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Job title:	Roughbirchworth Lane, Oxspring
Report type:	Geo-Environmental Appraisal
Prepared for:	Sourced
Date:	July 2022

Document Control Form	
PROJECT	*ROUGHBIRCHWORTH LANE, OXSPRING*
REPORT NAME	*GEO-ENVIRONMENTAL APPRAISAL*
REPORT REFERENCE	*GRO-22118-3591*
STATUS	*FINAL*
ISSUE DATE	*06 JULY 2022*
REVISION	
CLIENT	*SOURCED*
CLIENT CONTACT	-
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SUMMARY

Site Details	
Site Location	*The site is located circa 3.0km south east of Penistone in the village of Oxspring and is approximately centred on National Grid Reference 426758, 402046.*
Site Area	*The southern area of the site is undeveloped and occupied primarily by semi-mature and mature trees and an area of grassland is present in the northern part.* *The central portion comprises derelict cottages, barns and outbuildings situated around small courtyard which consists of concrete surfacing which is in poor condition. The buildings are of one and two storey construction and constructed from bricks, stone blockwork and breeze blocks.* *Fly tipped material is present across the central part of the site and includes scrap metal, plastic containers, glass jars and bottles, bricks and asbestos sheeting.*
Ground Model	
Made Ground Soils	*Made Ground was encountered in WS01 to WS05, WS07, SuDS1, SuDS2 and HP01 to HP03 to depths of between 0.23m and in excess of 0.6m bgl.* *The surfacing of the site comprised reworked topsoil WS01 to WS05, SuDS1, SuDS2 and HP01 to HP03. Gravel of mixed lithology was present in the topsoil and included brick, sandstone, ceramics, tarmac and mudstone. Fragments of asbestos cement were present in SuDS1 in the southern part of the site.* *Concrete surfacing over granular subbase was in WS07 to 0.3m bgl.* *Hand pits were undertaken on Made Ground stockpiles present and reached 0.60m bgl.*
Natural Soils	*Firm brown variably sandy gravelly Clay was encountered in WS03, WS05, WS08 to WS12 to a maximum depth of 1.1m bgl.* *Brown very clayey cobbly Sand was in WS03, WS04, WS06, WS08, WS09 and WS10 to depths of between 0.6m and 1.1m bgl.* *These sand and clay soils are considered to be weathered bedrock deposits.*
Bedrock	*Very weak orange brown, pale brown and brown residually to distinctly weathered Sandstone recovered as sandy clayey gravel and cobbles and was encountered from depths of between 0.23m and 1.1m bgl.*
Groundwater	*No groundwater strikes were observed during the ground investigation.*
Ground Engineering Assessment	
Foundations	*The most suitable foundations for the proposed dwellings are considered to be unreinforced strip/trench fill foundations cast within the weathered sandstone bedrock at a minimum depth of 0.6m bgl. Competent sandstone bedrock has been observed from depths of between 0.23m and 1.1m bgl.* *Foundations should be deepened through all Made Ground, former construction and the clay/sand deposits that have been encountered to found within the sandstone.*

Highways	*The plate load tests were carried out within the brown clayey gravelly Sand. CBR values recorded ranged between 2.1% and 27.9% at the assumed formation level of the proposed road.*
SuDS	*Variable soil infiltration rates have been calculated in SuDS1 and SuDS2 and good to poor drainage conditions have been determined and were better in SuDS1.*
Constraints	*The main development constraints on site include the following:* • *The culvert that crosses the southern part of the site.* • *Trees on the southern part of the site.* • *Slope along the northern boundary down to the Trans Pennine Trail.* • *The strength of the underlying sandstone bedrock if deep excavations are required.*
GQRA and Revised (PL) Assessment	
Human Health	*Elevated concentrations of arsenic, lead, PAHs and locally TPH CWG were recorded in the underlying reworked topsoil materials in the central and southern parts of the site. In addition, Chrysotile asbestos was detected in one sample of Made Ground in WS04 at 0.2m bgl and was quantified at 0.063mass %.* *No elevated Contaminants of Concern were recorded in the natural Topsoil materials from the northern part of the site.* *Due to the widespread contamination recorded across the central and southern areas and the private gardens in the proposed development, a plausible pollution linkage is considered to exist and the risk to human health is Moderate.*
Controlled Waters	*A source of mobile contamination has not been identified and the risk to controlled waters is Low.*
Permanent Ground Gas	*The initial gas monitoring results place the site in CS1 and gas protection measures are not likely to be required within the proposed residential development. The site is not within an area requiring radon precautions within foundations. The risk from permanent ground gases is currently Low and will be confirmed on completion of monitoring.*
Final Appraisal	

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

- *Completion of gas monitoring programme.*
- *Issue gas assessment.*
- *Additional ground investigation works in areas previously inaccessible to confirm ground conditions.*
- *Demolition Asbestos survey.*
- *Design of Remediation Specification.*
- *Detailed foundation design.*
- *Confirmation of the recommendations made within this report with the Local Authority.*

TABLE OF CONTENTS

Plans		
Plan Reference	*Revision*	*Title*
GRO-22118-P01	-	*Project Location Plan*
GRO-22118-P02	-	*Exploratory Hole Location Plan*
GRO-22118-P03	-	*Generalised Ground Model*
GRO-22118-P04	-	*Contamination Plan*
GRO-22118-P05	-	*Revised Illustrative CSM*

1.0 INTRODUCTION

1.1 Project Objectives

Groundtech Consulting Limited have been instructed by BDI Structural Solutions on behalf of Sourced to undertake a Geo-Environmental Appraisal for a site at Roughbirchworth Lane in Oxspring.

The objectives of the Preliminary Risk Assessment were to establish the sites environmental and geotechnical background in order to generate a Conceptual Site Model to identify any potential constraints and linkages which may affect the redevelopment of the site.

A main investigation was undertaken in accordance with BS 5930:2015, BS 10175:2013, BS 8576 and BS 22475 to revise the CSM and quantify the level of risk identified in the PRA. The Appraisal has been prepared in accordance with current UK Legislation and to discharge Land Quality pre-commencement planning conditions.

1.2 Proposed Development

The proposed development is residential end use comprising the construction of 22 No. dwellings with associated private gardens and infrastructure.

Proposed Development

1.3 Limitations

Other conditions may exist on the site that have not been taken into account in this assessment as they are outside the scope of works. Groundtech Consulting are not responsible for these circumstances that are not outlined in the report.

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2.0 SITE SETTING

2.1 Location

The site is located circa 3.0km south east of Penistone in the village of Oxspring, as shown on the Project Location Plan *GRO-22118-P01* and is approximately centred on National Grid Reference 426758, 402046.

Project Location

Access to the site is gained off Roughbirchworth Lane to the south east.

2.2 Site Description

The site is roughly rectangular in shape and approximately 0.39 ha in area. The topographically of the site slopes down gently from north west to south east.

Onsite Features

Access is gained by a gate way in the southeast corner of site and leads to an unsurfaced track.

The south eastern area of the site is undeveloped and occupied primarily by semi-mature and mature trees.

The central part of the site comprises derelict cottages, barns and outbuildings situated around a small courtyard which consists of concrete surfacing which is in poor condition. The buildings are of one and two storey construction and constructed from bricks, stone blockwork and breeze blocks.

Anecdotal evidence indicates that an above ground storage tank (AST) was located in the south west of the courtyard area however this was not present at the time of the site reconnaissance.

Fly tipped material is present across the central part of the site and includes scrap metal, tree branches, plastic containers, glass jars, bottles, bricks and asbestos sheeting. Heaped stockpiles of topsoil and tipped waste are present along the eastern boundary in the central area of the site.

The northern portion of the site is formed by a grassed field. The most northern boundary of the site comprises a steep slope down to a historic railway, now the Pennine Trail.

A culverted watercourse is present beneath the south eastern part of the site in the wooded area.

Site Boundaries and Surrounding Features

The site boundaries are formed by a mixture of stone walls, fencing and vegetation/ hedgerows.

The site is surrounded by following features/land uses:

- *North - Fields.*
- *East - The Trans Pennine Trail, with a school, a post office and housing beyond.*
- *South - Roughbirchworth Lane with housing beyond.*
- *West - Residential housing and fields.*

Site photographs are presented in *Appendix 2*.

3.0 SUMMARY OF PREVIOUS DESK STUDY REPORT

A Desk Study Report was previously carried out by JNP Group referenced S10565 R001, dated May 2018. A summary of the findings is provided below.

Site History
The site was developed from at least 1850 with a residential building (Low House), this was subdivided into cottages in the 1930s.

The nearby area was subject to localised quarrying and a railway cutting ran adjacent to the site. The surrounding area that has been developed, predominantly for residential use.

Geology
No artificial or Made Ground is indicated to be present underlying the site however, from the aerial imagery viewed and from the site walkover, buildings are present in the south west of the site.

No superficial geology is recorded at the site.

The underlying solid geology is indicated to be a sandstone outcrop (Grenoside Sandstone) of the Pennine Lower Coal Measures, which is described by the BGS as "a fine-grained, thinly bedded, cross-laminated, micaceous and carbonaceous sandstone".

There are five faults / coal seams denoted within 500m of the site, the nearest being an inferred fault 315m south east.

Hydrology
The nearest surface water feature is the River Don located 499m east of the site.

The site does not lie in an area considered by the Environment Agency to be at risk of fluvial flooding.

The Groundsure Report does not identify any active surface water abstractions within 1km of the site.

Hydrogeology
The Aquifer Maps contained in the Groundsure Report indicates that the site is underlain by a Secondary A Aquifer. The aquifer status refers to Grenoside Sandstone.

The Groundsure Report does not identify any active licensed groundwater abstractions within 1 km of the site.

The site is not within a groundwater Source Protection Zone.

Coal Mining
There is no historical mining recorded at the site.

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) are not present at the site.

No mine entries are recorded within, or within 100m, of the boundary of the site.

In conclusion, risks associated with coal mining legacy have not been identified at the site.

Environmental Information

The following environmental information was gained:

- *The nearest landfill was located 170 m to the north east of the site. Waste is recorded as being deposited in 1994 and the landfill was operated by Stevlorra Developments Limited, no further details are provided by the report.*
- *There are no recorded pollution incidents to controlled waters according to the report.*
- *Oxspring Garage was located 204m east and is no longer operational.*
- *The Groundsure Report states that the Health Protection Agency identified less than 1% of homes above the action level. The British Geological Survey Information Services Group indicates that no radon protection measures are necessary.*

Preliminary Conceptual Site Model

The following Preliminary Conceptual Site Model was determined based on the findings of the Desk Study:

- *Medium risk to land.*
- *Medium risk to groundwater.*
- *Low risk to surface water.*

4.0 SCOPE OF INVESTIGATION AND RATIONALE

4.1 Project Objectives

The aim of the fieldwork was to:

Determine the stratification beneath the site.
Maintain a watching brief for visual and olfactory evidence of contamination.
Obtain samples using methodology in current guidance for contamination analysis.
Identify realistic pollution linkages to groundwater.
Obtain relevant geotechnical parameters for preliminary foundation design to address both ULS and SLS conditions.
Determine soil infiltration rates.
Determine the modulus of subgrade reaction.
Determine if targeted supplementary investigation in areas of concern is required and for remedial design.
Install monitoring standpipes for gas and groundwater monitoring.
Assess the identified pollution linkages in the CSM.

4.2 Scope of Works

The following scope of works was completed between the dates of 27th to 28th April 2022.

- *12 No. Windowless Sample Boreholes (WS01 – WS12) were advanced to a maximum depth of 1.8m bgl due to the hard sandstone bedrock encountered.*
- *2 No. Soil Percolation tests (SuDS1 & SuDS2) were undertaken to calculate soil infiltration rates to determine feasibility of SuDS drainage.*
- *5 No. Plate Load tests (PBT1 to PBT5) were carried out to determine the modulus of subgrade reaction to inform highway/pavement design.*

The exploratory hole locations are presented on Groundtech Plan *GRO-22118-P02*, and the logs are presented in *Appendix 3*.

The exploratory holes were positioned to establish the stratification beneath the site, and target any areas of concern as summarised in the table below:

Location	Target Rationale
WS01 to WS12	*Across the site in the vicinity of proposed housing locations*
SuDS1 and SuDS2	*Positioned in areas of possible SuDS drainage*
PLT01 to PLT05	*Positioned in areas of the proposed access road*
WS04 to WS09	*Historic buildings onsite*
WS05	*Vicinity of former AST*
HP01 to HP03	*Stockpiled/heaped material*

The exploratory holes were logged by a suitably experienced geo-environmental engineer in general accordance with the following current guidance:

- *BS 5930 'Code of Practice for Site Investigations' 2015.*

- *BS EN 14688-1:2002 'Geotechnical Investigation and Testing – Identification and classification of soil'.*
- *BS EN ISO 14689:2002 'Geotechnical investigation and testing – Identification and classification of rock'.*

4.3 Soil Sampling

During the intrusive investigation, representative samples were taken at regular intervals, changes of strata and where evidence of contamination existed. Laboratory analysis was scheduled on the samples obtained.

The samples obtained are summarised in the table below:

Soil Sample	Number
Environmental Sample	*12*
Disturbed Sample	*25*

The samples have been obtained in accordance with current environmental and geotechnical guidance. The sampling plan has been designed to obtain samples from all required strata using the correct methodology.

Disturbed samples of soil for chemical analysis were placed in the correct sampling containers as required by the laboratory in accordance with their MCERTS and UKAS Accreditation. Transportation was arranged in a timely manner and the samples were at the correct temperature.

The sample locations and depths are recorded on the exploratory logs.

4.4 Geo-Environmental Analysis

To inform the Generic Quantitative Risk Assessment, the following geo-environmental testing was scheduled to assess the risk from contamination on the site. The testing is based on the potential sources identified in the PRA and observations during the ground investigation.

Contaminants of Concern	Matrix	Number
Arsenic, cadmium, chromium (total and hexavalent), copper, lead, mercury, nickel, selenium, zinc and pH.	*Soil*	*12*
Speciated PAHs	*Soil*	*12*
TPH CWG, BTEX and MTBE	*Soil*	*6*
Asbestos Screening	*Soil*	*12*
Asbestos Quantification	*Soil*	*1*

The Geo-Environmental Laboratory Testing Results are presented in *Appendix 4*.

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

British Standard	Test Method	Number
Part 2	*Water Content*	*3*
Part 2	*Atterberg Limits*	*3*

British Standard	Test Method	Number
Part 3	*pH Value*	*4*
Part 3	*Water Soluble Sulphate Content*	*4*
BRE Full Suite	*Soil*	*3*

The Geotechnical Laboratory Testing Results are presented in *Appendix 4*.

4.5 Gas and Groundwater Monitoring

Gas and groundwater monitoring installations were constructed in the boreholes. The standpipes consisted of polyvinyl chloride high-density polyethylene (HDPE) pipe - a bentonite seal was placed around the plain pipe and a clean gravel pack was placed around the slotted pipe. A summary of the installation construction is presented in the table below:

Location	Depth (m)	Response Zone (m bgl)	Targeted Strata	Reason
WS01	*1.40*	*0.50-1.40*	*Natural Ground*	*Ground Gas*
WS05	*1.50*	*0.50-1.50*	*Natural Ground*	*Ground Gas*
WS06	*1.50*	*0.50-1.50*	*Natural Ground*	*Ground Gas*
WS08	*1.50*	*0.50-1.50*	*Natural Ground*	*Ground Gas*
WS10	*1.80*	*0.50-1.80*	*Natural Ground*	*Ground Gas*

Permanent gas and flow rate monitoring was carried out using a GFM 436 infrared gas monitor with integral electronic flow analyser. The measurements taken are listed below:

- *Oxygen (O_2), carbon dioxide (CO_2) and methane (CH_4) as the percentage volume in air (% v/v).*
- *Hydrogen sulphide (H_2S) and carbon monoxide (CO) as the percentage volume in air (% v/v).*
- *Lower Explosive Limit (%LEL) of methane.*
- *Atmospheric and borehole pressure, including pressure trend.*
- *Flow measurements (l/hr).*
- *Weather and ground surface conditions.*

Both peak and steady state conditions were monitored to understand the behaviour of the permanent ground gas, the steady state conditions were recorded by allowing the gas monitor to run for a minimum of 3 minutes.

Interim permanent gas and groundwater monitoring results are presented in *Appendix 6*.

4.6 Vapour Survey - Photo Ionisation Detector

Standard sampling protocol and preservation of samples was undertaken as described in the EA guidance on site investigation. The on-site monitoring was carried out in line CIRIA C6658 to aid targeting samples for VOC laboratory analysis.

Soil was collected for onsite testing. A plastic bag was half filled with soil allowing a suitably sized headspace. The bag was sealed and stored for at least 20 minutes before being tested for Total Volatile Organic Compounds (TVOCs) using a Photo Ionisation Detector (PID).

Results of the PID readings are presented on the exploratory hole logs.

5.0 GROUND MODEL

5.1 Made Ground

Made Ground was encountered in WS01 to WS05, WS07, SuDS1, SuDS2 and HP01 to HP03 to depths of between 0.23m and in excess of 0.6m bgl.

The surfacing of the site comprised reworked topsoil at locations WS01 to WS05, SuDS1, SuDS2 and HP01 to HP03. Gravel of mixed lithology was present in the topsoil and included brick, sandstone, ceramics, tarmac and mudstone. Fragments of asbestos cement were present in SuDS1 in the southern part of the site. Asbestos sheeting was generally present across the central and southern area of the site at the surface.

Concrete surfacing over granular subbase was encountered in WS07 to 0.3m bgl and degraded concrete was encountered in WS05 to 0.1m bgl.

Exploratory Hole Locations

5.2 Topsoil

Natural brown variably clayey sandy gravelly Topsoil was present in WS06 and WS08 to WS12 to depths of between 0.35m and 0.4m bgl.

5.3 Natural Ground

The natural strata encountered generally confirmed the published geological records.

Firm brown variably sandy gravelly Clay was encountered in WS03, WS05, WS08 to WS12 to a maximum depth of 1.1m bgl.

Brown very clayey cobbly Sand was in WS03, WS04, WS06, WS08, WS09 and WS10 to depths of between 0.6m and 1.1m bgl.

These sand and clay soils are considered to be weathered bedrock deposits.

5.4 Bedrock

Very weak orange brown, pale brown and brown residually to distinctly weathered Sandstone recovered as sandy clayey gravel and cobbles and was encountered from depths of between 0.23m and 1.1m bgl.

