethane	CE066	µg/l	<1	<1	<1
Chloromethane	CE066	µg/l	<1	<1	<1
Vinyl chloride	CE066	µg/l	<1	<1	<1
Bromomethane	CE066	µg/l	<3	<3	<3
Chloroethane	CE066	µg/l	<1	<1	<1
Trichlorofluoromethane	CE066	µg/l	<1	<1	<1
1,1-Dichloroethene	CE066	µg/l	<1	<1	<1
Trans-1,2-Dichloroethene	CE066	µg/l	<1	<1	<1
1,1-Dichloroethane	CE066	µg/l	<1	<1	<1
2,2-Dichloropropane	CE066	µg/l	<1	<1	<1
Cis-1,2-Dichloroethene	CE066	µg/l	<1	<1	<1
Bromochloromethane	CE066	µg/l	<1	<1	<1
Chloroform	CE066	µg/l	<1	<1	<1
1,1,1-Trichloroethane	CE066	µg/l	<1	<1	<1
Carbon tetrachloride	CE066	µg/l	<1	<1	<1
1,1-Dichloro-1-propene	CE066	µg/l	<1	<1	<1
1,2-Dichloroethane	CE066	µg/l	<1	<1	<1
Trichloroethene	CE066	µg/l	<1	<1	<1
1,2-Dichloropropane	CE066	µg/l	<1	<1	<1
Dibromomethane	CE066	µg/l	<1	<1	<1
Bromodichloromethane	CE066	µg/l	<1	<1	<1
cis-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	<1
trans-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	<1

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## WATERS

Lab number			90765-1	90765-2	90765-3
Sample id			BH01	BH02	BH10
Depth (m)			-	-	-
Date sampled			03/11/2020	03/11/2020	03/11/2020
Time sampled			-	-	-
Test	Method	Units			
1,1,2-Trichloroethane	CE066	µg/l	<1	<1	<1
Tetrachloroethene	CE066	µg/l	<1	<1	<1
1,3-Dichloropropane	CE066	µg/l	<1	<1	<1
Dibromochloromethane	CE066	µg/l	<1	<1	<1
1,2-Dibromoethane	CE066	µg/l	<1	<1	<1
Chlorobenzene	CE066	µg/l	<1	<1	<1
1,1,1,2-Tetrachloroethane	CE066	µg/l	<1	<1	<1
Styrene	CE066	µg/l	<1	<1	<1
Tribromomethane	CE066	µg/l	<1	<1	<1
Isopropylbenzene	CE066	µg/l	<1	<1	<1
Bromobenzene	CE066	µg/l	<1	<1	<1
1,1,2,2-Tetrachloroethane	CE066	µg/l	<1	<1	<1
1,2,3-Trichloropropane	CE066	µg/l	<1	<1	<1
Propylbenzene	CE066	µg/l	<1	<1	<1
2-Chlorotoluene	CE066	µg/l	<1	<1	<1
4-Chlorotoluene	CE066	µg/l	<1	<1	<1
1,3,5-Trimethylbenzene	CE066	µg/l	<1	<1	<1
tert-Butylbenzene	CE066	µg/l	<1	<1	<1
1,2,4-Trimethylbenzene	CE066	µg/l	<1	<1	<1
sec-Butylbenzene	CE066	µg/l	<1	<1	<1
1,3-Dichlorobenzene	CE066	µg/l	<1	<1	<1
4-Isopropyltoluene	CE066	µg/l	<1	<1	<1
1,4-Dichlorobenzene	CE066	µg/l	<1	<1	<1
1,2-Dichlorobenzene	CE066	µg/l	<1	<1	<1
Butylbenzene	CE066	µg/l	<1	<1	<1
1,2-Dibromo-3-chloropropane	CE066	µg/l	<1	<1	<1
1,2,4-Trichlorobenzene	CE066	µg/l	<1	<1	<1
Hexachloro-1,3-butadiene	CE066	µg/l	<1	<1	<1
1,2,3-Trichlorobenzene	CE066	µg/l	<1	<1	<1

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## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Boron (dissolved)	ICP-MS	U	8	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
CE128	Chromium (dissolved)	ICP-MS	U	0.2	µg/l Cr
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE213	pH	Based on BS 1377, pH Meter	U	-	units
CE012	Ammonia	Colorimetry	U	10	µg/l N
CE049	Sulphate	Ion Chromatography	U	1.7	mg/l SO <sub>4</sub>
CE128	Sulphur (dissolved)	ICP-MS	U	0.2	mg/l S
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE051	Naphthalene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluorene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Phenanthrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Chrysene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(b)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(k)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Indeno(123cd)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Dibenz(ah)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(ghi)perylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l
CE057	MTBE	Headspace GC-FID	U	2	µg/l
CE057	Benzene	Headspace GC-FID	U	1	µg/l
CE057	Toluene	Headspace GC-FID	U	1	µg/l
CE057	Ethylbenzene	Headspace GC-FID	U	1	µg/l
CE057	m & p-Xylene	Headspace GC-FID	U	2	µg/l
CE057	o-Xylene	Headspace GC-FID	U	1	µg/l
CE175	VPH Aromatic (>EC5-EC7)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC7-EC8)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC8-EC10)	Headspace GC-FID		1	µg/l
CE161	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID		1	µg/l



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## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE161	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID		1	µg/l
CE175	VPH Aliphatic (>C5-C6)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C6-C8)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C8-C10)	Headspace GC-FID		1	µg/l
CE161	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID		1	µg/l
CE052	EPH (>C10-C40)	Solvent extraction, GC-FID		10	µg/l
CE066	Dichlorodifluoromethane	Headspace GC-MS		1	µg/l
CE066	Chloromethane	Headspace GC-MS		1	µg/l
CE066	Vinyl chloride	Headspace GC-MS		1	µg/l
CE066	Bromomethane	Headspace GC-MS		3	µg/l
CE066	Chloroethane	Headspace GC-MS		1	µg/l
CE066	Trichlorofluoromethane	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Trans-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	2,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Cis-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Bromochloromethane	Headspace GC-MS		1	µg/l
CE066	Chloroform	Headspace GC-MS		1	µg/l
CE066	1,1,1-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Carbon tetrachloride	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	Trichloroethene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromomethane	Headspace GC-MS		1	µg/l
CE066	Bromodichloromethane	Headspace GC-MS		1	µg/l
CE066	cis-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	trans-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,1,2-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Tetrachloroethene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromochloromethane	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromoethane	Headspace GC-MS		1	µg/l
CE066	Chlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,1,1,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	Styrene	Headspace GC-MS		1	µg/l
CE066	Tribromomethane	Headspace GC-MS		1	µg/l
CE066	Isopropylbenzene	Headspace GC-MS		1	µg/l
CE066	Bromobenzene	Headspace GC-MS		1	µg/l

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## METHOD DETAILS

METHOD	WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE066	1,1,2,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichloropropane	Headspace GC-MS		1	µg/l
CE066	Propylbenzene	Headspace GC-MS		1	µg/l
CE066	2-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	4-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	1,3,5-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	tert-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	sec-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	4-Isopropyltoluene	Headspace GC-MS		1	µg/l
CE066	1,4-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromo-3-chloropropane	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Hexachloro-1,3-butadiene	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichlorobenzene	Headspace GC-MS		1	µg/l

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## DEVIATING SAMPLE INFORMATION

### Comments

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

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

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

### Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
90765-1	BH01	-	N	
90765-2	BH02	-	N	
90765-3	BH10	-	N	



## ANALYTICAL TEST REPORT

Contract no: 103880

Contract name: Houghton (Colliery)

Client reference: 2585

Clients name: Shadbolt Group Ltd

Clients address: 18 Bewick Road  
Gateshead  
Tyne and Wear  
NE8 4DP

Samples received: 16 December 2021

Analysis started: 16 December 2021

Analysis completed: 23 December 2021

Report issued: 23 December 2021

Key

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

Approved by:

A handwritten signature in black ink, appearing to read 'R. Burton', written over a horizontal line.

Rachael Burton

Reporting Team Lead

# Chemtech Environmental Limited

## GROUNDWATERS

Lab number			103880-1	103880-2	103880-3	103880-4	103880-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			15/12/2021	15/12/2021	15/12/2021	15/12/2021	15/12/2021
Time sampled			12:00	13:00	13:30	14:00	15:00
Test	Method	Units					
Arsenic (dissolved)	CE128 <sup>u</sup>	µg/l As	0.52	2.65	0.66	1.54	0.60
Boron (dissolved)	CE128 <sup>u</sup>	µg/l B	653	565	301	1024	548
Cadmium (dissolved)	CE128 <sup>u</sup>	µg/l Cd	0.08	<0.07	<0.07	<0.07	<0.07
Chromium (dissolved)	CE128 <sup>u</sup>	µg/l Cr	0.6	0.4	0.3	0.9	0.4
Copper (dissolved)	CE128 <sup>u</sup>	µg/l Cu	1.2	<0.4	<0.4	<0.4	0.8
Lead (dissolved)	CE128 <sup>u</sup>	µg/l Pb	0.5	0.4	0.2	<0.2	<0.2
Mercury (dissolved)	CE128 <sup>u</sup>	µg/l Hg	<0.008	<0.008	<0.008	<0.008	<0.008
Nickel (dissolved)	CE128 <sup>u</sup>	µg/l Ni	5.9	6.1	3.7	7.1	5.3
Selenium (dissolved)	CE128 <sup>u</sup>	µg/l Se	13.29	1.19	5.65	43.90	15.37
Zinc (dissolved)	CE128 <sup>u</sup>	µg/l Zn	10	3	2	3	4
pH	CE213 <sup>u</sup>	units	7.4	7.4	7.5	7.4	7.3
Ammonia	CE012 <sup>u</sup>	µg/l N	864	231	151	162	133
Sulphate	CE049 <sup>u</sup>	mg/l SO <sub>4</sub>	259	137	199	891	21
Sulphur (dissolved)	CE128 <sup>u</sup>	mg/l S	92.3	42.3	79.4	343.5	113.1
Cyanide (total)	CE147	µg/l CN	<20	<20	<20	<20	<20
PAH							
Naphthalene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
PAH (total of USEPA 16)	CE051	µg/l	<1.6	<1.6	<1.6	<1.6	<1.6
TPH							
VPH Aromatic (>EC5-EC7)	CE175	µg/l	<1	<1	<1	<1	<1
VPH Aromatic (>EC7-EC8)	CE175	µg/l	<1	<1	<1	<1	<1
VPH Aromatic (>EC8-EC10)	CE175	µg/l	<1	<1	<1	<1	<1
EPH Aromatic (>EC10-EC12)	CE161	µg/l	<1	<1	<1	<1	<1
EPH Aromatic (>EC12-EC16)	CE161	µg/l	<1	<1	<1	<1	<1
EPH Aromatic (>EC16-EC21)	CE161	µg/l	<1	<1	<1	<1	<1

# Chemtech Environmental Limited

## GROUNDWATERS

Lab number			103880-1	103880-2	103880-3	103880-4	103880-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			15/12/2021	15/12/2021	15/12/2021	15/12/2021	15/12/2021
Time sampled			12:00	13:00	13:30	14:00	15:00
Test	Method	Units					
EPH Aromatic (>EC21-EC35)	CE161	µg/l	<1	<1	<1	<1	<1
EPH Aromatic (>EC35-EC44)	CE161	µg/l	<1	<1	<1	<1	<1
VPH Aliphatic (>C5-C6)	CE175	µg/l	<1	<1	<1	<1	<1
VPH Aliphatic (>C6-C8)	CE175	µg/l	<1	<1	<1	<1	<1
VPH Aliphatic (>C8-C10)	CE175	µg/l	<1	<1	<1	<1	<1
EPH Aliphatic (>C10-C12)	CE161	µg/l	20	11	<1	6	<1
EPH Aliphatic (>C12-C16)	CE161	µg/l	49	45	11	13	1
EPH Aliphatic (>C16-C35)	CE161	µg/l	<1	217	12	51	<1
EPH Aliphatic (>C35-C44)	CE161	µg/l	<1	75	<1	<1	<1
EPH (>C10-C40)	CE052	µg/l	35	319	30	71	<10
Volatiles							
MTBE	CE057 <sup>u</sup>	µg/l	<2	<2	<2	<2	<2
Benzene	CE057 <sup>u</sup>	µg/l	<1	<1	<1	<1	<1
Toluene	CE057 <sup>u</sup>	µg/l	<1	<1	<1	<1	<1
Ethylbenzene	CE057 <sup>u</sup>	µg/l	<1	<1	<1	<1	<1
m & p-Xylene	CE057 <sup>u</sup>	µg/l	<2	<2	<2	<2	<2
o-Xylene	CE057 <sup>u</sup>	µg/l	<1	<1	<1	<1	<1
Dichlorodifluoromethane	CE066	µg/l	<1	<1	<1	<1	<1
Chloromethane	CE066	µg/l	<1	<1	<1	<1	<1
Vinyl chloride	CE066	µg/l	<1	<1	<1	<1	<1
Bromomethane	CE066	µg/l	<1	<1	<1	<1	<1
Chloroethane	CE066	µg/l	<1	<1	<1	<1	<1
Trichlorofluoromethane	CE066	µg/l	<1	<1	<1	<1	<1
1,1-Dichloroethene	CE066	µg/l	<1	<1	<1	<1	<1
Trans-1,2-Dichloroethene	CE066	µg/l	<1	<1	<1	<1	<1
1,1-Dichloroethane	CE066	µg/l	<1	<1	<1	<1	<1
2,2-Dichloropropane	CE066	µg/l	<1	<1	<1	<1	<1
Cis-1,2-Dichloroethene	CE066	µg/l	<1	<1	<1	<1	<1
Bromochloromethane	CE066	µg/l	<1	<1	<1	<1	<1
Chloroform	CE066	µg/l	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	CE066	µg/l	<1	<1	<1	<1	<1
Carbon tetrachloride	CE066	µg/l	<1	<1	<1	<1	<1
1,1-Dichloro-1-propene	CE066	µg/l	<1	<1	<1	<1	<1
1,2-Dichloroethane	CE066	µg/l	<1	<1	<1	<1	<1
Trichloroethene	CE066	µg/l	<1	<1	<1	<1	<1
1,2-Dichloropropane	CE066	µg/l	<1	<1	<1	<1	<1
Dibromomethane	CE066	µg/l	<1	<1	<1	<1	<1
Bromodichloromethane	CE066	µg/l	<1	<1	<1	<1	<1
cis-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	<1	<1	<1
trans-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	<1	<1	<1

# Chemtech Environmental Limited

## GROUNDWATERS

Lab number			103880-1	103880-2	103880-3	103880-4	103880-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			15/12/2021	15/12/2021	15/12/2021	15/12/2021	15/12/2021
Time sampled			12:00	13:00	13:30	14:00	15:00
Test	Method	Units					
1,1,2-Trichloroethane	CE066	µg/l	<1	<1	<1	<1	<1
Tetrachloroethene	CE066	µg/l	<1	<1	<1	<1	<1
1,3-Dichloropropane	CE066	µg/l	<1	<1	<1	<1	<1
Dibromochloromethane	CE066	µg/l	<1	<1	<1	<1	<1
1,2-Dibromoethane	CE066	µg/l	<1	<1	<1	<1	<1
Chlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	CE066	µg/l	<1	<1	<1	<1	<1
Ethylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
Tribromomethane	CE066	µg/l	<1	<1	<1	<1	<1
Isopropylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
Bromobenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	CE066	µg/l	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	CE066	µg/l	<1	<1	<1	<1	<1
Propylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
2-Chlorotoluene	CE066	µg/l	<1	<1	<1	<1	<1
4-Chlorotoluene	CE066	µg/l	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
tert-Butylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
sec-Butylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1
4-Isopropyltoluene	CE066	µg/l	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1
Butylbenzene	CE066	µg/l	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	CE066	µg/l	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1
Hexachloro-1,3-butadiene	CE066	µg/l	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	CE066	µg/l	<1	<1	<1	<1	<1

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## METHOD DETAILS

METHOD	GROUNDWATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Boron (dissolved)	ICP-MS	U	8	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
CE128	Chromium (dissolved)	ICP-MS	U	0.2	µg/l Cr
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE213	pH	Based on BS 1377, pH Meter	U	-	units
CE012	Ammonia	Colorimetry	U	10	µg/l N
CE049	Sulphate	Ion Chromatography	U	1.7	mg/l SO <sub>4</sub>
CE128	Sulphur (dissolved)	ICP-MS	U	0.2	mg/l S
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE051	Naphthalene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluorene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Phenanthrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Chrysene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(b)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(k)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Indeno(123cd)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Dibenz(ah)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(ghi)perylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l
CE175	VPH Aromatic (>EC5-EC7)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC7-EC8)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC8-EC10)	Headspace GC-FID		1	µg/l
CE161	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID		1	µg/l
CE175	VPH Aliphatic (>C5-C6)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C6-C8)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C8-C10)	Headspace GC-FID		1	µg/l
CE161	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID		1	µg/l



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## METHOD DETAILS

METHOD	GROUNDWATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE161	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID		1	µg/l
CE052	EPH (>C10-C40)	Solvent extraction, GC-FID		10	µg/l
CE057	MTBE	Headspace GC-FID	U	2	µg/l
CE057	Benzene	Headspace GC-FID	U	1	µg/l
CE057	Toluene	Headspace GC-FID	U	1	µg/l
CE057	Ethylbenzene	Headspace GC-FID	U	1	µg/l
CE057	m & p-Xylene	Headspace GC-FID	U	2	µg/l
CE057	o-Xylene	Headspace GC-FID	U	1	µg/l
CE066	Dichlorodifluoromethane	Headspace GC-MS		1	µg/l
CE066	Chloromethane	Headspace GC-MS		1	µg/l
CE066	Vinyl chloride	Headspace GC-MS		1	µg/l
CE066	Bromomethane	Headspace GC-MS		3	µg/l
CE066	Chloroethane	Headspace GC-MS		1	µg/l
CE066	Trichlorofluoromethane	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Trans-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	2,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Cis-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Bromochloromethane	Headspace GC-MS		1	µg/l
CE066	Chloroform	Headspace GC-MS		1	µg/l
CE066	1,1,1-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Carbon tetrachloride	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	Trichloroethene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromomethane	Headspace GC-MS		1	µg/l
CE066	Bromodichloromethane	Headspace GC-MS		1	µg/l
CE066	cis-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	trans-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,1,2-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Tetrachloroethene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromochloromethane	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromoethane	Headspace GC-MS		1	µg/l
CE066	Chlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,1,1,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	Styrene	Headspace GC-MS		1	µg/l
CE066	Tribromomethane	Headspace GC-MS		1	µg/l
CE066	Isopropylbenzene	Headspace GC-MS		1	µg/l
CE066	Bromobenzene	Headspace GC-MS		1	µg/l

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## METHOD DETAILS

METHOD	GROUNDWATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE066	1,1,2,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichloropropane	Headspace GC-MS		1	µg/l
CE066	Propylbenzene	Headspace GC-MS		1	µg/l
CE066	2-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	4-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	1,3,5-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	tert-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	sec-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	4-Isopropyltoluene	Headspace GC-MS		1	µg/l
CE066	1,4-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromo-3-chloropropane	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Hexachloro-1,3-butadiene	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichlorobenzene	Headspace GC-MS		1	µg/l

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## DEVIATING SAMPLE INFORMATION

### Comments

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

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

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

### Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
103880-1	BH01	-	N	-
103880-2	BH02	-	N	-
103880-3	BH03	-	N	-
103880-4	BH04	-	N	-
103880-5	BH10	-	N	-

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## ADDITIONAL INFORMATION

### Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.



## ANALYTICAL TEST REPORT

Contract no: 104157

Contract name: Houghton (Colliery)

Client reference: 2585

Clients name: Shadbolt Group

Clients address: 18 Bewick Road  
Gateshead  
Tyne & Wear  
NE8 4DP

Samples received: 22 December 2021

Analysis started: 22 December 2021

Analysis completed: 10 January 2022

Report issued: 10 January 2022

Key

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

Approved by:

A handwritten signature in black ink, appearing to read 'R. Burton', written over a horizontal line.

Rachael Burton

Reporting Team Lead

# Chemtech Environmental Limited

## SURFACE WATERS

Lab number			104157-1	104157-2	104157-3	104157-4	104157-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			21/12/2021	21/12/2021	21/12/2021	21/12/2021	21/12/2021
Time sampled			16:00	16:01	16:02	16:03	16:04
Test	Method	Units					
Arsenic (dissolved)	CE128 <sup>u</sup>	µg/l As	0.81	0.89	1.46	1.77	0.79
Boron (dissolved)	CE128 <sup>u</sup>	µg/l B	623	606	1207	2093	699
Cadmium (dissolved)	CE128 <sup>u</sup>	µg/l Cd	<0.07	<0.07	<0.07	<0.07	<0.07
Chromium (dissolved)	CE128 <sup>u</sup>	µg/l Cr	1.2	0.6	3.9	1.7	0.9
Copper (dissolved)	CE128 <sup>u</sup>	µg/l Cu	2.6	3.4	3.3	1.1	2.7
Lead (dissolved)	CE128 <sup>u</sup>	µg/l Pb	<0.2	<0.2	1.0	0.2	<0.2
Mercury (dissolved)	CE128 <sup>u</sup>	µg/l Hg	0.019	0.015	0.028	0.010	0.013
Nickel (dissolved)	CE128 <sup>u</sup>	µg/l Ni	7.3	4.4	31.0	6.0	4.4
Selenium (dissolved)	CE128 <sup>u</sup>	µg/l Se	15.86	2.73	16.13	53.43	13.33
Zinc (dissolved)	CE128 <sup>u</sup>	µg/l Zn	11	11	49	4	4
pH	CE213 <sup>u</sup>	units	7.8	7.6	8.0	7.8	7.5
Ammonia	CE012 <sup>u</sup>	µg/l N	123	83	140	149	108
Sulphate	CE049	mg/l SO <sub>4</sub>	262	182	185	I/S	284
Sulphur (dissolved)	CE128 <sup>u</sup>	mg/l S	81.6	54.7	143.4	351.4	87.3
Cyanide (total)	CE147	µg/l CN	<20	<20	<20	<20	<20
PAH							
Naphthalene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(123cd)pyrene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(ah)anthracene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	CE051	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1
PAH (total of USEPA 16)	CE051	µg/l	<1.6	<1.6	<1.6	<1.6	<1.6
BTEX & TPH							
Benzene	CE057 <sup>u</sup>	µg/l	<1	<1	I/S	I/S	<1
Toluene	CE057 <sup>u</sup>	µg/l	<1	<1	I/S	I/S	<1
Ethylbenzene	CE057 <sup>u</sup>	µg/l	<1	<1	I/S	I/S	<1
m & p-Xylene	CE057 <sup>u</sup>	µg/l	<2	<2	I/S	I/S	<2
o-Xylene	CE057 <sup>u</sup>	µg/l	<1	<1	I/S	I/S	<1

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## SURFACE WATERS

Lab number			104157-1	104157-2	104157-3	104157-4	104157-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			21/12/2021	21/12/2021	21/12/2021	21/12/2021	21/12/2021
Time sampled			16:00	16:01	16:02	16:03	16:04
Test	Method	Units					
VPH Aromatic (>EC5-EC7)	CE175	µg/l	<1	<1	I/S	I/S	<1
VPH Aromatic (>EC7-EC8)	CE175	µg/l	<1	<1	I/S	I/S	<1
VPH Aromatic (>EC8-EC10)	CE175	µg/l	<1	<1	I/S	I/S	<1
EPH Aromatic (>EC10-EC12)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aromatic (>EC12-EC16)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aromatic (>EC16-EC21)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aromatic (>EC21-EC35)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aromatic (>EC35-EC44)	CE161	µg/l	<1	<1	I/S	I/S	<1
VPH Aliphatic (>C5-C6)	CE175	µg/l	<1	<1	I/S	I/S	<1
VPH Aliphatic (>C6-C8)	CE175	µg/l	<1	<1	I/S	I/S	<1
VPH Aliphatic (>C8-C10)	CE175	µg/l	4	<1	I/S	I/S	6
EPH Aliphatic (>C10-C12)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aliphatic (>C12-C16)	CE161	µg/l	<1	<1	I/S	I/S	<1
EPH Aliphatic (>C16-C35)	CE161	µg/l	84	112	I/S	I/S	25
EPH Aliphatic (>C35-C44)	CE161	µg/l	21	26	I/S	I/S	31
Volatiles							
Dichlorodifluoromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Chloromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Vinyl chloride	CE066	µg/l	<1	<1	I/S	I/S	<1
Bromomethane	CE066	µg/l	<3	<3	I/S	I/S	<3
Chloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Trichlorofluoromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1-Dichloroethene	CE066	µg/l	<1	<1	I/S	I/S	<1
Trans-1,2-Dichloroethene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1-Dichloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
2,2-Dichloropropane	CE066	µg/l	<1	<1	I/S	I/S	<1
Cis-1,2-Dichloroethene	CE066	µg/l	<1	<1	I/S	I/S	<1
Bromochloromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Chloroform	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1,1-Trichloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Carbon tetrachloride	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1-Dichloro-1-propene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2-Dichloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Trichloroethene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2-Dichloropropane	CE066	µg/l	<1	<1	I/S	I/S	<1
Dibromomethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Bromodichloromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
cis-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	I/S	I/S	<1
trans-1,3-Dichloro-1-propene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1,2-Trichloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1

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## SURFACE WATERS

Lab number			104157-1	104157-2	104157-3	104157-4	104157-5
Sample id			BH01	BH02	BH03	BH04	BH10
Depth (m)			-	-	-	-	-
Date sampled			21/12/2021	21/12/2021	21/12/2021	21/12/2021	21/12/2021
Time sampled			16:00	16:01	16:02	16:03	16:04
Test	Method	Units					
Tetrachloroethene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,3-Dichloropropane	CE066	µg/l	<1	<1	I/S	I/S	<1
Dibromochloromethane	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2-Dibromoethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Chlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1,1,2-Tetrachloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Styrene	CE066	µg/l	<1	<1	I/S	I/S	<1
Tribromomethane	CE066	µg/l	<1	<1	I/S	I/S	<1
Isopropylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
Bromobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,1,1,2-Tetrachloroethane	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2,3-Trichloropropane	CE066	µg/l	<1	<1	I/S	I/S	<1
Propylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
2-Chlorotoluene	CE066	µg/l	<1	<1	I/S	I/S	<1
4-Chlorotoluene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,3,5-Trimethylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
tert-Butylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2,4-Trimethylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
sec-Butylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,3-Dichlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
4-Isopropyltoluene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,4-Dichlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2-Dichlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
Butylbenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2-Dibromo-3-chloropropane	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2,4-Trichlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1
Hexachloro-1,3-butadiene	CE066	µg/l	<1	<1	I/S	I/S	<1
1,2,3-Trichlorobenzene	CE066	µg/l	<1	<1	I/S	I/S	<1



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## METHOD DETAILS

METHOD	SURFACE WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE128	Arsenic (dissolved)	ICP-MS	U	0.06	µg/l As
CE128	Boron (dissolved)	ICP-MS	U	8	µg/l B
CE128	Cadmium (dissolved)	ICP-MS	U	0.07	µg/l Cd
CE128	Chromium (dissolved)	ICP-MS	U	0.2	µg/l Cr
CE128	Copper (dissolved)	ICP-MS	U	0.4	µg/l Cu
CE128	Lead (dissolved)	ICP-MS	U	0.2	µg/l Pb
CE128	Mercury (dissolved)	ICP-MS	U	0.008	µg/l Hg
CE128	Nickel (dissolved)	ICP-MS	U	0.5	µg/l Ni
CE128	Selenium (dissolved)	ICP-MS	U	0.07	µg/l Se
CE128	Zinc (dissolved)	ICP-MS	U	1	µg/l Zn
CE213	pH	Based on BS 1377, pH Meter	U	-	units
CE012	Ammonia	Colorimetry	U	10	µg/l N
CE049	Sulphate	Ion Chromatography		1.7	mg/l SO <sub>4</sub>
CE128	Sulphur (dissolved)	ICP-MS	U	0.2	mg/l S
CE147	Cyanide (total)	Continuous Flow Colorimetry		20	µg/l CN
CE051	Naphthalene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Acenaphthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluorene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Phenanthrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Chrysene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(b)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(k)fluoranthene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(a)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Indeno(123cd)pyrene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Dibenz(ah)anthracene	Solvent extraction, GC-MS		0.1	µg/l
CE051	Benzo(ghi)perylene	Solvent extraction, GC-MS		0.1	µg/l
CE051	PAH (total of USEPA 16)	Solvent extraction, GC-MS		1.6	µg/l
CE057	Benzene	Headspace GC-FID	U	1	µg/l
CE057	Toluene	Headspace GC-FID	U	1	µg/l
CE057	Ethylbenzene	Headspace GC-FID	U	1	µg/l
CE057	m & p-Xylene	Headspace GC-FID	U	2	µg/l
CE057	o-Xylene	Headspace GC-FID	U	1	µg/l
CE175	VPH Aromatic (>EC5-EC7)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC7-EC8)	Headspace GC-FID		1	µg/l
CE175	VPH Aromatic (>EC8-EC10)	Headspace GC-FID		1	µg/l
CE161	EPH Aromatic (>EC10-EC12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC12-EC16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC16-EC21)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aromatic (>EC21-EC35)	Solvent extraction, GC-FID		1	µg/l

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	SURFACE WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE161	EPH Aromatic (>EC35-EC44)	Solvent extraction, GC-FID		1	µg/l
CE175	VPH Aliphatic (>C5-C6)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C6-C8)	Headspace GC-FID		1	µg/l
CE175	VPH Aliphatic (>C8-C10)	Headspace GC-FID		1	µg/l
CE161	EPH Aliphatic (>C10-C12)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C12-C16)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C16-C35)	Solvent extraction, GC-FID		1	µg/l
CE161	EPH Aliphatic (>C35-C44)	Solvent extraction, GC-FID		1	µg/l
CE066	Dichlorodifluoromethane	Headspace GC-MS		1	µg/l
CE066	Chloromethane	Headspace GC-MS		1	µg/l
CE066	Vinyl chloride	Headspace GC-MS		1	µg/l
CE066	Bromomethane	Headspace GC-MS		3	µg/l
CE066	Chloroethane	Headspace GC-MS		1	µg/l
CE066	Trichlorofluoromethane	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Trans-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	2,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Cis-1,2-Dichloroethene	Headspace GC-MS		1	µg/l
CE066	Bromochloromethane	Headspace GC-MS		1	µg/l
CE066	Chloroform	Headspace GC-MS		1	µg/l
CE066	1,1,1-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Carbon tetrachloride	Headspace GC-MS		1	µg/l
CE066	1,1-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloroethane	Headspace GC-MS		1	µg/l
CE066	Trichloroethene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromomethane	Headspace GC-MS		1	µg/l
CE066	Bromodichloromethane	Headspace GC-MS		1	µg/l
CE066	cis-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	trans-1,3-Dichloro-1-propene	Headspace GC-MS		1	µg/l
CE066	1,1,2-Trichloroethane	Headspace GC-MS		1	µg/l
CE066	Tetrachloroethene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichloropropane	Headspace GC-MS		1	µg/l
CE066	Dibromochloromethane	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromoethane	Headspace GC-MS		1	µg/l
CE066	Chlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,1,1,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	Styrene	Headspace GC-MS		1	µg/l
CE066	Tribromomethane	Headspace GC-MS		1	µg/l
CE066	Isopropylbenzene	Headspace GC-MS		1	µg/l
CE066	Bromobenzene	Headspace GC-MS		1	µg/l
CE066	1,1,2,2-Tetrachloroethane	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichloropropane	Headspace GC-MS		1	µg/l

# Chemtech Environmental Limited

## METHOD DETAILS

METHOD	SURFACE WATERS	METHOD SUMMARY	STATUS	LOD	UNITS
CE066	Propylbenzene	Headspace GC-MS		1	µg/l
CE066	2-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	4-Chlorotoluene	Headspace GC-MS		1	µg/l
CE066	1,3,5-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	tert-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trimethylbenzene	Headspace GC-MS		1	µg/l
CE066	sec-Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,3-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	4-Isopropyltoluene	Headspace GC-MS		1	µg/l
CE066	1,4-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Butylbenzene	Headspace GC-MS		1	µg/l
CE066	1,2-Dibromo-3-chloropropane	Headspace GC-MS		1	µg/l
CE066	1,2,4-Trichlorobenzene	Headspace GC-MS		1	µg/l
CE066	Hexachloro-1,3-butadiene	Headspace GC-MS		1	µg/l
CE066	1,2,3-Trichlorobenzene	Headspace GC-MS		1	µg/l

# Chemtech Environmental Limited

## DEVIATING SAMPLE INFORMATION

### Comments

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

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

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

### Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
104157-1	BH01	-	N	
104157-2	BH02	-	N	
104157-3	BH03	-	Y	Ammonia (EHT), Cyanide (NCF, IC)
104157-4	BH04	-	Y	Ammonia (EHT), Cyanide (NCF, IC)
104157-5	BH10	-	N	

# Chemtech Environmental Limited

## ADDITIONAL INFORMATION

### Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

BTEX compounds are identified by retention time only and may include interference from co-eluting compounds.