5.5 Groundwater

No groundwater strikes were observed during the ground investigation.

5.6 Watching Brief

A watching brief was maintained during the ground investigation for visual and olfactory evidence of contamination.

Visual evidence of contamination was recorded in the form of ash content within the Made Ground topsoil of WS03. Asbestos cement sheeting was also present and witnessed across the site.

5.7 Excavation Stability

No evidence of spalling or collapse was noted during excavation of the trial pits.

5.8 Excavation/Borehole Progress

Slow progress while excavating the trial pits was experienced when the weathered sandstone deposits were encountered. Window samples boreholes recorded SPT refusals across the site in the competent bedrock deposits.

6.0 GROUND ENGINEERING

6.1 Geotechnical Testing Results

Comparison of water content and the value of 0.4 times the Liquid Limit in accordance with BRE Digest 412 'Desiccation in Clay Soils' suggests significant desiccation has taken place when 0.4 times the Liquid Limit is greater than the actual water measured water content. This is a rudimentary method but also a good guide.

Results of the PI analysis and the volume change potential of the clays is summarised in the table below:

Reference	Depth (m)	Modified PI	Volume Change Potential	Significantly Desiccated Y/N
WS10	*1.00*	*17.0*	*Low*	*N*
WS09	*1.00*	*9.6*	*Low*	*N*
WS07	*0.60*	*21.3*	*Medium*	*N*

6.2 Assessment Background

Background

The ground engineering investigation has been undertaken to formulate an accurate ground model in order to undertake preliminary foundation design. The ground model has been constructed with a moderate to high level of confidence and has evolved from the information obtained by the PRA.

It is proposed to redevelop the site residentially with semi-detached and detached dwelling being constructed. It is assumed that they will be of traditional two-storey construction.

The central area of the site is currently occupied by a number of cottages along with barns and outbuildings. Many of these structures are in a state of disrepair. The southern part of the site is heavily wooded whilst the northern area is a field. As part of the enabling works, the structures will need to be demolished and foundations and hardstanding grubbed up. In addition, trees will need to be removed from the southern area if they are not protected.

The topsoil from the northern field should be stripped and stockpiled separately for potential reuse within the garden areas of the proposed development. The reworked topsoil is unlikely to be suitable for reuse as it contains bricks, ceramics and asbestos sheeting.

Stockpiled waste material from across the site will require removal as part of the enabling works and stockpiles of asbestos cement sheeting should be removed by a licenced contractor.

A culvert crosses the southern part of the site, and its position should be considered in the final development layout. An easement is likely to be in place either side of it where construction will be restricted.

Ground Conditions

Made Ground has been encountered to a maximum depth of 0.6m bgl in the hand dug pits along the northern boundary and was generally present in the central and southern parts of the site. Natural topsoil was present beneath the northern field to a maximum depth of 0.4m bgl. Weathered bedrock deposits comprising firm Clay and Sand was observed beneath the site to a maximum depth of 1.1m bgl. Extremely weak Sandstone was encountered from depths of between 0.23m and 1.1m bgl.

No groundwater was encountered within any of the boreholes or trial pits.

Limitations

The main development constraints on site include the following:

- *The culvert that crosses the site.*
- *Trees on the southern part of the site.*
- *The strength of the underlying sandstone bedrock if deep excavations are required.*

It is recommended that supplementary investigation comprising confirmatory trail pits is undertaken in the areas where access was not possible post demolition to ensure ground conditions do not differ and confirm the geotechnical recommendations.

6.3 Geotechnical Parameters

The geotechnical test results have been evaluated to derive geotechnical parameters for the soils underlying the site. A 'depth to SPT N value' graph is presented in Plan *GRO-22118-P03* in *Appendix 7* to provide a generalised ground model for the site.

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

For the residual sandstone bedrock, a ϕ' value of 35° has been selected based on published values.

6.4 Preliminary Foundation Design

The most suitable foundations for the proposed dwellings are considered to be unreinforced strip/trench fill foundations cast within the weathered sandstone bedrock at a minimum depth of 0.6m bgl. Competent sandstone bedrock has been observed from depths of between 0.23m and 1.1m bgl.

Foundations should be deepened through all Made Ground, former construction and the clay/sand deposits that have been encountered to found within the sandstone.

Preliminary foundation design has been undertaken by calculation, a safe allowable bearing capacity of 150kN/m^2 is provided for ultimate limit state design for a 600mm wide strip foundation constructed within the sandstone at c.0.6m bgl.

Using the above pressures, settlement criteria will be negligible and Serviceability Limit State conditions will be satisfied. The majority of the settlement will occur during the construction phase.

If the ground conditions encountered during the construction phase differ significantly to the conditions encountered during the round Investigation, work should cease, and Groundtech Consulting contacted for further advice.

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

6.5 Building Near Trees

Foundation excavations will be taken down to bedrock therefore, foundations will not need to be adjusted in full accordance with NHBC Standards Chapter 4.2 and heave precautions will not be required.

6.6 Floor Slabs

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

6.7 Construction

The trial pits indicate that instability of excavations is not anticipated provided they are not exposed to adverse weather conditions for any substantial period of time. Tracked high specification plant is recommended to maintain the building programme. Selection of appropriate plant should also take into consideration of the diggability of the underlying sandstone.

Based on the ground investigation works carried out, groundwater is not considered to be an issue during the groundworks at the site.

The final development layout should take into consideration the position of the culvert beneath the southern part of the site and the slope along the northern boundary.

6.8 Concrete Classification

Made Ground
Water soluble sulphate testing was not undertaken on any samples obtained of the Made Ground as it was generally reworked topsoil which will not be in contact with concrete.

Natural Strata
Water soluble sulphate testing was undertaken on seven samples of the natural ground. The range of soluble sulphate (SO_4) recorded is 8mg/l to 308mg/l and associated pH values ranged between 7.1 and 8.2 indicating neutral to slightly alkaline conditions.

As a dataset of between five and nine has been tested, the average of the highest two of the water-soluble sulphate test results and the average of the lowest two of the pH result should be taken as the characteristic value. A characteristic sulphate concentration of 166.9mg/l and a pH value of 7.25 have been selected.

Natural granular soils are present beneath the site therefore the groundwater is considered to be mobile.

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

The concentrations of magnesium, chloride and nitrate that have been recorded do not affect the concrete classification above.

Pyrite Potential
Additional testing was undertaken to determine if the natural strata underlying the site is pyritic. Three samples were tested for total sulphur and total sulphate which was used to determine the total amount of oxidisable sulphides in the sample. If the amount of oxidisable sulphate is greater than 0.3% SO_4, pyrite is

probably present. The maximum total amount of oxidisable sulphates in the samples was determined to be 0.007% SO_4 and it is therefore unlikely that the natural ground is pyritic.

6.9 Highway Design

Plate load testing was carried out at locations PBT01 to PBT05 in the approximate areas of the proposed road at depths of between 0.2m bgl and 0.7m bgl. The results are presented in *Appendix 8.*

The plate load tests were carried out within the brown clayey gravelly Sand. CBR values recorded ranged between 2.1% and 27.9% at the assumed formation level of the proposed road. At three of the locations (PBT01 to PBT03), the design criteria of 5% was met. As a minimum, the subgrade should be proof rolled prior to construction.

The soils are considered to be frost susceptible due to the fines content and construction should be a minimum thickness of 450mm to mitigate the risk.

6.10 Sustainable Urban Drainage System (SuDS)

Soil percolation testing was undertaken at two locations (SuDS1 and SuDS2). The results of the testing are in *Appendix 9* and a summary is provided below.

SuDS1
Reworked topsoil was encountered to a depth of 0.32m bgl and was underlain by extremely weak Sandstone to 1.42m bgl where the soil infiltration test was carried out.

Three fills were carried out at this location and calculated infiltration rates of between 4.47×10^{-5} m/s and 1.29×10^{-4} m/s were recorded.

SuDS2
Similar ground conditions were encountered in SuDS2 and the trial pit was terminated at 1.2m bgl in the extremely weak sandstone deposits.

Three soil percolation tests were caried out at this location and infiltration rates of between 8.39×10^{-6} m/s and 9.27×10^{-6} m/s were recorded.

Summary
Variable soil infiltration rates have been calculated in SuDS1 and SuDS2 and good to poor drainage conditions have been determined and were better in SuDS1.

6.11 Slope Stability

A steep slope is present along the northern site boundary which slopes down to the Trans Pennine Trail. Consideration should be given to the position of the proposed dwellings in this part of the site such that the slope is not surcharged.

7.0 LAND QUALITY

7.1 Geo-Environmental Testing Results - Soils

Samples of Made Ground and natural soils have been tested for a range of relevant Contaminants of Concern. In accordance with LCRM, a Generic Quantitative Risk Assessment (GQRA) has been undertaken to determine the significance of the concentrations as derived through Geo-Environmental analysis.

The GQRA process comprises the comparison of the actual concentrations measured on site with Generic Assessment Criteria (GACs) for the protection of human health.

The GACs used for the assessment of soil concentrations have been derived using the CLEA model. The GACs used and their ranking of importance are listed below:

- *Soil Guideline Values (SGVs) which demonstrate minimal risk.*
- *LQM/CIEH S4ULs which use the same toxicological data as the SGVs but different exposure criteria.*
- *C4SLs which demonstrate low risk.*

In deriving the GACs for use on Brownfield sites, we have assumed a 1.0% Soil Organic Matter unless the results indicate otherwise.

The proposed end-use for the site is a residential development comprising housing with private domestic gardens with associated driveways, pavements and access roads. We have therefore undertaken the GQRA on the basis that the proposed development site falls under the Residential (with Plant Uptake) land-use scenario as defined in SR3 (EA, 2009b).

The strata or sources of contamination targeted by the laboratory testing scheduled is summarised in the table below:

Strata	Number of Samples Tested	Locations
MG – reworked topsoil (Population 1)	*8*	*WS01 to WS05, HP01 to HP03*
MG – sandy gravel (Population 2)	*1*	*WS07*
Topsoil (Population 3)	*3*	*WS08, WS10, WS12*

A summary of the Geo-Environmental Testing results is presented below and the GQRA Screening Values are presented in *Appendix 10*:

Metals				
Contaminant	Range (mg/kg)	Screening Values (mg/kg)	Exceedances	Locations
Arsenic	*13 – 50*	*32*	*1*	*HP02 at 0.2m*
Cadmium	*<0.2 – 1*	*10*	*0*	*-*
Chromium	*18 - 82*	*910*	*0*	*-*
Hexavalent Chromium	*<4.0*	*21*	*0*	*-*
Copper	*19 – 120*	*2400*	*0*	*-*
Lead	*61 - 790*	*200*	*1*	*HP02 at 0.2m*
Mercury	*<0.3 – 0.9*	*1*	*0*	*-*

Nickel	*11 – 43*	*130*	*0*	*-*
Selenium	*<1.0*	*350*	*0*	*-*
Zinc	*71 - 1500*	*3700*	*0*	*-*
Polycyclic Aromatic Hydrocarbons (PAHs)				
Contaminant	Range (mg/kg)	Screening Values (mg/kg)	Exceedances	Locations
Naphthalene	*<0.05 – 2.9*	*2.3*	*1*	*WS03 at 0.2m*
Acenaphthylene	*<0.05 – 6.1*	*170*	*0*	*-*
Acenaphthene	*<0.05 – 17*	*210*	*0*	*-*
Fluorene	*<0.05 – 19*	*170*	*0*	*-*
Phenanthrene	*<0.05 – 170*	*95*	*2*	*WS04 at 0.2m* *WS05 at 0.2m*
Anthracene	*<0.05 – 67*	*2400*	*0*	*-*
Fluoranthene	*<0.05 - 310*	*280*	*1*	*WS05 at 0.2m*
Pyrene	*<0.05 – 260*	*620*	*0*	*-*
Benzo(a)anthracene	*<0.05 - 170*	*7.2*	*3*	*WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m*
Chrysene	*<0.05 - 130*	*15*	*3*	*WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m*
Benzo(k)fluoranthene	*<0.05 - 75*	*77*	*0*	*-*
Benzo(b)fluoranthene	*<0.05 - 160*	*2.6*	*6*	*WS02 at 0.2m* *WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m* *HP02 at 0.2m* *HP03 at 0.2m*
Benzo(a)pyrene	*<0.05 - 150*	*2.2*	*7*	*WS02 at 0.2m* *WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m* *WS07 at 0.2m* *HP02 at 0.2m* *HP03 at 0.2m*
Indeno(123cd)pyrene	*<0.05 - 63*	*27*	*3*	*WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m*
Dibenzo(ah)anthracene	*<0.05 - 19*	*0.24*	*7*	*WS02 at 0.2m* *WS03 at 0.2m* *WS04 at 0.2m* *WS05 at 0.2m* *WS07 at 0.2m* *HP02 at 0.2m* *HP03 at 0.2m*
Benzo(ghi)perylene	*<0.05 - 70*	*320*	*0*	*-*

TPH CWG - Aliphatics				
Contaminant	Range (mg/kg)	Screening Values (mg/kg)	Exceedances	Locations
>C5-C6	*<0.001*	*42*	*0*	-
>C6-C8	*<0.001*	*100*	*0*	-
>C8-C10	*<0.001*	*27*	*0*	-
>C10-C12	*<1.0*	*130*	*0*	-
>C12-C16	*<2.0 – 13*	*1100*	*0*	-
>C16-C21	*<8.0 – 38*	*65000*	*0*	-
>C21-C35	*<8.0 – 170*	*65000*	*0*	-
TPH CWG - Aromatics				
Contaminant	Range (mg/kg)	Screening Values (mg/kg)	Exceedances	Locations
>C5-EC7	*<0.001*	*70*	*0*	-
>EC7-EC8	*<0.001*	*130*	*0*	-
>EC8-EC10	*<0.001*	*34*	*0*	-
>EC10-EC12	*<1.0 – 2.6*	*74*	*0*	-
>EC12-EC16	*<2.0 – 56*	*140*	*0*	-
>EC16-EC21	*<10 - 590*	*260*	*1*	*WS04 at 0.2m*
>EC21-EC35	*<10 - 1100*	*1100*	*0*	-
MTBE	*<0.001*	*49*	*0*	-
Benzene	*<0.001*	*0.33*	*0*	-
Toluene	*<0.001*	*610*	*0*	-
Ethylbenzene	*<0.001*	*350*	*0*	-
m/p-Xylene	*<0.001*	*230*	*0*	-
o-Xylene	*<0.001*	*250*	*0*	-
Others				
Organic Matter	*2.3 - 14 %*			
Asbestos Screen				
Position	Depth (m bgl)	Result		
WS01	*0.20*	*Not detected*		
WS02	*0.20*	*Not detected*		
WS03	*0.20*	*Not detected*		
WS04	*0.20*	*Not detected*		
WS05	*0.20*	*Chrysotile (Hard/Cement Type Material) – 0.063mass %*		
WS07	*0.20*	*Not detected*		
WS08	*0.20*	*Not detected*		
WS10	*0.20*	*Not detected*		
WS12	*0.20*	*Not detected*		
HP01	*0.20*	*Not detected*		
HP02	*0.20*	*Not detected*		
HP03	*0.20*	*Not detected*		

7.2 Generic Quantitative Risk Assessment - Soils

Made Ground has been encountered in the central and southern parts of the site and generally consisted of reworked topsoil. Locally in WS07, concrete surfacing over granular subbase was present and degraded concrete was present in WS05 also. In the area around the barns and cottages in the central area, much tipped rubbish was encountered including plastic, rubble, tree branches and asbestos sheeting fragments.

Metals

Based on the site having a residential with plant uptake end use, elevated metals were recorded in HP02 only, which was a hand dug pit excavated into a mound of soil along the northern site boundary.

Arsenic was recorded at 50mg/kg when compared to the screening value of 32mg/kg and lead was at 790mg/kg when compared to the screening value of 200mg/kg. The elevated concentrations are likely associated with ash within the Made Ground matrix.

No other elevated concentrations of metals were recorded in the soils analysed across the site, in particular in the natural Topsoil materials beneath the northern part of the site.

Polycyclic Aromatic Hydrocarbons

Elevated concentrations were recorded within the reworked topsoil materials in the central and southern parts of the site in WS01 to WS05, HP02 and HP03.

In addition, elevated benzo(a)pyrene and dibenzo(ah)anthracene was detected in the granular Made Ground beneath the concrete surfacing in WS07. The PAH contamination is likely to be associated with ash in the Made Ground.

No elevations of PAHs were recorded in the natural Topsoil in the north of the site.

TPH CWG, BTEX and MTBE

No visual or olfactory evidence of hydrocarbon contamination was noted within the soils recovered as part of this investigation.

TPH CWG, BTEX and MTBE testing was carried out on six samples of the shallow Made Ground and generally, all of the concentrations recorded were below the residential with plant uptake screening values.

A slight exceedance of aromatic hydrocarbons in the range EC16-EC21 was recorded in WS04 at 0.2m in the reworked topsoil at a concentration of 590mg/kg when compared to the screening value of 260mg/kg.

Asbestos

Twelve samples were screened for asbestos. Asbestos was only detected in WS04 at 0.2m bgl in the reworked topsoil and was hard/cement type material and quantified at 0.063mass %.

It should be noted that ACMs were noted in the shallow soils across the site and stacks of asbestos sheeting were also noted.

A contamination plan is presented as *GRO-22118-P04*.

7.3 Permanent Ground Gases

A single gas monitoring visit has been carried out to date and a further five visits are to be carried out to determine the gas regime.

No methane was detected in any of the standpipes and the maximum recorded carbon dioxide concentration was 1.6% v/v. Slightly depleted oxygen was recorded at a minimum concentration of 18.1% v/v.

No positive gas flow rates were detected.

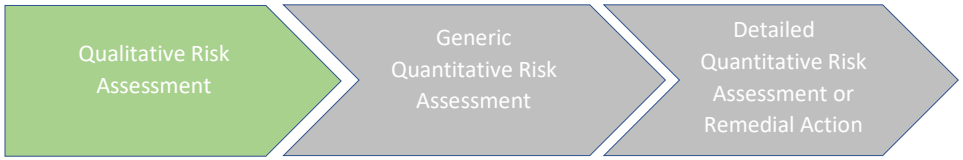
Based on the initial gas monitoring carried out, no gas protection measures will be required within the proposed residential development. This will be confirmed on completion of the monitoring.

The site is located in an area where radon precautions are not required.