# DETS

## Certificate of Analysis

*Certificate Number* 22-08745

*Issued:* 18-May-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-08745

*Client Reference* (not supplied)

*Order No* 2585

*Contract Title* 2585 Houghton Colliery

*Description* 11 Soil samples.

*Date Received* 09-May-22

*Date Started* 09-May-22

*Date Completed* 18-May-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



Kirk Bridgewood  
General Manager



2139

## Summary of Chemical Analysis Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006194	2006195	2006196	2006197	2006198	2006199	2006200
.Sample ID	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
Depth	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>Preparation</b>										
Stones >20mm	DETSC 1003*	1	% m/m	16	29	24	33	37	21	< 1.0
Moisture Content	DETSC 1004	0.1	%	8.7	9.4	17	12	11	13	3.5
<b>Metals</b>										
Arsenic	DETSC 2301#	0.2	mg/kg	7.2	4.2	26	4.0	11	13	3.0
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.4	0.5	0.8	0.6	1.6	1.2	0.8
Cadmium	DETSC 2301#	0.1	mg/kg	0.4	0.3	2.8	0.2	0.4	0.8	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	21	18	15	5.5	16	5.0	3.7
Copper	DETSC 2301#	0.2	mg/kg	32	13	200	24	67	54	13
Lead	DETSC 2301#	0.3	mg/kg	38	51	540	45	100	110	22
Mercury	DETSC 2325#	0.05	mg/kg	0.08	< 0.05	0.55	0.07	0.14	0.10	< 0.05
Nickel	DETSC 2301#	1	mg/kg	27	22	48	15	32	17	9.7
Selenium	DETSC 2301#	0.5	mg/kg	0.7	< 0.5	0.8	0.6	0.7	1.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	110	61	610	37	120	160	9.5
<b>Inorganics</b>										
pH	DETSC 2008#		pH	8.1	8.9	7.8	8.6	8.6	7.8	8.6
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	4.4	0.3	14	1.4	8.0	23	0.1
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	32	46	78	150	100	72	65

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006194	2006195	2006196	2006197	2006198	2006199	2006200
Sample ID	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
Depth	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>Petroleum Hydrocarbons</b>										
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg							
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	2.8	< 1.2	< 1.2	< 1.2
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg							
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	11	< 1.5	< 1.5	< 1.5
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg							
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	38	< 3.4	< 3.4	< 3.4
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg							
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	51	< 10	< 10	< 10
Aliphatic C5-C35	DETSC 3521*	10	mg/kg							
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg							
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg							
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg							
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg							
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C35	DETSC 3521*	10	mg/kg							
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	51	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg							
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	96	< 10	48	95	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01



## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006194	2006195	2006196	2006197	2006198	2006199	2006200
<b>Sample ID</b>	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
<b>Depth</b>	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
<b>Other ID</b>							
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>PAHs</b>										
Naphthalene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	0.05	< 0.03	< 0.03	0.13	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.10	< 0.03	0.32	< 0.03	0.08	0.27	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	0.44	< 0.03	0.07	0.07	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	0.07	< 0.03	0.38	< 0.03	0.06	0.06	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	0.20	< 0.03	0.05	0.04	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	0.05	< 0.03	0.29	< 0.03	0.15	0.07	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	0.41	< 0.03	0.17	0.05	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.13	< 0.03	0.06	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.26	< 0.03	0.12	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.11	< 0.03	0.04	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	0.11	< 0.03	0.05	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.38	< 0.10	2.8	< 0.10	< 0.76	0.69	< 0.10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006194	2006195	2006196	2006197	2006198	2006199	2006200
Sample ID	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
Depth	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
<b>VOCs</b>											
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	

## Summary of Chemical Analysis Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006194	2006195	2006196	2006197	2006198	2006199	2006200
<b>.Sample ID</b>	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
<b>Depth</b>	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
<b>Other ID</b>							
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006194	2006195	2006196	2006197	2006198	2006199	2006200
Sample ID	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
Depth	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
Other ID							
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2006194	2006195	2006196	2006197	2006198	2006199	2006200
<b>SVOCs</b>										
Phenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETS 3433	0.1	mg/kg	0.2	< 0.1	0.3	< 0.1	0.1	1.1	< 0.1
Hexachlorocyclopentadiene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1	< 0.1	0.4	< 0.1
2,6-Dinitrotoluene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diphenylamine	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006194	2006195	2006196	2006197	2006198	2006199	2006200
<b>.Sample ID</b>	TP-301	TP-302	TP-303	TP-304	TP-305	TP-307	TP-307
<b>Depth</b>	1.00-1.20	2.50	2.00-3.00	3.20-3.50	3.50	1.20-1.30	3.70
<b>Other ID</b>							
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006201	2006202	2006203	2006204
<b>.Sample ID</b>	TP-308	TP-309	TP-309	TP-310
<b>Depth</b>	3.50	1.20-1.30	4.20	3.50
<b>Other ID</b>				
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>Preparation</b>							
Stones >20mm	DETSC 1003*	1	% m/m	38	19	21	24
Moisture Content	DETSC 1004	0.1	%	10	20	9.6	16
<b>Metals</b>							
Arsenic	DETSC 2301#	0.2	mg/kg	9.0	38	7.1	16
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.8	1.1	2.5	1.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	1.2	0.4	0.6
Chromium	DETSC 2301#	0.15	mg/kg	14	15	12	18
Copper	DETSC 2301#	0.2	mg/kg	35	66	39	83
Lead	DETSC 2301#	0.3	mg/kg	230	150	46	110
Mercury	DETSC 2325#	0.05	mg/kg	0.08	0.06	< 0.05	0.15
Nickel	DETSC 2301#	1	mg/kg	16	29	35	27
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	1.3	< 0.5	0.6
Zinc	DETSC 2301#	1	mg/kg	79	130	110	170
<b>Inorganics</b>							
pH	DETSC 2008#		pH	8.6	8.3	8.0	9.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	4.5	18	3.9	9.2
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	59	74	90	290

## Summary of Chemical Analysis Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006201	2006202	2006203	2006204
Sample ID	TP-308	TP-309	TP-309	TP-310
Depth	3.50	1.20-1.30	4.20	3.50
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>Petroleum Hydrocarbons</b>							
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg				
Aliphatic >EC10-EC12	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg				
Aliphatic >EC12-EC16	DETSC 3521#	1.2	mg/kg	< 1.20	< 1.20	< 1.20	< 1.20
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg				
Aliphatic >EC16-EC21	DETSC 3521#	1.5	mg/kg	< 1.50	< 1.50	< 1.50	< 1.50
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg				
Aliphatic >EC21-EC35	DETSC 3521#	3.4	mg/kg	< 3.40	< 3.40	< 3.40	< 3.40
Aliphatic C5-C35	DETSC 3072*	10	mg/kg				
Aliphatic C5-C35	DETSC 3521*	10	mg/kg	< 10.00	< 10.00	< 10.00	< 10.00
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg				
Aromatic >EC10-EC12	DETSC 3521#	0.9	mg/kg	< 0.90	< 0.90	< 0.90	< 0.90
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg				
Aromatic >EC12-EC16	DETSC 3521#	0.5	mg/kg	< 0.50	< 0.50	< 0.50	< 0.50
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg				
Aromatic >EC16-EC21	DETSC 3521#	0.6	mg/kg	2.95	< 0.60	< 0.60	< 0.60
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg				
Aromatic >EC21-EC35	DETSC 3521#	1.4	mg/kg	120.8	< 1.40	< 1.40	< 1.40
Aromatic C5-C35	DETSC 3072*	10	mg/kg				
Aromatic C5-C35	DETSC 3521*	10	mg/kg	123.8	< 10.00	< 10.00	< 10.00
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg				
TPH Ali/Aro Total C5-C35	DETSC 3521*	10	mg/kg	123.8	< 10.00	< 10.00	< 10.00
EPH (C10-C40)	DETSC 3311#	10	mg/kg	130	< 10	< 10	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006201	2006202	2006203	2006204
<b>Sample ID</b>	TP-308	TP-309	TP-309	TP-310
<b>Depth</b>	3.50	1.20-1.30	4.20	3.50
<b>Other ID</b>				
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>PAHs</b>							
Naphthalene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	< 0.03	0.06
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	0.20	< 0.03	0.05	0.25
Anthracene	DETSC 3303	0.03	mg/kg	0.04	< 0.03	< 0.03	0.04
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.37	< 0.03	< 0.03	0.21
Pyrene	DETSC 3303#	0.03	mg/kg	0.29	< 0.03	< 0.03	0.17
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	0.14	< 0.03	< 0.03	0.06
Chrysene	DETSC 3303	0.03	mg/kg	0.16	< 0.03	< 0.03	0.12
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.19	< 0.03	< 0.03	0.11
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	0.08	< 0.03	< 0.03	0.05
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	0.14	< 0.03	< 0.03	0.06
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	0.11	< 0.03	< 0.03	0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.12	< 0.03	< 0.03	0.04
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	1.9	< 0.10	< 0.10	1.1



## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006201	2006202	2006203	2006204
Sample ID	TP-308	TP-309	TP-309	TP-310
Depth	3.50	1.20-1.30	4.20	3.50
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>VOCs</b>							
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006201	2006202	2006203	2006204
<b>.Sample ID</b>	TP-308	TP-309	TP-309	TP-310
<b>Depth</b>	3.50	1.20-1.30	4.20	3.50
<b>Other ID</b>				
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

Lab No	2006201	2006202	2006203	2006204
.Sample ID	TP-308	TP-309	TP-309	TP-310
Depth	3.50	1.20-1.30	4.20	3.50
Other ID				
Sample Type	SOIL	SOIL	SOIL	SOIL
Sampling Date	03/05/2022	03/05/2022	03/05/2022	03/05/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>SVOCs</b>							
Phenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETS 3433	0.1	mg/kg	0.2	0.2	< 0.1	0.3
Hexachlorocyclopentadiene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1
2,6-Dinitrotoluene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Diphenylamine	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-08745

Client Ref

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2006201	2006202	2006203	2006204
<b>.Sample ID</b>	TP-308	TP-309	TP-309	TP-310
<b>Depth</b>	3.50	1.20-1.30	4.20	3.50
<b>Other ID</b>				
<b>Sample Type</b>	SOIL	SOIL	SOIL	SOIL
<b>Sampling Date</b>	03/05/2022	03/05/2022	03/05/2022	03/05/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 22-08745

*Client Ref*

*Contract Title* 2585 Houghton Colliery

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2006194	TP-301 1.00-1.20	SOIL	NAD	none	Keith Wilson
2006195	TP-302 2.50	SOIL	NAD	none	Keith Wilson
2006196	TP-303 2.00-3.00	SOIL	NAD	none	Keith Wilson
2006197	TP-304 3.20-3.50	SOIL	NAD	none	Keith Wilson
2006198	TP-305 3.50	SOIL	NAD	none	Keith Wilson
2006199	TP-307 1.20-1.30	SOIL	NAD	none	Keith Wilson
2006200	TP-307 3.70	SOIL	NAD	none	Keith Wilson
2006201	TP-308 3.50	SOIL	NAD	none	Keith Wilson
2006202	TP-309 1.20-1.30	SOIL	NAD	none	Keith Wilson
2006203	TP-309 4.20	SOIL	NAD	none	Keith Wilson
2006204	TP-310 3.50	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 22-08745

Client Ref

Contract 2585 Houghton Colliery

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2006194	TP-301 1.00-1.20 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006195	TP-302 2.50 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006196	TP-303 2.00-3.00 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006197	TP-304 3.20-3.50 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006198	TP-305 3.50 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006199	TP-307 1.20-1.30 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006200	TP-307 3.70 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006201	TP-308 3.50 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006202	TP-309 1.20-1.30 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006203	TP-309 4.20 SOIL	03/05/22	GJ 250ml, GJ 60ml		
2006204	TP-310 3.50 SOIL	03/05/22	GJ 250ml, GJ 60ml		

Key: G-Glass J-Jar

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 22-12615

*Issued:* 14-Jul-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-12615

*Client Reference* 2585

*Order No* 2585

*Contract Title* Houghton Le Spring

*Description* 6 Soil samples, 6 Leachate samples.

*Date Received* 04-Jul-22

*Date Started* 04-Jul-22

*Date Completed* 14-Jul-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood  
General Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12615  
 Client Ref 2585  
 Contract Title Houghton Le Spring

Lab No	2028404	2028405	2028406	2028407	2028408	2028409
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028404	2028405	2028406	2028407	2028408	2028409
<b>Preparation</b>									
Stones >20mm	DETSC 1003*	1	% m/m	< 1.0	8.0	< 1.0	< 1.0	< 1.0	< 1.0
Moisture Content	DETSC 1004	0.1	%	11	11	17	12	43	17
<b>Metals</b>									
Arsenic	DETSC 2301#	0.2	mg/kg	6.0	14	2.1	4.0	4.1	3.4
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	0.5	0.4	3.3	0.2	14	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.2	0.4	0.2	0.2	0.8	0.1
Chromium	DETSC 2301#	0.15	mg/kg	16	16	13	25	9.1	11
Copper	DETSC 2301#	0.2	mg/kg	18	74	12	27	17	8.5
Lead	DETSC 2301#	0.3	mg/kg	25	120	45	19	35	52
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.22	< 0.05	< 0.05	0.12	< 0.05
Nickel	DETSC 2301#	1	mg/kg	24	27	11	34	8.5	11
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5	9.1	< 0.5
Zinc	DETSC 2301#	1	mg/kg	59	130	43	65	18	50
<b>Inorganics</b>									
pH	DETSC 2008#		pH	7.5	7.7	8.6	8.1	7.5	8.1
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	< 0.1	0.1	< 0.1	< 0.1	0.7
Organic matter	DETSC 2002#	0.1	%	1.1	5.2	0.6	2.6	8.5	0.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	1100	35	200	160	150	49
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	0.39	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	2.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	93	< 10	< 10	49	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01





# Summary of Chemical Analysis Soil Samples

Our Ref 22-12615  
Client Ref 2585  
Contract Title Houghton Le Spring

<b>Lab No</b>	2028404	2028405	2028406	2028407	2028408	2028409
<b>Sample ID</b>	RC05	RC06	RC06	RC07	RC08	RC08
<b>Depth</b>	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
<b>Other ID</b>	4	3	5	3	3	4
<b>Sample Type</b>	ES	ES	ES	ES	ES	ES
<b>Sampling Date</b>	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>									
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	0.09	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	0.06	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.86	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	0.12	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	1.7	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	1.5	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.58	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.67	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.70	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.21	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.41	< 0.03	< 0.03	0.12	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.19	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	0.06	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	0.23	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	7.5	< 0.10	< 0.10	< 0.10	< 0.10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12615

Client Ref 2585

Contract Title Houghton Le Spring

Lab No	2028404	2028405	2028406	2028407	2028408	2028409
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028404	2028405	2028406	2028407	2028408	2028409
<b>VOCs</b>									
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12615

Client Ref 2585

Contract Title Houghton Le Spring

Lab No	2028404	2028405	2028406	2028407	2028408	2028409
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028404	2028405	2028406	2028407	2028408	2028409
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>SVOCs</b>									
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	0.9	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	0.4	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12615  
 Client Ref 2585  
 Contract Title Houghton Le Spring

Lab No	2028404	2028405	2028406	2028407	2028408	2028409
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028404	2028405	2028406	2028407	2028408	2028409
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12615  
 Client Ref 2585  
 Contract Title Houghton Le Spring

Lab No	2028410	2028411	2028412	2028413	2028414	2028415
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028410	2028411	2028412	2028413	2028414	2028415
<b>Preparation</b>									
NRA Leachate Preparation	DETSC 1009*			Y	Y	Y	Y	Y	Y
<b>Metals</b>									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	1.1	0.72	1.0	0.37	0.50	1.6
Boron, Dissolved	DETSC 2306*	12	ug/l	43	13	110	< 12	61	23
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	< 0.03	< 0.03	< 0.03	0.05	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.81	1.3	4.6	1.0	1.3	3.2
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.9	2.4	2.0	1.3	1.4	4.8
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	1.2	7.9	0.26	2.2	9.2
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.6	1.5	2.7	1.3	1.6	3.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.38	0.30	1.2	0.47	< 0.25	0.58
Zinc, Dissolved	DETSC 2306	1.3	ug/l	< 1.3	2.2	5.0	< 1.3	1.7	11
<b>Inorganics</b>									
pH	DETSC 2008		pH	6.3	6.7	7.2	6.6	6.7	7.0
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Sulphate as SO4	DETSC 2055	0.1	mg/l	120	6.4	11	14	1.6	6.4
Total Organic Carbon	DETSC 2085	1	mg/l	1.5	2.6	7.3	1.6	2.3	5.4
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	1.0	1.9	2.5	< 0.1	1.7
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	1.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	41	19	11	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	3.4	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	44	21	17	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	1.9	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	6.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	24	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	34	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	77	21	18	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Leachate Samples

Our Ref 22-12615

Client Ref 2585

Contract Title Houghton Le Spring

Lab No	2028410	2028411	2028412	2028413	2028414	2028415
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	0.05	0.12
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.03
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.02
Phenanthrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	0.02	0.09
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Fluoranthene	DETSC 3304	0.01	ug/l	0.03	< 0.01	0.01	< 0.01	< 0.01	0.14
Pyrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.12
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06
Chrysene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.13
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.05
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.99

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12615  
 Client Ref 2585  
 Contract Title Houghton Le Spring

Lab No	2028410	2028411	2028412	2028413	2028414	2028415
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028410	2028411	2028412	2028413	2028414	2028415
<b>VOCs</b>									
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETS 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETS 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1



# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12615

Client Ref 2585

Contract Title Houghton Le Spring

Lab No	2028410	2028411	2028412	2028413	2028414	2028415
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028410	2028411	2028412	2028413	2028414	2028415
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12615

Client Ref 2585

Contract Title Houghton Le Spring

Lab No	2028410	2028411	2028412	2028413	2028414	2028415
Sample ID	RC05	RC06	RC06	RC07	RC08	RC08
Depth	9.40-9.50	1.00-1.20	5.00-5.20	11.00-11.20	5.60-5.70	6.50-6.60
Other ID	4	3	5	3	3	4
Sample Type	ES	ES	ES	ES	ES	ES
Sampling Date	27/06/2022	28/06/2022	28/06/2022	29/06/2022	30/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028410	2028411	2028412	2028413	2028414	2028415
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Asbestos Analysis Soil Samples

*Our Ref* 22-12615

*Client Ref* 2585

*Contract Title* Houghton Le Spring

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2028404	RC05 4 9.40-9.50	SOIL	NAD	none	Lee Kerridge
2028405	RC06 3 1.00-1.20	SOIL	Chrysotile	Chrysotile present as bundle	Lee Kerridge
2028406	RC06 5 5.00-5.20	SOIL	NAD	none	Lee Kerridge
2028407	RC07 3 11.00-11.20	SOIL	NAD	none	Lee Kerridge
2028408	RC08 3 5.60-5.70	SOIL	NAD	none	Lee Kerridge
2028409	RC08 4 6.50-6.60	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* -not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 22-12615  
 Client Ref 2585  
 Contract Houghton Le Spring

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Hold time exceeded for tests	Inappropriate container for tests
2028404	RC05 9.40-9.50 SOIL	27/06/22	GJ 250ml x2, PT 1L		
2028405	RC06 1.00-1.20 SOIL	28/06/22	GJ 250ml x2, PT 1L		
2028406	RC06 5.00-5.20 SOIL	28/06/22	GJ 250ml x2, PT 1L		
2028407	RC07 11.00-11.20 SOIL	29/06/22	GJ 250ml x2, PT 1L		
2028408	RC08 5.60-5.70 SOIL	30/06/22	GJ 250ml x2, PT 1L		
2028409	RC08 6.50-6.60 SOIL	30/06/22	GJ 250ml x2, PT 1L		
2028410	RC05 9.40-9.50 LEACHATE	27/06/22	GJ 250ml x2, PT 1L		
2028411	RC06 1.00-1.20 LEACHATE	28/06/22	GJ 250ml x2, PT 1L		
2028412	RC06 5.00-5.20 LEACHATE	28/06/22	GJ 250ml x2, PT 1L		
2028413	RC07 11.00-11.20 LEACHATE	29/06/22	GJ 250ml x2, PT 1L		
2028414	RC08 5.60-5.70 LEACHATE	30/06/22	GJ 250ml x2, PT 1L		
2028415	RC08 6.50-6.60 LEACHATE	30/06/22	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



## Certificate of Analysis

*Certificate Number* 22-12616

*Issued:* 14-Jul-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-12616

*Client Reference* 2585

*Order No* 2585

*Contract Title* HOUGHTON COLLIERY

*Description* 5 Soil samples, 5 Leachate samples.

*Date Received* 04-Jul-22

*Date Started* 04-Jul-22

*Date Completed* 14-Jul-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*

A handwritten signature in black ink, appearing to read "K. Bridgewood".

Kirk Bridgewood  
General Manager



# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12616  
 Client Ref 2585  
 Contract Title HOUGHTON COLLIERY

Lab No	2028416	2028417	2028418	2028419	2028420
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>Preparation</b>								
Stones >20mm	DETSC 1003*	1	% m/m	< 1.0	6.0	68	< 1.0	< 1.0
Moisture Content	DETSC 1004	0.1	%	11	9.6	110	14	12
<b>Metals</b>								
Arsenic	DETSC 2301#	0.2	mg/kg	3.3	2.3	0.6	2.3	1.9
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	2.6	0.6	0.4	0.3	0.7
Cadmium	DETSC 2301#	0.1	mg/kg	0.9	0.1	< 0.1	0.2	< 0.1
Chromium	DETSC 2301#	0.15	mg/kg	36	14	8.7	8.1	8.4
Copper	DETSC 2301#	0.2	mg/kg	54	17	9.5	14	11
Lead	DETSC 2301#	0.3	mg/kg	100	15	4.1	14	7.6
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	DETSC 2301#	1	mg/kg	39	20	8.2	13	12
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	0.7	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	330	53	13	45	29
<b>Inorganics</b>								
pH	DETSC 2008#		pH	7.8	8.3	8.5	8.6	8.5
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	0.2	< 0.1	< 0.1	< 0.1
Organic matter	DETSC 2002#	0.1	%	< 0.1	1.1	2.2	0.7	1.4
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	2200	160	68	65	76
<b>Petroleum Hydrocarbons</b>								
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.11	< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	< 3.4	< 3.4	< 3.4	< 3.4	< 3.4
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	< 1.4	< 1.4	< 1.4	< 1.4	< 1.4
Aromatic C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311#	10	mg/kg	< 10	< 10	< 10	22	< 10
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12616  
 Client Ref 2585  
 Contract Title HOUGHTON COLLIERY

Lab No	2028416	2028417	2028418	2028419	2028420
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
MTBE	DETSC 3321	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
<b>PAHs</b>								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12616

Client Ref 2585

Contract Title HOUGHTON COLLIERY

Lab No	2028416	2028417	2028418	2028419	2028420
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>VOCs</b>								
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

# Summary of Chemical Analysis Soil Samples

Our Ref 22-12616

Client Ref 2585

Contract Title HOUGHTON COLLIERY

Lab No	2028416	2028417	2028418	2028419	2028420
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028416	2028417	2028418	2028419	2028420
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	0.05	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	0.02	< 0.01	< 0.01	< 0.01
<b>SVOCs</b>								
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-12616

Client Ref 2585

Contract Title HOUGHTON COLLIERY

Lab No	2028416	2028417	2028418	2028419	2028420
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Diphenylamine	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromophenylphenylether	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pentachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-butylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Butylbenzylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Di-n-octylphthalate	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dinitrobenzene	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azobenzene	DETS 3433	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	DETS 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12616  
 Client Ref 2585  
 Contract Title HOUGHTON COLLIERY

Lab No	2028421	2028422	2028423	2028424	2028425
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>Preparation</b>								
NRA Leachate Preparation	DETSC 1009*			Y	Y	Y	Y	Y
<b>Metals</b>								
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.52	0.20	0.20	0.24	< 0.16
Boron, Dissolved	DETSC 2306*	12	ug/l	24	19	21	20	22
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.06	< 0.03	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	1.0	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.8	0.7	0.9	1.6	0.9
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.3	< 0.09	< 0.09	0.16	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.04	< 0.01	< 0.01	0.27	0.03
Nickel, Dissolved	DETSC 2306	0.5	ug/l	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.3	0.42	0.27	0.34	< 0.25
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.6	< 1.3	2.1	< 1.3	< 1.3
<b>Inorganics</b>								
pH	DETSC 2008		pH	7.0	6.9	6.7	6.6	6.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40
Sulphate as SO4	DETSC 2055	0.1	mg/l	4.1	3.7	3.6	9.9	6.6
Total Organic Carbon	DETSC 2085	1	mg/l	1.9	1.3	< 1.0	1.7	1.2
<b>Petroleum Hydrocarbons</b>								
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	2.0	1.8	2.6	2.8	2.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	29	< 10	< 10	69	< 10
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12616  
 Client Ref 2585  
 Contract Title HOUGHTON COLLIERY

Lab No	2028421	2028422	2028423	2028424	2028425
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>PAHs</b>								
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	0.04	< 0.01	0.02	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12616  
 Client Ref 2585  
 Contract Title HOUGHTON COLLIERY

Lab No	2028421	2028422	2028423	2028424	2028425
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028421	2028422	2028423	2028424	2028425
<b>VOCs</b>								
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETS 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Benzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Toluene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETS 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Styrene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Bromoform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12616

Client Ref 2585

Contract Title HOUGHTON COLLIERY

Lab No	2028421	2028422	2028423	2028424	2028425
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	2	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>								
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

# Summary of Chemical Analysis

## Leachate Samples

Our Ref 22-12616

Client Ref 2585

Contract Title HOUGHTON COLLIERY

Lab No	2028421	2028422	2028423	2028424	2028425
Sample ID	RC01	RC01	RC01	RC02	RC02
Depth	4.76-4.89	6.23-6.40	6.80-7.00	5.50-5.60	7.53-7.65
Other ID	3	4	5	4	5
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	20/06/2022	20/06/2022	20/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units	2028421	2028422	2028423	2028424	2028425
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Asbestos Analysis Soil Samples

*Our Ref* 22-12616

*Client Ref* 2585

*Contract Title* HOUGHTON COLLIERY

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2028416	RC01 3 4.76-4.89	SOIL	NAD	none	Lee Kerridge
2028417	RC01 4 6.23-6.40	SOIL	NAD	none	Lee Kerridge
2028418	RC01 5 6.80-7.00	SOIL	NAD	none	Lee Kerridge
2028419	RC02 4 5.50-5.60	SOIL	NAD	none	Lee Kerridge
2028420	RC02 5 7.53-7.65	SOIL	NAD	none	Lee Kerridge

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 22-12616  
 Client Ref 2585  
 Contract HOUGHTON COLLIERY

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2028416	RC01 4.76-4.89 SOIL	20/06/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2028417	RC01 6.23-6.40 SOIL	20/06/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2028418	RC01 6.80-7.00 SOIL	20/06/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2028419	RC02 5.50-5.60 SOIL	20/06/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2028420	RC02 7.53-7.65 SOIL	20/06/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2028421	RC01 4.76-4.89 LEACHATE	20/06/22	GJ 250ml x2, PT 1L		
2028422	RC01 6.23-6.40 LEACHATE	20/06/22	GJ 250ml x2, PT 1L		
2028423	RC01 6.80-7.00 LEACHATE	20/06/22	GJ 250ml x2, PT 1L		
2028424	RC02 5.50-5.60 LEACHATE	20/06/22	GJ 250ml x2, PT 1L		
2028425	RC02 7.53-7.65 LEACHATE	20/06/22	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report





## Certificate of Analysis

*Certificate Number* 22-13076

*Issued:* 01-Aug-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-13076

*Client Reference* 2585

*Order No* (not supplied)

*Contract Title* HOUGHTON

*Description* 5 Soil samples.

*Date Received* 11-Jul-22

*Date Started* 11-Jul-22

*Date Completed* 01-Aug-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*

A handwritten signature in black ink, appearing to read "Kirk Bridgewood".

Kirk Bridgewood  
General Manager

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-13076  
 Client Ref 2585  
 Contract Title HOUGHTON

Lab No	2030784	2030785	2030786	2030787	2030788
Sample ID	RC01	RC02	RC05	RC06	RC08
Depth	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
Other ID	1	1	1	1	1
Sample Type	ES	ES	ES	ES	ES
Sampling Date	20/06/2022	20/06/2022	27/06/2022	28/06/2022	30/06/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
<b>OCPs</b>								
alpha-BHC	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
gamma-BHC (Lindane)	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
beta-BHC	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
delta-BHC	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Heptachlor	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aldrin	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Heptachlor epoxide	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
gamma-Chlordane	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endosulphan I & Alpha-chlorodane	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4,4-DDE	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dieldrin	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endrin	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endosulphan II & 4,4-DDD	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endrin aldehyde	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
4,4-DDT	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endosulphan sulphate	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Methoxychlor	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Endrin ketone	DETSC 3441*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
<b>OPPs</b>								
Dichlorvos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Mevinphos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Demeton-O	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethoprop	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Naled	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phorate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Demeton-S	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Diazinon	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Disulfoton	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Methylparathion	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ronnel	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fenthion	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chlopyrifos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Trichlorinate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Merphos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Stirofos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Tokuthion	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fensulfothion	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Bolstar	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Azinphos methyl	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Coumaphos	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
<b>Triazines</b>								
Atraton	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

## Summary of Chemical Analysis

### Soil Samples

Our Ref 22-13076

Client Ref 2585

Contract Title HOUGHTON

<b>Lab No</b>	2030784	2030785	2030786	2030787	2030788
<b>Sample ID</b>	RC01	RC02	RC05	RC06	RC08
<b>Depth</b>	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20	0.10-0.20
<b>Other ID</b>	1	1	1	1	1
<b>Sample Type</b>	ES	ES	ES	ES	ES
<b>Sampling Date</b>	20/06/2022	20/06/2022	27/06/2022	28/06/2022	30/06/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units					
Prometon	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Simazine	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Atrazine	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Propazine	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Terbutylazine	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Secbumeton	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Symetryn	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ametryn	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Prometryne	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Terbutryn	DETSC 3445*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

## Information in Support of the Analytical Results

Our Ref 22-13076  
 Client Ref 2585  
 Contract HOUGHTON

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2030779	RC01 0.10-0.20 SOIL	20/06/22	GJ 250ml x2, PT 1L		
2030780	RC02 0.10-0.20 SOIL	20/06/22	GJ 250ml x2, PT 1L		
2030781	RC05 0.10-0.20 SOIL	27/06/22	GJ 250ml x2, PT 1L		
2030782	RC06 0.10-0.20 SOIL	28/06/22	GJ 250ml x2, PT 1L		
2030783	RC08 0.10-0.20 SOIL	30/06/22	GJ 250ml x2, PT 1L		
2030784	RC01 0.10-0.20 SOIL	20/06/22	GJ 250ml x2, PT 1L	OP Pesticides (14 days), Triazines (14 days)	
2030785	RC02 0.10-0.20 SOIL	20/06/22	GJ 250ml x2, PT 1L	OP Pesticides (14 days), Triazines (14 days)	
2030786	RC05 0.10-0.20 SOIL	27/06/22	GJ 250ml x2, PT 1L		
2030787	RC06 0.10-0.20 SOIL	28/06/22	GJ 250ml x2, PT 1L		
2030788	RC08 0.10-0.20 SOIL	30/06/22	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

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### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



# DETS

## Certificate of Analysis

*Certificate Number* 22-13580

*Issued:* 26-Jul-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-13580

*Client Reference* 2585

*Order No* PO-2205

*Contract Title* Houghton Colliery

*Description* 11 Water samples.