7.4 Revised Pollution Linkage Assessment

A pollution linkage assessment has been undertaken based on the findings of the Ground Investigation and testing to identify any realistic pollution linkages in order to quantify the risks to human health and controlled waters. An illustrative CSM is presented on Groundtech Plan *GRO-22118-P04*. The risk classification has been estimated in accordance with the CIRIA C552 assessment criteria outlined in *Appendix 11*.

Human Health Pollution Linkage Assessment



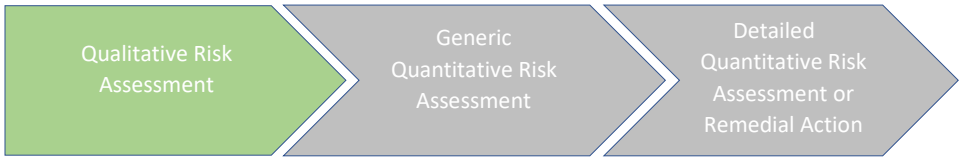
- The table below represents the first stage in the land quality risk assessment process - **the Qualitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose of each stage of risk assessment is to establish if there is a requirement for additional stages of assessment in order to have sufficient confidence to support a risk characterisation or remedial action.

Conceptual Site Model					*Qualitative Risk Assessment*	
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
PL1	Contaminated Soils	Ingestion of soil and dust. Dermal contact with soil.	Unlikely	Medium	Low	*Pollution Linkage 1 refers to proposed site users coming into contact with contaminated soils on the site.* *The site is currently occupied by a refuse disposal works, historically the site was occupied by a large railway interchange in 1895. Based on the history of the site, contaminants may include metals, speciated PAHs, hydrocarbons and asbestos.* *Several potential offsite sources of contamination have been identified however significant mobile contamination is unlikely to have migrated onto site.* *The proposed development is to remediate an existing floor slab that has started to fail and sag. The site will therefore be covered with hardsurfacing breaking the pathway to potentially contaminated soils and a viable pollution linkage is not considered to exist.*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
PL2	Contaminated Soils	Inhalation of vapour.	Unlikely	Medium to Severe	Low	*This pollution linkage refers to volatile vapours migrating into confined spaces within the proposed development. Due to historical uses a potential source of volatiles is unlikely to be present.* *A plausible pollution linkage is not considered to exist at this stage.*
PL3	Contaminated Soils	Inhalation of soil dust by adjacent site users.	Unlikely	Medium	Low	*This pollution linkage relates to contamination on the subject site affecting adjacent site users. It is not anticipated that significant mobile contamination will be present beneath the site and the site is to have a continued use. Therefore, a realistic pollution linkage is not considered to exist.*
PL4	Contaminated Soils	Attacking potable water supply pipe.	Unlikely	Medium	Very Low	*Pollution Linkage 4 refers to the possible contaminants permeating potable water pipes and consumption by the future site end users of the tainted water supply. Made Ground is likely to be present at installation depth which may be contaminated with organics as the site has been used as a garage.* *New potable water supply pipes are not included as part of the development and a pollution linkage is therefore not considered to exist.*
PL5	Ground Gas	Migration and accumulation of	Unlikely	Medium to Severe	Low	*Made Ground is likely to be present beneath the site and potential offsite sources of ground gas have been identified which includes an infilled dock and infilled cuttings.*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential Source	Pollution Linkage	Likelihood	Consequence/ Severity	Risk Rating	*Rationale and Action*
		ground gas in internal spaces.				*Potential onsite and offsite sources have been identified, however it is likely that gas protection measures will have been included in the existing structure if they were required and the site is in a well ventilated open area. A risk is not considered to exist unless new buildings are constructed onsite.* *The site is not in an area requiring radon precautions within foundations.*

Controlled Waters Pollution Linkage Assessment



- The table below represents the first stage in the land quality risk assessment process – **Qualitative Risk Assessment**.
- In order for a development site to be deemed 'suitable for use' the level of risk needs to be reduced to an acceptable level - low to negligible risk. The purpose of each stage of risk assessment is to establish if there is a requirement for additional stages of assessment in order to have sufficient confidence to support a risk characterisation or remedial action.

Conceptual Site Model					*Qualitative Risk Assessment*	
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	*Rationale*
PL6	Contaminated Soils	Impaction of groundwater from soil contamination (diffuse and point). Impaction of groundwater from groundwater plume.	Unlikely	Medium	Low	*The site is currently occupied by a refuse disposal works, historically the site was occupied by a large railway interchange in 1895. Significant mobile contamination is not anticipated to be present beneath the site.* *Geological maps indicate that the site is underlain by Made Ground. The superficial deposits are the Pelaw Clay Member (Unproductive) and the bedrock is Pennine Middle Coal Measures (Secondary A Aquifer).* *The site is not indicated to lie within 500m of a Source Protection Zone therefore the groundwater is not considered to be a sensitive resource. In addition, no potable water abstractions are recorded within 2000m of the site.* *The proposed slab and new drainage will reduce the likelihood of leaching. No soirces of mobile contamination has been identified through the PRA therefore the risk to groundwater is considered low. In addition, the site is to have a continued use.*

Conceptual Site Model						*Qualitative Risk Assessment*
PL	Potential source	Pollution linkage	Likelihood	Severity	Level of risk	*Rationale*
PL7	Contaminated Soils	Migration of soil and groundwater contamination impacting surface waters.	Unlikely	Medium	Low	*Pollution Linkage 7 refers to the impaction of the River Tyne c.980m north of the site from contaminated soils and groundwater.* *A source of mobile contamination has not been identified onsite and there is a significant attenuation distance to the receptor. A viable pollution linkage is not considered to exist.*

7.5 Outline Remedial Strategy

Enabling Works

The existing buildings onsite will need to be demolished and all foundations and former construction grubbed up. In addition, the southern area is wooded therefore several trees will need to be removed to allow development in this part of the site, subject to trees not being protected.

Piles of asbestos sheeting have been identified onsite. These will need to be disposed of in an appropriate manner.

The reworked topsoil materials from the central and southern areas should be stripped and stockpiled separately. In addition, the clean topsoil from the northern area should be stripped and stockpiled separately from the reworked topsoil to prevent cross-contamination.

Soils

Based on the results of the Ground Investigation, elevated concentrations of arsenic, lead, PAHs and locally TPH CWG have been recorded within the reworked topsoil materials across much of the central and southern parts of the site. In addition, asbestos was detected in the Made Ground of WS04 0.2m bgl.

Given the significant contamination recorded within the reworked topsoil materials, it is recommended that these are stockpiled separately and removed offsite to a suitably licenced facility together with the rubbish amongst it.

Clean subsoil and topsoil will need to be placed within the proposed garden areas of the site. Based on the results of testing, the topsoil from the northern part of the site is considered to be suitably clean for reuse as part of the proposed residential development. As the Made Ground soils are to be removed from site, the garden areas will be formed off natural soils and a nominal thickness of topsoil of 150mm will be required however it is likely that site levels will need to be raised with either additional topsoil and/or clean subsoil as a result of removing the Made Ground.

Groundwater

Significant mobile contamination has not been identified therefore remedial works with respect to controlled waters is not required. In addition, it is proposed

Ground Gas

Based on the results of initial monitoring, gas precautions will not be required within the proposed dwellings. This will be confirmed on completion of the monitoring.

The site is not in an area requiring radon protection measures.

Additional Ground Investigation

It is recommended that additional Ground Investigation works are carried out in areas previously inaccessible once the structures onsite have been demolished in order to confirm ground conditions.

Watching Brief and Regulatory Liaison

A watching brief is recommended during future ground works for any previously unseen contamination. If identified, work should cease in that area and advice sought from Groundtech Consulting Limited.

Approval from the regulators should be obtained prior to the development commencing to avoid any delays at the construction stage. A Remedial Specification will be required which will include a protocol for dealing with the risk from asbestos in soils.

7.6 Asbestos in Soils

Asbestos was only detected in WS04 at 0.2m bgl in the reworked topsoil and was hard/cement type material and quantified at 0.063mass %. It should be noted that ACMs were noted in the shallow soils across the site and stacks of asbestos sheeting are also present.

As the Made Ground comprising predominantly of reworked topsoil is significantly contaminated with metals and PAHs, this material should be removed offsite. It is the reworked topsoil that contains the asbestos containing materials therefore, the source will be removed offsite.

The asbestos sheeting will also need to be removed offsite and disposed of in the correct manner.

Where soils will be disturbed as part of the ground works, in accordance with the Joint Industry Working Group (JIWG) decision support tool for CAR2012 work categories, the combined hazard and exposure ranking is Low. The work is classified as non-licenced and CAR does not apply.

The JIWG tables are presented in *Appendix 12*. This should be used as an aid to classify risk and recommend the level of protection required and the final decision on how asbestos within the soils should be made by the contractor.

7.7 Health and Safety - Construction and Ground Workers

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

Pollution Linkage Ref	Potential Source	Pollution Linkage	Likelihood	Severity	Level of Risk
PL8	*Asbestos*	*Ingestion, direct contact, inhalation of dusts.*	*Likely*	*Medium*	*Moderate*
PL8	*Made Ground*	*Ingestion, direct contact, inhalation of dusts.*	*Likely*	*Medium*	*Moderate*

Elevated concentrations of metals, PAHs and hydrocarbons have been recorded in the reworked topsoil materials across much of the central and southern parts of the site. In addition, asbestos was detected located in the reworked topsoil and asbestos sheeting is present onsite. The risks associated with the Made Ground should be communicated to site workers through a site induction and information on noticeboards and appropriate PPE should be worn.

General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following measures are suggested to provide a minimum level of protection:

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

7.8 Waste Classification by Assessment

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

This is a useful tool as waste producers have the legal responsibility to classify any waste they produce.

Twelve samples were tested to assess whether they contained any contaminants in the hazardous range when screened against assessment criteria within WM3. The results are in the Waste Classification Report presented in *Appendix 13*.

Based on the HazWasteOnline assessment tool, the Made Ground soils has generally been classified as Non-Hazardous for waste disposal purposes. However, two samples of reworked topsoil have been classified as Hazardous. The sample from WS04 at 0.2m has carcinogenic and mutagenic hazardous properties based on the TPH levels, and the sample from HP02 at 0.2m has carcinogenic and ecotoxic hazardous properties based on the zinc concentrations recorded. It will be difficult to segregate the reworked topsoil materials from WS04 and HP02 as they are similar across the central and southern parts.

Total testing was not undertaken on the natural soils and are assumed to be Non-Hazardous.

Asbestos was recorded at a maximum quantification of 0.063mass % which is below the hazardous threshold of 0.1mass %.

7.9 Waste Acceptance Criteria (WAC) Results

The Landfill Directive (Directive 1999/31/EC on the landfilling of waste) led to the establishment of a methodology for classifying wastes. Wastes can only be accepted at a landfill if they meet the relevant Waste Acceptance Criteria (WAC) for that type of landfill. There are three different WAC, these are for:

- *Inert waste*
- *Non–Hazardous waste*
- *Hazardous waste*

Wastes should first be classified based on their total concentrations as detailed in the previous section. WAC testing is then required if the end disposal route is a landfill.

Waste Acceptance Criteria (WAC) testing was outside the scope of this investigation and the guidance given below is general.

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

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

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

Materials should be segregated and where necessary sufficient time is allowed to further classify the material properly, including discussion with landfill sites and waste transfer stations to find the best disposal route. It is recommended that where possible, the soils could be recycled at a suitable local waste treatment plant or transfer station rather than a landfill disposal route.

The reuse of soils on the site this should be done in accordance with the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE CoP). Any re-use scheme should be designed to minimise disposal costs.

After a cut and fill balance plan/volume calculation has been carried out, a U1 and T5 exemption could be registered. This will allow the use of the following soils without a waste permit or under Dow CoP MMP:

- *1,000 tonnes (c.600m^3) of non-hazardous soil*
- *5,000 tonnes (c.3,000m^3) of natural sand and gravels.*
- *50,000 tonnes (c.25,000m^3) of bituminous material to be used in roadways.*
- *5,000 tonnes (c.3,000m^3) of crushed concrete / stone.*

8.0 FINAL APPRAISAL

8.1 Land Quality

The site has been occupied by cottages, barns and outbuildings with a wooded area in the southern part. The northern area is formed by a field. Made Ground was encountered to a maximum depth of 0.6m bgl and generally comprised reworked topsoil. Rubbish was present across much of the surface of the central part of the site around the former cottages and included ACMs in places. In addition, stockpiles of asbestos sheeting were also noted. Natural topsoil was beneath the field in the northern area.

Elevated concentrations of arsenic, lead, PAHs and locally TPH CWG were recorded in the underlying reworked topsoil materials in the central and southern parts of the site. In addition, Chrysotile asbestos was detected in one sample of Made Ground in WS04 at 0.2m bgl and was quantified at 0.063mass %.

No elevated Contaminants of Concern were recorded in the natural Topsoil materials from the northern part of the site.

Due to the widespread contamination recorded across the central and southern areas and the private gardens in the proposed development, a plausible pollution linkage is considered to exist and the risk to human health is *Moderate*.

The initial gas monitoring results place the site in CS1 and gas protection measures are not likely to be required within the proposed residential development. The site is not within an area requiring radon precautions within foundations. The risk from permanent ground gases is currently *Low* and will be confirmed on completion of monitoring.

A significant source of mobile contamination has not been identified and the risk to controlled waters is *Low*.

As part of the remediation of the site, it is recommended that the reworked topsoil materials from across the central and southern parts are removed off site given the widespread contamination that is present.

The natural topsoil from the northern is considered to be clean enough for reuse within the proposed garden areas of the residential development.

The reworked topsoil materials from WS04 and HP02 have been classified as Hazardous for waste disposal purposes.

8.2 Ground Engineering

The most suitable foundations for the proposed dwellings are considered to be unreinforced strip/trench fill foundations cast within the weathered sandstone bedrock at a minimum depth of 0.6m bgl. Competent sandstone bedrock has been observed from depths of between 0.23m and 1.1m bgl.

Foundations should be deepened through all Made Ground, former construction and the clay/sand deposits that have been encountered to found within the sandstone.

A steep slope is present along the northern site boundary which slopes down to the Trans Pennine Trail. Consideration should be given to the position of the proposed dwellings in this part of the site such that the slope is not surcharged.

The final development layout should take into consideration the position of the culvert beneath the southern part of the site.

Variable soil infiltration rates have been calculated in SuDS1 and SuDS2 and good to poor drainage conditions have been determined and were better in SuDS1.

8.3 Required Supplementary Investigation

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

Completion of gas monitoring programme.
Issue gas assessment.
Additional ground investigation works in areas previously inaccessible to confirm ground conditions.
Demolition Asbestos survey.
Design of Remediation Specification.
Detailed foundation design.
Confirmation of the recommendations made within this report with the Local Authority.

9.0 RELEVANT INDUSTRY REFERENCES

British Standards Institution. *Investigation of Potentially Contaminated sites - code of practice*. BS 10175:2017.

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

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

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

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

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

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

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

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

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

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

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

The Hazardous Waste (England) Regulations 2005.

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

The National Planning Policy Framework (NPPF) March 2012

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

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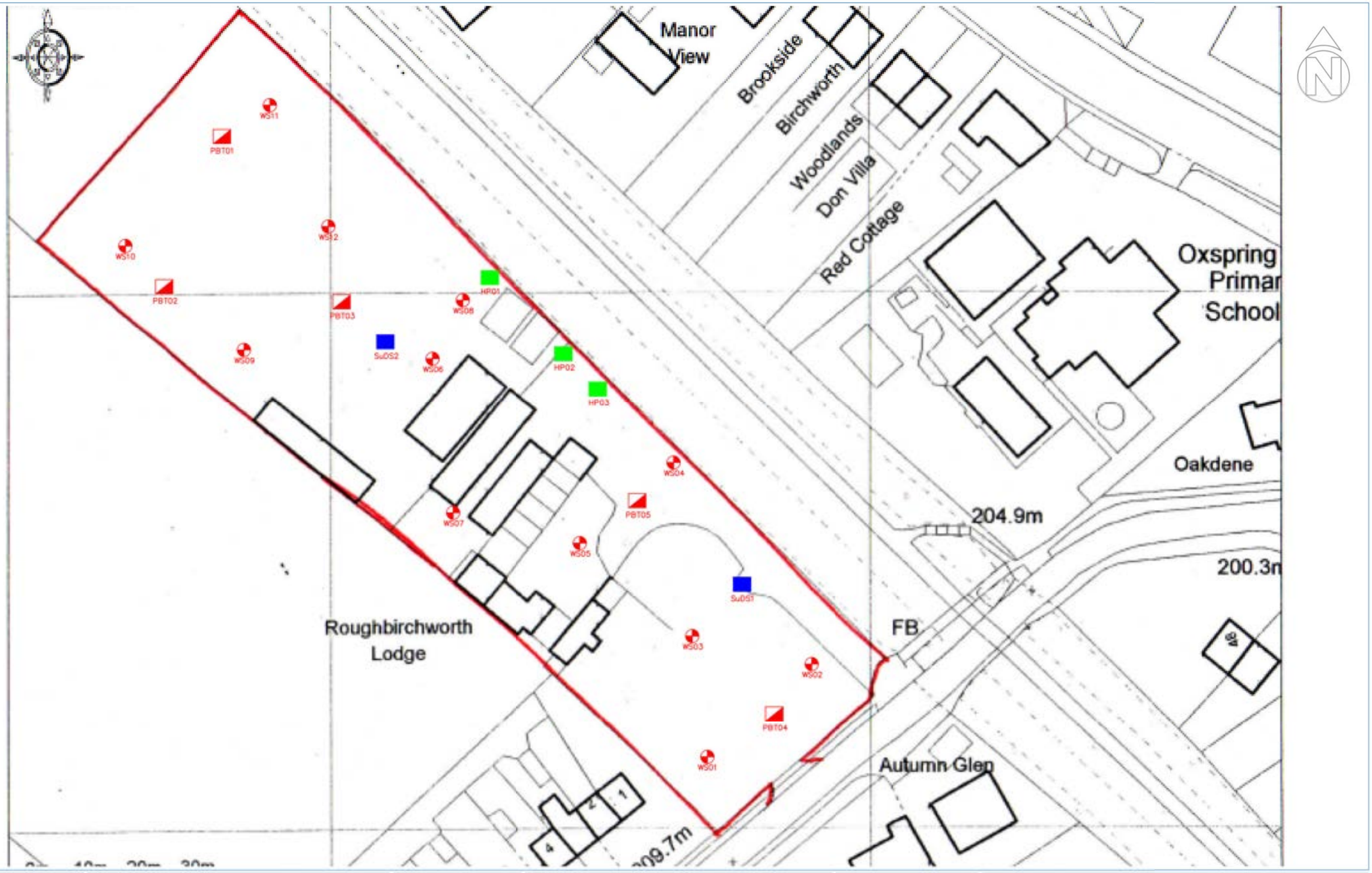
APPENDIX 1 – Plans