*Date Received* 18-Jul-22

*Date Started* 18-Jul-22

*Date Completed* 26-Jul-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



Kirk Bridgewood  
General Manager



2139

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033545	2033546	2033547	2033548	2033549	2033550	2033551
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06	RC07
Depth							
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
<b>Metals</b>										
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.21	0.40	0.18	1.7	0.40	0.84	0.89
Boron, Dissolved	DETSC 2306*	12	ug/l	120	170	190	780	680	700	94
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.10	< 0.03	0.03	0.15	0.09	0.07
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.26	< 0.25	< 0.25	13	0.71	0.75	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	< 0.4	< 0.4	1.0	6.4	1.0	2.0	2.2
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	< 0.09	< 0.09	0.22	0.12	0.58	0.67
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.03	0.02	< 0.01	0.02	< 0.01	0.05	0.03
Nickel, Dissolved	DETSC 2306	0.5	ug/l	5.5	13	1.6	8.8	5.1	5.5	12
Selenium, Dissolved	DETSC 2306	0.25	ug/l	2.3	9.7	4.6	27	2.8	11	11
Zinc, Dissolved	DETSC 2306	1.3	ug/l	32	34	42	65	57	41	53
<b>Inorganics</b>										
pH	DETSC 2008		pH	7.6	7.4	7.4	7.1	7.3	7.5	7.3
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40	< 40
Sulphate as S	DETSC 2055	0.0334	mg/l	69	71	110	410	590	210	690
Total Organic Carbon	DETSC 2085	1	mg/l	40	34	5.8	14	58	4.9	5.1
<b>Petroleum Hydrocarbons</b>										
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	3.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	4.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	9.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	99	< 1.0	< 1.0	42	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	120	< 10	< 10	43	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.5	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.8	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	120	< 10	< 10	43	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	150	40	< 10	35	22	20	39
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

<b>Lab No</b>	2033545	2033546	2033547	2033548	2033549	2033550	2033551
<b>Sample ID</b>	RC01	RC02	RC03	RC04	RC05	RC06	RC07
<b>Depth</b>							
<b>Other ID</b>							
<b>Sample Type</b>	WATER	WATER	WATER	WATER	WATER	WATER	WATER
<b>Sampling Date</b>	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
<b>PAHs</b>											
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	DETSC 3304	0.01	ug/l	0.02	< 0.01	0.02	0.04	0.06	< 0.01	< 0.01	
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	0.01	< 0.01	< 0.01	
Pyrene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	0.01	0.02	< 0.01	< 0.01	
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	0.04	< 0.01	0.02	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	0.17	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
PAH Total	DETSC 3304	0.2	ug/l	0.27	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
<b>PCBs</b>											
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 3.0	< 0.3	< 0.3	< 0.3	< 0.3	
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 3.0	< 0.3	< 0.3	< 0.3	< 0.3	
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 6.0	< 0.6	< 0.6	< 0.6	< 0.6	
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033545	2033546	2033547	2033548	2033549	2033550	2033551
.Sample ID	RC01	RC02	RC03	RC04	RC05	RC06	RC07
Depth							
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units								
<b>VOCs</b>											
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27	< 27	
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4	< 4	
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4	< 4	
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2	< 2	
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033545	2033546	2033547	2033548	2033549	2033550	2033551
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06	RC07
Depth							
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>										
Phenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Aniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033545	2033546	2033547	2033548	2033549	2033550	2033551
.Sample ID	RC01	RC02	RC03	RC04	RC05	RC06	RC07
Depth							
Other ID							
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s

Test	Method	LOD	Units							
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Diphenylamine	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	3.3
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Azobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
Carbazole	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 3.3	< 2.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033553	2033554	2033555	2033556
Sample ID	RC09	RC10	RC11	RC12
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>Metals</b>							
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.30	1.2	0.39	0.42
Boron, Dissolved	DETSC 2306*	12	ug/l	89	730	350	130
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.08	< 0.03	< 0.03	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	0.70	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.9	0.8	2.5	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	< 0.09	0.36	< 0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	0.02	0.03	0.05
Nickel, Dissolved	DETSC 2306	0.5	ug/l	3.4	3.2	5.4	4.8
Selenium, Dissolved	DETSC 2306	0.25	ug/l	6.9	6.4	2.7	0.95
Zinc, Dissolved	DETSC 2306	1.3	ug/l	51	29	63	24
<b>Inorganics</b>							
pH	DETSC 2008		pH	7.2	8.1	7.5	7.8
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40
Sulphate as S	DETSC 2055	0.0334	mg/l	140	98	130	120
Total Organic Carbon	DETSC 2085	1	mg/l	5.8	19	56	< 1.0
<b>Petroleum Hydrocarbons</b>							
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	120
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	120
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	120
EPH (C10-C40)	DETSC 3311	10	ug/l	58	58	64	410
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033553	2033554	2033555	2033556
Sample ID	RC09	RC10	RC11	RC12
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>PAHs</b>							
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	7.7
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.54
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	0.04	0.01	2.8
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	0.02	< 0.01	4.0
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.06	0.04	27
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	2.9
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.02	0.05	15
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	0.03	0.08	20
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	9.7
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.01	7.6
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	7.7
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	0.04	4.3
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	7.2
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	3.8
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.96
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	3.0
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	0.24	120
<b>PCBs</b>							
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 3.0	< 3.0
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 2.0
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 3.0	< 3.0
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 6.0	< 6.0
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 2.0
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 2.0
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 2.0	< 2.0
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033553	2033554	2033555	2033556
.Sample ID	RC09	RC10	RC11	RC12
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
<b>VOCs</b>							
Dichlorodifluoromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Vinyl Chloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Chloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Methylene Chloride	DETS 3432*	27	ug/l	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETS 3432*	2	ug/l	< 2	< 2	< 2	< 2
Bromochloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4
Chloroform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Benzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Trichloroethylene	DETS 3432*	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromomethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromodichloromethane	DETS 3432	4	ug/l	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Toluene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Dibromochloromethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Chlorobenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Ethylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
m+p-Xylene	DETS 3432	2	ug/l	< 2	< 2	< 2	< 2
o-Xylene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Styrene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromoform	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Isopropylbenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1
Bromobenzene	DETS 3432	1	ug/l	< 1	< 1	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033553	2033554	2033555	2033556
Sample ID	RC09	RC10	RC11	RC12
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1
<b>SVOCs</b>							
Phenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Aniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-13580

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2033553	2033554	2033555	2033556
Sample ID	RC09	RC10	RC11	RC12
Depth				
Other ID				
Sample Type	WATER	WATER	WATER	WATER
Sampling Date	14/07/2022	14/07/2022	14/07/2022	14/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Diphenylamine	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	18
Pentachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	41	43
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Azobenzene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
Carbazole	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 2.0	< 2.0	< 10.0	< 10.0



## Information in Support of the Analytical Results

Our Ref 22-13580  
 Client Ref 2585  
 Contract Houghton Colliery

### Containers Received & Deviating Samples

Lab No	Sample ID	Date		Holding time exceeded for tests	Inappropriate container for tests
		Sampled	Containers Received		
2033545	RC01 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033546	RC02 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033547	RC03 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033548	RC04 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033549	RC05 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033550	RC06 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033551	RC07 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033552	RC08 WATER	14/07/22	GB 1L, PB 1L		
2033553	RC09 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033554	RC10 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033555	RC11 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	
2033556	RC12 WATER	14/07/22	GB 1L, PB 1L	pH/Cond/TDS (1 days)	

Key: G-Glass P-Plastic B-Bottle  
 DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report





# DETS

## Certificate of Analysis

*Certificate Number* 22-14010

*Issued:* 29-Jul-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-14010

*Client Reference* 2585

*Order No* (not supplied)

*Contract Title* Houghton le Spring

*Description* 4 Soil samples, 2 Leachate samples.

*Date Received* 21-Jul-22

*Date Started* 21-Jul-22

*Date Completed* 29-Jul-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



Kirk Bridgewood  
General Manager



2139

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

Lab No	2036019	2036020	2036021	2036022
Sample ID	RC-11	RC-11	RC-12	RC-12
Depth	0.10-0.20	0.40-0.50	0.10-0.20	0.50-0.60
Other ID	1	2	1	2
Sample Type	ES	ES	ES	ES
Sampling Date	06/07/2022	06/07/2022	07/07/2022	07/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units			
<b>Preparation</b>						
Stones >20mm	DETSC 1003*	1	% m/m	< 1.0		< 1.0
Moisture Content	DETSC 1004	0.1	%	12		7.6
<b>Metals</b>						
Arsenic	DETSC 2301#	0.2	mg/kg	12		9.0
Boron, Water Soluble	DETSC 2311#	0.2	mg/kg	1.5		0.6
Cadmium	DETSC 2301#	0.1	mg/kg	0.5		0.3
Chromium	DETSC 2301#	0.15	mg/kg	18		20
Copper	DETSC 2301#	0.2	mg/kg	49		42
Lead	DETSC 2301#	0.3	mg/kg	93		54
Mercury	DETSC 2325#	0.05	mg/kg	0.12		0.06
Nickel	DETSC 2301#	1	mg/kg	22		24
Selenium	DETSC 2301#	0.5	mg/kg	0.6		< 0.5
Zinc	DETSC 2301#	1	mg/kg	160		99
<b>Inorganics</b>						
pH	DETSC 2008#		pH	7.0		7.8
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.4		0.2
Organic matter	DETSC 2002#	0.1	%	13		5.6
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	91		94
<b>Petroleum Hydrocarbons</b>						
Aliphatic C5-C6	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aliphatic C6-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aliphatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aliphatic C10-C12	DETSC 3072#	1.5	mg/kg	2.2		< 1.5
Aliphatic C12-C16	DETSC 3072#	1.2	mg/kg	2.5		< 1.2
Aliphatic C16-C21	DETSC 3072#	1.5	mg/kg	5.2		< 1.5
Aliphatic C21-C35	DETSC 3072#	3.4	mg/kg	40		42
Aliphatic C5-C35	DETSC 3072*	10	mg/kg	50		44
Aromatic C5-C7	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aromatic C7-C8	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aromatic C8-C10	DETSC 3321*	0.01	mg/kg	< 0.01		< 0.01
Aromatic C10-C12	DETSC 3072#	0.9	mg/kg	< 0.9		1.1
Aromatic C12-C16	DETSC 3072#	0.5	mg/kg	1.4		4.3
Aromatic C16-C21	DETSC 3072#	0.6	mg/kg	9.4		19
Aromatic C21-C35	DETSC 3072#	1.4	mg/kg	84		160
Aromatic C5-C35	DETSC 3072*	10	mg/kg	95		180
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	mg/kg	140		220
EPH (C10-C40)	DETSC 3311#	10	mg/kg	170		290
Benzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01
Ethylbenzene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01
Toluene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01
Xylene	DETSC 3321#	0.01	mg/kg	< 0.01		< 0.01

# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

Lab No	2036019	2036020	2036021	2036022
Sample ID	RC-11	RC-11	RC-12	RC-12
Depth	0.10-0.20	0.40-0.50	0.10-0.20	0.50-0.60
Other ID	1	2	1	2
Sample Type	ES	ES	ES	ES
Sampling Date	06/07/2022	06/07/2022	07/07/2022	07/07/2022
Sampling Time	n/s	n/s	n/s	n/s

Test	Method	LOD	Units			
MTBE	DETS 3321	0.01	mg/kg	< 0.01		< 0.01
<b>PAHs</b>						
Naphthalene	DETS 3303#	0.03	mg/kg	0.09		< 0.03
Acenaphthylene	DETS 3303#	0.03	mg/kg	0.09		0.05
Acenaphthene	DETS 3303#	0.03	mg/kg	0.04		0.05
Fluorene	DETS 3303	0.03	mg/kg	0.05		0.07
Phenanthrene	DETS 3303#	0.03	mg/kg	0.68		1.4
Anthracene	DETS 3303	0.03	mg/kg	0.21		0.37
Fluoranthene	DETS 3303#	0.03	mg/kg	1.5		2.6
Pyrene	DETS 3303#	0.03	mg/kg	1.4		2.0
Benzo(a)anthracene	DETS 3303#	0.03	mg/kg	1.3		1.6
Chrysene	DETS 3303	0.03	mg/kg	0.89		0.98
Benzo(b)fluoranthene	DETS 3303#	0.03	mg/kg	1.7		1.5
Benzo(k)fluoranthene	DETS 3303#	0.03	mg/kg	0.53		0.60
Benzo(a)pyrene	DETS 3303#	0.03	mg/kg	0.98		1.1
Indeno(1,2,3-c,d)pyrene	DETS 3303#	0.03	mg/kg	0.41		0.35
Dibenzo(a,h)anthracene	DETS 3303#	0.03	mg/kg	0.14		0.14
Benzo(g,h,i)perylene	DETS 3303#	0.03	mg/kg	0.46		0.37
PAH - USEPA 16, Total	DETS 3303	0.1	mg/kg	11		< 12.05
<b>OCPs</b>						
alpha-BHC	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
gamma-BHC (Lindane)	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
beta-BHC	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
delta-BHC	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Heptachlor	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Aldrin	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Heptachlor epoxide	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
gamma-Chlordane	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endosulphan I & Alpha-chlorodane	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
4,4-DDE	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Dieldrin	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endrin	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endosulphan II & 4,4-DDD	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endrin aldehyde	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
4,4-DDT	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endosulphan sulphate	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Methoxychlor	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
Endrin ketone	DETS 3441*	0.1	mg/kg		< 0.1	< 0.1
<b>OPPs</b>						
Dichlorvos	DETS 3433*	0.1	mg/kg		< 0.1	< 0.1
Mevinphos	DETS 3433*	0.1	mg/kg		< 0.1	< 0.1
Demeton-O	DETS 3433*	0.1	mg/kg		< 0.1	< 0.1



# Summary of Chemical Analysis

## Soil Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

<b>Lab No</b>	2036019	2036020	2036021	2036022
<b>Sample ID</b>	RC-11	RC-11	RC-12	RC-12
<b>Depth</b>	0.10-0.20	0.40-0.50	0.10-0.20	0.50-0.60
<b>Other ID</b>	1	2	1	2
<b>Sample Type</b>	ES	ES	ES	ES
<b>Sampling Date</b>	06/07/2022	06/07/2022	07/07/2022	07/07/2022
<b>Sampling Time</b>	n/s	n/s	n/s	n/s

Test	Method	LOD	Units				
Ethoprop	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Naled	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Phorate	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Demeton-S	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Diazinon	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Disulfoton	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Methylparathion	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Ronnel	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Fenthion	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Chlopyrifos	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Trichlorinate	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Merphos	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Stirofos	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Tokuthion	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Fensulfothion	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Bolstar	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Azinphos methyl	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
Coumaphos	DETSC 3433*	0.1	mg/kg		< 0.1	< 0.1	
<b>Triazines</b>							
Atraton	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Prometon	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Simazine	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Atrazine	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Propazine	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Terbutylazine	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Secbumeton	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Symetryn	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Ametryn	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Prometryne	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	
Terbutryn	DETSC 3445*	0.1	mg/kg		< 0.1	< 0.1	

# Summary of Chemical Analysis

## Soil VOC/SVOC Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

Lab No	2036019	2036022
Sample ID	RC-11	RC-12
Depth	0.10-0.20	0.50-0.60
Other ID	1	2
Sample Type	ES	ES
Sampling Date	06/07/2022	07/07/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>VOCs</b>					
Vinyl Chloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1 Dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trans-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Cis-1,2-dichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chloroform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Carbon tetrachloride	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Benzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Trichloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromomethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromodichloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
cis-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Toluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
trans-1,3-dichloropropene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,2-trichloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tetrachloroethylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Dibromochloromethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromoethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Chlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,1,1,2-tetrachloroethane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Ethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
m+p-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
o-Xylene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Styrene	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
Bromoform	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Isopropylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Bromobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-propylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
2-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3,5-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
4-chlorotoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Tert-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trimethylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

Lab No	2036019	2036022
Sample ID	RC-11	RC-12
Depth	0.10-0.20	0.50-0.60
Other ID	1	2
Sample Type	ES	ES
Sampling Date	06/07/2022	07/07/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
sec-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
p-isopropyltoluene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,3-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,4-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
n-butylbenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2-dibromo-3-chloropropane	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,4-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
Hexachlorobutadiene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
1,2,3-trichlorobenzene	DETSC 3431	0.01	mg/kg	< 0.01	< 0.01
MTBE	DETSC 3431*	0.01	mg/kg	< 0.01	< 0.01
<b>SVOCs</b>					
Phenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Aniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Benzyl Alcohol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis(2-chloroisopropyl)ether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
3&4-Methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dimethylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Bis-(dichloroethoxy)methane	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4-Dichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,2,4-Trichlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chloro-3-methylphenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Methylnaphthalene	DETSC 3433	0.1	mg/kg	0.3	0.1
Hexachlorocyclopentadiene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4,6-Trichlorophenol	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,4,5-Trichlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Chloronaphthalene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,4-Dinitrotoluene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
3-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dibenzofuran	DETSC 3433	0.1	mg/kg	0.2	< 0.1
2,6-Dinitrotoluene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
2,3,4,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Chlorophenylphenylether	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
4-Nitroaniline	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2-Methyl-4,6-Dinitrophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Diphenylamine	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
4-Bromophenylphenylether	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1

## Summary of Chemical Analysis Soil VOC/SVOC Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

<b>Lab No</b>	2036019	2036022
<b>Sample ID</b>	RC-11	RC-12
<b>Depth</b>	0.10-0.20	0.50-0.60
<b>Other ID</b>	1	2
<b>Sample Type</b>	ES	ES
<b>Sampling Date</b>	06/07/2022	07/07/2022
<b>Sampling Time</b>	n/s	n/s

Test	Method	LOD	Units		
Hexachlorobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Pentachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Di-n-butylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Butylbenzylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Bis(2-ethylhexyl)phthalate	DETSC 3433	0.1	mg/kg	0.3	0.2
Di-n-octylphthalate	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,4-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Dimethylphthalate	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
1,3-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
1,2-Dinitrobenzene	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
2,3,5,6-Tetrachlorophenol	DETSC 3433*	0.1	mg/kg	< 0.1	< 0.1
Azobenzene	DETSC 3433	0.1	mg/kg	< 0.1	< 0.1
Carbazole	DETSC 3433*	0.1	mg/kg	0.2	< 0.1



## Summary of Chemical Analysis

### Leachate Samples

Our Ref 22-14010

Client Ref 2585

Contract Title Houghton le Spring

Lab No	2036023	2036024
Sample ID	RC-11	RC-12
Depth	0.10-0.20	0.50-0.60
Other ID	1	2
Sample Type	ES	ES
Sampling Date	06/07/2022	07/07/2022
Sampling Time	n/s	n/s

Test	Method	LOD	Units		
<b>Preparation</b>					
Leachate 2:1 250g Non-WAC	DETSC 1009*			Y	Y
<b>Metals</b>					
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	4.1	1.1
Boron, Dissolved	DETSC 2306*	12	ug/l	26	14
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	< 0.03	0.04
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	0.61
Copper, Dissolved	DETSC 2306	0.4	ug/l	7.5	5.7
Lead, Dissolved	DETSC 2306	0.09	ug/l	1.6	3.9
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	1.2	1.2
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.32	0.29
Zinc, Dissolved	DETSC 2306	1.3	ug/l	2.0	4.6
<b>Inorganics</b>					
pH	DETSC 2008		pH	6.6	6.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40
Sulphate as S	DETSC 2055	0.0334	mg/l	0.78	1.6
Total Organic Carbon	DETSC 2085	1	mg/l	49	59
<b>Petroleum Hydrocarbons</b>					
EPH (C10-C40)	DETSC 3311	10	ug/l	120	97
<b>PAHs</b>					
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.01	0.02
Anthracene	DETSC 3304	0.01	ug/l	0.01	0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01	0.02
Pyrene	DETSC 3304	0.01	ug/l	0.01	0.02
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20



## Summary of Asbestos Analysis

### Soil Samples

*Our Ref* 22-14010

*Client Ref* 2585

*Contract Title* Houghton le Spring

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
2036019	RC-11 1 0.10-0.20	SOIL	NAD	none	Keith Wilson
2036022	RC-12 2 0.50-0.60	SOIL	NAD	none	Keith Wilson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: \* - not included in laboratory scope of accreditation.

## Information in Support of the Analytical Results

Our Ref 22-14010  
 Client Ref 2585  
 Contract Houghton le Spring

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2036019	RC-11 0.10-0.20 SOIL	06/07/22	GJ 250ml x2, PT 1L	Aliphatics/Aromatics (14 days), BTEX (14 days), Naphthalene (14 days), PAH MS (14 days), pH + Conductivity (7 days), Cyanide/Mono pHoh (14 days), SVOC (14 days), EPH/TPH (14 days)	
2036020	RC-11 0.40-0.50 SOIL	06/07/22	GJ 250ml x2, PT 1L	OP Pesticides (14 days), Triazines (14 days)	
2036021	RC-12 0.10-0.20 SOIL	07/07/22	GJ 250ml x2, PT 1L		
2036022	RC-12 0.50-0.60 SOIL	07/07/22	GJ 250ml x2, PT 1L	pH + Conductivity (7 days), VOC (7 days)	
2036023	RC-11 0.10-0.20 LEACHATE	06/07/22	GJ 250ml x2, PT 1L		
2036024	RC-12 0.50-0.60 LEACHATE	07/07/22	GJ 250ml x2, PT 1L		

Key: G-Glass P-Plastic J-Jar T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis.

The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



# DETS

## Certificate of Analysis

*Certificate Number* 22-15537

*Issued:* 18-Aug-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-15537

*Client Reference* 2585

*Order No* PO-2205

*Contract Title* Houghton Colliery

*Description* 12 Water samples.

*Date Received* 10-Aug-22

*Date Started* 10-Aug-22

*Date Completed* 18-Aug-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



Kirk Bridgewood  
General Manager



2139

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044077	2044078	2044079	2044080	2044081	2044082
Sample ID	RC1	RC2	RC3	RC4	RC5	RC6
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.34	0.54	0.34	0.44	0.62	0.37
Boron, Dissolved	DETSC 2306*	12	ug/l	120	190	720	810	750	740
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.06	0.07	0.03	< 0.03	0.18	0.05
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	0.30	< 0.25	0.63	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	1.5	1.6	2.7	2.4	1.6	1.9
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.26	0.29	0.18	0.29	0.13	0.12
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.10	0.02	0.01	0.01	< 0.01	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	12	3.1	2.4	3.1	3.5	3.9
Selenium, Dissolved	DETSC 2306	0.25	ug/l	6.0	4.0	18	30	3.1	8.0
Zinc, Dissolved	DETSC 2306	1.3	ug/l	57	19	69	71	59	98
<b>Inorganics</b>									
pH	DETSC 2008		pH	6.7	6.9	6.9	7.0	7.1	7.2
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Sulphate as S	DETSC 2055	0.0334	mg/l	79	120	520	420	610	270
Total Organic Carbon	DETSC 2085	1	mg/l	130	140	72	110	150	18
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	15000	1400	1100	830	110	150
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044077	2044078	2044079	2044080	2044081	2044082
Sample ID	RC1	RC2	RC3	RC4	RC5	RC6
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	0.03	< 0.01	< 0.01	< 0.01	0.06	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	0.01	< 0.01	< 0.01	< 0.01	0.02	0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



# Summary of Chemical Analysis

## Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044077	2044078	2044079	2044080	2044081	2044082
Sample ID	RC1	RC2	RC3	RC4	RC5	RC6
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units	2044077	2044078	2044079	2044080	2044081	2044082
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	3
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044077	2044078	2044079	2044080	2044081	2044082
Sample ID	RC1	RC2	RC3	RC4	RC5	RC6
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Aniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044077	2044078	2044079	2044080	2044081	2044082
Sample ID	RC1	RC2	RC3	RC4	RC5	RC6
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Diphenylamine	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	3.0	2.2
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Azobenzene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
Carbazole	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 10.0	< 10.0	< 10.0	< 1.0	< 1.0	< 1.0



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044083	2044084	2044085	2044086	2044087	2044088
Sample ID	RC7	RC8	RC9	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.51	0.52	0.30	4.1	0.46	0.78
Boron, Dissolved	DETSC 2306*	12	ug/l	73	550	54	780	480	99
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.11	0.08	0.15	< 0.03	0.05	< 0.03
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.9	3.1	0.8	< 0.4	3.4	< 0.4
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.15	0.13	0.12	0.45	0.09	< 0.09
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	0.02	0.15
Nickel, Dissolved	DETSC 2306	0.5	ug/l	9.4	3.9	4.0	2.3	15	19
Selenium, Dissolved	DETSC 2306	0.25	ug/l	1.9	16	0.92	3.0	0.89	3.4
Zinc, Dissolved	DETSC 2306	1.3	ug/l	47	72	54	24	46	42
<b>Inorganics</b>									
pH	DETSC 2008		pH	7.3	7.2	7.2	8.1	7.4	7.6
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Sulphate as S	DETSC 2055	0.0334	mg/l	770	210	200	130	130	70
Total Organic Carbon	DETSC 2085	1	mg/l	120	92	75	68	250	160
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	< 100.0	< 20.0	< 100.0	< 20.0	2400	5800
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044083	2044084	2044085	2044086	2044087	2044088
Sample ID	RC7	RC8	RC9	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.03	0.06	0.02
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.02	0.12	0.02
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	0.15	0.03
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.06	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.04	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	0.03	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	0.71	< 0.20
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



# Summary of Chemical Analysis

## Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044083	2044084	2044085	2044086	2044087	2044088
Sample ID	RC7	RC8	RC9	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units	2044083	2044084	2044085	2044086	2044087	2044088
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	11	6	3	13	5	2
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	1	< 1	< 1	2	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044083	2044084	2044085	2044086	2044087	2044088
Sample ID	RC7	RC8	RC9	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Aniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-15537

Client Ref 2585

Contract Title Houghton Colliery

Lab No	2044083	2044084	2044085	2044086	2044087	2044088
Sample ID	RC7	RC8	RC9	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022	09/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Diphenylamine	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	1.9	< 1.0	7.3	< 5.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Azobenzene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
Carbazole	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0

## Information in Support of the Analytical Results

Our Ref 22-15537  
 Client Ref 2585  
 Contract Houghton Colliery

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2044077	RC1 WATER	09/08/22	GB 1L, GV, PB 1L		
2044078	RC2 WATER	09/08/22	GB 1L, GV, PB 1L		
2044079	RC3 WATER	09/08/22	GB 1L, GV, PB 1L		
2044080	RC4 WATER	09/08/22	GB 1L, GV, PB 1L		
2044081	RC5 WATER	09/08/22	GB 1L, GV, PB 1L		
2044082	RC6 WATER	09/08/22	GB 1L, GV, PB 1L		
2044083	RC7 WATER	09/08/22	GB 1L, GV, PB 1L		
2044084	RC8 WATER	09/08/22	GB 1L, GV, PB 1L		
2044085	RC9 WATER	09/08/22	GB 1L, GV, PB 1L		
2044086	RC10 WATER	09/08/22	GB 1L, GV, PB 1L		
2044087	RC11 WATER	09/08/22	GB 1L, GV, PB 1L		
2044088	RC12 WATER	09/08/22	GB 1L, GV, PB 1L		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



# DETS

## Interim Report of Analysis

*Certificate Number* 22-16368

*Issued:* 26-Aug-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-16368

*Client Reference* 2585

*Order No* PO-2254

*Contract Title* 2585 Houghton Colliery

*Description* 12 Water samples.

*Date Received* 19-Aug-22

*Date Started* 19-Aug-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



2139



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETS 2306	0.16	ug/l	0.25	0.27	0.20	0.22	0.68	0.29
Boron, Dissolved	DETS 2306*	12	ug/l	170	150	160	710	730	640
Cadmium, Dissolved	DETS 2306	0.03	ug/l	0.07	0.20	< 0.03	< 0.03	0.11	0.04
Chromium, Dissolved	DETS 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	0.29	< 0.25
Copper, Dissolved	DETS 2306	0.4	ug/l	4.4	0.4	1.0	0.5	1.1	2.2
Lead, Dissolved	DETS 2306	0.09	ug/l	0.48	0.12	0.11	< 0.09	0.28	0.24
Mercury, Dissolved	DETS 2306	0.01	ug/l	0.06	0.01	< 0.01	< 0.01	0.03	< 0.01
Nickel, Dissolved	DETS 2306	0.5	ug/l	9.7	14	2.6	0.7	2.0	3.2
Selenium, Dissolved	DETS 2306	0.25	ug/l	6.5	6.4	1.4	25	4.0	6.2
Zinc, Dissolved	DETS 2306	1.3	ug/l	91	70	51	43	68	76
<b>Inorganics</b>									
pH	DETS 2008		pH	7.5	7.5	7.2	7.1	7.2	7.2
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Ammoniacal Nitrogen as NH3	DETS 2207	0.015	mg/l	0.71	0.13	0.066	0.13	0.51	0.057
Sulphate as SO4	DETS 2055	0.1	mg/l	170	150	290	840	1200	680
Sulphur as S, Total	DETS 2320*	10	mg/l	72	45	130	390	590	200
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETS 3072*	1	ug/l	< 1.0	22	12	9.8	7.8	15
Aliphatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0
Aliphatic C5-C35	DETS 3072*	10	ug/l	< 10	23	12	11	< 10	18
Aromatic C5-C7	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETS 3072*	10	ug/l	< 10	23	12	11	< 10	18
EPH (C10-C40)	DETS 3311	10	ug/l	8100	35000	1200	2200	770	1600
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	0.01	< 0.01	0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

# Summary of Chemical Analysis

## Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

# Summary of Chemical Analysis

## Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Aniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Chlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Benzyl Alcohol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
3&4-Methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Methylnaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Chloronaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
3-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Nitrophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Dibenzofuran	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Diethylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Diphenylamine	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Hexachlorobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Pentachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Di-n-butylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Butylbenzylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Di-n-octylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Dimethylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Azobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Carbazole	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1-Methylnaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETS 2306	0.16	ug/l	0.26	0.37	0.25	6.6	0.48	0.45
Boron, Dissolved	DETS 2306*	12	ug/l	48	630	54	820	620	99
Cadmium, Dissolved	DETS 2306	0.03	ug/l	0.14	0.08	0.14	< 0.03	0.05	0.04
Chromium, Dissolved	DETS 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETS 2306	0.4	ug/l	0.6	1.7	2.1	0.5	4.1	0.8
Lead, Dissolved	DETS 2306	0.09	ug/l	0.10	0.15	< 0.09	0.19	0.12	0.11
Mercury, Dissolved	DETS 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.04
Nickel, Dissolved	DETS 2306	0.5	ug/l	4.7	2.9	3.1	1.8	10	9.5
Selenium, Dissolved	DETS 2306	0.25	ug/l	0.71	16	1.1	1.6	0.78	1.8
Zinc, Dissolved	DETS 2306	1.3	ug/l	70	86	52	31	50	48
<b>Inorganics</b>									
pH	DETS 2008		pH	7.1	7.1	7.1	8.5	7.0	7.5
Cyanide, Total	DETS 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Ammoniacal Nitrogen as NH3	DETS 2207	0.015	mg/l	0.049	0.047	0.062	6.9	0.10	0.25
Sulphate as SO4	DETS 2055	0.1	mg/l	490	460	350	280	360	190
Sulphur as S, Total	DETS 2320*	10	mg/l	170	200	150	120	160	76
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETS 3072*	1	ug/l	25	29	34	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETS 3072*	1	ug/l	4.8	13	29	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETS 3072*	10	ug/l	30	42	63	< 10	< 10	< 10
Aromatic C5-C7	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETS 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETS 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETS 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETS 3072*	10	ug/l	30	43	64	< 10	< 10	< 10
EPH (C10-C40)	DETS 3311	10	ug/l	1400	3800	1200	3100	5300	4000
Benzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETS 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units							
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
<b>PAHs</b>										
Naphthalene	DETSC 3304	0.05	ug/l	t/f	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	DETSC 3304	0.01	ug/l	t/f	0.02	< 0.01	< 0.01	< 0.01	0.02	
Fluorene	DETSC 3304	0.01	ug/l	t/f	0.02	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	DETSC 3304	0.01	ug/l	t/f	0.03	0.02	< 0.01	0.04	0.02	
Anthracene	DETSC 3304	0.01	ug/l	t/f	0.03	< 0.01	< 0.01	0.02	< 0.01	
Fluoranthene	DETSC 3304	0.01	ug/l	t/f	0.03	< 0.01	< 0.01	0.07	0.03	
Pyrene	DETSC 3304	0.01	ug/l	t/f	0.06	< 0.01	< 0.01	0.10	0.03	
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	t/f	0.03	< 0.01	< 0.01	0.02	< 0.01	
Chrysene	DETSC 3304	0.01	ug/l	t/f	0.03	< 0.01	< 0.01	0.02	< 0.01	
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	t/f	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
PAH Total	DETSC 3304	0.2	ug/l	t/f	0.26	< 0.20	< 0.20	0.26	< 0.20	
<b>PCBs</b>										
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
PCB 52	DETSC 3402	0.2	ug/l		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 101	DETSC 3402	0.3	ug/l		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l		< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	
PCB 138	DETSC 3402	0.2	ug/l		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 153	DETSC 3402	0.2	ug/l		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 180	DETSC 3402	0.2	ug/l		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
PCB 7 Total	DETSC 3402	1	ug/l		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Aniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Chlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Benzyl Alcohol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
3&4-Methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Methylnaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Chloronaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
3-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Nitrophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Dibenzofuran	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Diethylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Nitroaniline	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Diphenylamine	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Hexachlorobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Pentachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Di-n-butylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Butylbenzylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Di-n-octylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Dimethylphthalate	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Azobenzene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
Carbazole	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f
1-Methylnaphthalene	DETSC 3434*	1	ug/l	t/f	t/f	t/f	t/f	t/f	t/f

## Information in Support of the Analytical Results

Our Ref 22-16368  
 Client Ref 2585  
 Contract 2585 Houghton Colliery

### Containers Received & Deviating Samples

Lab No	Sample ID	Date		Containers Received	Holding time exceeded for tests	Inappropriate container for tests
		Sampled				
2048431	RC01 WATER	18/08/22		GB 1L, GV, PB 1L		
2048432	RC02 WATER	18/08/22		GB 1L, GV, PB 1L		
2048433	RC03 WATER	18/08/22		GB 1L, GV, PB 1L		
2048434	RC04 WATER	18/08/22		GB 1L, GV, PB 1L		
2048435	RC05 WATER	18/08/22		GB 1L, GV, PB 1L		
2048436	RC06 WATER	18/08/22		GB 1L, GV, PB 1L		
2048437	RC07 WATER	18/08/22		GB 1L, GV, PB 1L		
2048438	RC08 WATER	18/08/22		GB 1L, GV, PB 1L		
2048439	RC09 WATER	18/08/22		GB 1L, GV, PB 1L		
2048440	RC10 WATER	18/08/22		GB 1L, GV, PB 1L		
2048441	RC11 WATER	18/08/22		GB 1L, GV, PB 1L		
2048442	RC12 WATER	18/08/22		GB 1L, GV, PB 1L		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



# DETS

## Certificate of Analysis

*Certificate Number* 22-16368

*Issued:* 31-Aug-22

*Client* Shadbolt Group  
18 Bewick Road  
Gateshead  
NE8 4DP

*Our Reference* 22-16368

*Client Reference* 2585

*Order No* PO-2254

*Contract Title* 2585 Houghton Colliery

*Description* 12 Water samples.

*Date Received* 19-Aug-22

*Date Started* 19-Aug-22

*Date Completed* 31-Aug-22

*Test Procedures* Identified by prefix DETSn (details on request).

*Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. 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 except in full, without the prior written approval of the laboratory.

*Approved By*



Kirk Bridgewood  
General Manager



2139

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.25	0.27	0.20	0.22	0.68	0.29
Boron, Dissolved	DETSC 2306*	12	ug/l	170	150	160	710	730	640
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.07	0.20	< 0.03	< 0.03	0.11	0.04
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	0.29	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	4.4	0.4	1.0	0.5	1.1	2.2
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.48	0.12	0.11	< 0.09	0.28	0.24
Mercury, Dissolved	DETSC 2306	0.01	ug/l	0.06	0.01	< 0.01	< 0.01	0.03	< 0.01
Nickel, Dissolved	DETSC 2306	0.5	ug/l	9.7	14	2.6	0.7	2.0	3.2
Selenium, Dissolved	DETSC 2306	0.25	ug/l	6.5	6.4	1.4	25	4.0	6.2
Zinc, Dissolved	DETSC 2306	1.3	ug/l	91	70	51	43	68	76
<b>Inorganics</b>									
pH	DETSC 2008		pH	7.5	7.5	7.2	7.1	7.2	7.2
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Ammoniacal Nitrogen as NH3	DETSC 2207	0.015	mg/l	0.71	0.13	0.066	0.13	0.51	0.057
Sulphate as SO4	DETSC 2055	0.1	mg/l	170	150	290	840	1200	680
Sulphur as S, Total	DETSC 2320*	10	mg/l	72	45	130	390	590	200
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	22	12	9.8	7.8	15
Aliphatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	< 10	23	12	11	< 10	18
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	< 10	23	12	11	< 10	18
EPH (C10-C40)	DETSC 3311	10	ug/l	8100	35000	1200	2200	770	1600
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	< 0.01	0.01	0.01	< 0.01	0.01	< 0.01
Anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

# Summary of Chemical Analysis

## Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units	2048431	2048432	2048433	2048434	2048435	2048436
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

SVOCs									
Phenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048431	2048432	2048433	2048434	2048435	2048436
Sample ID	RC01	RC02	RC03	RC04	RC05	RC06
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	0900	0915	0930	0945	1000	1015

Test	Method	LOD	Units						
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Diphenylamine	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	5.3	< 5.0	< 5.0	< 5.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Azobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Carbazole	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0



## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
<b>Metals</b>									
Arsenic, Dissolved	DETSC 2306	0.16	ug/l	0.26	0.37	0.25	6.6	0.48	0.45
Boron, Dissolved	DETSC 2306*	12	ug/l	48	630	54	820	620	99
Cadmium, Dissolved	DETSC 2306	0.03	ug/l	0.14	0.08	0.14	< 0.03	0.05	0.04
Chromium, Dissolved	DETSC 2306	0.25	ug/l	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Copper, Dissolved	DETSC 2306	0.4	ug/l	0.6	1.7	2.1	0.5	4.1	0.8
Lead, Dissolved	DETSC 2306	0.09	ug/l	0.10	0.15	< 0.09	0.19	0.12	0.11
Mercury, Dissolved	DETSC 2306	0.01	ug/l	< 0.01	< 0.01	< 0.01	0.01	< 0.01	0.04
Nickel, Dissolved	DETSC 2306	0.5	ug/l	4.7	2.9	3.1	1.8	10	9.5
Selenium, Dissolved	DETSC 2306	0.25	ug/l	0.71	16	1.1	1.6	0.78	1.8
Zinc, Dissolved	DETSC 2306	1.3	ug/l	70	86	52	31	50	48
<b>Inorganics</b>									
pH	DETSC 2008		pH	7.1	7.1	7.1	8.5	7.0	7.5
Cyanide, Total	DETSC 2130	40	ug/l	< 40	< 40	< 40	< 40	< 40	< 40
Ammoniacal Nitrogen as NH3	DETSC 2207	0.015	mg/l	0.049	0.047	0.062	6.9	0.10	0.25
Sulphate as SO4	DETSC 2055	0.1	mg/l	490	460	350	280	360	190
Sulphur as S, Total	DETSC 2320*	10	mg/l	170	200	150	120	160	76
<b>Petroleum Hydrocarbons</b>									
Aliphatic C5-C6	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C6-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aliphatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic C16-C21	DETSC 3072*	1	ug/l	25	29	34	< 1.0	< 1.0	< 1.0
Aliphatic C21-C35	DETSC 3072*	1	ug/l	4.8	13	29	< 1.0	< 1.0	< 1.0
Aliphatic C5-C35	DETSC 3072*	10	ug/l	30	42	63	< 10	< 10	< 10
Aromatic C5-C7	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C7-C8	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C8-C10	DETSC 3322	0.1	ug/l	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aromatic C10-C12	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C12-C16	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C16-C21	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C21-C35	DETSC 3072*	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic C5-C35	DETSC 3072*	10	ug/l	< 10	< 10	< 10	< 10	< 10	< 10
TPH Ali/Aro Total C5-C35	DETSC 3072*	10	ug/l	30	43	64	< 10	< 10	< 10
EPH (C10-C40)	DETSC 3311	10	ug/l	1400	3800	1200	3100	5300	4000
Benzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE	DETSC 3322	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
<b>PAHs</b>									
Naphthalene	DETSC 3304	0.05	ug/l	< 0.50	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	DETSC 3304	0.01	ug/l	0.12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	DETSC 3304	0.01	ug/l	0.66	0.02	< 0.01	< 0.01	< 0.01	0.02
Fluorene	DETSC 3304	0.01	ug/l	0.88	0.02	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	DETSC 3304	0.01	ug/l	1.3	0.03	0.02	< 0.01	0.04	0.02
Anthracene	DETSC 3304	0.01	ug/l	0.88	0.03	< 0.01	< 0.01	0.02	< 0.01
Fluoranthene	DETSC 3304	0.01	ug/l	1.0	0.03	< 0.01	< 0.01	0.07	0.03
Pyrene	DETSC 3304	0.01	ug/l	2.8	0.06	< 0.01	< 0.01	0.10	0.03
Benzo(a)anthracene	DETSC 3304*	0.01	ug/l	0.99	0.03	< 0.01	< 0.01	0.02	< 0.01
Chrysene	DETSC 3304	0.01	ug/l	0.78	0.03	< 0.01	< 0.01	0.02	< 0.01
Benzo(b)fluoranthene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	DETSC 3304	0.01	ug/l	< 0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
PAH Total	DETSC 3304	0.2	ug/l	9.4	0.26	< 0.20	< 0.20	0.26	< 0.20
<b>PCBs</b>									
PCB 28 + PCB 31	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 52	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 101	DETSC 3402	0.3	ug/l	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB 118 + PCB 123	DETSC 3402	0.6	ug/l	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6	< 0.6
PCB 138	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 153	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 180	DETSC 3402	0.2	ug/l	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB 7 Total	DETSC 3402	1	ug/l	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units	2048437	2048438	2048439	2048440	2048441	2048442
<b>VOCs</b>									
Dichlorodifluoromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Vinyl Chloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichlorofluoromethane	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Methylene Chloride	DETSC 3432*	27	ug/l	< 27	< 27	< 27	< 27	< 27	< 27
Trans-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Cis-1,2-dichloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2,2-dichloropropane	DETSC 3432*	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
Bromochloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
Chloroform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Carbon tetrachloride	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Benzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Trichloroethylene	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromomethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromodichloromethane	DETSC 3432	4	ug/l	< 4	< 4	< 4	< 4	< 4	< 4
cis-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Toluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
trans-1,3-dichloropropene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2-trichloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachloroethylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromoethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Chlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,1,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Ethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
m+p-Xylene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
o-Xylene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Styrene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromoform	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Isopropylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,1,2,2-tetrachloroethane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Bromobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

Lab No	2048437	2048438	2048439	2048440	2048441	2048442
Sample ID	RC07	RC08	RC09	RC10	RC11	RC12
Depth						
Other ID						
Sample Type	WATER	WATER	WATER	WATER	WATER	WATER
Sampling Date	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
Sampling Time	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
1,2,3-trichloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-propylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
2-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3,5-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
4-chlorotoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Tert-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trimethylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
sec-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
p-isopropyltoluene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,3-dichlorobenzene	DETSC 3432	2	ug/l	< 2	< 2	< 2	< 2	< 2	< 2
1,4-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
n-butylbenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2-dibromo-3-chloropropane	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,4-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
Hexachlorobutadiene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
1,2,3-trichlorobenzene	DETSC 3432	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
MTBE	DETSC 3432*	1	ug/l	< 1	< 1	< 1	< 1	< 1	< 1
<b>SVOCs</b>									
Phenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Aniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2-Chlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Benzyl Alcohol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Bis(2-chloroisopropyl)ether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
3&4-Methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Bis(2-chloroethoxy)methane	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,4-Dimethylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,4-Dichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
1,2,4-Trichlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
4-Chloro-3-methylphenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2-Methylnaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Hexachlorocyclopentadiene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,4,6-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,4,5-Trichlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2-Chloronaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,4-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
3-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
4-Nitrophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Dibenzofuran	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,6-Dinitrotoluene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0

## Summary of Chemical Analysis

### Water Samples

Our Ref 22-16368

Client Ref 2585

Contract Title 2585 Houghton Colliery

<b>Lab No</b>	2048437	2048438	2048439	2048440	2048441	2048442
<b>Sample ID</b>	RC07	RC08	RC09	RC10	RC11	RC12
<b>Depth</b>						
<b>Other ID</b>						
<b>Sample Type</b>	WATER	WATER	WATER	WATER	WATER	WATER
<b>Sampling Date</b>	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022	18/08/2022
<b>Sampling Time</b>	1030	1045	1100	1115	1130	1145

Test	Method	LOD	Units						
2,3,4,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Diethylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
4-Chlorophenylphenylether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
4-Nitroaniline	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Diphenylamine	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
4-Bromophenylphenylether	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Hexachlorobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Bis(2-ethylhexyl)ester	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Pentachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Di-n-butylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Butylbenzylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Bis(2-ethylhexyl)phthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Di-n-octylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
1,4-Dinitrobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Dimethylphthalate	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
1,3-Dinitrobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
2,3,5,6-Tetrachlorophenol	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Azobenzene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
Carbazole	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0
1-Methylnaphthalene	DETSC 3434*	1	ug/l	< 5.0	< 5.0	< 5.0	< 1.0	< 5.0	< 5.0

## Information in Support of the Analytical Results

Our Ref 22-16368  
 Client Ref 2585  
 Contract 2585 Houghton Colliery

### Containers Received & Deviating Samples

Lab No	Sample ID	Date Sampled	Containers Received	Holding time exceeded for tests	Inappropriate container for tests
2048431	RC01 WATER	18/08/22	GB 1L, GV, PB 1L		
2048432	RC02 WATER	18/08/22	GB 1L, GV, PB 1L		
2048433	RC03 WATER	18/08/22	GB 1L, GV, PB 1L		
2048434	RC04 WATER	18/08/22	GB 1L, GV, PB 1L		
2048435	RC05 WATER	18/08/22	GB 1L, GV, PB 1L		
2048436	RC06 WATER	18/08/22	GB 1L, GV, PB 1L		
2048437	RC07 WATER	18/08/22	GB 1L, GV, PB 1L		
2048438	RC08 WATER	18/08/22	GB 1L, GV, PB 1L		
2048439	RC09 WATER	18/08/22	GB 1L, GV, PB 1L		
2048440	RC10 WATER	18/08/22	GB 1L, GV, PB 1L		
2048441	RC11 WATER	18/08/22	GB 1L, GV, PB 1L		
2048442	RC12 WATER	18/08/22	GB 1L, GV, PB 1L		

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

### Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-  
 Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX E  
GEOTECHNICAL LABORATORY RESULTS



# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



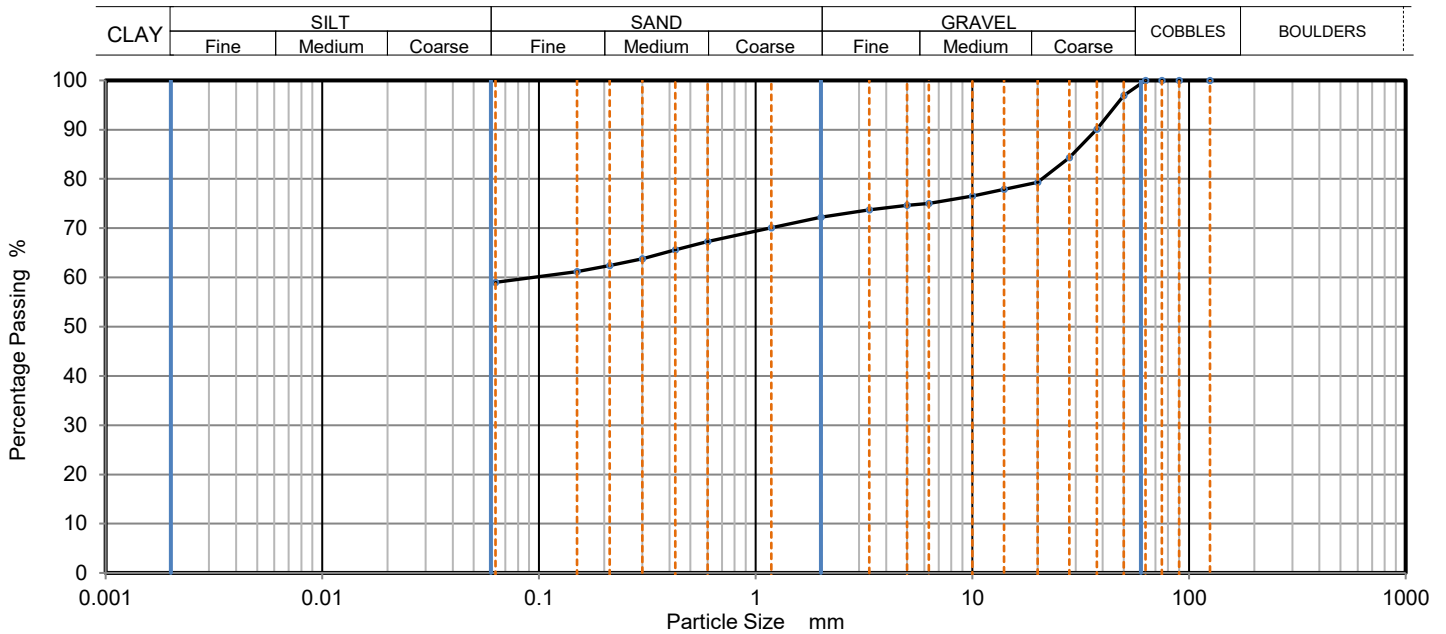
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276519  
Hole No.: TP-02  
Sample Reference: Not Given  
Sample Description: Brown sandy gravelly CLAY

Depth Top [m]: 0.80  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	90		
28	84		
20	79		
14	78		
10	77		
6.3	75		
5	75		
3.35	74		
2	72		
1.18	70		
0.6	67		
0.425	66		
0.3	64		
0.212	62		
0.15	61		
0.063	60		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	27.80
Sand	12.50
Fines <0.063mm	59.70

Grading Analysis		
D100	mm	63
D60	mm	0.0736
D30	mm	
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



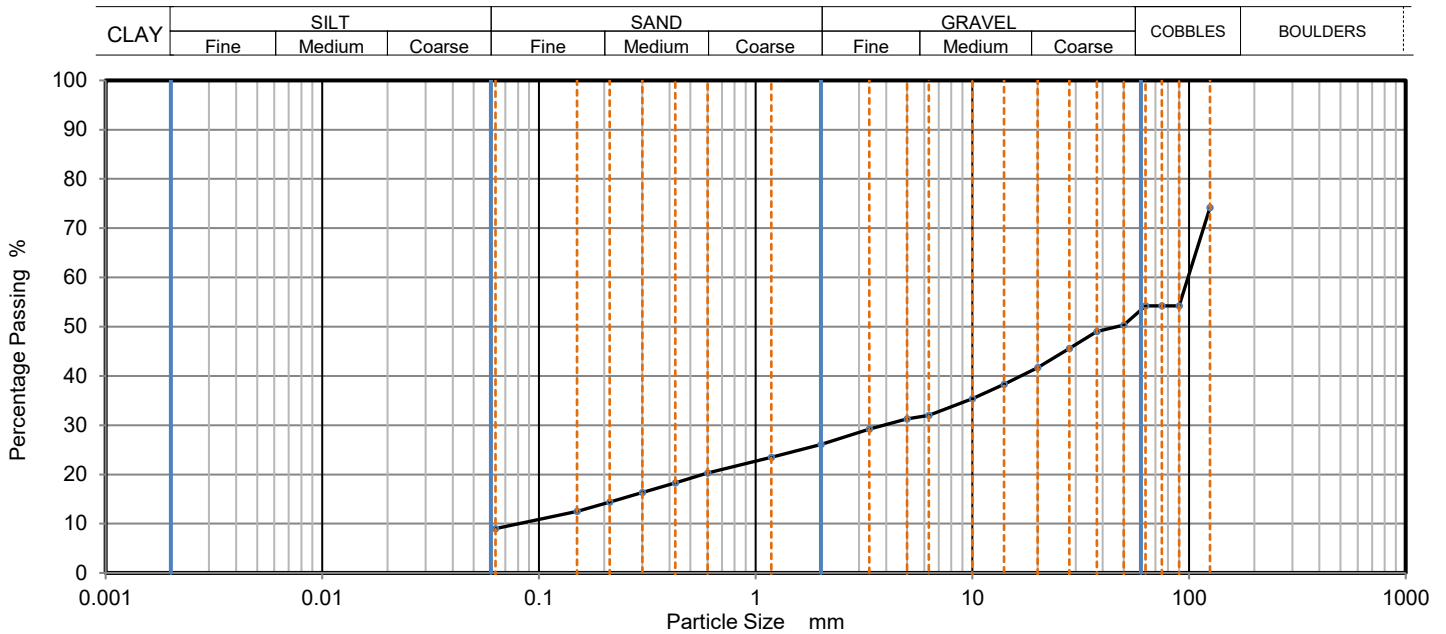
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276520  
Hole No.: TP-04  
Sample Reference: Not Given  
Sample Description: Brown slightly clayey sandy GRAVEL with cobbles

Depth Top [m]: 2.00  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	74		
90	54		
75	54		
63	54		
50	50		
37.5	49		
28	46		
20	42		
14	38		
10	35		
6.3	32		
5	31		
3.35	29		
2	26		
1.18	24		
0.6	20		
0.425	18		
0.3	16		
0.212	14		
0.15	13		
0.063	10		

Sample Proportions	% dry mass
Very coarse	45.80
Gravel	28.10
Sand	16.60
Fines <0.063mm	9.60

Grading Analysis	
D100	mm
D60	mm
D30	mm
D10	mm
Uniformity Coefficient	1400
Curvature Coefficient	2.2

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

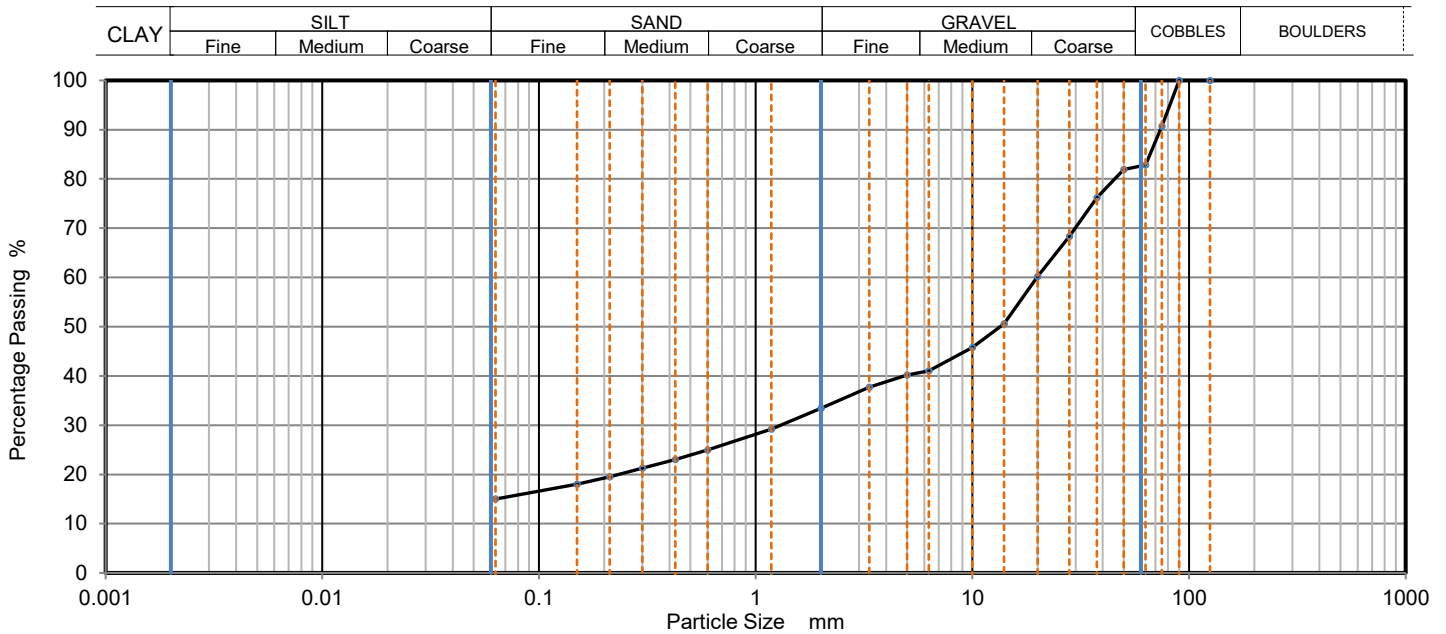
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276521  
Hole No.: TP-09  
Sample Reference: Not Given  
Sample Description: Brown clayey sandy GRAVEL with cobbles

Depth Top [m]: 0.50  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	91		
63	83		
50	82		
37.5	76		
28	68		
20	60		
14	51		
10	46		
6.3	41		
5	40		
3.35	38		
2	33		
1.18	29		
0.6	25		
0.425	23		
0.3	21		
0.212	20		
0.15	18		
0.063	15		

Sample Proportions	% dry mass
Very coarse	17.20
Gravel	49.50
Sand	18.20
Fines <0.063mm	15.20

Grading Analysis		
D100	mm	90
D60	mm	19.9
D30	mm	1.3
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



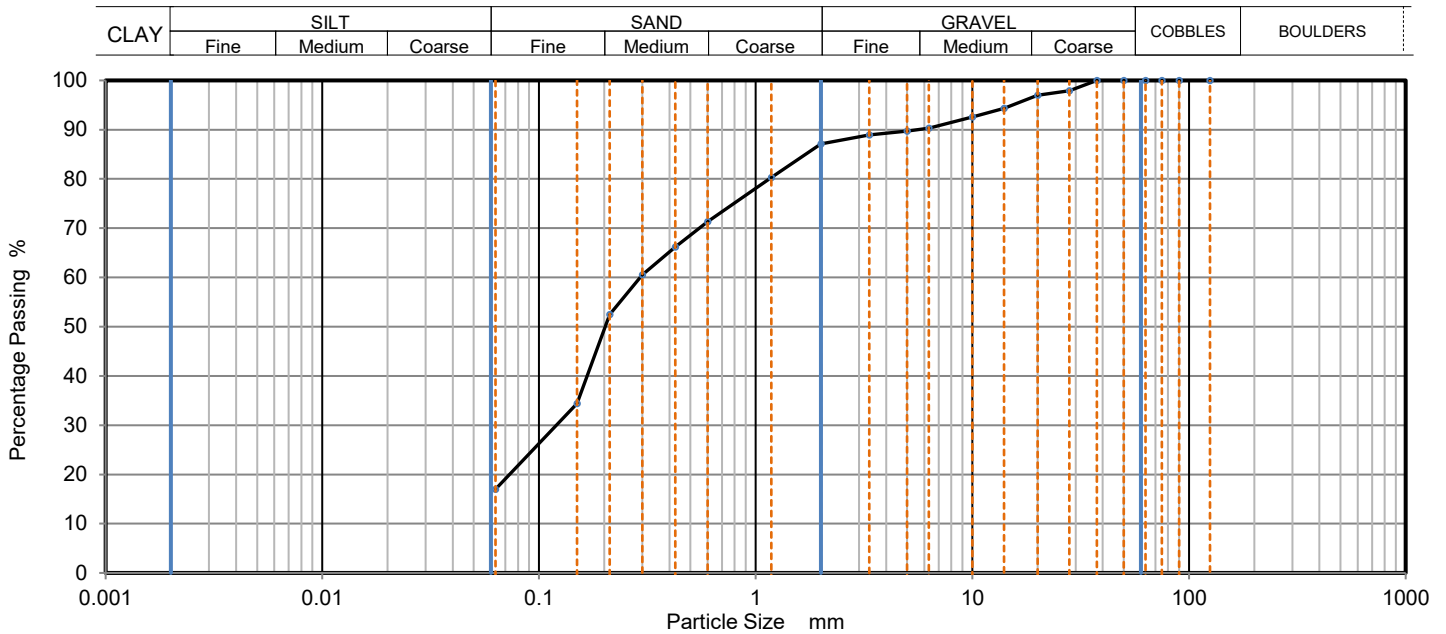
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276522  
Hole No.: TP-08  
Sample Reference: Not Given  
Sample Description: Brown gravelly clayey SAND

Depth Top [m]: 1.50  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	98		
20	97		
14	94		
10	93		
6.3	90		
5	90		
3.35	89		
2	87		
1.18	80		
0.6	71		
0.425	66		
0.3	61		
0.212	53		
0.15	34		
0.063	17		