GROUNDTECH CONSULTING	CLIENT	DATE				Status	Notes
	SOURCED	JUNE 2022				Preliminary	SITE LOCATION
	PROJECT TITLE	SCALE				Draft	
	ROUGHBIRCHWORTH LANE, OXSPRING	NTS				Issued	●
	PLAN TITLE	PLAN NUMBER				For Comment	
	PROJECT LOCATION PLAN	GRO-22118-P01	Rev.	Details	Date	Approved	



GROUNDTECH CONSULTING

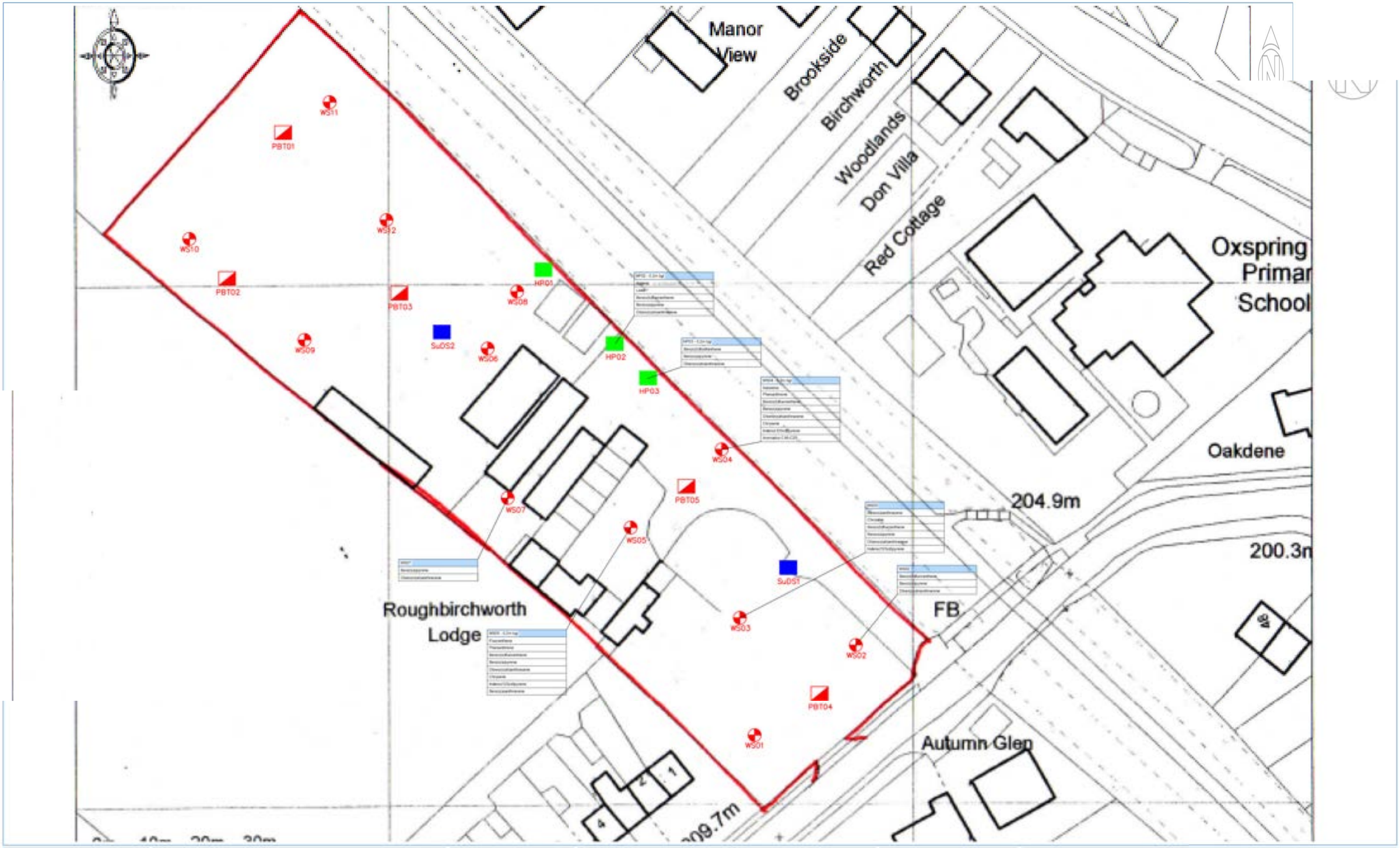
CLIENT	SOURCED
PROJECT TITLE	ROUGHBIRCHWORTH LANE, OXSPRING
PLAN TITLE	EXPLORATORY HOLE LOCATION PLAN
DATE	JUNE 2022
SCALE	NTS
PLAN NUMBER	GRO-22118-P02

Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

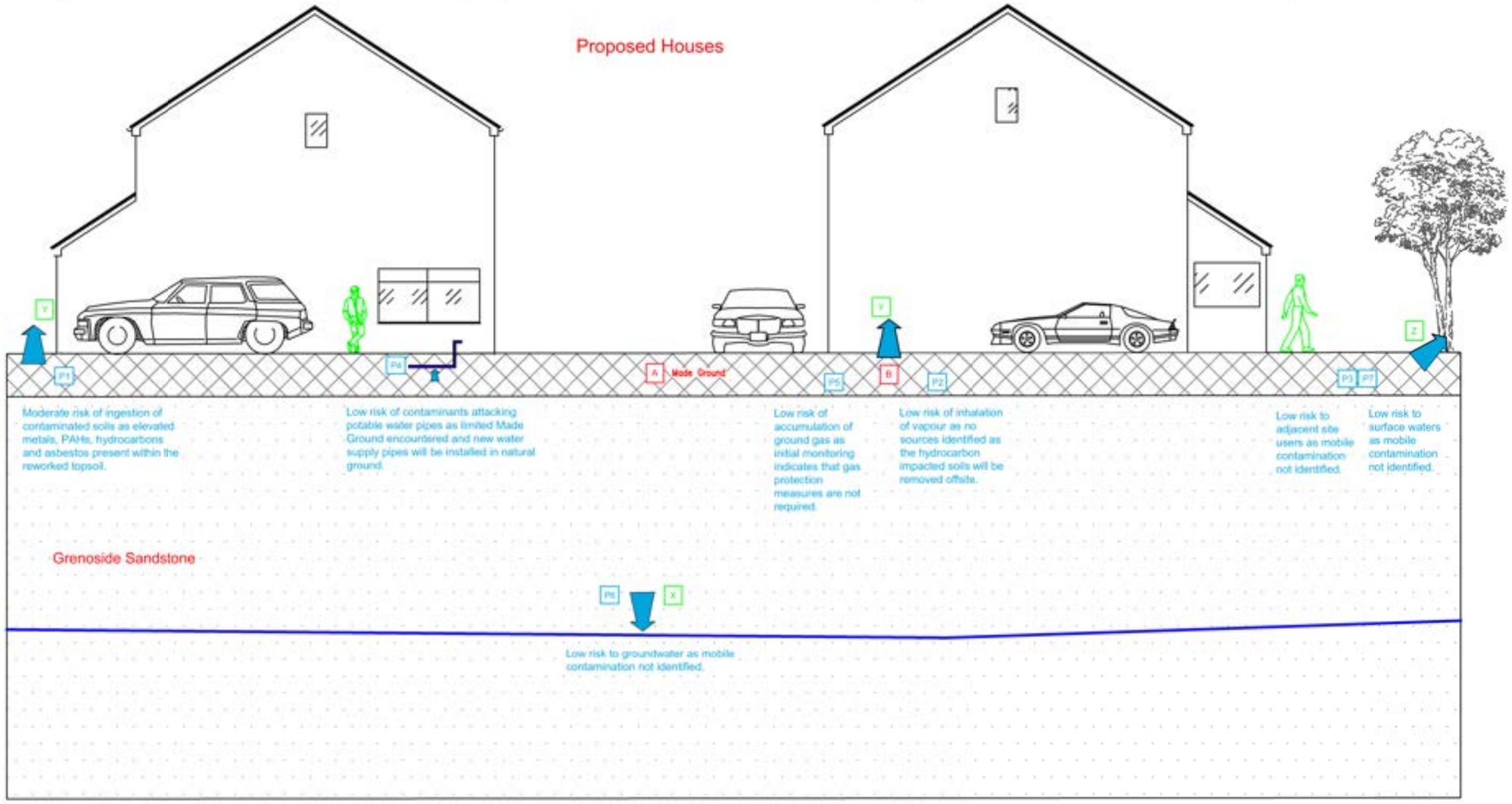
Notes

- WINDOWLESS SAMPLE BOREHOLE LOCATION
- PLATE LOAD TEST LOCATION
- SOIL PERCOLATION TEST LOCATION
- HAND DUG PIT POSITION



GROUNDTECH CONSULTING	CLIENT: SOURCED	DATE: JUNE 2022				Status: Preliminary / Draft / Issued ● / For Comment / Approved
	PROJECT TITLE: ROUGHBIRCHWORTH LANE, OXSPRING	SCALE: NTS				Notes: WINDOWLESS SAMPLE BOREHOLE LOCATION; PLATE LOAD TEST LOCATION; SOIL PERCOLATION TEST LOCATION; HAND DUG PIT POSITION
	PLAN TITLE: CONTAMINATION PLAN	PLAN NUMBER: GRO-22118-P04	Rev.	Details	Date	

SOURCES	POLLUTION LINKAGES	RECEPTORS
A. Contaminated soils / Made Ground. B. Ground gas.	P1. Ingestion of soil and dust. P2. Inhalation of vapour. P3. Inhalation of soil dust by adjacent site users. P4. Attacking of potable water supply pipe. P5. Migration and accumulation of ground gas in internal places. P6. Impaction of groundwater from soil contamination. P7. Migration of soil and groundwater contamination impacting surface waters.	W. No surface watercourses within 250m. X. Groundwater within the Secondary A Aquifer. Y. Site end users. Z. Adjacent site users.



GROUNDTECH CONSULTING

CLIENT	SOURCED
PROJECT TITLE	ROUGHBIRCHWORTH LANE, OXSPRING
PLAN TITLE	ILLUSTRATIVE CSM
DATE	JUNE 2022
SCALE	NTS
PLAN NUMBER	GRO-22118-P05

Rev.	Details	Date

Status	
Preliminary	
Draft	
Issued	●
For Comment	
Approved	

Notes

APPENDIX 2 – Site Photographs

Photograph 1 – Access from Roughbirchworth Lane

Photograph 2 – Cottages and outbuildings in the central area

Photograph 3 – Rubbish along the northern boundary which slopes down to the Trans Pennine Trail

Photograph 4 – Stacked asbestos sheeting

Photograph 5 – ACMs present in the surface soils

Photograph 6 – Northern field

APPENDIX 3 – Exploratory Hole Logs

Borehole Log

GROUNDTECH CONSULTING			Borehole No. **WS01** Sheet 1 of 1
Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.3				MADE GROUND: Grey black sandy gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone and mudstone.
		0.50	D		0.40			Extremely weak brown SANDSTONE distinctly weathered recovered as sandy very clayey cobbles.
		1.00	D					
		1.20		N=50 (8,9/50 for 200mm)				
					1.40			End of borehole at 1.40 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Gas monitoring standpipe installed to 1.4m bgl (0.5m plain, 0.9m slotted).

Borehole Log

Borehole No. **WS02**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.2				MADE GROUND: Black very sandy gravelly slightly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.40			Extremely weak brown SANDSTONE distinctly weathered recovered as sandy very clayey cobbles.
		1.00	D					
		1.20		N=50 (2,4/50 for 255mm)				
					1.40			End of borehole at 1.40 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

Borehole No. **WS03**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.4				MADE GROUND: Brown very sandy gravelly ashy topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.40			Firm brown very sandy cobbly CLAY. Sand is fine to coarse. Cobbles are angular to subangular fine to coarse of sandstone.
		0.80	D		0.60			Brown very clayey cobbly SAND. Cobbles are angular to subangular fine to coarse of sandstone.
		1.20		N=50 (9,13/50 for 160mm)	1.10			Extremely weak pale brown SANDSTONE distinctly weathered recovered as gravel.
					1.40			End of borehole at 1.40 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

			Borehole No. **WS04** Sheet 1 of 1
Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.3				MADE GROUND: Black sandy gravelly topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.40			Dark brown very clayey gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		1.00	D		0.60			Extremely weak SANDSTONE distinctly weathered recovered as sandy gravelly cobbles of sandstone.
		1.20		N=50 (7,6/50 for 265mm)	1.40			End of borehole at 1.40 m

Remarks
1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

GROUNDTECH CONSULTING		Borehole No. **WS05** Sheet 1 of 1
Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - / Hole Type WS
Location: OXSPRING		Level: / Scale 1:25
Client: SOURCED		Dates: 27/04/2022 - / Logged By AW

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
					0.10			MADE GROUND: Concrete.
		0.20	ES	PID = 0.6	0.30			MADE GROUND: Grey black sandy gravelly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone and mudstone.
		0.50	D					Firm brown very sandy cobbly CLAY. Sand is fine to coarse. Cobbles are angular to subangular of sandstone.
		1.00	D		0.90			Extremely weak pale brown SANDSTONE recovered as distinctly weathered sandy clayey cobbles.
		1.20		N=50 (10,12/50 for 285mm)	1.50			End of borehole at 1.50 m

1 2 3 4 5

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Gas monitoring standpipe installed to 1.5m bgl (0.5m plain, 1m slotted).

Borehole Log

Borehole No. **WS06**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0				Brown sandy gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.40			Dark brown very clayey gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		1.00	D		0.60			Extremely weak pale brown SANDSTONE distinctly weathered recovered as sandy slightly clayey gravelly cobbles.
		1.20		N=50 (4,3/50 for 275mm)				
					1.50			End of borehole at 1.50 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Gas monitoring standpipe installed to 1.5m bgl (0.5m plain,1m slotted).

Borehole Log

Borehole No. **WS07**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.05			MADE GROUND: Concrete.
		0.20	ES	PID = 0.5				MADE GROUND: Black sandy angular to subangular fine to coarse gravel of mixed lithologies including brick.
					0.30			Extremely weak pale brown SANDSTONE distinctly weathered recovered as sandy cobbles.
		0.60	D					
		1.00	D					
		1.20		N=50 (7,9/50 for 275mm)				
					1.40			End of borehole at 1.40 m

1
2
3
4
5

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

Borehole No. **WS08**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.2				Grass over brown very sandy slightly gravelly TOPSOIL.
		0.50	D		0.40			Brown very clayey gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		1.00	D		0.60			Firm brown very sandy gravelly CLAY. Sand is fine to medium. Gravel is angular to subangular fine to coarse of sandstone.
		1.20		N=50 (8,12/50 for 235mm)	1.00			Extremely weak pale brown SANDSTONE distinctly weathered recovered as slightly clayey cobbles.
					1.50			End of borehole at 1.50 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Gas monitoring standpipe installed to 1.5m bgl (0.5m plain, 1m slotted).

Borehole Log

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Borehole No. **WS09** Sheet 1 of 1
Location: OXSPRING		Level:	Hole Type WS
Client: SOURCED		Dates: 27/04/2022 -	Scale 1:25
			Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.1				Grass over brown sandy gravelly clayey TOPSOIL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.40			Brown clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		1.00	D		0.70			Firm brown sandy CLAY with cobbles of sandstone.
		1.20		N=50 (25 for 135mm/50 for 235mm)	1.10			Extremely weak SANDSTONE distinctly weathered recovered as very sandy cobbles.
					1.40			End of borehole at 1.40 m

1
2
3
4
5

Remarks
1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

Borehole No. **WS10**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.2				Grass over brown sandy gravelly TOPSOIL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		0.50	D		0.35			Brown clayey slightly gravelly SAND. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
		1.00	D		0.60			Firm brown sandy CLAY with cobbles of sandstone.
		1.20		N=47 (9,13/10,12,12,13)	1.10			Extremely weak pale brown SANDSTONE distinctly weathered recovered as very clayey cobbles.
		1.50	D					
		1.80		N=50 (25 for 115mm/50 for 125mm)	1.80			End of borehole at 1.80 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Gas monitoring standpipe installed to 1.8m bgl (0.8 plain,1m slotted).

Borehole Log

Borehole No. **WS11**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.1				Grass over brown sandy gravelly clayey TOPSOIL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
					0.40			
		0.60	D					Firm brown very sandy CLAY with moderate cobble content of sandstone.
					0.90			
		1.00	D					Extremely SANDSTONE distinctly weathered recovered as slightly clayey cobbles.
		1.20		N=50 (4,7/50 for 255mm)				
					1.40			End of borehole at 1.40 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Borehole Log

Borehole No. **WS12**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: -	Hole Type WS
Location: OXSPRING		Level:	Scale 1:25
Client: SOURCED		Dates: 27/04/2022 -	Logged By AW

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES	PID = 0.0				Grass over brown sandy gravelly clayey TOPSOIL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including sandstone.
					0.40			
		0.60	D					Firm brown very sandy CLAY with moderate cobble content of sandstone.
					0.80			
		1.00	D					Extremely weak pale brown SANDSTONE distinctly weathered recovered as slightly clayey cobbles.
		1.20		N=50 (7,9/50 for 275mm)				
					1.50			End of borehole at 1.50 m

Remarks

1. Location cleared with hand held CAT. 2. Hand pit dug to 1.2m bgl. 3. No groundwater encountered. 4. Borehole backfilled with arisings.

Trial Pit Log

GROUNDTECH CONSULTING

Trialpit No **HP01**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - Level:	Date 28/04/2022
Location: OXSPRING		Dimensions (m): Depth 0.50	Scale 1:25
Client: SOURCED			Logged AW

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES	PID = 0.3	0.50			MADE GROUND: Black sandy gravelly slightly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and sandstone. End of pit at 0.50 m

1 2 3 4 5

Remarks: 1. Location scanned with hand held CAT. 2. Hand pit dug through stockpile. 3. Pit backfilled with arisings.