Sample Proportions	% dry mass
Very coarse	0.00
Gravel	12.90
Sand	69.70
Fines <0.063mm	17.40

Grading Analysis		
D100	mm	37.5
D60	mm	0.293
D30	mm	0.12
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

### Remarks:

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



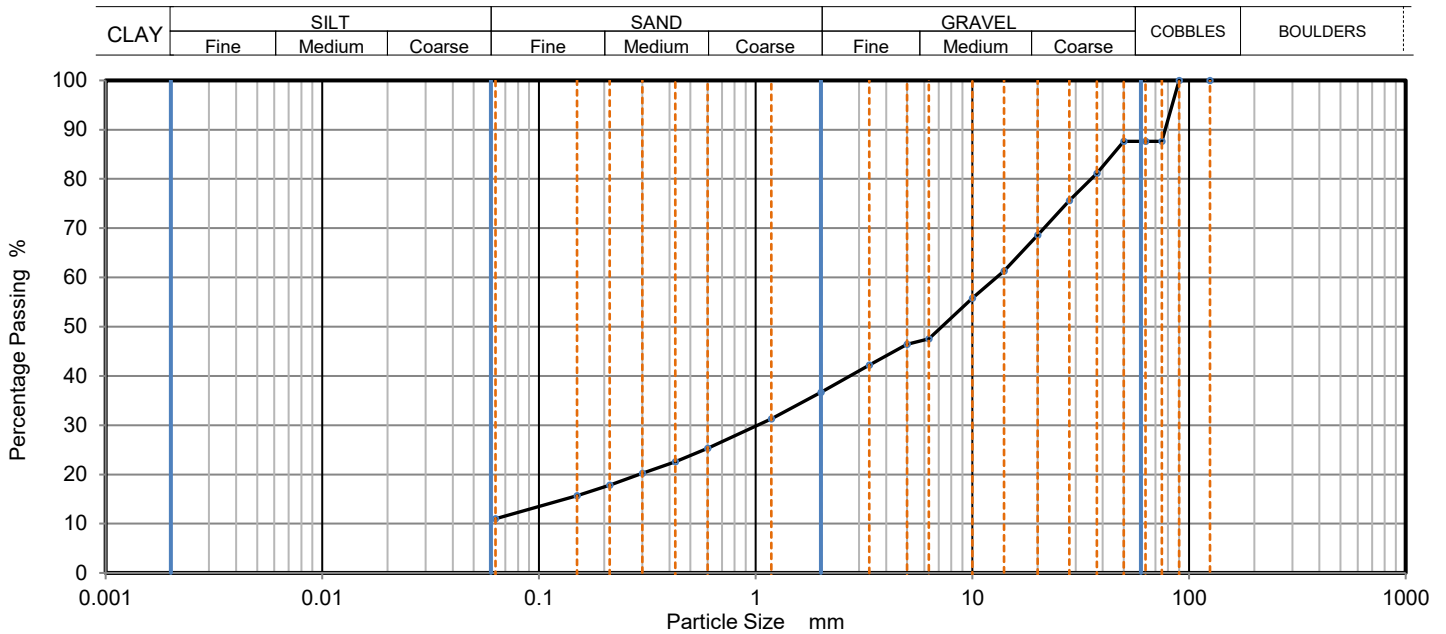
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276523  
Hole No.: TP-10  
Sample Reference: Not Given  
Sample Description: Brown clayey sandy GRAVEL with cobbles

Depth Top [m]: 1.00  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	88		
63	88		
50	88		
37.5	81		
28	76		
20	69		
14	61		
10	56		
6.3	48		
5	46		
3.35	42		
2	37		
1.18	31		
0.6	25		
0.425	23		
0.3	20		
0.212	18		
0.15	16		
0.063	12		

Sample Proportions	% dry mass
Very coarse	12.40
Gravel	51.00
Sand	25.00
Fines <0.063mm	11.70

Grading Analysis		
D100	mm	90
D60	mm	12.9
D30	mm	1.02
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



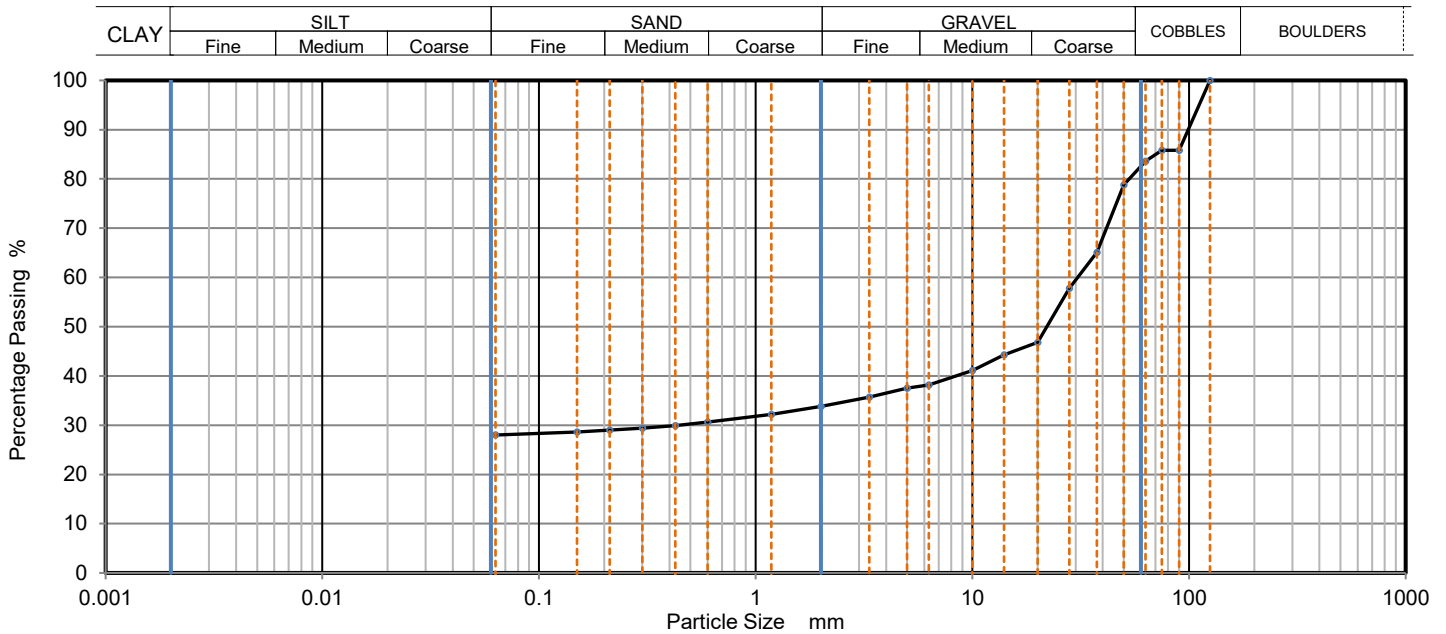
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead,  
NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276524  
Hole No.: TP-10  
Sample Reference: Not Given  
Sample Description: Reddish brown slightly sandy clayey GRAVEL with cobbles

Depth Top [m]: 2.50  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	86		
75	86		
63	84		
50	79		
37.5	65		
28	58		
20	47		
14	44		
10	41		
6.3	38		
5	38		
3.35	36		
2	34		
1.18	32		
0.6	31		
0.425	30		
0.3	29		
0.212	29		
0.15	29		
0.063	28		

Sample Proportions	% dry mass
Very coarse	16.40
Gravel	49.90
Sand	5.70
Fines <0.063mm	28.00

Grading Analysis		
D100	mm	125
D60	mm	30.6
D30	mm	0.441
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



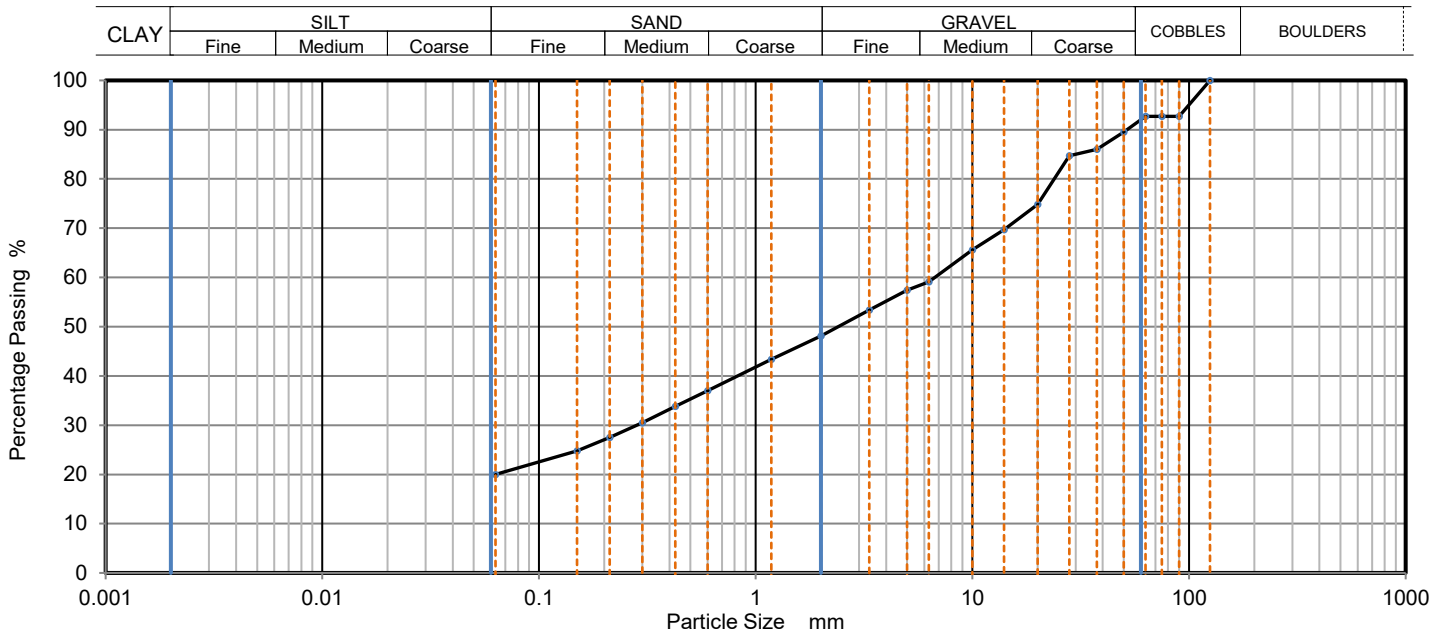
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276525  
Hole No.: TP-20  
Sample Reference: Not Given  
Sample Description: Brown clayey sandy GRAVEL with cobbles

Depth Top [m]: 1.50  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	93		
75	93		
63	93		
50	90		
37.5	86		
28	85		
20	75		
14	70		
10	66		
6.3	59		
5	57		
3.35	53		
2	48		
1.18	43		
0.6	37		
0.425	34		
0.3	31		
0.212	28		
0.15	25		
0.063	21		

Sample Proportions	% dry mass
Very coarse	7.30
Gravel	44.60
Sand	27.50
Fines <0.063mm	20.60

Grading Analysis		
D100	mm	125
D60	mm	6.7
D30	mm	0.283
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



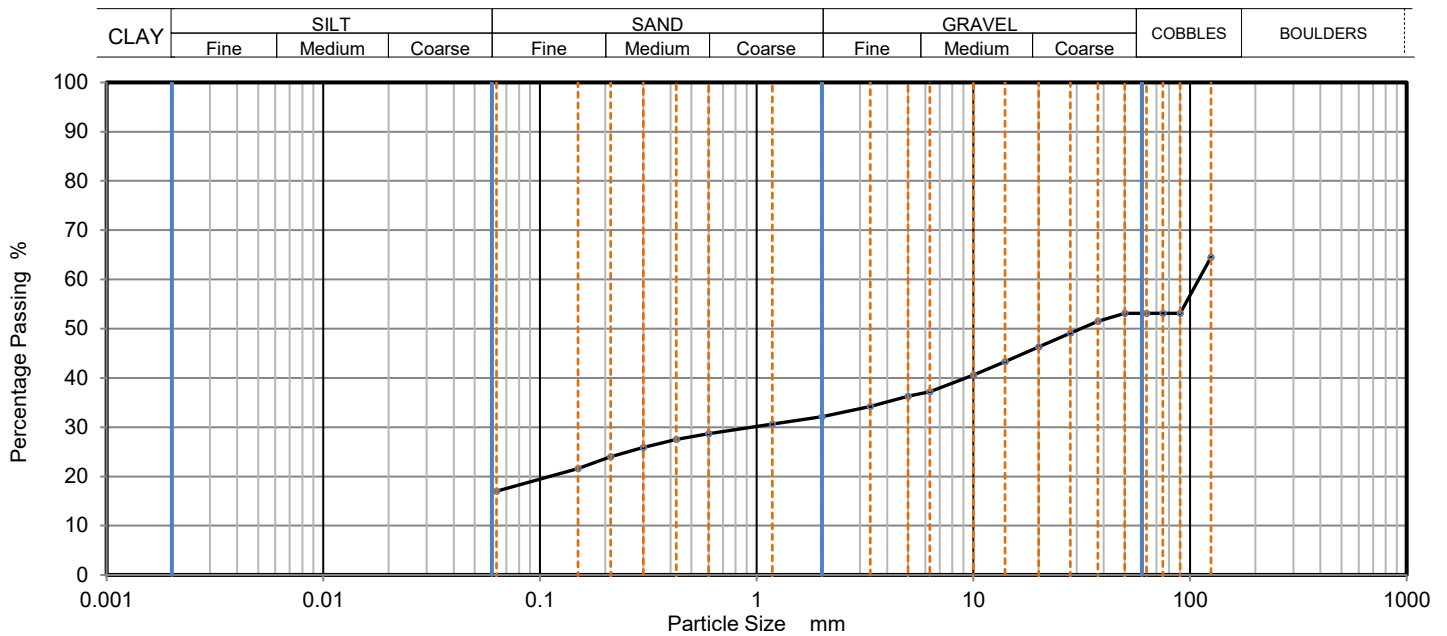
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276526  
Hole No.: TP-19  
Sample Reference: Not Given  
Sample Description: Greyish brown sandy very clayey GRAVEL with cobbles

Depth Top [m]: 0.60  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	65		
90	53		
75	53		
63	53		
50	53		
37.5	52		
28	49		
20	46		
14	43		
10	41		
6.3	37		
5	36		
3.35	34		
2	32		
1.18	31		
0.6	29		
0.425	28		
0.3	26		
0.212	24		
0.15	22		
0.063	18		

Sample Proportions	% dry mass
Very coarse	46.90
Gravel	21.00
Sand	14.30
Fines <0.063mm	17.70

Grading Analysis		
D100	mm	
D60	mm	110
D30	mm	0.965
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
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# TEST CERTIFICATE

## Particle Size Distribution

Tested in Accordance with: BS 1377-2: 1990

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



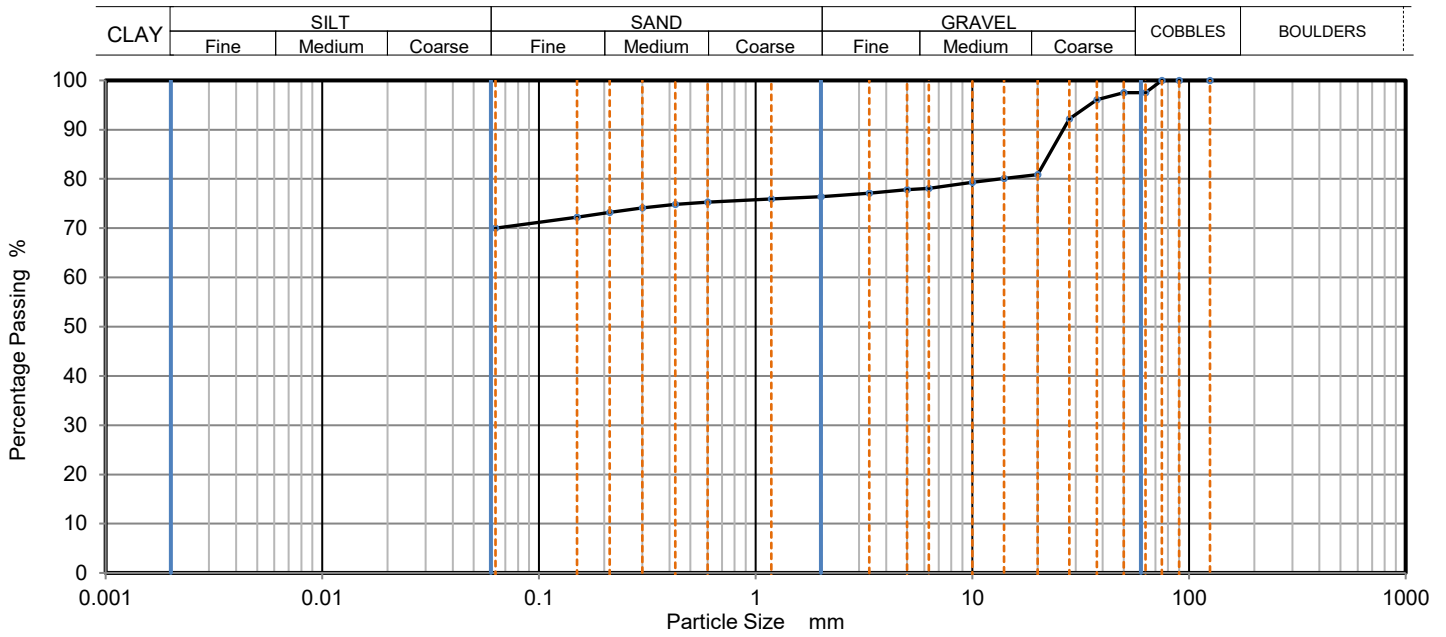
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276527  
Hole No.: TP-11  
Sample Reference: Not Given  
Sample Description: Brown slightly sandy gravelly CLAY with cobbles

Depth Top [m]: 1.00  
Depth Base [m]: Not Given  
Sample Type: B







# TEST CERTIFICATE

## Particle Size Distribution

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



Tested in Accordance with: BS 1377-2: 1990

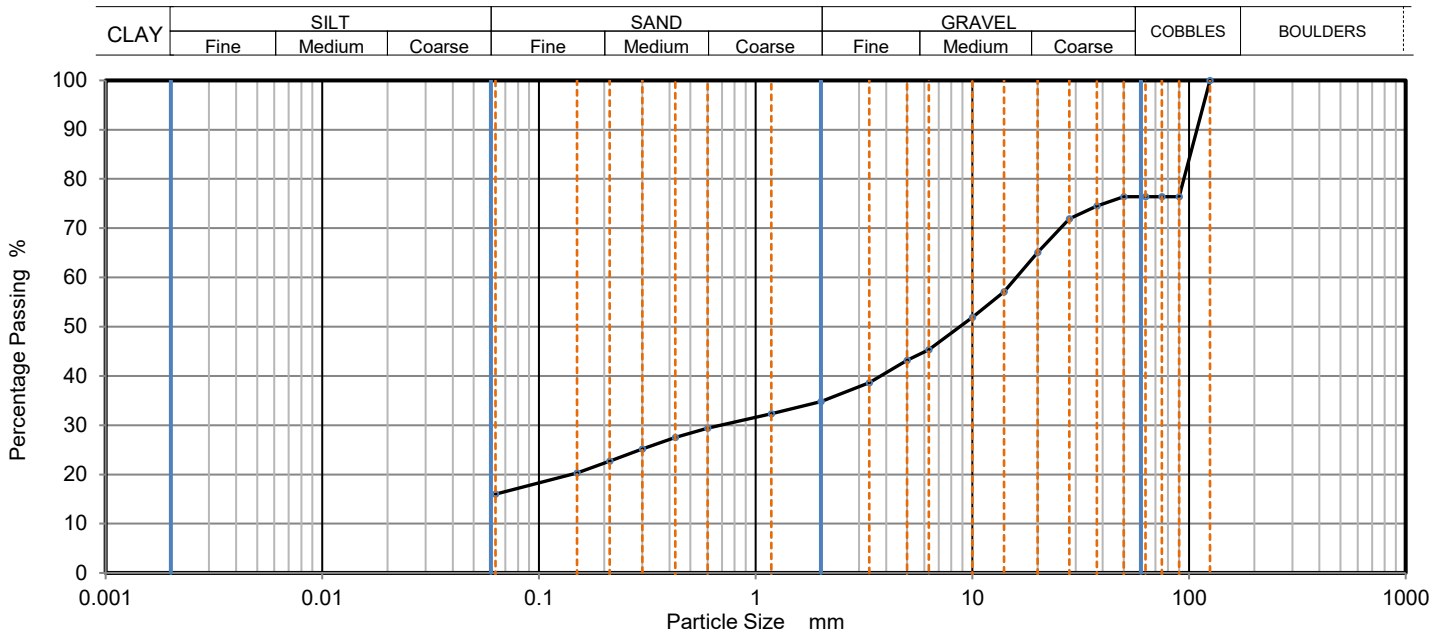
Client: The Shadbolt Group  
Client Address: 18 Bewick Road, Gateshead, NE8 4DP  
Contact: Iain McLean  
Site Name: Newbottle Street, Houghton le Spring  
Site Address: Not Given

Client Reference: 2585  
Job Number: 19-51605  
Date Sampled: Not Given  
Date Received: 25/07/2019  
Date Tested: 30/07/2019  
Sampled By: Not Given

### Test Results:

Laboratory Reference: 1276528  
Hole No.: TP-01  
Sample Reference: Not Given  
Sample Description: Brown slightly sandy gravelly CLAY with cobbles

Depth Top [m]: 2.00  
Depth Base [m]: Not Given  
Sample Type: B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	76		
75	76		
63	76		
50	76		
37.5	75		
28	72		
20	65		
14	57		
10	52		
6.3	45		
5	43		
3.35	39		
2	35		
1.18	32		
0.6	29		
0.425	28		
0.3	25		
0.212	23		
0.15	20		
0.063	16		

Sample Proportions	% dry mass
Very coarse	23.60
Gravel	41.70
Sand	18.50
Fines <0.063mm	16.30

Grading Analysis		
D100	mm	125
D60	mm	15.9
D30	mm	0.693
D10	mm	
Uniformity Coefficient		
Curvature Coefficient		

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks: The material submitted - fails to meet the minimum mass requirements as stated in BS1377 Part 2 Table 3

Approved: Dariusz Piotrowski  
PL Geotechnical Laboratory Manager  
Date Reported: 08/08/2019

Signed: Darren Berrill  
Geotechnical General Manager  
for and on behalf of i2 Analytical Ltd GF 100.12

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



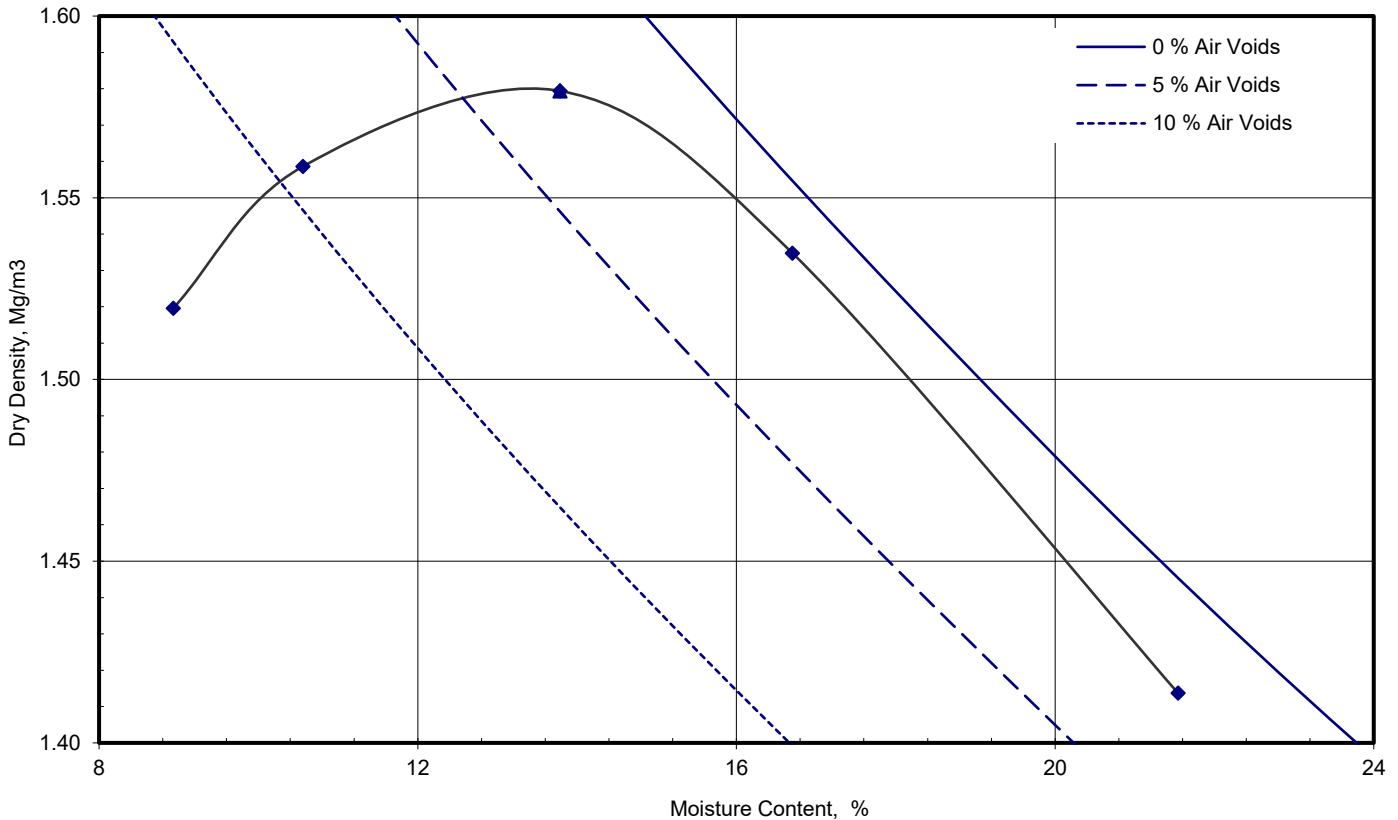
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276509  
 Hole No.: TP-02  
 Sample Reference: Not Given  
 Sample Description: Black slightly clayey very gravelly SAND

Depth Top [m]: 1.50  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	2
Material Retained on 20.0 mm Sieve	%	5
Particle Density - Assumed	Mg/m <sup>3</sup>	2.10
As received Moisture Content	%	22
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.58</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>14</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Insufficient amount of material - compacted in proctor mould

**Approved:** Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

**Signed:** Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



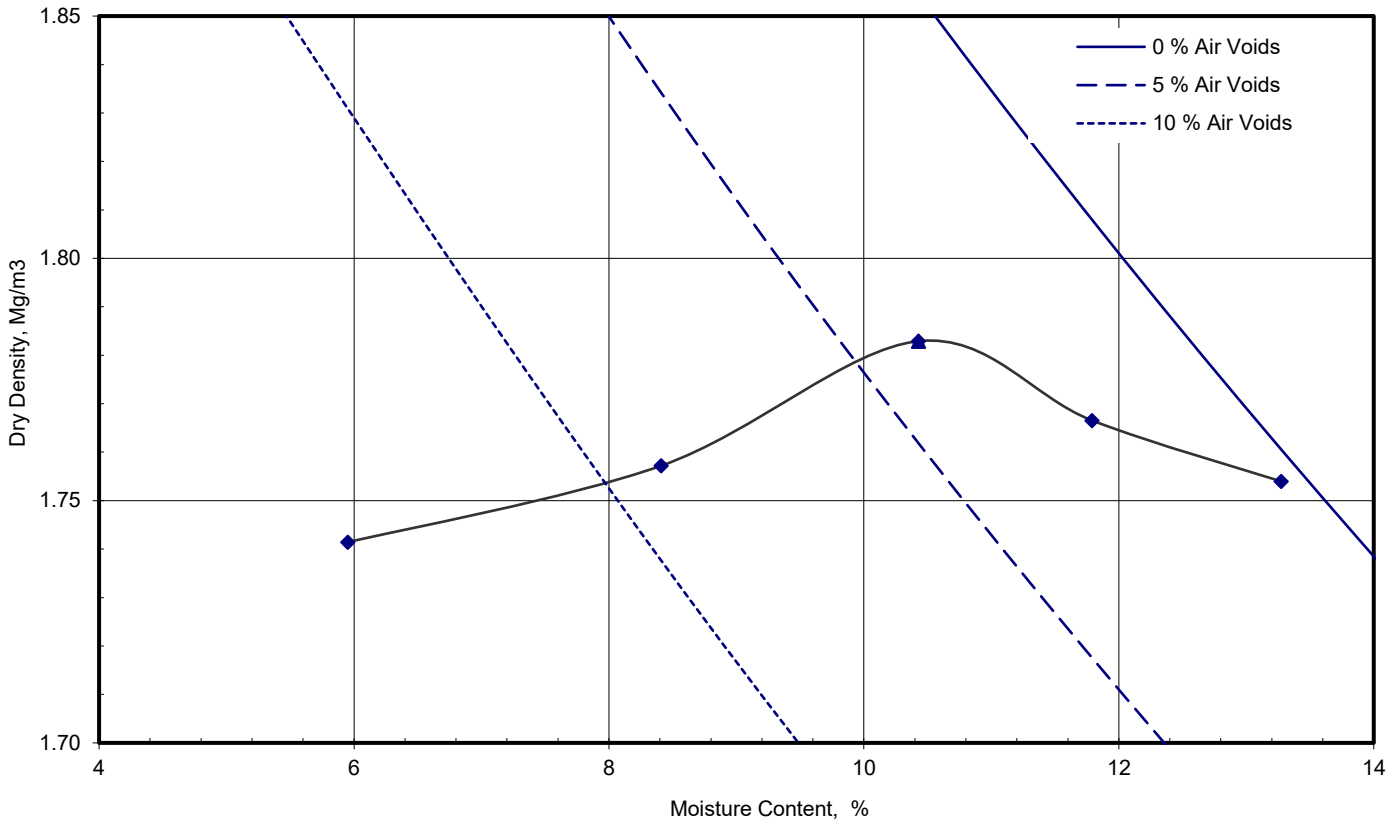
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276510  
 Hole No.: TP-04  
 Sample Reference: Not Given  
 Sample Description: Dark grey very gravelly very clayey SAND

Depth Top [m]: 0.50  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	10
Material Retained on 20.0 mm Sieve	%	14
Particle Density - Assumed	Mg/m <sup>3</sup>	2.30
As received Moisture Content	%	13
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.78</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>10</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request. Insufficient amount of material - compacted in proctor mould

Approved: Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

Signed: Darren Berrill  
 Geotechnical General Manager  
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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



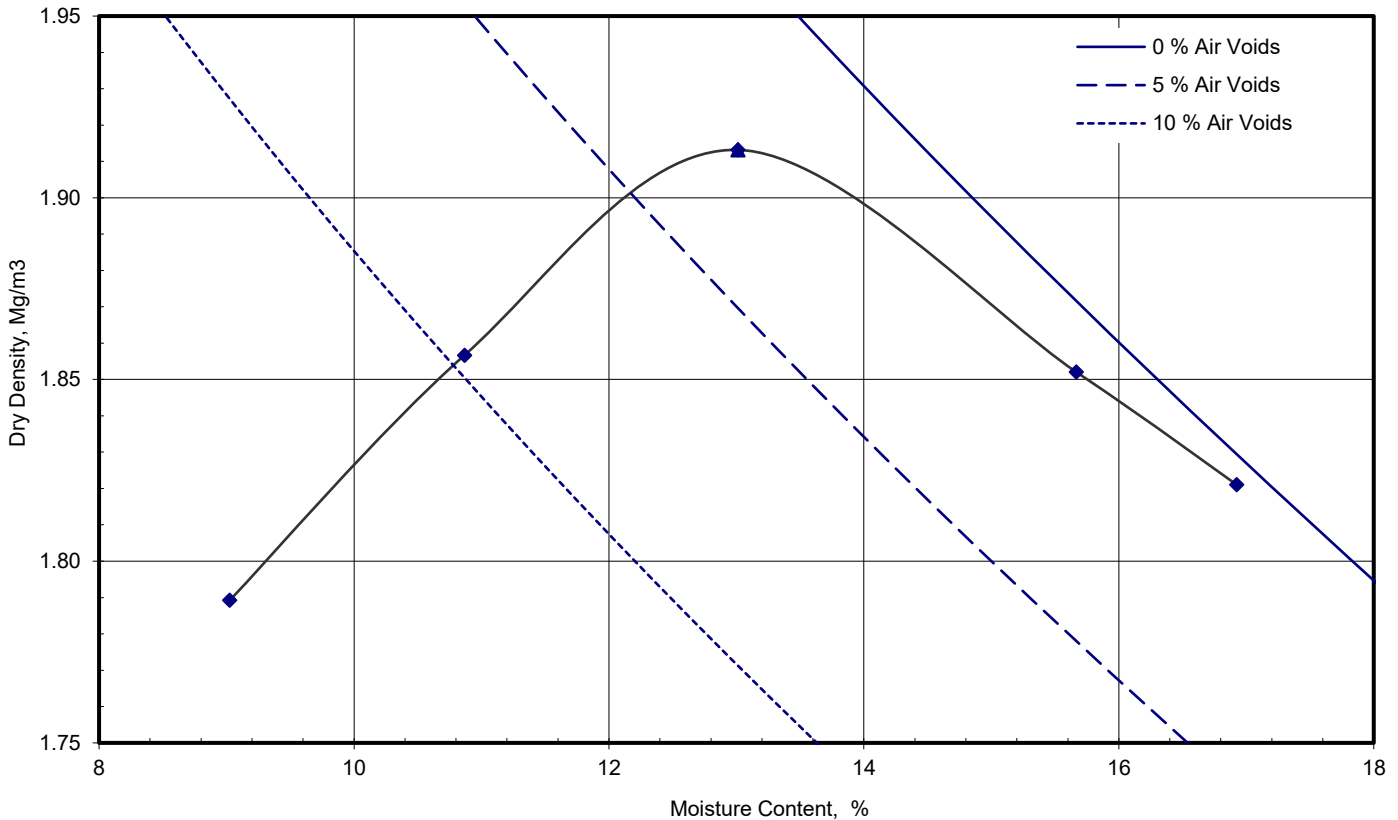
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276511  
 Hole No.: TP-09  
 Sample Reference: Not Given  
 Sample Description: Reddish brown slightly clayey sandy GRAVEL

Depth Top [m]: 2.00  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	8
Material Retained on 20.0 mm Sieve	%	25
Particle Density - Assumed	Mg/m <sup>3</sup>	2.65
As received Moisture Content	%	14
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.91</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>13</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request. Insufficient amount of material - compacted in proctor mould

**Approved:** Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

**Signed:** Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



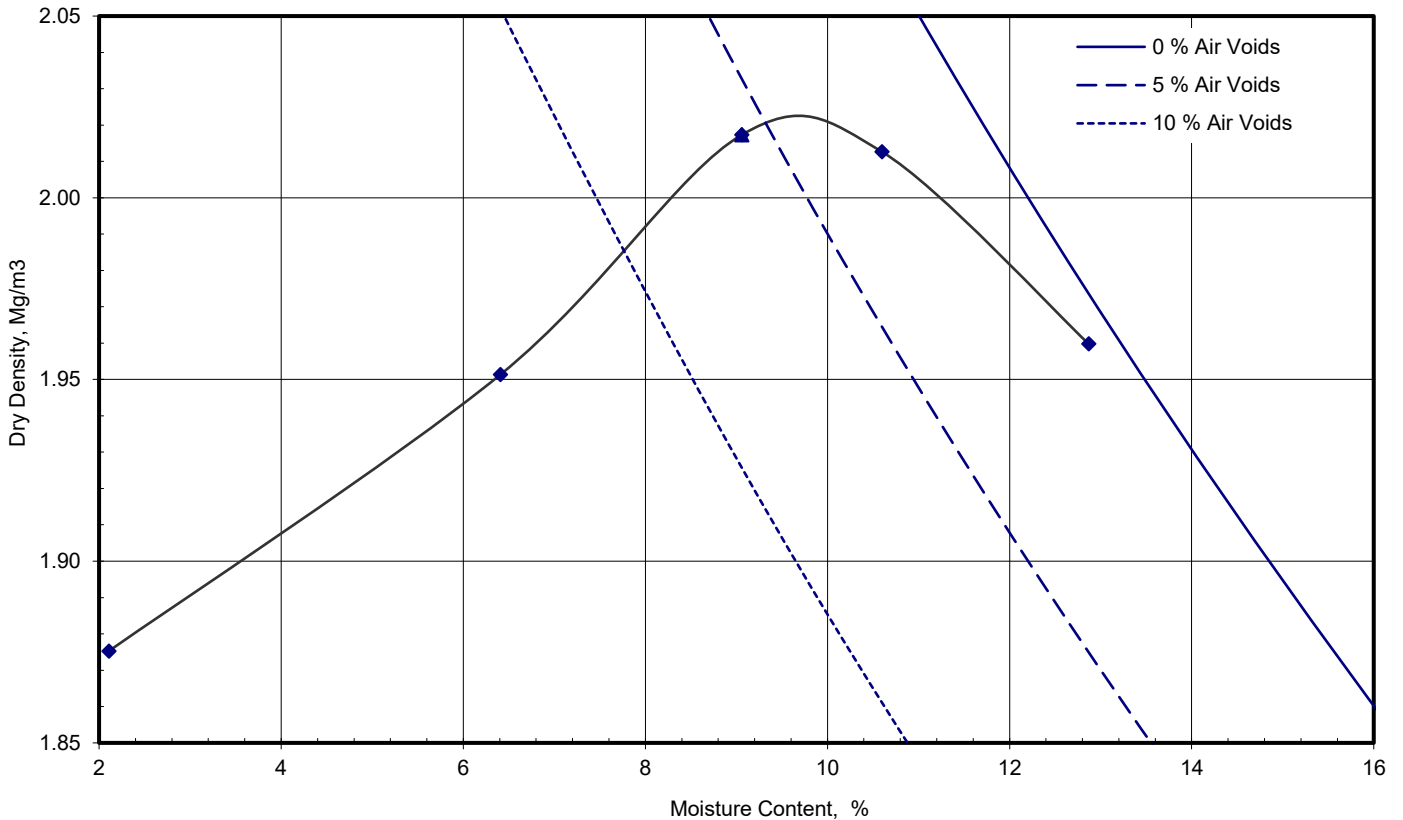
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276513  
 Hole No.: TP-10  
 Sample Reference: Not Given  
 Sample Description: Yellowish brown sandy gravelly CLAY

Depth Top [m]: 2.50  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	4
Material Retained on 20.0 mm Sieve	%	8
Particle Density - Assumed	Mg/m <sup>3</sup>	2.65
As received Moisture Content	%	22
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>2.02</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>9.1</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

**Approved:** Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
*Piotrowski*  
**Date Reported:** 08/08/2019

**Signed:** Darren Berrill  
 Geotechnical General Manager  
*Darren Berrill*  
**for and on behalf of i2 Analytical Ltd GF 110.15**

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



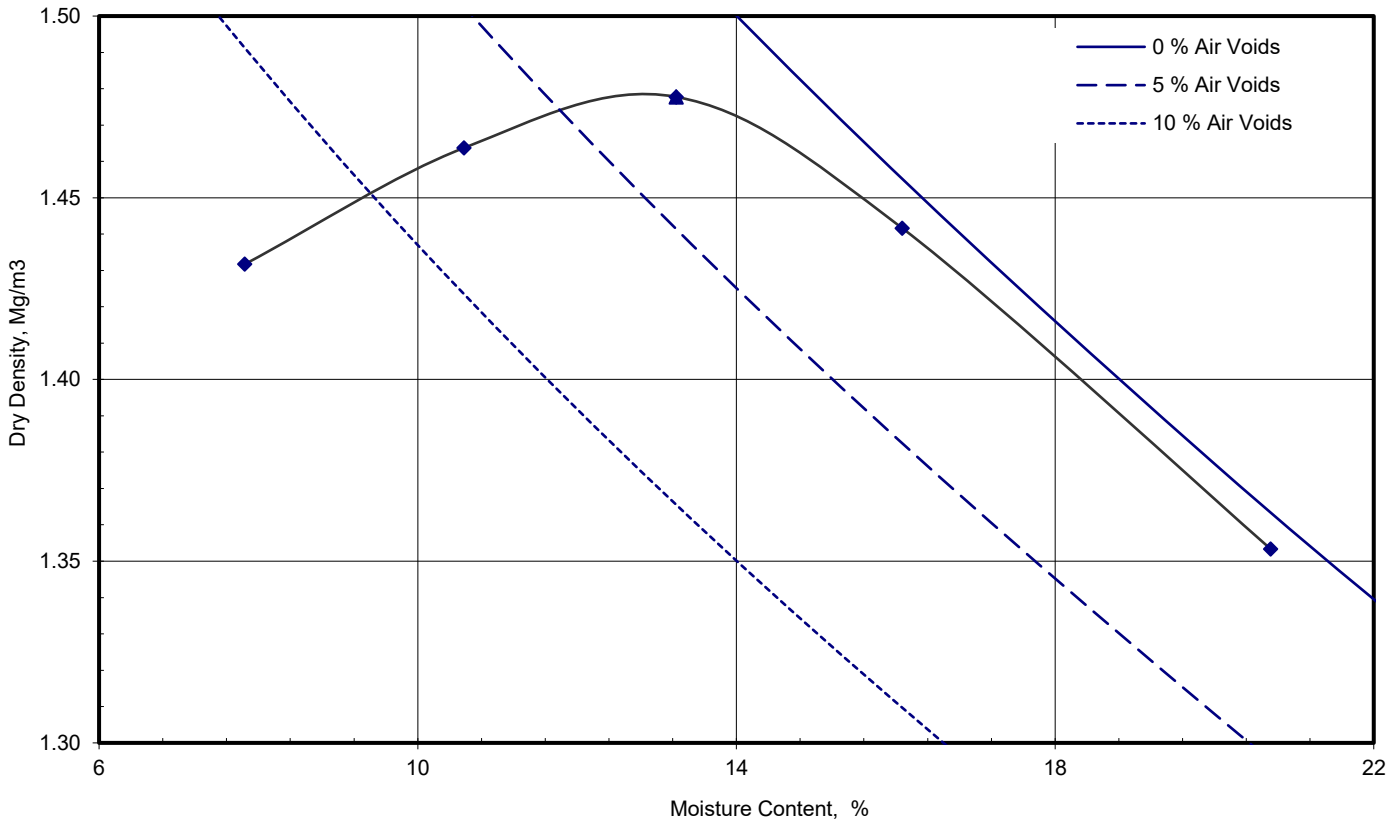
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276514  
 Hole No.: TP-18  
 Sample Reference: Not Given  
 Sample Description: Black slightly clayey very gravelly COAL

Depth Top [m]: 1.50  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	36
Material Retained on 20.0 mm Sieve	%	42
Particle Density - Assumed	Mg/m <sup>3</sup>	1.90
As received Moisture Content	%	21
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.48</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>13</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request. Insufficient amount of material - compacted in proctor mould

Approved: Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

Signed: Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



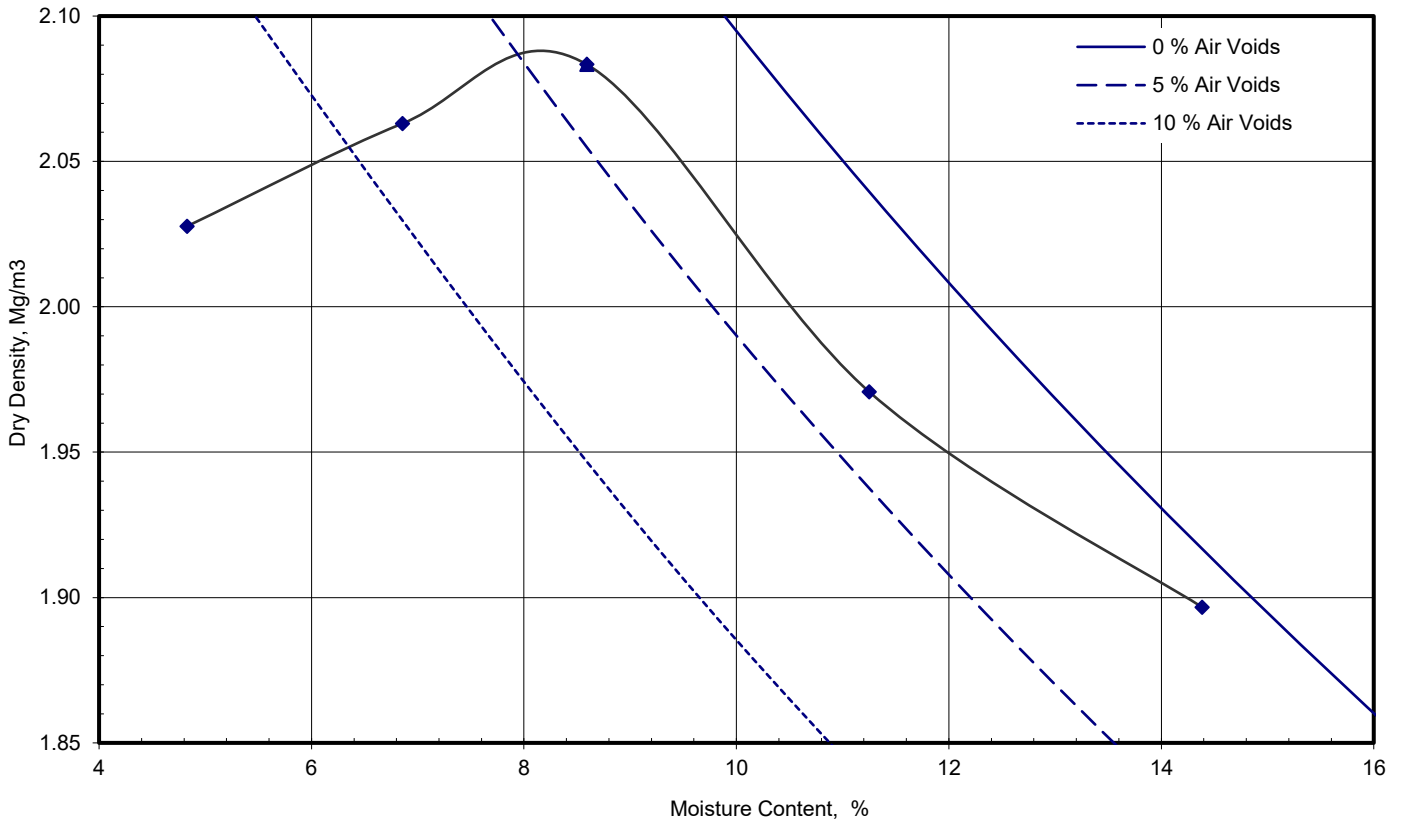
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 03/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276515  
 Hole No.: TP-19  
 Sample Reference: Not Given  
 Sample Description: Brownish grey very clayey very sandy GRAVEL

Depth Top [m]: 2.00  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	2
Material Retained on 20.0 mm Sieve	%	18
Particle Density - Assumed	Mg/m <sup>3</sup>	2.65
As received Moisture Content	%	14
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>2.08</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>8.6</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Insufficient amount of material - compacted in proctor mould

Approved: Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

Signed: Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



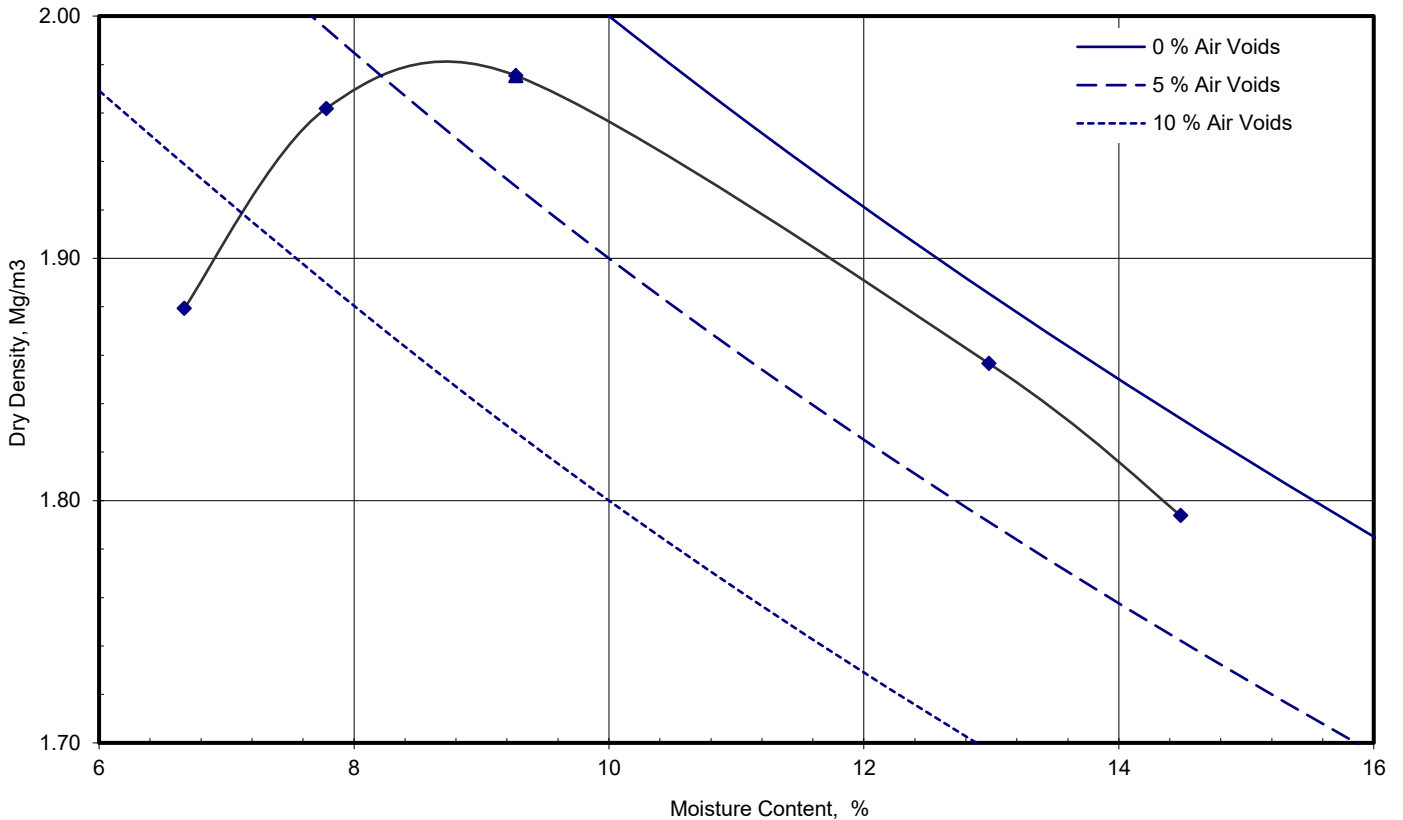
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276516  
 Hole No.: TP-16  
 Sample Reference: Not Given  
 Sample Description: Reddish brown clayey very sandy GRAVEL

Depth Top [m]: 1.00  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	41
Material Retained on 20.0 mm Sieve	%	51
Particle Density - Assumed	Mg/m <sup>3</sup>	2.50
As received Moisture Content	%	13
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.98</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>9.3</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request. Insufficient amount of material - compacted in proctor mould

Approved: Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

Signed: Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



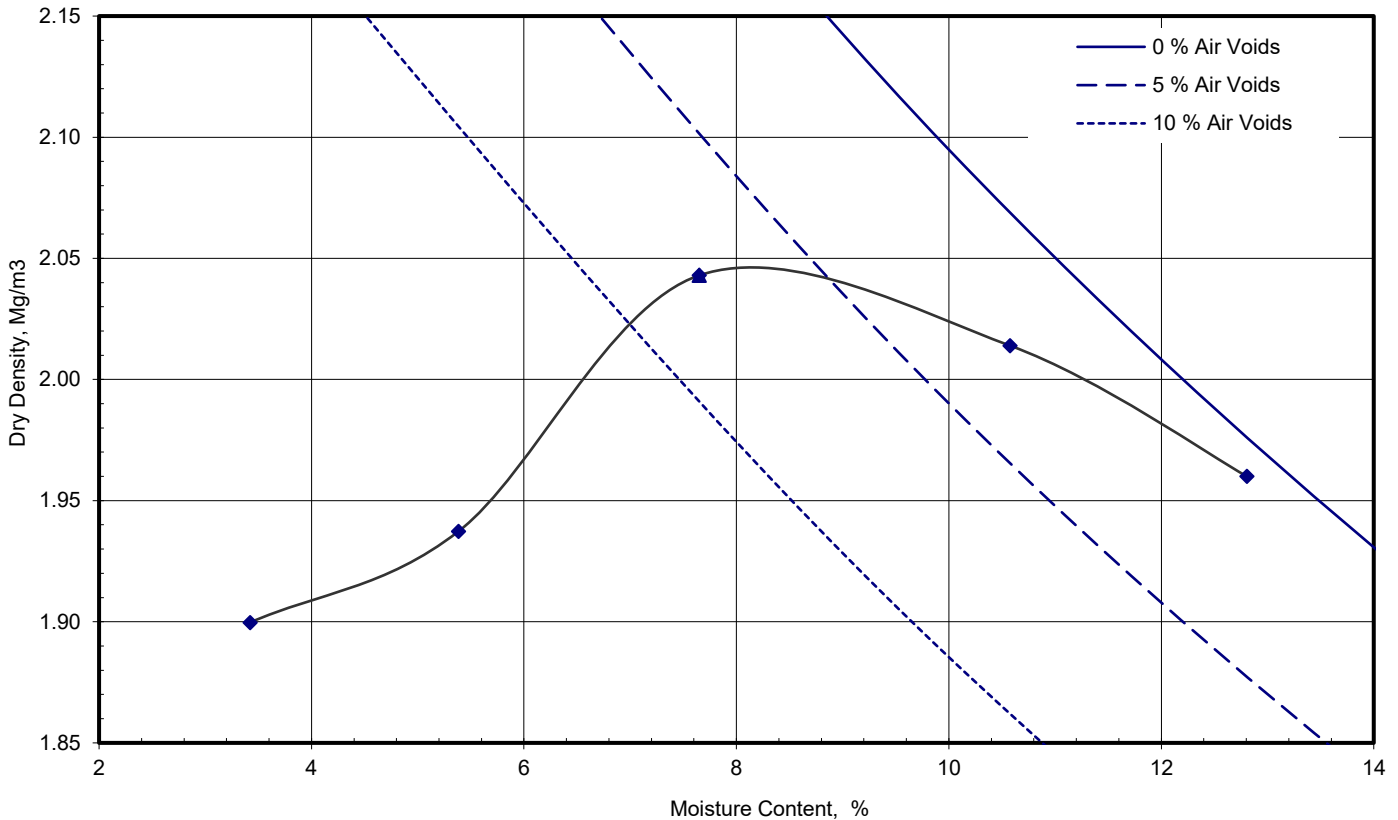
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 05/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276517  
 Hole No.: TP-14  
 Sample Reference: Not Given  
 Sample Description: Dark brown gravelly very sandy CLAY

Depth Top [m]: 1.20  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	5
Material Retained on 20.0 mm Sieve	%	10
Particle Density - Assumed	Mg/m <sup>3</sup>	2.65
As received Moisture Content	%	13
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>2.04</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>7.7</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks:

**Approved:** Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

**Signed:** Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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**TEST CERTIFICATE**  
**Dry Density / Moisture Content**  
**Relationship Heavy Compaction**

Tested in Accordance with:  
 BS 1377-4: 1990

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



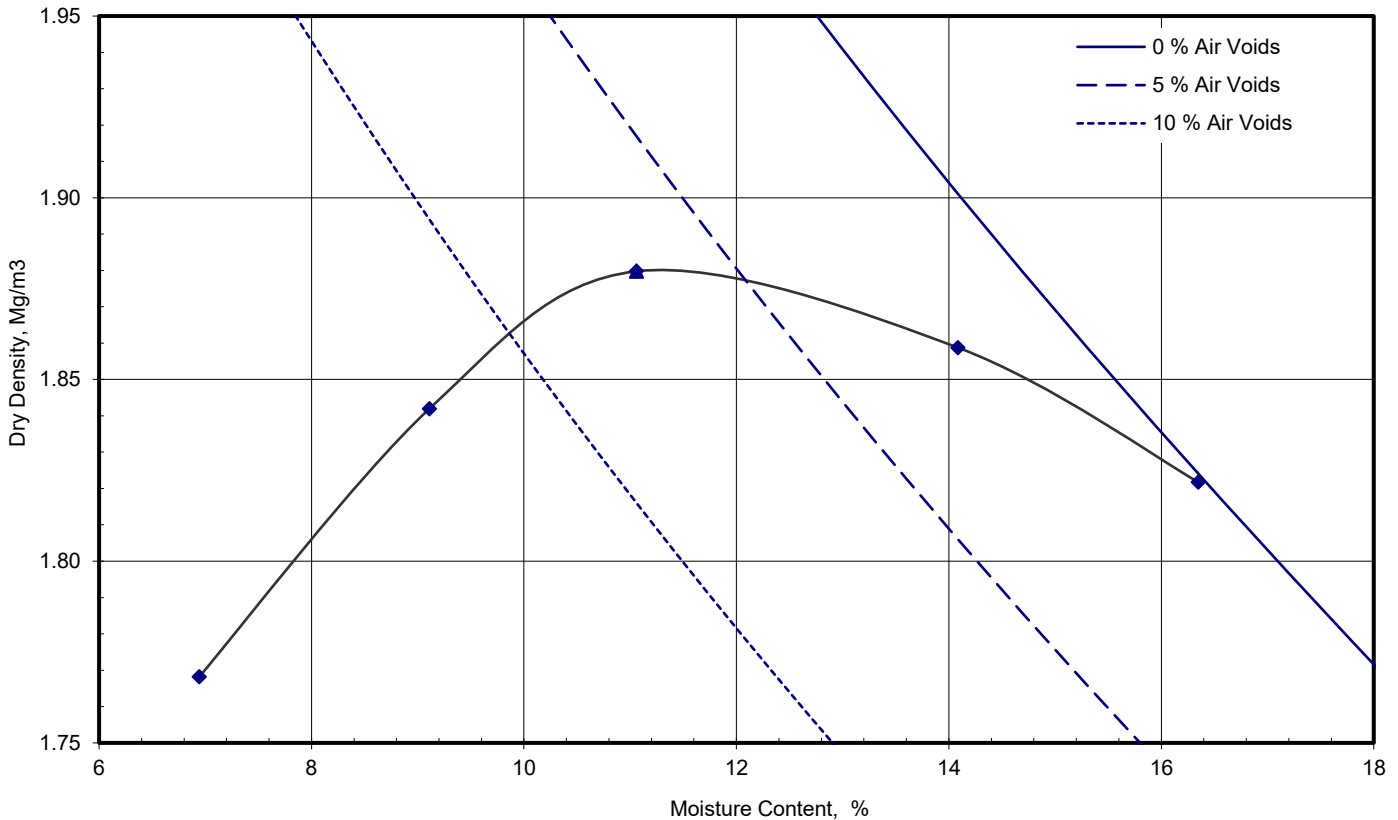
Client: The Shadbolt Group  
 Client Address: 18 Bewick Road, Gateshead,  
 NE8 4DP  
 Contact: Iain McLean  
 Site Name: Newbottle Street, Houghton le Spring  
 Site Address: Not Given

Client Reference: 2585  
 Job Number: 19-51605  
 Date Sampled: Not Given  
 Date Received: 25/07/2019  
 Date Tested: 03/08/2019  
 Sampled By: Not Given

**Test Results:**

Laboratory Reference: 1276518  
 Hole No.: TP-03  
 Sample Reference: Not Given  
 Sample Description: Brownish grey very sandy very gravelly CLAY

Depth Top [m]: 1.50  
 Depth Base [m]: Not Given  
 Sample Type: B



Preparation		Material used was natural
Mould Type		1 Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	20
Material Retained on 20.0 mm Sieve	%	28
Particle Density - Assumed	Mg/m <sup>3</sup>	2.60
As received Moisture Content	%	25
<b>Maximum Dry Density</b>	<b>Mg/m<sup>3</sup></b>	<b>1.88</b>
<b>Optimum Moisture Content</b>	<b>%</b>	<b>11</b>

Note: Tested in Accordance with BS 1377-4: 1990: Clause 3.5 using 4.5kg [heavy] Rammer

Remarks: Zone X - test carried out as per client request. Insufficient amount of material - compacted in proctor mould

**Approved:** Dariusz Piotrowski  
 PL Geotechnical Laboratory Manager  
 Date Reported: 08/08/2019

**Signed:** Darren Berrill  
 Geotechnical General Manager  
 for and on behalf of i2 Analytical Ltd GF 110.15

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# LABORATORY REPORT



4043

**Contract Number: PSL20/2480**

Report Date: 27 May 2020  
Client's Reference: 2585  
Client Name: The Shadbolt Group  
18 Bewick Road  
Gateshead  
Tyne & Wear  
NE8 4DP

**For the attention of: Iain Mclean/Mike Taylor**

Contract Title: Houghton Colliery, Houghton le Spring  
Date Received: 20/5/2020  
Date Commenced: 20/5/2020  
Date Completed: 27/5/2020

**Notes: Opinions 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson  
(Director)

A Watkins  
(Director)

R Berriman  
(Quality Manager)

L Knight  
(Senior Technician)

S Eyre  
(Senior Technician)

S Royle  
(Laboratory Manager)

5 – 7 Hexthorpe Road, Hexthorpe,  
Doncaster DN4 0AR  
tel: +44 (0)844 815 6641  
fax: +44 (0)844 815 6642  
e-mail: [rgunson@prosoils.co.uk](mailto:rgunson@prosoils.co.uk)  
[awatkins@prosoils.co.uk](mailto:awatkins@prosoils.co.uk)