Stability:

Trial Pit Log

GROUNDTECH CONSULTING

Trialpit No **HP02**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - Level:	Date 28/04/2022
Location: OXSPRING		Dimensions (m): Depth 0.60	Scale 1:25
Client: SOURCED			Logged AW

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES	PID = 0.1				MADE GROUND: Black sandy gravelly slightly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and sandstone.
				0.60			End of pit at 0.60 m

1
2
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4
5

Remarks: 1. Location scanned with hand held CAT. 2. Hand pit dug through stockpile. 3. Pit backfilled with arisings.

Stability:

Trial Pit Log

GROUNDTECH CONSULTING

Trialpit No **HP03**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - Level:	Date 28/04/2022
Location: OXSPRING		Dimensions (m): Depth 0.60	Scale 1:25
Client: SOURCED			Logged AW

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES	PID = 0.2				MADE GROUND: Black sandy gravelly slightly clayey topsoil. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of mixed lithologies including brick and sandstone.
				0.60			End of pit at 0.60 m

1
2
3
4
5

Remarks: 1. Location scanned with hand held CAT. 2. Hand pit dug through stockpile. 3. Pit backfilled with arisings.

Stability:

Trial Pit Log

Trialpit No **SuDS1**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - Level:	Date 27/04/2022
Location: OXSPRING		Dimensions (m): 1.4 × 0.65, Depth 1.35	Scale 1:25
Client: SOURCED			Logged AW

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.32			MADE GROUND: Dark brown black ashy sandy gravelly topsoil with roots. Sand is fine to medium. Gravel is angular to subangular fine to coarse of sandstone and tarmac. Asbestos cement at surface.
				1.35			Extremely weak orange brown SANDSTONE residually weathered recovered as clayey gravelly fine to medium sand with moderate cobble content of angular sandstone. End of pit at 1.35 m

1 2 3 4 5

Remarks: 1. Location cleared with hand held CAT. 2. No groundwater encountered. 3. Trial pit backfilled with arisings.

Stability: Stable

Trial Pit Log

GROUNDTECH CONSULTING

Trialpit No **SuDS2**

Sheet 1 of 1

Project Name: ROUGHBIRCHWORTH LANE	Project No. GRO-22118	Co-ords: - Level:	Date 27/04/2022
Location: OXSPRING		Dimensions (m): 1.5 × 0.7, Depth 1.20	Scale 1:25
Client: SOURCED			Logged AW

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.23			MADE GROUND: Grey brown slightly clayey slightly sandy slightly gravelly topsoil. Sand is fine to medium. Gravel is subangular to subrounded fine to coarse of sandstone and ceramics.
							Extremely weak orange brown SANDSTONE distinctly weathered recovered as very sandy angular to subangular medium to coarse gravel with moderate cobble content of sandstone and occasional boulder content of sandstone.
				1.20			End of pit at 1.20 m

1 2 3 4 5

Remarks: 1. Location cleared with hand held CAT. 2. No groundwater encountered. 3. Trial pit backfilled with arisings.

Stability: Stable

APPENDIX 4 – Geo-Environmental Results

Callum Holden
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e: reception@i2analytical.com

Analytical Report Number : 22-57014

Project / Site name:	Roughbrichworth Lane, Oxspring	**Samples received on:**	03/05/2022
Your job number:	GRO-22118	**Samples instructed on/ Analysis started on:**	09/05/2022
Your order number:	2258	**Analysis completed by:**	23/05/2022
Report Issue Number:	1	**Report issued on:**	23/05/2022
Samples Analysed:	12 soil samples		

Signed:

Martyna Langer
Junior Reporting Specialist
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: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2268320	2268321	2268322	2268323	2268324
Sample Reference				WS01	WS02	WS03	WS04	WS05
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				27/04/2022	27/04/2022	27/04/2022	27/04/2022	27/04/2022
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	39	36
Moisture Content	%	0.01	NONE	12	13	7.6	10	5.4
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.9	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	0.063
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	0.063
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MLO	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.7	7.8	8	8.8	8.6
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	18	30	330	810	520
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0092	0.015	0.17	0.41	0.26
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	9.2	14.9	165	406	262
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	2.3	5.1	6.3	11	6
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	2.9	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.44	6.1	2.5	1.9
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	7.9	17	13
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.41	8.9	18	19
Phenanthrene	mg/kg	0.05	MCERTS	0.52	3	67	170	140
Anthracene	mg/kg	0.05	MCERTS	0.18	1.2	23	67	60
Fluoranthene	mg/kg	0.05	MCERTS	1.2	7.5	93	270	310
Pyrene	mg/kg	0.05	MCERTS	1.1	6.5	91	230	260
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.8	4.6	82	160	170
Chrysene	mg/kg	0.05	MCERTS	0.64	3.6	60	130	100
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.72	5.1	70	160	150
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.47	1.7	47	70	75
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.66	3.8	77	150	130
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.28	1.6	37	63	61
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.59	11	19	15
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.31	1.7	41	66	70
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	6.82	41.6	725	1590	1570

Analytical Report Number: 22-57014
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Lab Sample Number				2268320	2268321	2268322	2268323	2268324
Sample Reference				WS01	WS02	WS03	WS04	WS05
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				27/04/2022	27/04/2022	27/04/2022	27/04/2022	27/04/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	20	31	17	15
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.7	0.9
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	18	21	82	47	39
Copper (aqua regia extractable)	mg/kg	1	MCERTS	19	37	36	100	46
Lead (aqua regia extractable)	mg/kg	1	MCERTS	61	130	66	72	100
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	11	14	12	26	43
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	71	170	84	150	110
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	< 1.0	-	< 1.0	-
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	< 2.0	-	13	-
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	< 8.0	-	38	-
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	< 8.0	-	170	-
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	-	< 10	-	220	-
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001	-	< 0.001	-
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	< 1.0	-	2.6	-
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	5.4	-	56	-
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	32	-	590	-
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	71	-	1100	-
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	-	110	-	1800	-

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2268325	2268326	2268327	2268328	2268329
Sample Reference				WS07	WS08	WS10	WS12	HP01
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				27/04/2022	27/04/2022	27/04/2022	27/04/2022	28/04/2022
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	70	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	6	15	11	16	14
Total mass of sample received	kg	0.001	NONE	0.9	0.9	0.9	0.3	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MLO	MLO	MLO	MJN	MLO
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	10.6	7.3	6.1	6.6	7.7
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	310	21	38	17	150
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.16	0.011	0.019	0.0085	0.076
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	157	10.7	18.9	8.5	75.5
Organic Matter	%	0.1	MCERTS	-	-	-	-	-
Organic Matter (automated)	%	0.1	MCERTS	3.7	5.3	3.3	4.3	10
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.48	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	0.36	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.8	< 0.05	< 0.05	0.35	0.83
Anthracene	mg/kg	0.05	MCERTS	0.82	< 0.05	< 0.05	< 0.05	0.26
Fluoranthene	mg/kg	0.05	MCERTS	5.3	0.64	< 0.05	0.38	2.1
Pyrene	mg/kg	0.05	MCERTS	4.5	0.58	< 0.05	0.37	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.2	0.43	< 0.05	0.26	1.2
Chrysene	mg/kg	0.05	MCERTS	1.9	0.29	< 0.05	0.23	0.92
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.2	0.32	< 0.05	< 0.05	1.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	2.2	0.29	< 0.05	< 0.05	0.72
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.7	0.3	< 0.05	< 0.05	1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.2	0.27	< 0.05	< 0.05	0.57
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.34	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	0.29	< 0.05	< 0.05	0.74
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	27.6	3.41	< 0.80	2.43	11.4

Analytical Report Number: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2268325	2268326	2268327	2268328	2268329
Sample Reference				WS07	WS08	WS10	WS12	HP01
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				27/04/2022	27/04/2022	27/04/2022	27/04/2022	28/04/2022
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	23	13	21	14
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.7
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	22	22	22	25	32
Copper (aqua regia extractable)	mg/kg	1	MCERTS	54	63	61	41	42
Lead (aqua regia extractable)	mg/kg	1	MCERTS	160	110	63	110	120
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	21	18	17	17	15
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	240	200	170	130	270
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	< 2.0	-	< 2.0	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	< 8.0	-	< 8.0	-	33
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	< 10	-	< 10	-	33
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	< 0.001	-	< 0.001	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	3.1	-	< 2.0	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	19	-	< 10	-	< 10
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	44	-	< 10	-	55
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	66	-	< 10	-	64

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2268330	2268331
Sample Reference				HP02	HP03
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				28/04/2022	28/04/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	13	18
Total mass of sample received	kg	0.001	NONE	0.9	0.9
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN
General Inorganics					
pH - Automated	pH Units	N/A	MCERTS	7.6	7.2
Water Soluble Sulphate as SO4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	230	740
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.12	0.37
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	117	369
Organic Matter	%	0.1	MCERTS	-	14
Organic Matter (automated)	%	0.1	MCERTS	12	-
Speciated PAHs					
Naphthalene	mg/kg	0.05	MCERTS	0.55	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.36	0.22
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.21
Fluorene	mg/kg	0.05	MCERTS	0.52	0.28
Phenanthrene	mg/kg	0.05	MCERTS	3.4	3
Anthracene	mg/kg	0.05	MCERTS	1	0.89
Fluoranthene	mg/kg	0.05	MCERTS	9.8	9.1
Pyrene	mg/kg	0.05	MCERTS	9.2	8.6
Benzo(a)anthracene	mg/kg	0.05	MCERTS	5.2	5.5
Chrysene	mg/kg	0.05	MCERTS	4.6	4.4
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.4	7.4
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.4	3.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	6.8
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	3	3.5
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.96	0.91
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.1	4.2
Total PAH					
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	57.2	58.7

Analytical Report Number: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2268330	2268331
Sample Reference				HP02	HP03
Sample Number				None Supplied	None Supplied
Depth (m)				0.20	0.20
Date Sampled				28/04/2022	28/04/2022
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Heavy Metals / Metalloids					
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	50	21
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	1
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 4.0	< 4.0
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	39	36
Copper (aqua regia extractable)	mg/kg	1	MCERTS	120	68
Lead (aqua regia extractable)	mg/kg	1	MCERTS	790	140
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.9	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	35	18
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	1500	340
Monoaromatics & Oxygenates					
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					
TPH-CWG - Aliphatic >EC5 - EC6 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10 $_{HS\_1D\_AL}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12 $_{EH\_CU\_1D\_AL}$	mg/kg	1	MCERTS	-	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16 $_{EH\_CU\_1D\_AL}$	mg/kg	2	MCERTS	-	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35 $_{EH\_CU\_1D\_AL}$	mg/kg	8	MCERTS	-	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AL}$	mg/kg	10	MCERTS	-	< 10
TPH-CWG - Aromatic >EC5 - EC7 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic >EC7 - EC8 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic >EC8 - EC10 $_{HS\_1D\_AR}$	mg/kg	0.001	MCERTS	-	< 0.001
TPH-CWG - Aromatic >EC10 - EC12 $_{EH\_CU\_1D\_AR}$	mg/kg	1	MCERTS	-	< 1.0
TPH-CWG - Aromatic >EC12 - EC16 $_{EH\_CU\_1D\_AR}$	mg/kg	2	MCERTS	-	< 2.0
TPH-CWG - Aromatic >EC16 - EC21 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	32
TPH-CWG - Aromatic >EC21 - EC35 $_{EH\_CU\_1D\_AR}$	mg/kg	10	MCERTS	-	83
TPH-CWG - Aromatic (EC5 - EC35) $_{EH\_CU+HS\_1D\_AR}$	mg/kg	10	MCERTS	-	120

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring
Your Order No: 2258

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

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

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

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

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
2268324	WS05	0.20	186	Hard/Cement Type Material	**Chrysotile**	0.063	**0.063**

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

Analytical Report Number : 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring

* 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 *
2268320	WS01	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2268321	WS02	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2268322	WS03	None Supplied	0.2	Brown loam and clay with gravel and vegetation.
2268323	WS04	None Supplied	0.2	Grey loam and clay with stones and vegetation.
2268324	WS05	None Supplied	0.2	Brown loam and clay with stones and vegetation.
2268325	WS07	None Supplied	0.2	Brown loam and clay with stones and vegetation.
2268326	WS08	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2268327	WS10	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2268328	WS12	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2268329	HP01	None Supplied	0.2	Brown clay and loam with gravel and vegetation.
2268330	HP02	None Supplied	0.2	Brown loam and sand with gravel and vegetation.
2268331	HP03	None Supplied	0.2	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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.	L038-PL	D	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
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L023-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
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in NaOH and addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS

Analytical Report Number : 22-57014
Project / Site name: Roughbrichworth Lane, Oxspring

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Information in Support of Analytical Results

List of HWOL Acronyms and Operators

Acronym	Descriptions
HS	Headspace Analysis
MS	Mass spectrometry
FID	Flame Ionisation Detector
GC	Gas Chromatography
EH	Extractable Hydrocarbons (i.e. everything extracted by the solvent(s))
CU	Clean-up - e.g. by Florisil®, silica gel
1D	GC - Single coil/column gas chromatography
2D	GC-GC - Double coil/column gas chromatography
Total	Aliphatics & Aromatics
AL	Aliphatics
AR	Aromatics
#1	EH_2D_Total but with humics mathematically subtracted
#2	EH_2D_Total but with fatty acids mathematically subtracted
_	Operator - understore to separate acronyms (exception for +)
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total

APPENDIX 5 – Geotechnical Results

LABORATORY REPORT

4043

Contract Number: PSL22/3325

Report Date: 01 June 2022

Client's Reference:

Client Name: Groundtech Consulting
First Floor
Lloyd House
Orford Court
Greenfold Way
WN7 3XJ

For the attention of: Conor Hastings

Contract Title: Roughbirchworth, Oxspring

Date Received: 10/5/2022
Date Commenced: 10/5/2022
Date Completed: 32/05/2022

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:

A Watkins (Director)
R Berriman (Quality Manager)
S Royle (Laboratory Manager)

L Knight (Assistant Laboratory Manager)
S Eyre (Senior Technician)
M Fennell (Senior Technician)

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e-mail: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
WS10			1.00		Brown very sandy CLAY.
WS09			1.00		Brown slightly gravelly very sandy silty CLAY.
WS07			0.60		Brown slightly gravelly sandy CLAY.

SUMMARY OF SOIL CLASSIFICATION TESTS

(BS1377 : PART 2 : 1990)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Moisture Content % Clause 3.2	Linear Shrinkage % Clause 6.5	Particle Density Mg/m^3 Clause 8.2	Liquid Limit % Clause 4.3/4	Plastic Limit % Clause 5.3	Plasticity Index % Clause 5.4	Passing .425mm %	Remarks
WS10			1.00		15			33	16	17	100	Low Plasticity CL
WS09			1.00		16			25	15	10	96	Low Plasticity CL
WS07			0.60		20			45	23	22	97	Intermediate Plasticity CI

SYMBOLS : **NP : Non Plastic** *** : Liquid Limit and Plastic Limit Wet Sieved.**

UKAS TESTING 4043

PSL Professional Soils Laboratory

Roughbirchworth Lane, Oxspring

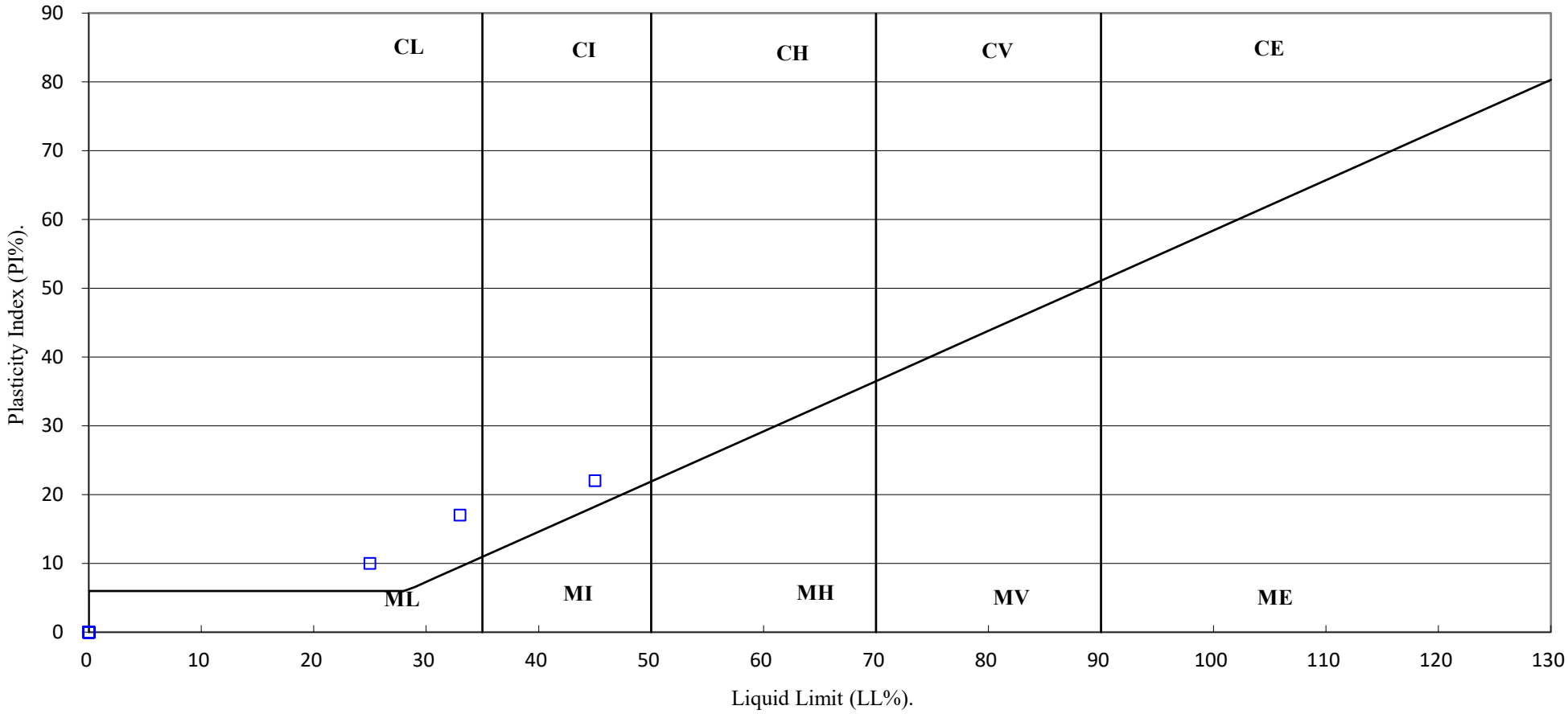
Contract No:

PSL22/3325

Client Ref:

GRO-22118

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.