Page 1 of



# CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

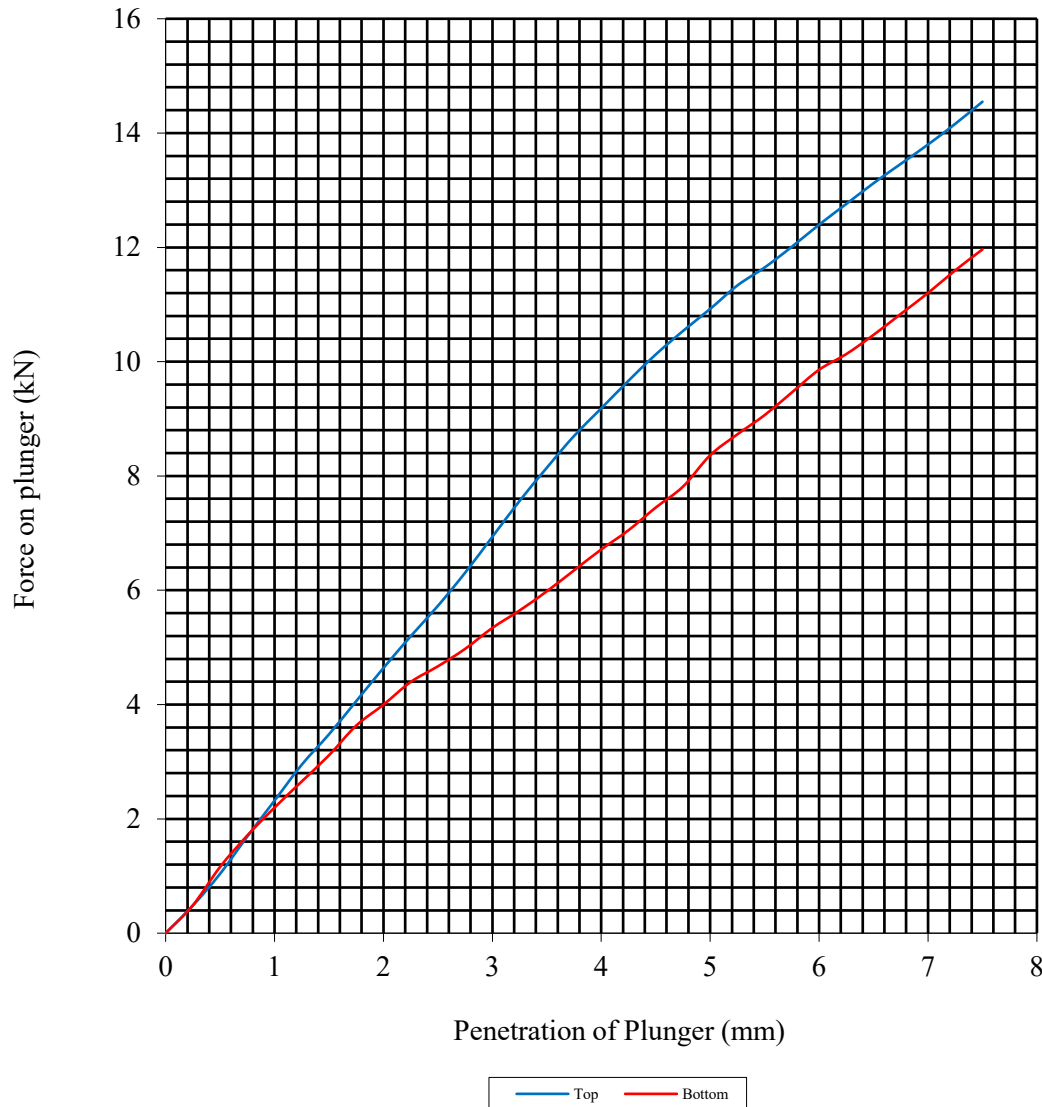
Hole Number: CBR-01

Top Depth (m): 0.50

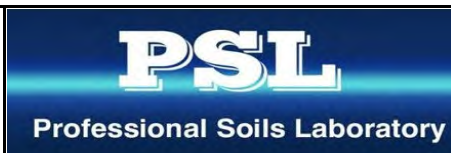
Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	9.0	Surcharge Kg:	4.20	Sample Top	8.8	Sample Top	54.6
Bulk Density Mg/m <sup>3</sup> :	2.00	Soaking Time hrs	0	Sample Bottom	9.2	Sample Bottom	41.8
Dry Density Mg/m <sup>3</sup> :	1.84	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:	18						
Compaction Conditions	2.5kg						



Houghton Colliery, Houghton le Spring

<b>Contract No:</b>
<b>PSL20/2480</b>
<b>Client Ref:</b>
<b>2585</b>

# CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

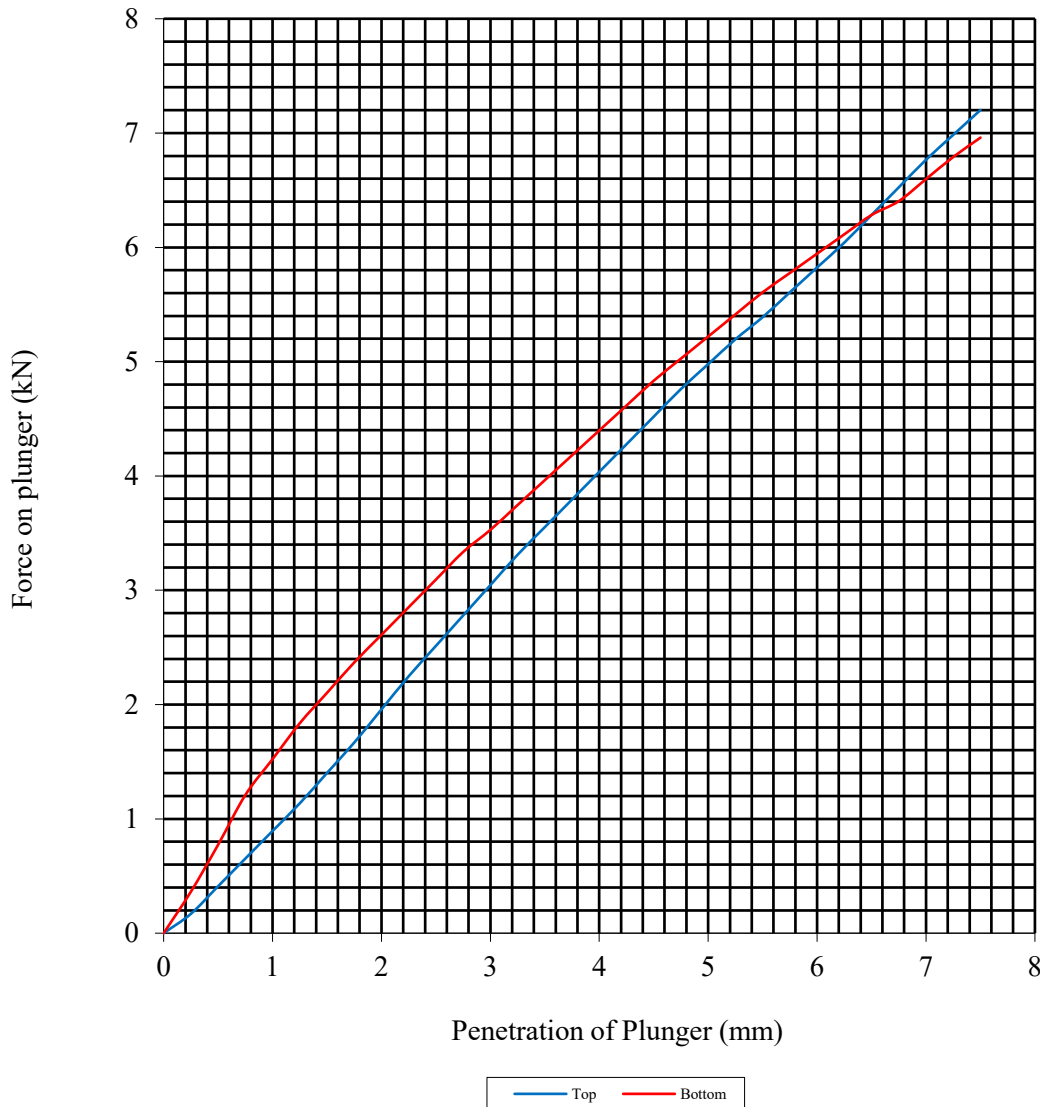
Hole Number: CBR-02

Top Depth (m): 0.50

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	12	Surcharge Kg:	4.20	Sample Top	12	Sample Top	24.9
Bulk Density Mg/m <sup>3</sup> :	2.08	Soaking Time hrs	0	Sample Bottom	12	Sample Bottom	26.1
Dry Density Mg/m <sup>3</sup> :	1.85	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			15				
Compaction Conditions		2.5kg					



**PSL**  
Professional Soils Laboratory

Houghton Colliery, Houghton le Spring

Contract No:  
**PSL20/2480**  
Client Ref:  
**2585**

# CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

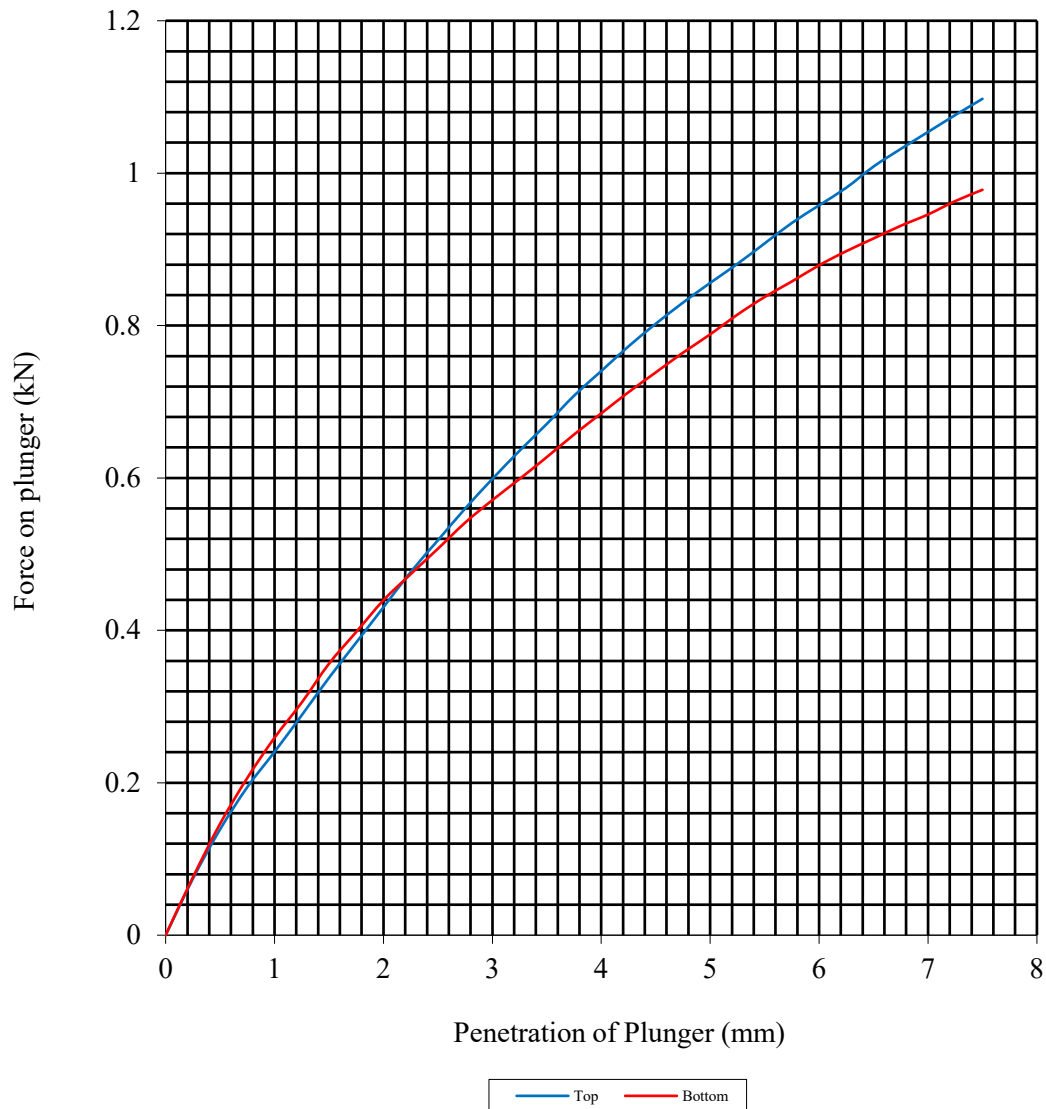
Hole Number: CBR-03

Top Depth (m): 0.50

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	23	Surcharge Kg:	4.20	Sample Top	23	Sample Top	4.3
Bulk Density Mg/m <sup>3</sup> :	2.06	Soaking Time hrs	0	Sample Bottom	23	Sample Bottom	3.9
Dry Density Mg/m <sup>3</sup> :	1.67	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions	2.5kg						



**PSL**  
Professional Soils Laboratory

Houghton Colliery, Houghton le Spring

Contract No:  
**PSL20/2480**  
Client Ref:  
**2585**

# CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

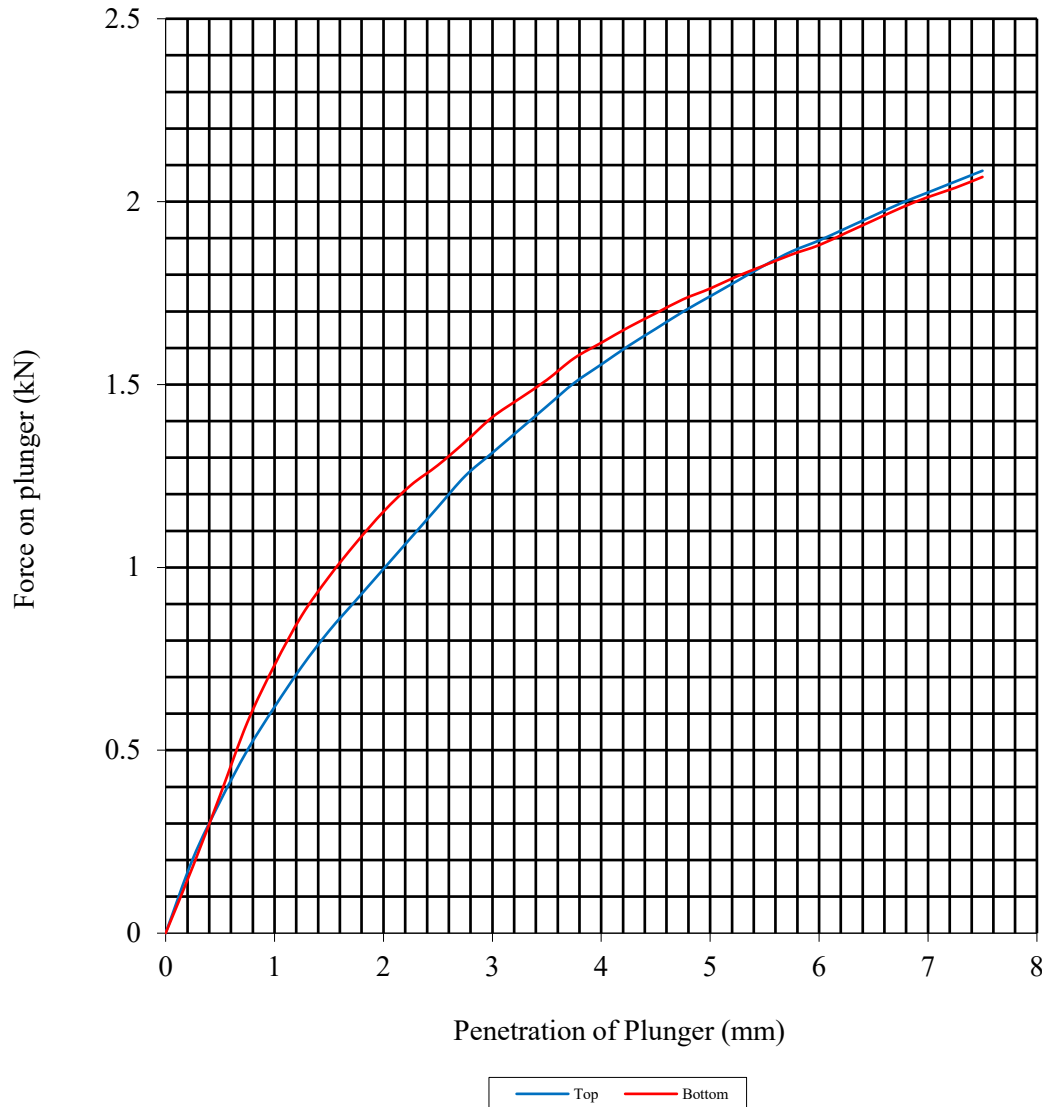
Hole Number: CBR-04

Top Depth (m): 0.50

Sample Number:

Base Depth (m):

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	20	Surcharge Kg:	4.20	Sample Top	20	Sample Top	8.8
Bulk Density Mg/m <sup>3</sup> :	2.06	Soaking Time hrs	0	Sample Bottom	20	Sample Bottom	9.7
Dry Density Mg/m <sup>3</sup> :	1.72	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			0				
Compaction Conditions	2.5kg						



Houghton Colliery, Houghton le Spring

Contract No:  
**PSL20/2480**  
Client Ref:  
**2585**





# LABORATORY REPORT



4043

**Contract Number: PSL19/5011**

Report Date: 23 August 2019  
Client's Reference: 2585  
Client Name: The Shadbolt Group  
18 Bewick Road  
Gateshead  
Tyne & Wear  
NE8 4DP

**For the attention of: Emmanuel Barreto**

Contract Title: Newbottle Street, Houghton le Spring  
Date Received: 19/8/2019  
Date Commenced: 19/8/2019  
Date Completed: 23/8/2019

**Notes: Opinions 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 other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson  
(Director)

A Watkins  
(Director)

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Page 1 of



# UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

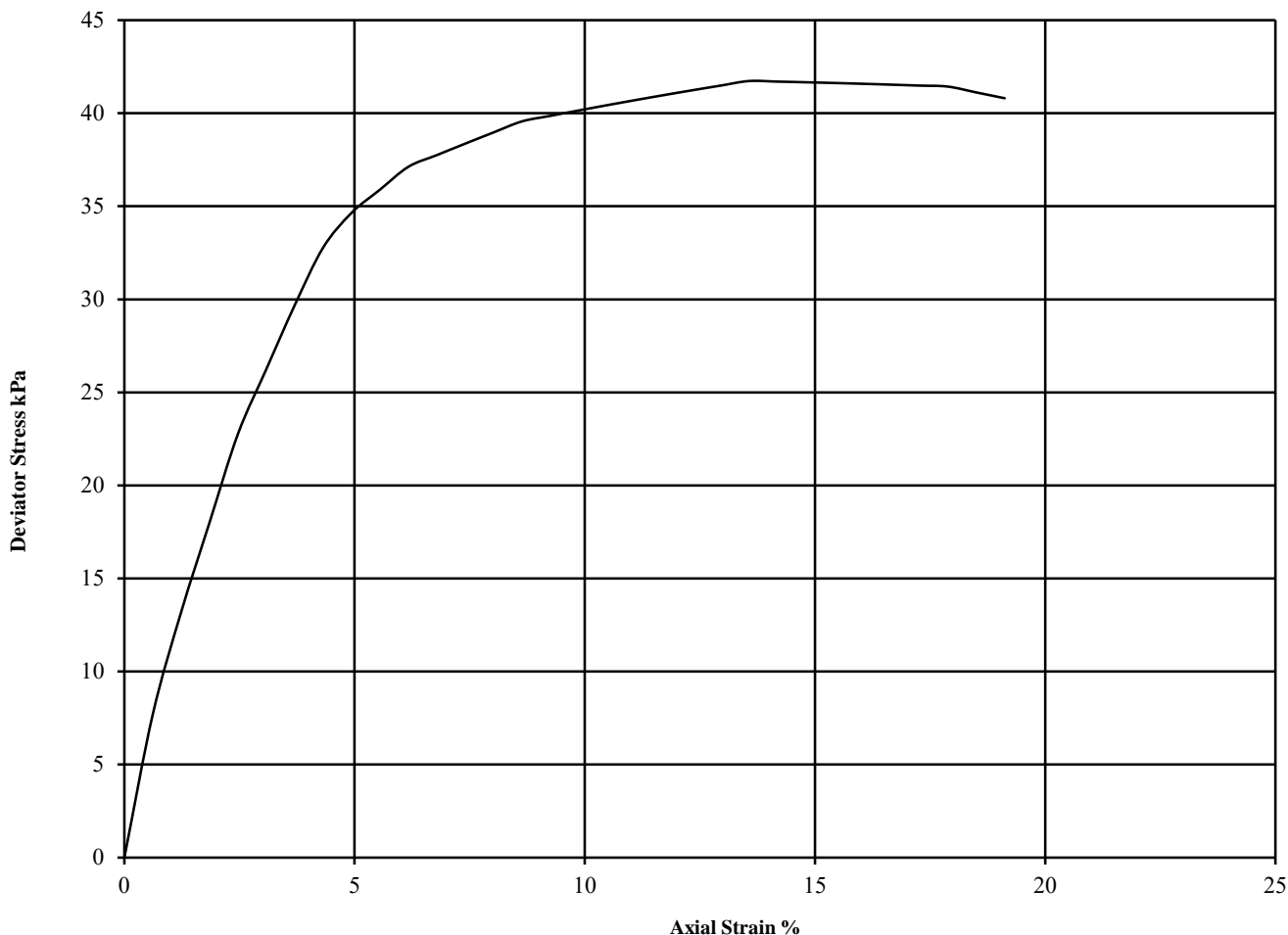
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: CP-10 Top Depth (m): 9.50

Sample Number: Base Depth (m): 9.95

Sample Type U



Diameter (mm):		103		Height (mm):		167		Test:		UU Single Stage		Remarks:	
Specimen	Moisture Content (%)	Bulk Density (Mg/m <sup>3</sup> )	Dry Density (Mg/m <sup>3</sup> )	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure					
				$\theta_3$	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$							
1	23	1.93	1.57	190	42	21	13.6	Plastic					Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.34 See summary of soil descriptions



**PSL**  
Professional Soils Laboratory

Newbottle Street, Houghton le Spring

Contract No:  
PSL19/5011  
Client Ref:  
2585

# UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

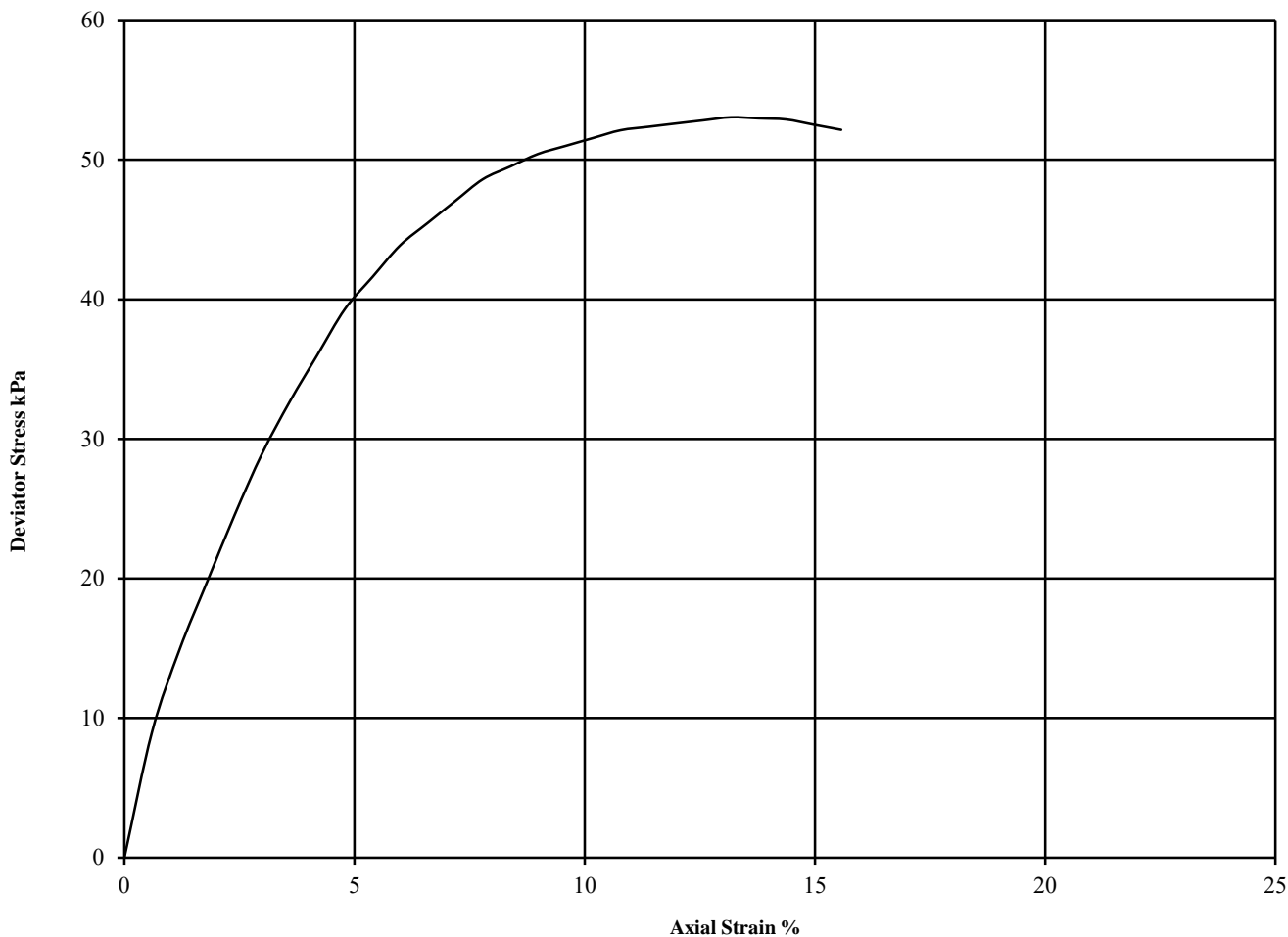
WITHOUT MEASUREMENT OF PORE PRESSURE

BS1377 : Part7 : 1990: Clause 8

Hole Number: CP-14 Top Depth (m): 3.00

Sample Number: Base Depth (m): 3.45

Sample Type U



Diameter (mm):		100		Height (mm):		167		Test:		UU Single Stage		Remarks:	
Specimen	Moisture Content (%)	Bulk Density (Mg/m3)	Dry Density (Mg/m3)	Cell Pressure (kPa)	Corr. Max. Deviator Stress (kPa)	Shear Strength Cu (kPa)	Failure Strain (%)	Mode of Failure					
1	20	2.05	1.71	60	$(\theta_1 - \theta_3)_f$	$\frac{1}{2}(\theta_1 - \theta_3)_f$	13.2	Plastic					Undisturbed Sample Sample taken from top of tube Rate of strain = 2 %/min Latex Membrane used 0.2 mm thick, Correction applied 0.35 See summary of soil descriptions



4043

**PSL**  
Professional Soils Laboratory

Newbottle Street, Houghton le Spring

Contract No:

PSL19/5011

Client Ref:

2585

APPENDIX F  
GAS PROTECTION MEASURES ASSESSMENT TABLES  
(BS8485:2015)  
GAS AND GROUNDWATER MONITORING RESULTS

## CIRIA C665 Characteristic Situation

Characteristic Situation (CIRIA 149)	Comparable Classification In DETER <i>et al</i> (1999)	Risk Classification	Gas Screening Value (GSV) (CH <sub>4</sub> or CO <sub>2</sub> ) (l/hr) <sup>1</sup>	Additional Factors	Typical source of generation
1	A	Very Low Risk	<0.07	Typically methane 1 % and/or carbon dioxide 5 %. Otherwise consider increase to Situation 2.	<b>Natural soils with low organic content.</b>  "Typical" made ground
2	B	Low. Risk	<0.7	Borehole air flow rate not to exceed 70 l/hr. Otherwise consider increase to characteristic Situation 3	<b>Natural soil, high peat/ organic content</b>  "Typical" made ground
3	C	Moderate Risk	<3.5		<b>Old landfill, inert waste, mineworkings flooded</b>
4	D	Moderate to high risk	<15	Quantitative risk assessment required to evaluate scope of protective measures	<b>Mineworkings – susceptible to flooding, completed landfill (WMP 26B criteria)</b>
5	E	High risk	<70		<b>Mineworkings Unflooded inactive with shallow workings near surface</b>
6	F	Very high risk	>70		<b>Recent landfill site</b>

**Notes:**

Gas screening value: (Litres of gas/hour) is calculated by multiplying the maximum gas concentration (%) by the maximum measured borehole flow rate (l.hr) – See Glossary.

Site Characterisation should be based on gas monitoring of concentrations and borehole flow rates for the minimum period defined in Table 5.5, CIRIA 659.

Source of gas and generation potential/performance should be identified.

Soil gas investigation should be in accordance with guidance provided in Chapters 4 to 6.

If there is no detectable flow, use the limit of detection of the instrument.

The boundaries between the Partners in Technology classifications do not fit exactly with the boundaries for the CIRIA classification.

**Gas Risk Assessment – Characteristic Situations with Typical Maximum concentrations and Gas Screening Values (Reproduced from Table 8.5, CIRIA Report C659 – Assessing risk posed by hazardous ground gases to buildings).**

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 3

<u>BRITISH STANDARD</u>		<u>BS 8485:2015</u>		
<b>Table 3 Building types</b>				
	Type A	Type B	Type C	Type D
<b>Ownership</b>	Private	Private or commercial/public, possible multiple	Commercial/public	Commercial/industrial
<b>Control (change of use, structural alterations, ventilation)</b>	None	Some but not all	Full	Full
<b>Room sizes</b>	Small	Small/medium	Small to large	Large industrial/retail park style

- **Type A building:** private ownership with no building management controls on alterations to the internal structure, the use of rooms, the ventilation of rooms or the structural fabric of the building. Some small rooms present. Probably conventional building construction (rather than civil engineering). Examples include private housing and some retail premises.
- **Type B building:** private or commercial property with central building management control of any alterations to the building or its uses but limited or no central building management control of the maintenance of the building, including the gas protection measures. Multiple occupancy. Small to medium size rooms with passive ventilation of rooms and other internal spaces throughout ground floor and basement areas. May be conventional building or civil engineering construction. Examples include managed apartments, multiple occupancy offices, some retail premises and parts of some public buildings (such as schools, hospitals, leisure centres) and parts of hotels.
- **Type C building:** commercial building with central building management control of any alterations to the building or its uses and central building management control of the maintenance of the building, including the gas protection measures. Single occupancy of ground floor and basement areas. Small to large size rooms with active ventilation or good passive ventilation of all rooms and other internal spaces throughout ground floor and basement areas. Probably civil engineering construction. Examples include offices, some retail premises, and parts of some public buildings (such as schools, hospitals, leisure centres and parts of hotels).
- **Type D building:** industrial style building having large volume internal space(s) that are well ventilated. Corporate ownership with building management controls on alterations to the ground floor and basement areas of the building and on maintenance of ground gas protective measures. Probably civil engineering construction. Examples are retail park sales buildings, factory shop floor areas, warehouses. (Small rooms within these style buildings should be separately categorized as Type B or Type C).

*NOTE 2 Type A buildings are those where the risk of failure of the gas protection measures is likely to be most significant to the safety of the occupants and Type D buildings are those where this same risk is likely to be least significant.*

From the design CS and the type of building (A, B, C or D) the minimum level of gas protection (score) in the range 0 to 7.5 should be determined in accordance with Table 4.



BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 4

BS 8485:2015		BRITISH STANDARD		
Table 4 Gas protection score by CS and type of building				
CS	Minimum gas protection score (points)			
	High risk	Medium risk		Low risk
	Type A building	Type B building	Type C building	Type D building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 <sup>A)</sup>	5.5 <sup>A)</sup>	4.5	3.5
5	— <sup>B)</sup>	6.5 <sup>A)</sup>	5.5	4.5
6	— <sup>B)</sup>	— <sup>B)</sup>	7.5	6.5

<sup>A)</sup> Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

<sup>B)</sup> The gas hazard is too high for this empirical method to be used to define the gas protection measures.

**NOTE 3** The NHBC has published guidance [8] for use on residential developments, which utilizes an alternative classification ("traffic light") system. This guidance typically applies to Type A buildings utilizing beam and block floor constructions with clear void ventilation. The design choice variables are limited to decisions relating to the membrane specification and verification recommendations (see Table 7). Designers utilizing this system would therefore need to refer to the NHBC [8] to assess compliance for specific recommendations.