UKAS TESTING 4043	PSL Professional Soils Laboratory	Roughbirchworth Lane, Oxspring	Contract No: PSL22/3325 Client Ref: GRO-22118

Callum Holden
Groundtech Consulting Ltd
First Floor, Lloyd House
Oxford Court
Greenfold Way
WN7 3XJ

t: 07449819886

e: ch@groundtechconsulting.com

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

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

Analytical Report Number : 22-57575

Project / Site name:	Roughbirchworth Lane, Oxspring	**Samples received on:**	10/05/2022
Your job number:	GRO-22118	**Samples instructed on/ Analysis started on:**	10/05/2022
Your order number:	2258	**Analysis completed by:**	19/05/2022
Report Issue Number:	1	**Report issued on:**	19/05/2022
Samples Analysed:	7 soil samples		

Izabela Wójcik

Signed:

Izabela Wójcik
Reporting Specialist
For & on behalf of i2 Analytical Ltd.

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

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

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

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

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

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: 22-57575
Project / Site name: Roughbirchworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2271297	2271298	2271299	2271300	2271301
Sample Reference				WS01	WS05	WS10	WS11	WS03
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.00	0.50	1.50	0.60	0.80
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
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	56	60	< 0.1	< 0.1	47
Moisture Content	%	0.01	NONE	5	8	7.1	8.5	8.2
Total mass of sample received	kg	0.001	NONE	0.5	0.5	0.5	0.5	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.4	8.2	7.6	7.5	8.2
Total Sulphate as SO4	%	0.005	MCERTS	-	-	-	-	0.016
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.019	0.024	0.016	0.008	0.024
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	-	-	-	-	24.2
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	2.3
Total Sulphur	%	0.005	MCERTS	-	-	-	-	0.005
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	-	-	-	-	< 0.5
Ammonium as NH4 (10:1 leachate equivalent)	mg/l	0.05	MCERTS	-	-	-	-	< 0.05
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	< 5.0
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	< 2.5

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number: 22-57575
Project / Site name: Roughbirchworth Lane, Oxspring
Your Order No: 2258

Lab Sample Number				2271302	2271303
Sample Reference				WS08	WS12
Sample Number				None Supplied	None Supplied
Depth (m)				0.50	1.00
Date Sampled				Deviating	Deviating
Time Taken				None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	11	8.1
Total mass of sample received	kg	0.001	NONE	0.5	0.5

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	7.1
Total Sulphate as SO4	%	0.005	MCERTS	0.021	0.068
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.026	0.31
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	25.8	308
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	2.6	1
Total Sulphur	%	0.005	MCERTS	0.008	0.025
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	< 0.5	< 0.5
Ammonium as NH4 (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	< 0.05
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	6.5	38
Magnesium (leachate equivalent)	mg/l	2.5	NONE	3.2	19

U/S = Unsuitable Sample I/S = Insufficient Sample

Analytical Report Number : 22-57575
Project / Site name: Roughbirchworth Lane, Oxspring

* 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 *
2271297	WS01	None Supplied	1	Brown clay and sand with stones.
2271298	WS05	None Supplied	0.5	Brown clay and sand with stones.
2271299	WS10	None Supplied	1.5	Brown clay and sand with gravel.
2271300	WS11	None Supplied	0.6	Brown clay and sand with gravel and vegetation.
2271301	WS03	None Supplied	0.8	Brown clay and sand with stones.
2271302	WS08	None Supplied	0.5	Brown clay and sand with vegetation.
2271303	WS12	None Supplied	1	Brown clay and sand with gravel.

Analytical Report Number : 22-57575
Project / Site name: Roughbirchworth Lane, Oxspring

Water matrix abbreviations:
Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Waters (PrW) Final Sewage Effluent (FSE) Landfill Leachate (LL)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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.	L038-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	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.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

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

Unless otherwise indicated, site information, order number, project number, sampling date, time, sample reference and depth are provided by the client. The instructed on date indicates the date on which this information was provided to the laboratory.

Sample Deviation Report

Analytical Report Number : 22-57575
Project / Site name: Roughbirchworth Lane, Oxspring

This deviation report indicates the sample and test deviations that apply to the samples submitted for analysis.Please note that the associated result(s) may be unreliable and should be interpreted with care.

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS01	None Supplied	S	2271297	a	None Supplied	None Supplied	None Supplied
WS03	None Supplied	S	2271301	a	None Supplied	None Supplied	None Supplied
WS05	None Supplied	S	2271298	a	None Supplied	None Supplied	None Supplied
WS08	None Supplied	S	2271302	a	None Supplied	None Supplied	None Supplied
WS10	None Supplied	S	2271299	a	None Supplied	None Supplied	None Supplied
WS11	None Supplied	S	2271300	a	None Supplied	None Supplied	None Supplied
WS12	None Supplied	S	2271303	a	None Supplied	None Supplied	None Supplied

APPENDIX 6 – Interim Permanent Ground Gas Monitoring Results

PERMANENT GROUND GAS MONITORING FORM

GROUNDTECH CONSULTING

SITE NAME:	*ROUGHBIRCHWORTH LANE, OXSPRING*	***ENGINEER:***	*William Sandiford-Mitchell*
CLIENT:	*SOURCED*	***DATE:***	*17/05/2022*
JOB NO:	*GRO-22118*		

Pressure Trend:	*Falling*	***Weather:***	*Overcast*	***Equipment:***	*GFM 436*

Ambient:	O_2 (%v/v)	CH_4 (%v/v)	CO_2 (%v/v)	LEL	H_2S (ppm)	CO (ppm)
Start	21.0	0.0	0.0	0.0	0.0	0.0
Finish	21.0	0.0	0.0	0.0	0.0	0.0

BH Ref.	Gas Flow Rate (l/hr)		Borehole Pressure (mb)	Methane (%v/v)			Carbon Dioxide (%v/v)		Oxygen (%v/v)		Hydrogen Sulphide (ppm)		Carbon Monoxide (ppm)		Q_{hg} CO_2 (l/hr)	Q_{hg} CH_4 (l/hr)	Atmos Press (mb)	PID (ppm)	Sheen (Y/N)	Depth to Water (m bgl)
	Peak	Steady		Peak	Steady	LEL	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady						
WS01	0.0	0.0	0.00	0.0	0.0	0.0	1.6	1.5	18.4	18.8	0.0	0.0	0.0	0.0	0.0016	0.0000	992	-	N	NGW
WS05	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	18.1	18.1	0.0	0.0	0.0	0.0	0.0000	0.0000	992	-	N	NGW
WS06	0.0	0.0	0.00	0.0	0.0	0.0	1.0	0.9	19.7	19.9	0.0	0.0	0.0	0.0	0.0010	0.0000	991	-	N	NGW
WS08	0.0	0.0	0.00	0.0	0.0	0.0	0.7	0.7	20.0	20.1	0.0	0.0	0.0	0.0	0.0007	0.0000	990	-	N	NGW
WS10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Notes:																				

APPENDIX 7 – Generalised Ground Model

GROUNDTECH CONSULTING	CLIENT	DATE				Status	Notes
	SOURCED	JUNE 2022				Preliminary	
	PROJECT TITLE	SCALE				Draft	
	ROUGHBIRCHWORTH LANE, OXSPRING	NTS				Issued	
	PLAN TITLE	PLAN NUMBER				For Comment	
	GENERALISED GROUND MODEL	GRO-22118-P03	Rev.	Details	Date	Approved	

APPENDIX 8 – Plate Load Test Results

LABORATORY REPORT

4043

Contract Number: PSL22/3029

Report Date: 28 April 2022

Client's Reference:

Client Name: Groundtech Consulting
First Floor
Lloyd House
Orford Court
Greenfold Way
WN7 3XJ

For the attention of: Adam White

Contract Title: Roughbirchworth, Oxspring

Date Received: 27/4/2022
Date Commenced: 27/4/2022
Date Completed: 28/4/2022

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:

A Watkins (Director)	R Berriman (Quality Manager)	S Royle (Laboratory Manager)
L Knight (Senior Technician)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

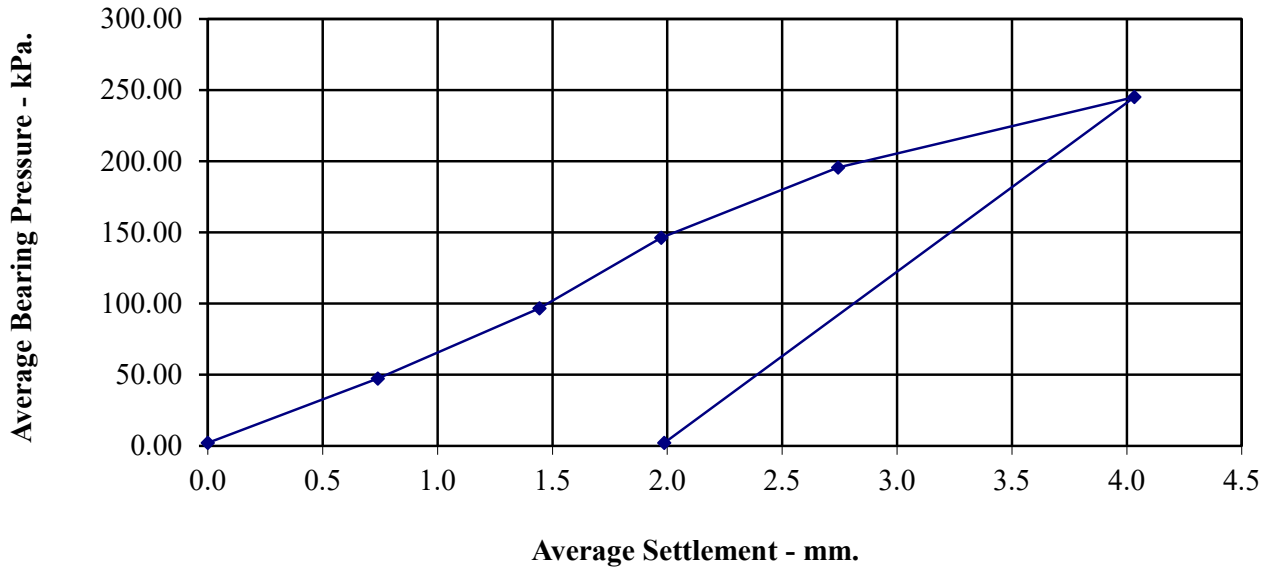
5 – 7 Hexthorpe Road, Hexthorpe,
Doncaster DN4 0AR
tel: +44 (0)844 815 6641
fax: +44 (0)844 815 6642
e-mail: awatkins@prosoils.co.uk
rberriman@prosoils.co.uk

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**27-Apr-22**	**Test Ref:**	**PBT 1**
Grid Ref:		**Depth (m):**	**0.45**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa): **245.13**
Maximum Deformation (mm): **4.03**
Plate Area (m2): **0.1626**
Description: **Brown gravelly clayey SAND**



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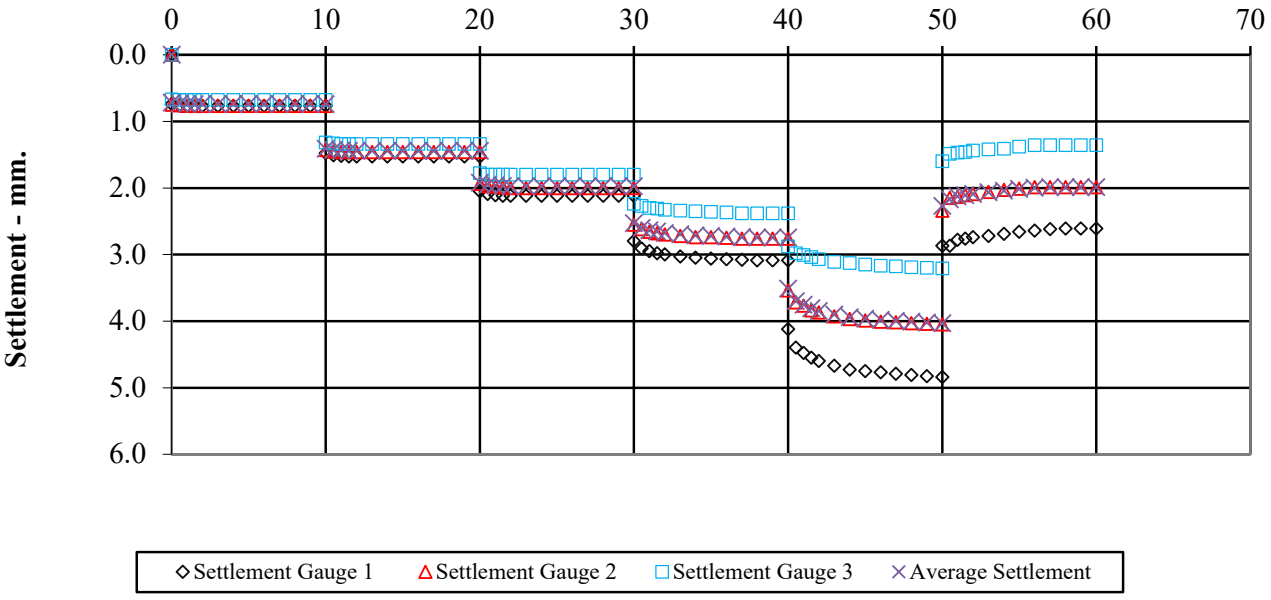


Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

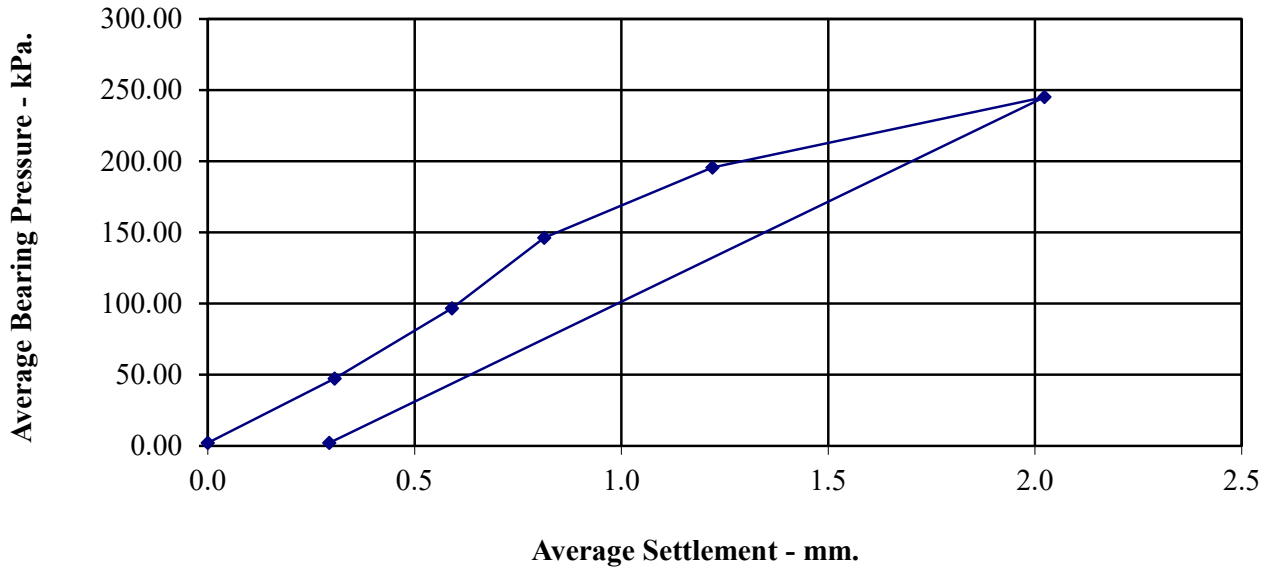
Date of Test	**27-Apr-22**	
Test Ref	**PBT 1**	
Depth (m)	**0.45**	
Grid Ref		
Layer		
Comments		
Description	**Brown gravelly clayey SAND**	
Maximum Deflection	**4.03**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**83**	**kN/m^2**
Plate diameter	**455**	**mm**
Conversion factor for plate diameter	**0.629**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**41.9**	**kN/m^2/mm**
CBR Value	**6.2**	**%**

VERTICAL DEFORMATION TESTS.

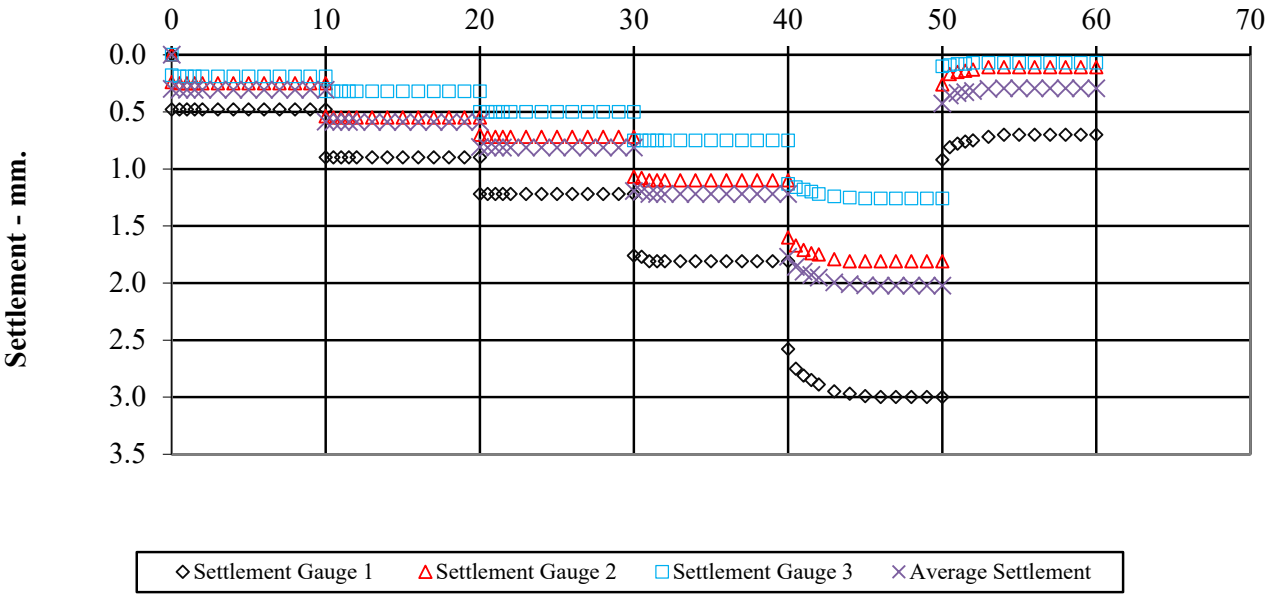
BS 1377 : Part 9 : 1990.

Date of Test:	**27-Apr-22**	**Test Ref:**	**PBT 2**
Grid Ref:		**Depth (m):**	**0.70**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa): **245.13**
Maximum Deformation (mm): **2.02**
Plate Area (m2): **0.1626**
Description: **Brown gravelly clayey SAND**



Time - minutes.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**27-Apr-22**
Test Ref	**PBT 2**
Depth (m)	**0.70**
Grid Ref	
Layer	
Comments	
Description	**Brown gravelly clayey SAND**

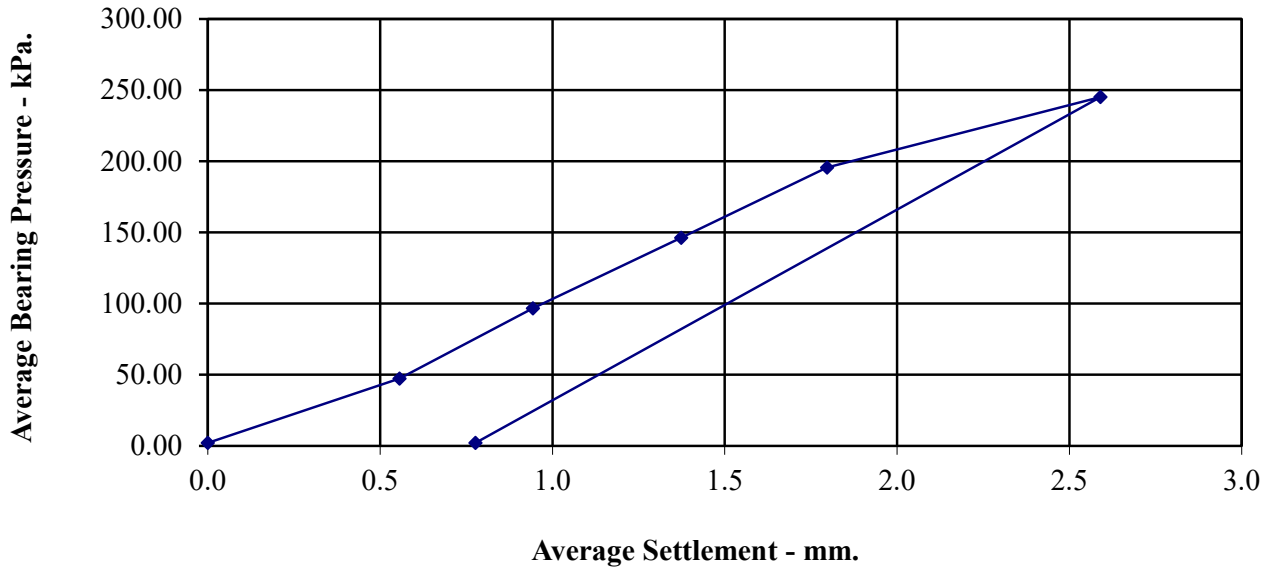
Maximum Deflection	**2.02**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**198**	**kN/m^2**
Plate diameter	**455**	**mm**
Conversion factor for plate diameter	**0.629**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**99.4**	**$kN/m^2/mm$**
CBR Value	**27.9**	**%**

VERTICAL DEFORMATION TESTS.

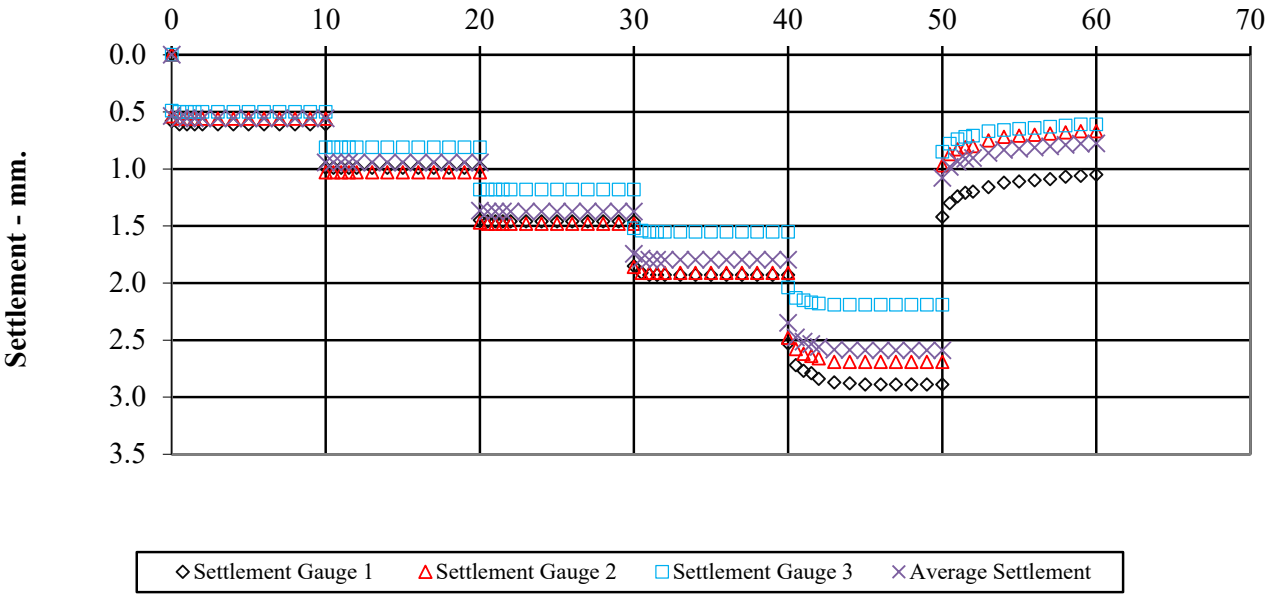
BS 1377 : Part 9 : 1990.

Date of Test:	**27-Apr-22**	**Test Ref:**	**PBT 3**
Grid Ref:		**Depth (m):**	**0.45**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa): **245.13**
Maximum Deformation (mm): **2.59**
Plate Area (m2): **0.1626**
Description: **Brown gravelly clayey SAND**



Time - minutes.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

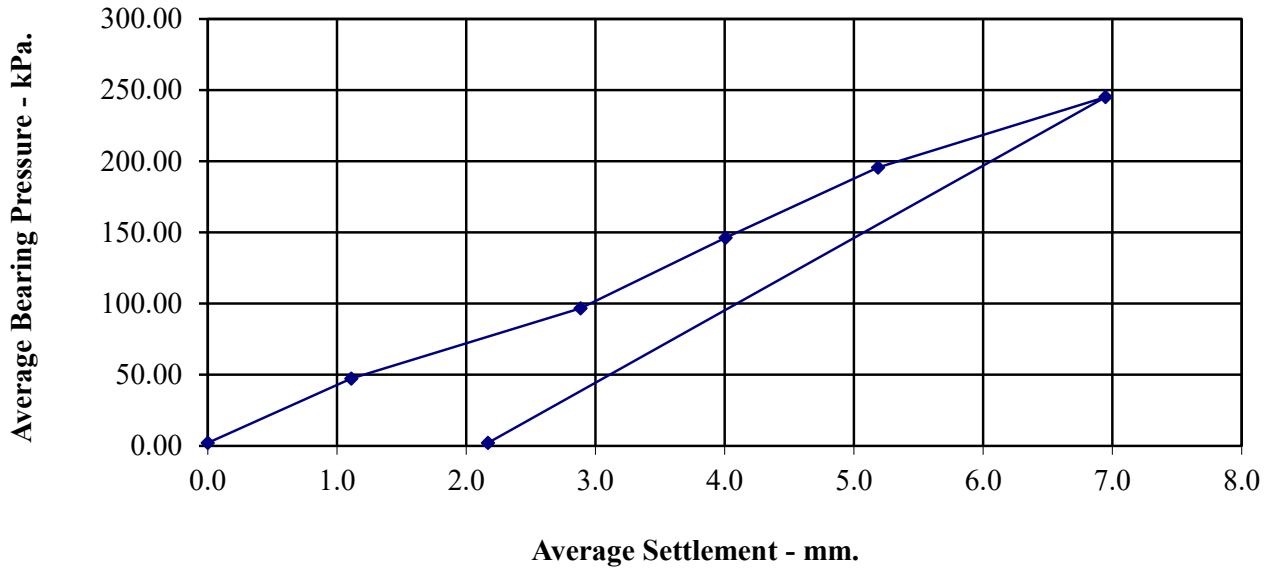
Date of Test	**27-Apr-22**	
Test Ref	**PBT 3**	
Depth (m)	**0.45**	
Grid Ref		
Layer		
Comments		
Description	**Brown gravelly clayey SAND**	
Maximum Deflection	**2.59**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**132**	**kN/m^2**
Plate diameter	**455**	**mm**
Conversion factor for plate diameter	**0.629**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**66.5**	**kN/m^2/mm**
CBR Value	**13.9**	**%**

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test:	**27-Apr-22**	**Test Ref:**	**PBT 4**
Grid Ref:		**Depth (m):**	**0.45**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa): **245.13**
Maximum Deformation (mm): **6.95**
Plate Area (m2): **0.1626**
Description: **Brown gravelly clayey SAND**



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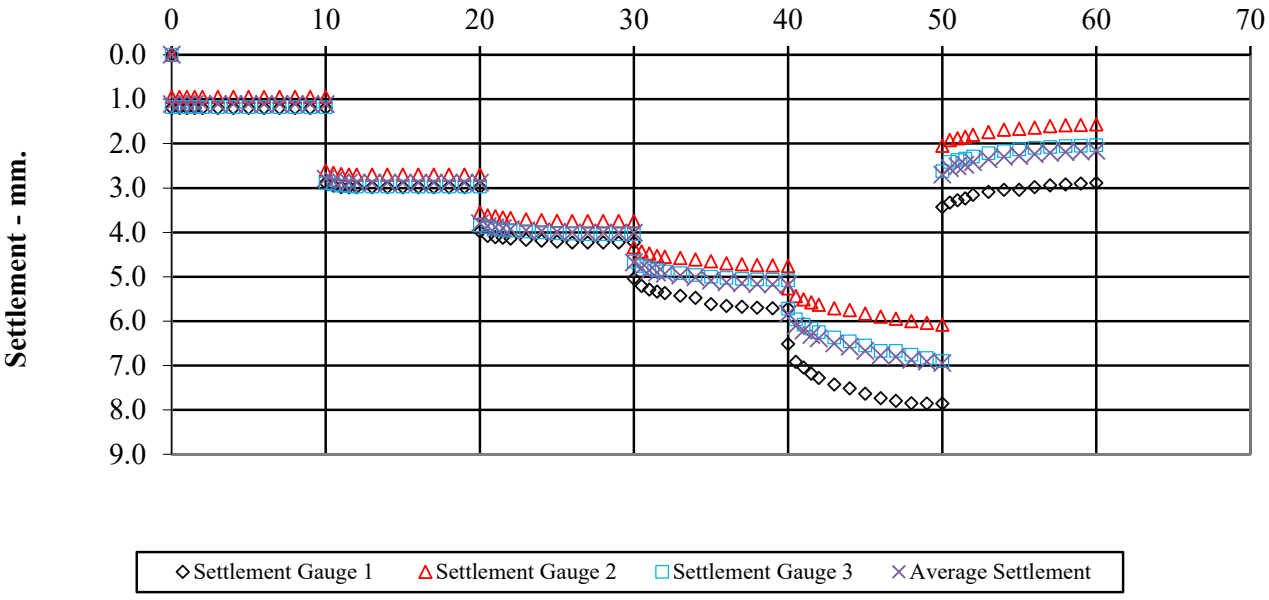


Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

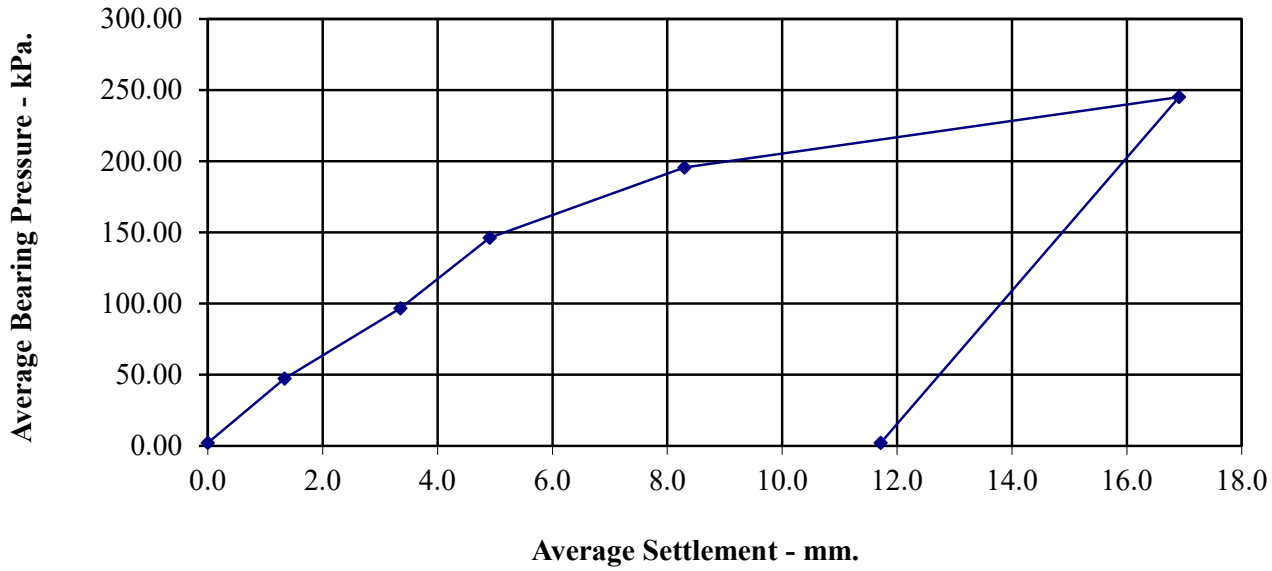
Date of Test	**27-Apr-22**	
Test Ref	**PBT 4**	
Depth (m)	**0.45**	
Grid Ref		
Layer		
Comments		
Description	**Brown gravelly clayey SAND**	
Maximum Deflection	**6.95**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**51**	**kN/m^2**
Plate diameter	**455**	**mm**
Conversion factor for plate diameter	**0.629**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**25.8**	**kN/m^2/mm**
CBR Value	**2.7**	**%**

VERTICAL DEFORMATION TESTS.

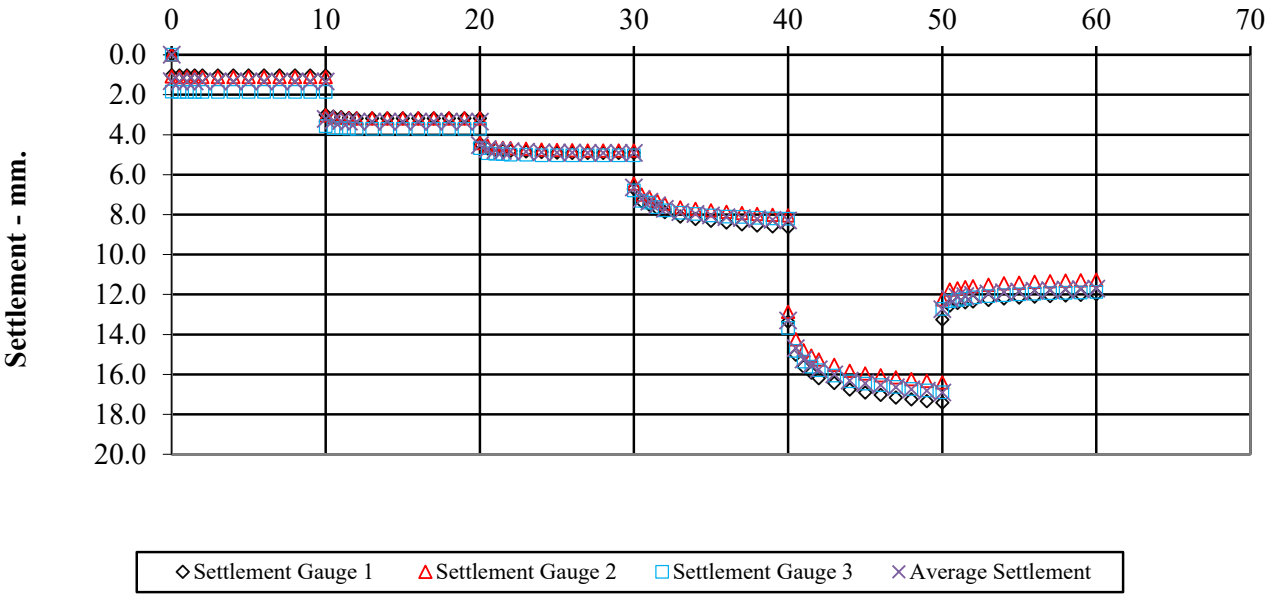
BS 1377 : Part 9 : 1990.

Date of Test:	**27-Apr-22**	**Test Ref:**	**PBT 5**
Grid Ref:		**Depth (m):**	**0.20**
Layer:		**Comments:**	

Maximum Applied Pressure (kPa): **245.13**
Maximum Deformation (mm): **16.91**
Plate Area (m2): **0.1626**
Description: **Brown gravelly clayey SAND**



Time - minutes.