When the minimum gas protection score has been determined for the building as a whole, or for each part of the building, then a combination of two or more of the following three types of protection measures should be used to achieve that score:

- the structural barrier of the floor slab, or of the basement slab and walls if a basement is present;
- ventilation measures; and
- gas resistant membrane.

**NOTE 4** The method of selecting the combination of these types of protection measures for a particular building is given in 7.2.

Once the types of protection measures have been decided, the detailed design and specification of the measures should be undertaken (see 7.3).

**NOTE 5** In some cases, the designer might be of the opinion at this stage that the extent of the protection measures is potentially more than is needed, because of limitations in the scope of the site investigation [these limitations having led to a more conservative GSV and CS than is likely from the conceptual site model (see 6.3.7.2 and 6.3.7.3)]. In this case, further site investigation could be carried out to check the GSV. Only if there is sufficient time to carry out additional site investigation and gas monitoring would this step be useful.

The detailed design and specification of the protection measures should be recorded in a design report (see 8.3).



BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide  
for New Buildings

Table 5

Floor and substructure design (see Annex A)	Score <sup>A)</sup>
Precast suspended segmental subfloor (i.e. beam and block)	0
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 <sup>B)</sup>
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing <sup>C)</sup>	2
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing <sup>C)</sup>	2.5

<sup>A)</sup> The scores are conditional on breaches of floor slabs, etc., being effectively sealed.  
<sup>B)</sup> To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see A.2.2.2).  
<sup>C)</sup> The score is conditional on the waterproofing not being based on the use of a geosynthetic clay liner waterproofing product (see C.3, Note 4).

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 6

<u>BRITISH STANDARD</u>		<u>BS 8485:2015</u>
Table 6 Gas protection scores for ventilation protection measures		
Protection element/system	Score	Comments
(a) Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems.  If the layer has a low permeability and/or is not terminated in a venting trench (or similar), then the score is zero.
(b) Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are: <ul style="list-style-type: none"> <li>• Clear void</li> <li>• Polystyrene void former blanket</li> <li>• Geocomposite void former blanket</li> <li>• No-fines gravel layer with gas drains <ul style="list-style-type: none"> <li>• No-fines gravel layer</li> </ul> </li> </ul>	2.5 1.5	Performance criteria for methane and carbon dioxide are shown in Figure B.6 and Figure B.7, respectively.  The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B. Passive ventilation should be designed to meet at least "good performance", see Annex B.
(c) Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers	1.5 to 2.5	This system relies on continued serviceability of the pumps, therefore alarm and response systems should be in place.  There should be robust management systems in place to ensure the continued maintenance of the system, including pumps and vents. Active ventilation should always be designed to meet at least "good performance", as described in Annex B.
(d) Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket	1.5 to 2.5	This system relies on continued operation of the pumps, therefore alarm and response systems should be in place.  The score assigned should be based on the efficient "coverage" of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least "good performance".
(e) Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park)	4	Assumes that the car park is vented to deal with car exhaust fumes, designed to <i>Buildings Regulations 2000, Approved Document F</i> [9].

BS8485:2015

Code of Practice for the Design of Gas Protective Measures for Methane and Carbon Dioxide for New Buildings

Table 7

<u>BRITISH STANDARD</u>		<u>BS 8485:2015</u>
<p><b>Table 7 Gas protection score for the gas resistant membrane</b></p>		
Protection element/system	Score	Comments
<p>Gas resistant membrane meeting all of the following criteria:</p> <ul style="list-style-type: none"> <li>• sufficiently impervious to the gases with a methane gas transmission rate &lt;40.0 ml/day/m<sup>2</sup>/atm (average) for sheet and joints (tested in accordance with BS ISO 15105-1 manometric method);</li> <li>• sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions;</li> <li>• sufficiently strong to withstand in-service stresses (e.g. settlement if placed below a floor slab);</li> <li>• sufficiently strong to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc);</li> <li>• capable, after installation, of providing a complete barrier to the entry of the relevant gas; and</li> <li>• verified in accordance with CIRIA C735 [N1]</li> </ul>	2	<p>The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints.</p> <p>For example, a minimum 0.4 mm thickness (equivalent to 370 g/m<sup>2</sup> for polyethelene) reinforced membrane (virgin polymer) meets the performance criteria in Table 7 (see C.3).</p> <p>If a membrane is installed that does not meet all the criteria in column 1 then the score is zero.</p>





























# The Shadbolt Group

Road,

Tel: 0191 478 3330 Email: admin@shadboltgroup.net



**SHADBOLT**  
ENVIRONMENTAL

## Groundwater and Gas Monitoring Record Sheet

Site:	2585 Houghton Colliery	Job No:	2585
		Date:	18/07/2022
Client:	Hellens	Weather:	Sunny
		Instruments Used:	Intrerface Propbe
Monitored by:	TJS	Pressure Trend:	-

Borehole	Surface Level m aOD	CH <sub>4</sub>		CO <sub>2</sub>		O <sub>2</sub>		CO	H <sub>2</sub> S	Flow Rate	Atmospheric	Water	Base	Water
		Peak	Steady	Peak	Steady	Low	Steady	Peak	Peak	Steady (Peak)	Pressure (mbar)	Depth (m bgl)	Depth (m bgl)	Depth (m aOD)
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	PPM	PPM	(l/hr)				
Ambient		-	-	-	-	-	-	-	-	-	-	-	-	-
RC01	71.13	-	-	-	-	-	-	-	-	-	-	13.90	16.40	57.23
RC02	71.92	-	-	-	-	-	-	-	-	-	-	15.55	16.70	56.37
RC03	71.99	-	-	-	-	-	-	-	-	-	-	6.30	7.85	65.69
RC04	73.03	-	-	-	-	-	-	-	-	-	-	18.52	23.58	54.51
RC05	72.59	-	-	-	-	-	-	-	-	-	-	15.30	18.42	57.29
RC06	73.34	-	-	-	-	-	-	-	-	-	-	12.75	16.30	60.59
RC07	72.87	-	-	-	-	-	-	-	-	-	-	8.91	17.60	63.96
RC08	73.17	-	-	-	-	-	-	-	-	-	-	11.25	18.56	61.92
RC09	72.85	-	-	-	-	-	-	-	-	-	-	17.45	24.20	55.40
RC10	72.89	-	-	-	-	-	-	-	-	-	-	4.78	9.18	68.11
RC11	73.4	-	-	-	-	-	-	-	-	-	-	5.30	6.25	68.10
RC12	73.19	-	-	-	-	-	-	-	-	-	-	17.91	20.65	55.28

Notes:

- 1 The peak reading is the maximum recorded level during a monitoring event.
- 2 The steady reading is the level which remained constant after approximately 1 minute.



# The Shadbolt Group

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**SHADBOLT**  
ENVIRONMENTAL

## Groundwater and Gas Monitoring Record Sheet

Site:	2585 Houghton Colliery	Job No:	2585
		Date:	10/08/2022
Client:	Hellens	Weather:	Sunny
		Instruments Used:	Intrerface Propbe
Monitored by:	TJS	Pressure Trend:	-

Borehole	Surface Level m aOD	CH <sub>4</sub>		CO <sub>2</sub>		O <sub>2</sub>		CO	H <sub>2</sub> S	Flow Rate	Atmospheric	Water	Base	Water
		Peak	Steady	Peak	Steady	Low	Steady	Peak	Peak	Steady (Peak)	Pressure (mbar)	Depth (m bgl)	Depth (m bgl)	Depth (m aOD)
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	PPM	PPM	(l/hr)				
Ambient		-	-	-	-	-	-	-	-	-	-	-	-	-
RC01	71.13	-	-	-	-	-	-	-	-	-	-	13.90	16.40	57.23
RC02	71.92	-	-	-	-	-	-	-	-	-	-	15.60	16.70	56.32
RC03	71.99	-	-	-	-	-	-	-	-	-	-	6.35	7.85	65.64
RC04	73.03	-	-	-	-	-	-	-	-	-	-	18.52	23.58	54.51
RC05	72.59	-	-	-	-	-	-	-	-	-	-	15.29	18.42	57.30
RC06	73.34	-	-	-	-	-	-	-	-	-	-	12.76	16.30	60.58
RC07	72.87	-	-	-	-	-	-	-	-	-	-	8.92	17.60	63.95
RC08	73.17	-	-	-	-	-	-	-	-	-	-	11.23	18.56	61.94
RC09	72.85	-	-	-	-	-	-	-	-	-	-	17.41	24.20	55.44
RC10	72.89	-	-	-	-	-	-	-	-	-	-	4.75	9.18	68.14
RC11	73.4	-	-	-	-	-	-	-	-	-	-	5.32	6.25	68.08
RC12	73.19	-	-	-	-	-	-	-	-	-	-	18.00	20.65	55.19

Notes:

- 1 The peak reading is the maximum recorded level during a monitoring event.
- 2 The steady reading is the level which remained constant after approximately 1 minute.

# The Shadbolt Group

Road,

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**SHADBOLT**  
ENVIRONMENTAL

## Groundwater and Gas Monitoring Record Sheet

Site:	2585 Houghton Colliery	Job No:	2585
		Date:	18/08/2022
Client:	Hellens	Weather:	Overcast with showers
		Instruments Used:	Intrerface Propbe
Monitored by:	TJS	Pressure Trend:	-

Borehole	Surface Level m aOD	CH <sub>4</sub>		CO <sub>2</sub>		O <sub>2</sub>		CO	H <sub>2</sub> S	Flow Rate	Atmospheric	Water	Base	Water
		Peak	Steady	Peak	Steady	Low	Steady	Peak	Peak	Steady (Peak)	Pressure (mbar)	Depth (m bgl)	Depth (m bgl)	Depth (m aOD)
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	PPM	PPM	(l/hr)				
Ambient		-	-	-	-	-	-	-	-	-	-	-	-	-
RC01	71.13	-	-	-	-	-	-	-	-	-	-	13.88	16.40	57.25
RC02	71.92	-	-	-	-	-	-	-	-	-	-	15.50	16.70	56.42
RC03	71.99	-	-	-	-	-	-	-	-	-	-	6.28	7.85	65.71
RC04	73.03	-	-	-	-	-	-	-	-	-	-	18.54	23.58	54.49
RC05	72.59	-	-	-	-	-	-	-	-	-	-	15.26	18.42	57.33
RC06	73.34	-	-	-	-	-	-	-	-	-	-	12.76	16.30	60.58
RC07	72.87	-	-	-	-	-	-	-	-	-	-	8.94	17.60	63.93
RC08	73.17	-	-	-	-	-	-	-	-	-	-	11.33	18.56	61.84
RC09	72.85	-	-	-	-	-	-	-	-	-	-	17.44	24.20	55.41
RC10	72.89	-	-	-	-	-	-	-	-	-	-	4.73	9.18	68.16
RC11	73.4	-	-	-	-	-	-	-	-	-	-	5.29	6.25	68.11
RC12	73.19	-	-	-	-	-	-	-	-	-	-	17.97	20.65	55.22

Notes:

- 1 The peak reading is the maximum recorded level during a monitoring event.
- 2 The steady reading is the level which remained constant after approximately 1 minute.

## APPENDIX G

### DEVELOPMENT PLAN (CORRECT AT THE TIME OF WRITING)





### Key

- Existing Buildings
- Retail Buildings
- Ancillary Buildings
- Landscaped Areas
- Paved Areas
- Concrete Service Yards
- Tarmac
- Totem Sign
- PFS Sign
- Mineshaft
- Planning Application Boundary Line



### Parking Provision

Standard Parking Spaces 4800 x 2500mm	274no
Accessible Spaces	22no
Parent & Child Spaces	17no
Electric Charging Spaces	16no
<b>Total Spaces</b>	<b>329no</b>

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**HELLENS**  
 www.hellens.co.uk  
 FINTRY | ESTATES

**IBA** ARCHITECTS  
 Keel Row 4 | The Watermark | Collieston | NE11 9SE  
 E: info@iba-architects.com T: 0191 461 1411  
 www.iba-architects.com

Project: HOUGHTON COLLIERY RETAIL  
 Newboothle Street  
 Houghton le Spring

Title: Proposed Site Layout

Client: Hellens Land / Finty Estates

Drawn: KW Scale: 1:500 @ AD  
 Checked: FW Date: 04.10.21

**TENDER**

**1485 (SP)040 T1**

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APPENDIX H  
MINE SHAFT INVESTIGATION LETTER REPORT

**Former Houghton Colliery**  
**Mineshaft Ground Investigation Report**

Hellens Land commissioned The Shadbolt Group to undertake supplementary ground investigations at the Former Houghton Colliery development site.

The physical ground investigation work was carried out by Shadbolt Environmental (part of the Shadbolt Group) in December 2019.

### **Scope of Investigation**

The site works comprised the following:

- Trial pit excavations down the side of the known mineshafts to assess the thickness and condition of the known mineshaft caps (CA Ref' 433550-001 and 433550-002)
- Trial trenching to locate the potential 3<sup>rd</sup> mineshaft located adjacent to the northern boundary (433550-003) with an area of trees and shrubs.

### **Limitations**

It should be noted that although every effort has been made to ensure the accuracy of the data obtained from the investigation, the possibility exists of variations in ground and groundwater conditions between and around the exploratory hole locations. In addition, groundwater levels and will vary seasonally and with changes in weather conditions.

### **Ground Investigation Findings**

Trial pits extended down the side of each 433550-001 and 433550-002 exposed 0.5m of concrete founded on Made Ground. The Made Ground generally comprised of dark grey, reddish, brown, clay with varying amounts of sand, gravel and cobbles (slag, sandstone, shale, brick, concrete, mudstone)

The concrete was observed to be good condition with no obvious signs of deterioration. As can be seen in the photographs below;



**Photo No.1 - 433550-001**



**Photo No.2 - 433550-002**

Both caps were observed to be hexagonal in shape with 433550-001 being approximately 8.1m across and 433550-002 being approximately 8.7m across.

Prior to undertaking the trial trenching exercise within the embankment to the north of the site tree and shrub clearance was undertaken comprising a 20m x 20m area around national grid reference 433896mE and 550402mN.

On completion of the tree clearance works trial trenching was undertaken to locate the potential mineshaft. Photographs of the trenching are shown below for reference;



**Photo No. 3 - 433550-003**  
Southern Edge of Concrete



**Photo No. 4 - 433550-003**  
Eastern Edge of Concrete



**Photo No. 5 - 433550-003**  
North Eastern Edge of Concrete



It was not possible to fully delineate the northern or western extents of the concrete due to the volume of soils to be removed within the timescales allowed and the requirements for further tree clearance.

The concrete encountered appeared to be a similar shape to that of the 433550-001 and 433550-002 and was generally appeared to be hexagonal in shape but was noted to be approximately 0.10m thick. The concrete did appear to be in relatively good condition and no sign of deterioration was noted. The concrete was encountered at the same level as the grassed plateau directly to the south of the embankment i.e. the same level as the other mineshaft caps and was approximately 6m across from southwest to northeast.

The ground conditions above the concrete comprised an initial 0.3m thick layer of topsoil overlying a reworked clay cap of firm to stiff brown slightly sandy gravelly clay, with gravel of fine to medium angular to subangular sandstone and mudstone. The clay cap was generally 1m thick and was underlain Made Ground consisting of dark grey, reddish, brown, clay with varying amounts of sand, gravel and cobbles (slag, sandstone, shale, brick, concrete, mudstone). During the trial trenching exercise steel railway girders and large relic armoured electricity cables were noted and natural soils were not encountered.

## Recommendations

Based on the investigations undertaken the site it is considered highly likely that the concrete encountered at NGR 433896mE and 550402mN is the cap of mineshaft 433550-003.

It is considered likely that that as part of the development that the Coal Authority would wish to see the shaft grouted to 20.0m bgl and a new a new cap to be designed and constructed at the site (similar to that of 433550-001 and 433550-002).

**Shadbolt Group**



## REPORT CONDITIONS

### GEO-ENVIRONMENTAL GROUND INVESTIGATION

*This report is produced for the benefit of **Hellens Land** accordance with the terms of the appointment.*

*This report has been prepared in accordance with the terms and conditions of the appointment and relates to the condition of the site at the time of ground investigations. No warranty is provided as to the possibility of future changes in the condition of the site.*

*Shadbolt Environmental takes no responsibility for conditions which occur between the individual exploratory holes. Whilst every effort has been made to interpret the conditions between investigation locations, such information is only indicative.*

*Whilst the contamination assessment detailed within this report reflects our view, because there are no exact UK definitions of these matters, being subject to risk analysis, Shadbolt Environmental are unable to give categoric assurances that they will be accepted by authorities or funds without question. This report is prepared and written for the purposed uses stated in the report and should not be used in a different context without reference to Shadbolt Environmental. In time, improved practices or amended legislation may necessitate a re-assessment.*

*The report is limited to the geotechnical and environmental aspects detailed within the report and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents.*



**SHADBOLT  
GROUP**

**APPENDIX B  
COAL AUTHORITY DATA**



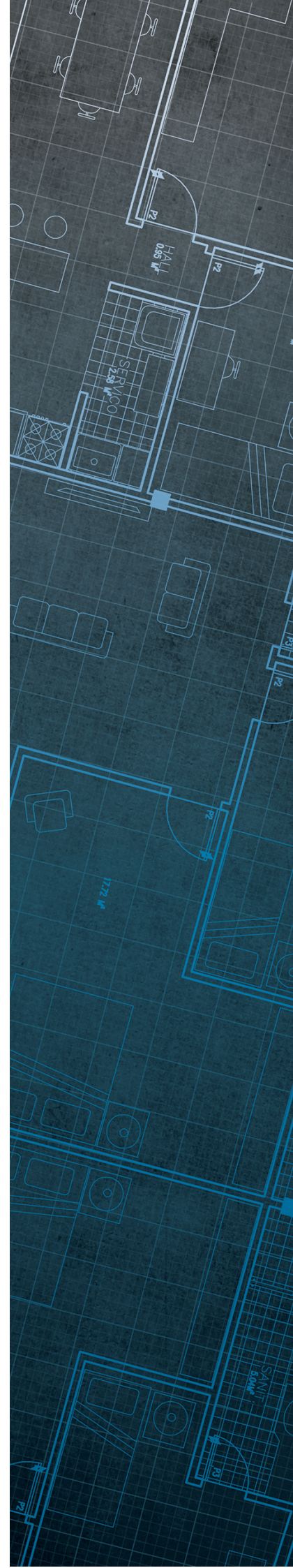
The Coal  
Authority

# Consultants Coal Mining Report

Former Houghton Colliery  
Houghton Le Spring  
Tyne & Wear

Date of enquiry: 20 March 2018  
Date enquiry received: 20 March 2018  
Issue date: 20 March 2018

Our reference: 51001813455001  
Your reference: 2585



# Consultants

## Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

### Client name

michael Taylor

### Enquiry address

Former Houghton Colliery  
Houghton Le Spring  
Tyne & Wear

### How to contact us

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NG18 4RG

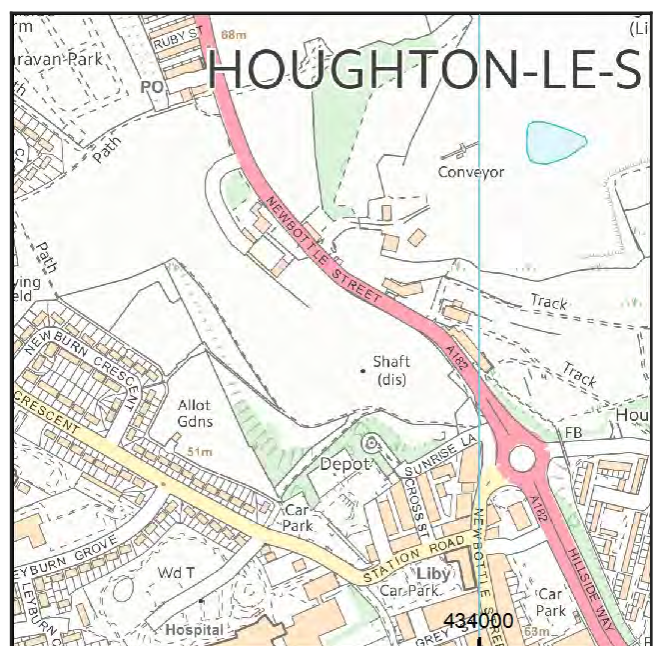
[www.groundstability.com](http://www.groundstability.com)

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 /thecoalauthority

 /thecoalauthority



Approximate position of property



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# Section 1 – Mining activity and geology

## Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	MAIN	Coal	3HCA	122	South	2.3	East	110	1928
unnamed	MAIN	Coal	3HTM	136	Beneath Property	5.9	North-West	110	1900
HOUGHTON	YARD	Coal	3HOR	142	South	2.0	East	180	1900
HOUGHTON	MAIN	Coal	3HT8	149	North-West	3.5	North-East	110	1944
unnamed	MAUDLIN	Coal	3HSJ	164	South	2.1	North-East	150	1900
unnamed	MAUDLIN	Coal	3HL6	166	South	1.7	East	140	1943
HOUGHTON	YARD	Coal	3HCD	169	Beneath Property	8.1	North-West	200	1922
HOUGHTON	LOW MAIN	Coal	3NQO	177	Beneath Property	5.3	South-West	163	1900
HOUGHTON	YARD	Coal	3HED	181	North-West	3.3	North	200	1922
HOUGHTON	LOW MAIN	Coal	3SMH	185	East	1.7	East	130	1900
unnamed	MAIN	Coal	3HTN	187	North-East	3.0	South-East	110	1900
HOUGHTON	HARVEY	Coal	3RIM	193	Beneath Property	34.4	South-West	76	1950
unnamed	MAUDLIN	Coal	3HBY	198	West	4.1	West	150	1909
HOUGHTON	LOW MAIN	Coal	3NQE	199	Beneath Property	9.8	North	163	1900
HOUGHTON	LOW MAIN	Coal	3NQS	202	Beneath Property	6.0	North-West	163	1900
unnamed	YARD	Coal	3HOD	208	North-East	2.0	East	180	1900
unnamed	MAUDLIN	Coal	3HBK	215	Beneath Property	5.0	South-East	150	1900
unnamed	MAUDLIN	Coal	3HTJ	215	North-West	0.5	North	150	1900
unnamed	MAUDLIN	Coal	3HKK	228	North-East	6.5	North	120	1900
HOUGHTON	HUTTON	Coal	3SLI	237	Beneath Property	3.8	East	230	1900
HOUGHTON	HUTTON	Coal	3SRW	237	South-East	6.6	N/A	100	1900
HOUGHTON	HUTTON	Coal	3SLW	242	Beneath Property	3.9	North	230	1900



Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
HOUGHTON	LOW MAIN	Coal	3SLH	245	North-East	2.8	North-East	170	1900
HOUGHTON	HARVEY	Coal	3RYL	248	South	2.3	East	65	1954
HOUGHTON	HARVEY	Coal	3RXL	251	South	2.3	East	65	1949
HOUGHTON	HARVEY	Coal	3RK8	257	South	8.1	North	76	1952
HOUGHTON	HUTTON	Coal	3SSI	258	Beneath Property	2.3	North-West	100	1900
unnamed	BUSTY	Coal	3HH2	275	South-East	1.6	South-East	173	1945
unnamed	BUSTY	Coal	3HGU	276	South-East	1.7	South-East	173	1945
unnamed	BUSTY	Coal	3HFU	279	East	2.5	East	107	1945
unnamed	BUSTY	Coal	3HG2	279	East	0.7	North	173	1945
unnamed	BUSTY	Coal	3HGG	279	East	1.7	South-East	173	1945
HOUGHTON	HARVEY	Coal	3RI8	285	West	4.8	North-East	76	1946
unnamed	BUSTY	Coal	3HBU	286	South	4.4	North-West	170	1979
HOUGHTON	HARVEY	Coal	3RJM	286	North	3.6	East	76	1950
HOUGHTON	HARVEY	Coal	3RJ8	300	North-East	8.8	North-West	76	1950
HOUGHTON	HARVEY	Coal	3RWZ	313	North-East	3.2	North	76	1950

### Probable unrecorded shallow workings

None.

### Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

## Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	433550-001	433802 550398	This entry was originally capped in 1982 and used for washery tailings disposal until 1986. The shaft was filled from the top of the tailings to a depth of 20m from the surface with hardcore and completed to the surface with 40mm size stone in 1987. The fill was grouted from rockhead to the surface and the cap was reinstated to NCB specification in 1988.	Coal	Sunderland Borough Council 12/09/1989
Shaft	433550-002	433876 550358	This entry was originally capped in 1982 and used for washery tailings disposal until 1986. The shaft was filled from the top of the tailings to a depth of 20m from the surface with hardcore and completed to the surface with 40mm size stone in 1987. The fill was grouted from rockhead to the surface and the cap was reinstated to NCB specification in 1988.	Coal	Sunderland Borough Council 12/09/1989
Shaft	433550-003	433896 550402	This entry was located during demolition in 1982 and subsequently filled to an unknown specification.	Coal	

## Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

16754	D769	13451
D1096	D1464	4020
D1040	D1039	12739

Our records show we have more plans than those shown above which could affect the enquiry boundary.

**Please contact us on 0345 762 6848** to determine the exact abandoned mine plans you require based on your needs.

## Outcrops

No outcrops recorded.

## Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Faults under or close to the property recorded.

## Opencast mines

None recorded within 500 metres of the enquiry boundary.

### **Coal Authority managed tips**

None recorded within 500 metres of the enquiry boundary.



## Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

### Site investigations

None recorded within 50 metres of the enquiry boundary.

### Remediated sites

None recorded within 50 metres of the enquiry boundary.

### Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal 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

None recorded within 500 metres of the enquiry boundary.

### Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

## Section 3 – Licensing and future mining activity

### Future underground mining

None recorded.

### Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

### Court orders

None recorded.

### Section 46 notices

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

### Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

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

### Payments to owners of former copyhold land

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

## Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

### **Development advice**

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

**For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at [groundstability@coal.gov.uk](mailto:groundstability@coal.gov.uk).**

## Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at [groundstability@coal.gov.uk](mailto:groundstability@coal.gov.uk)**.

### Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

### Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

### Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

### Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

### Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

### Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

### Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

### **Opencast mines**

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

### **Coal Authority managed tips**

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

### **Site investigations**

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

### **Remediated sites**

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

### **Coal mining subsidence**

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

### **Mine gas**

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

### **Mine water treatment schemes**

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

### **Future underground mining**

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

### **Coal mining licensing**

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

### **Court orders**

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

### **Section 46 notices**

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

### **Withdrawal of support notices**

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

### **Payment to owners of former copyhold land**

Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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## VAT receipt

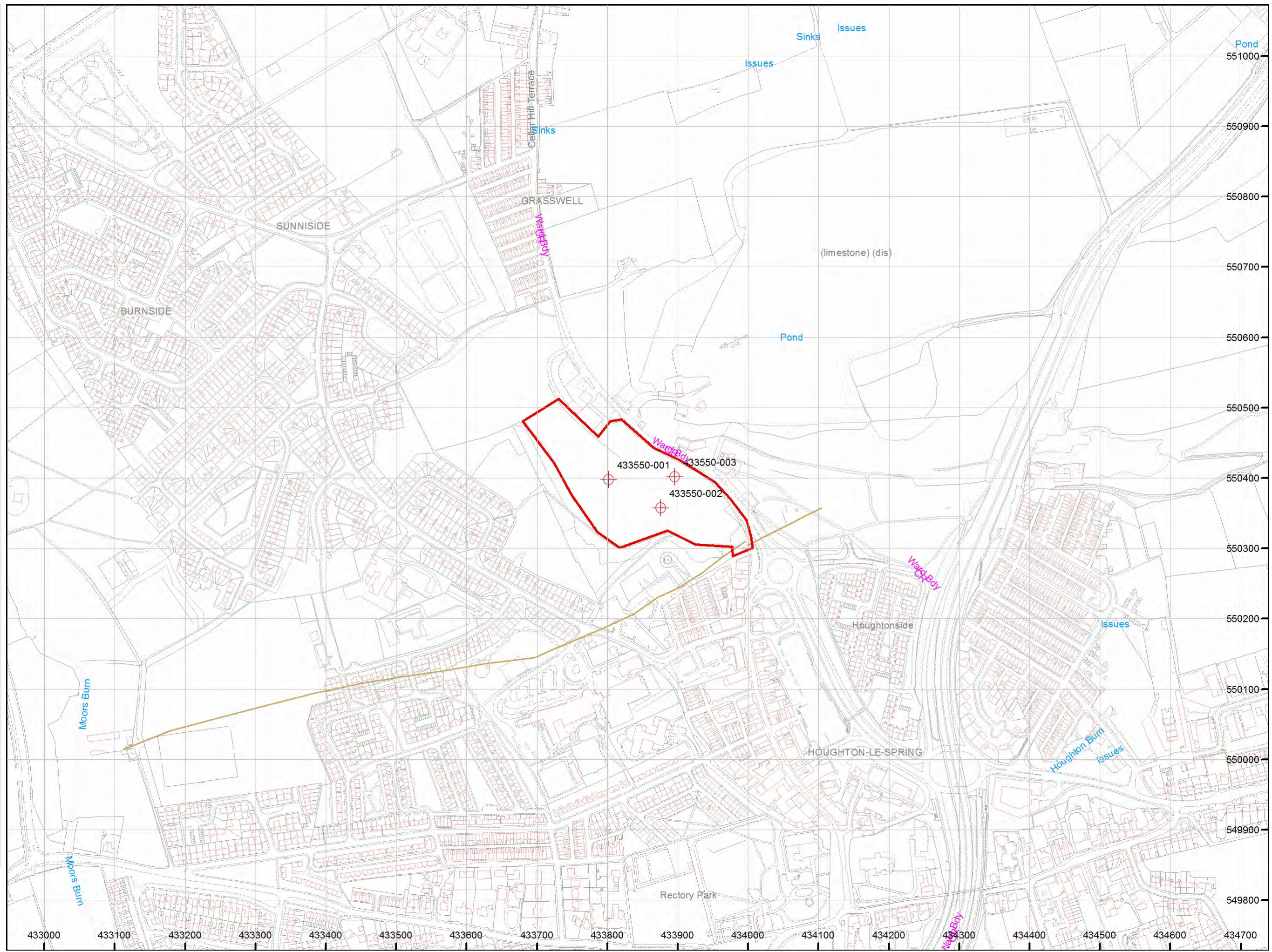
<b>Issued by</b>	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
<b>Tax point date</b>	20 March 2018
<b>Issued to</b>	MICHAEL TAYLOR 18 BEWICK ROAD BENSHAM GATESHEAD NE8 4DP
<b>Property search for</b>	FORMER HOUGHTON COLLIERY HOUGHTON LE SPRING TYNE & WEAR
<b>Reference number</b>	51001813455001
<b>Date of issue</b>	20 March 2018
<b>Cost</b>	£101.70
<b>VAT @ 20%</b>	£20.34
<b>Total received</b>	£122.04
<b>VAT registration</b>	598 5850 68



The map highlights any specific surface or subsurface features within or near to the boundary of the site.

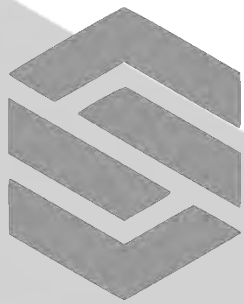
**Key**

- Approximate position of the enquiry boundary shown 
- Disused mine shaft 
- Geological faults 



**How to contact us**  
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 +44 (0)1623 637 000 (International)  
 www.groundstability.com





# SHADBOLT GROUP

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