Calculation of Equivalent CBR Value from Plate Bearing Test

Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	**27-Apr-22**	
Test Ref	**PBT 5**	
Depth (m)	**0.20**	
Grid Ref		
Layer		
Comments		
Description	**Brown gravelly clayey SAND**	
Maximum Deflection	**16.91**	**mm**
Deflection required for CBR value	**1.25**	**mm**
Load at 1.25mm	**44**	**kN/m^2**
Plate diameter	**455**	**mm**
Conversion factor for plate diameter	**0.629**	
K_{762}(modulus of subgrade reaction) calculated using 1.25mm settlement	**22.3**	**kN/m^2/mm**
CBR Value	**2.1**	**%**

APPENDIX 9 – Soil Infiltration Test Results

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

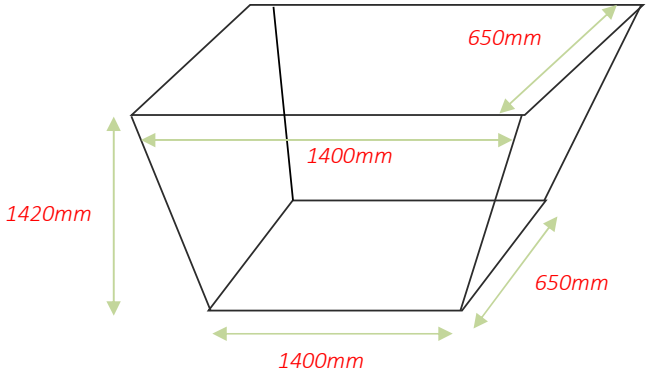
Date of Test: 27/04/2022

POSITION: SuDS1
TEST 1

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1420
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

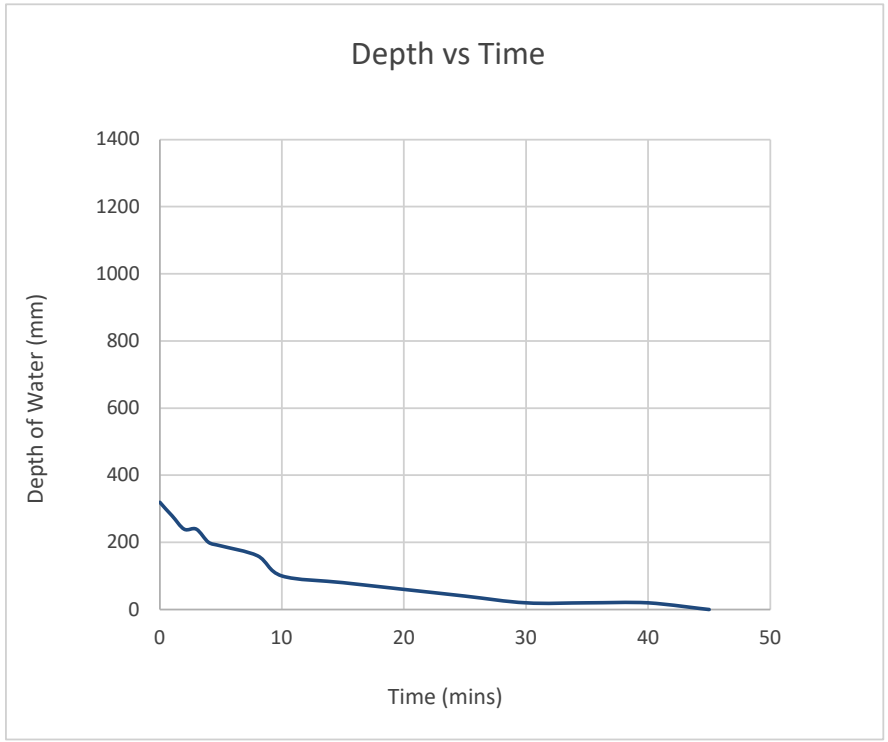
Time Elapsed (mins)	Depth to Water Level (mm)
0	1100
1	1140
2	1180
3	1180
4	1220
5	1230
8	1260
10	1320
15	1340
20	1360
25	1380
30	1400
35	1400
40	1400
45	1420

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 1



Volume of Pit (m^3)	1.2922
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.2912

Compliancy Check:

Water Level at 75% effective depth (mm)	240
Water Level at 25% effective depth (mm)	80

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	240
Water Level 2	80
Time to Drain from Level 1 to Level 2 (mins)	12
Volume of water discharged (m^3)	0.1456
Discharge Area (m^2)	1.566
Soil Infiltration Rate (m/min)	0.007748
Soil Infiltration Rate (m/sec)	***1.29E-04***

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

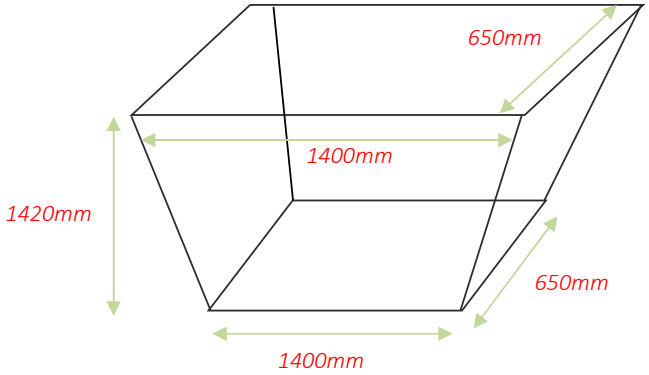
Date of Test: 27/04/2022

POSITION: SuDS1
TEST 2

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1420
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

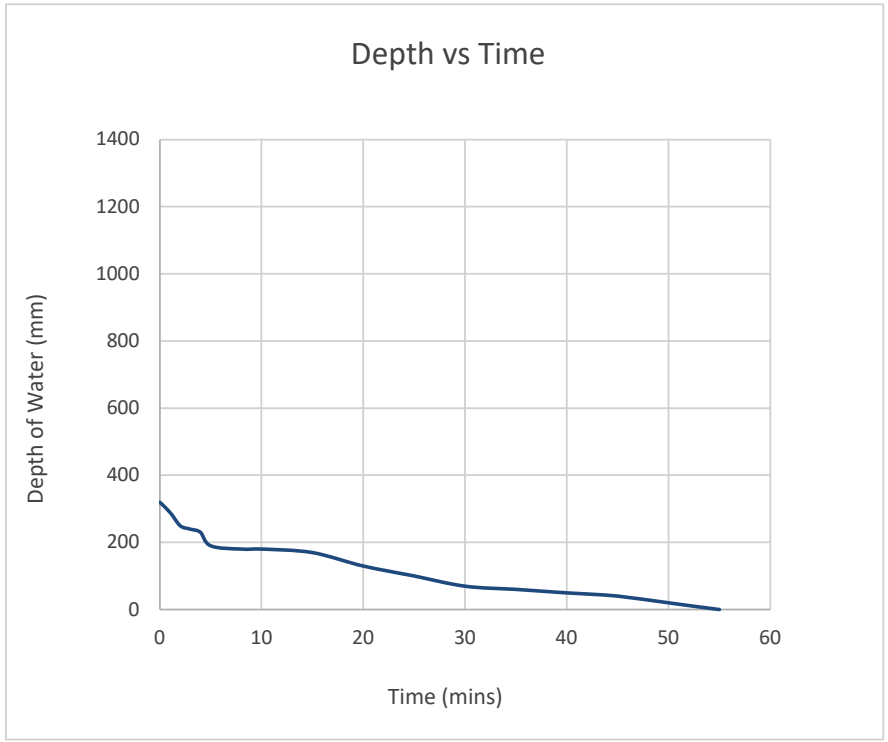
Time Elapsed (mins)	Depth to Water Level (mm)
0	1100
1	1130
2	1170
3	1180
4	1190
5	1230
8	1240
10	1240
15	1250
20	1290
25	1320
30	1350
35	1360
40	1370
45	1380
50	1400
55	1420

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 2



Volume of Pit (m^3)	1.2922
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.2912

Compliancy Check:

Water Level at 75% effective depth (mm)	240
Water Level at 25% effective depth (mm)	80

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	240
Water Level 2	80
Time to Drain from Level 1 to Level 2 (mins)	24.5
Volume of water discharged (m^3)	0.1456
Discharge Area (m^2)	1.566
Soil Infiltration Rate (m/min)	0.0037949
Soil Infiltration Rate (m/sec)	***6.32E-05***

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

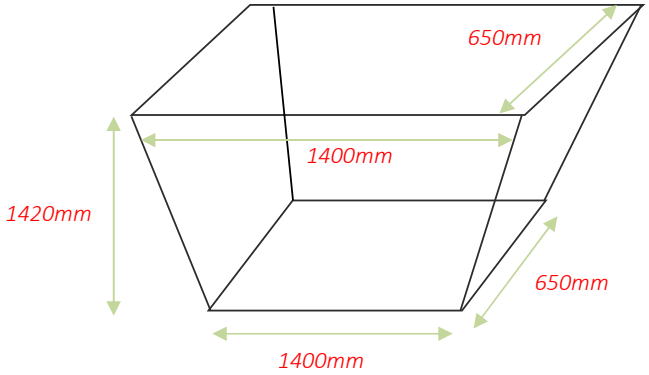
Date of Test: 27/04/2022

POSITION: SuDS1
TEST 3

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1420
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

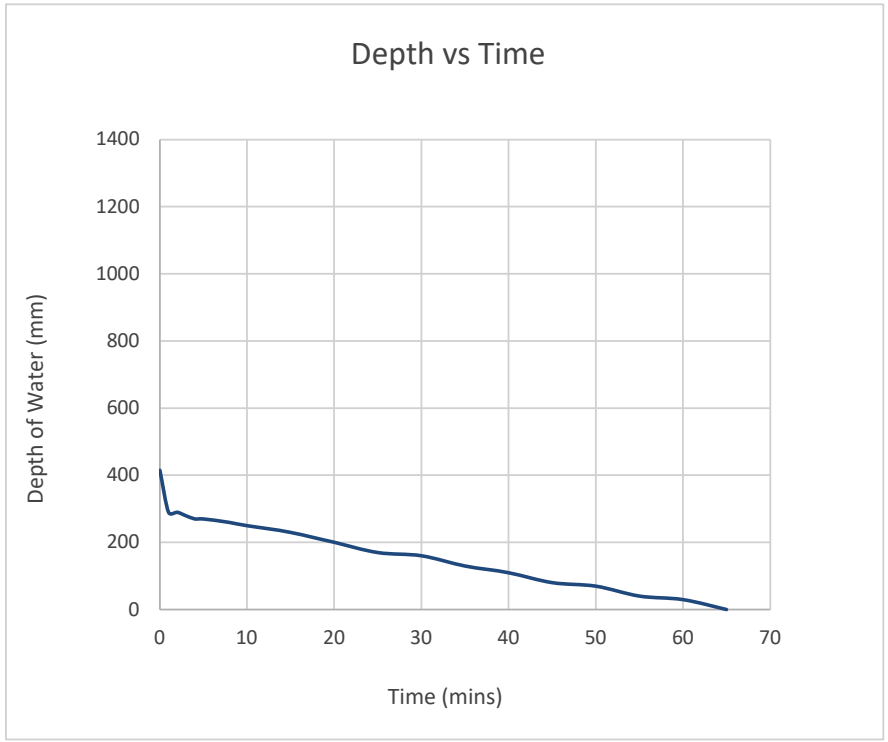
Time Elapsed (mins)	Depth to Water Level (mm)
0	1050
1	1130
2	1130
3	1140
4	1150
5	1150
8	1160
10	1170
15	1190
20	1220
25	1250
30	1260
35	1290
40	1310
45	1340
50	1350
55	1380
60	1390
65	1420

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS1
TEST 3



Volume of Pit (m^3)	1.2922
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.37765

Compliancy Check:

Water Level at 75% effective depth (mm)	311.25
Water Level at 25% effective depth (mm)	103.75

Compliant with BRE 365

Soil Infiltration Rate Calculation

Water Level 1	311.25
Water Level 2	103.75
Time to Drain from Level 1 to Level 2 (mins)	40
Volume of water discharged (m^3)	0.188825
Discharge Area (m^2)	1.76075
Soil Infiltration Rate (m/min)	0.002681
Soil Infiltration Rate (m/sec)	***4.47E-05***

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

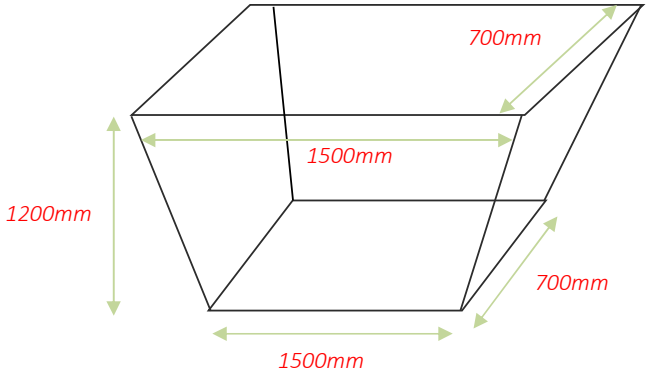
Date of Test: 27/04/2022

POSITION: SuDS2
TEST 1

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

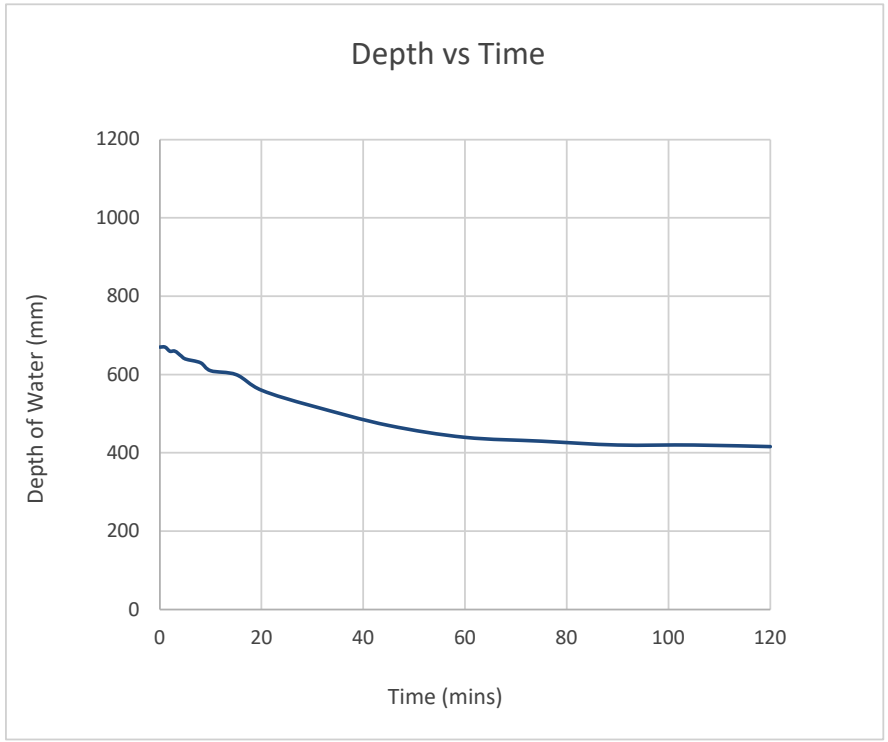
Time Elapsed (mins)	Depth to Water Level (mm)
0	530
1	530
2	540
3	540
4	550
5	560
8	570
10	590
15	600
20	640
30	680
45	730
60	760
75	770
90	780
105	780
120	784

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 1



Volume of Pit (m^3)	1.26
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.7035

Compliancy Check:

Water Level at 75% effective depth (mm)	502.5
Water Level at 25% effective depth (mm)	167.5

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	670
Water Level 2	416
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m^3)	0.2667

Discharge Area (m^2)	3.998
Soil Infiltration Rate (m/min)	0.0005559
Soil Infiltration Rate (m/sec)	***9.27E-06***

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

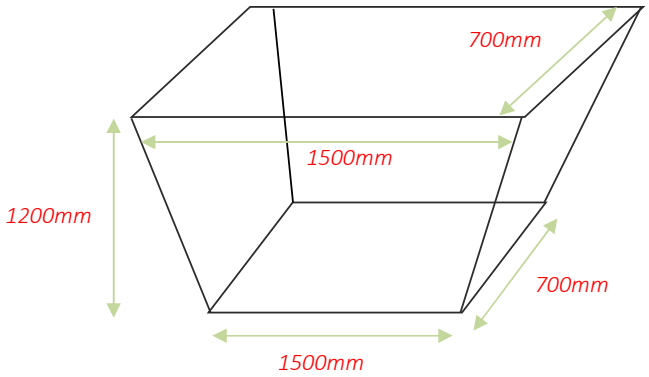
Date of Test: 27/04/2022

POSITION: SuDS2
TEST 2

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

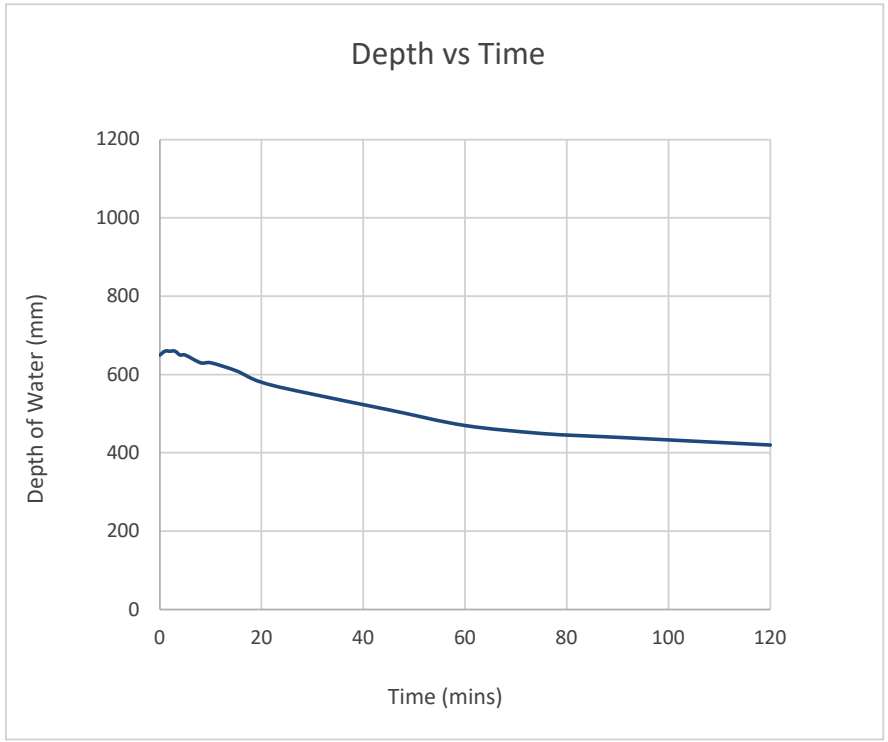
Time Elapsed (mins)	Depth to Water Level (mm)
0	550
1	540
2	540
3	540
4	550
5	550
8	570
10	570
15	590
20	620
30	650
45	690
60	730
75	750
90	760
105	770
120	780

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 2



Volume of Pit (m^3)	1.26
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.6825

Compliancy Check:

Water Level at 75% effective depth (mm)	487.5
Water Level at 25% effective depth (mm)	162.5

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	650
Water Level 2	420
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m^3)	0.2415

Discharge Area (m^2)	3.91
Soil Infiltration Rate (m/min)	0.0005147
Soil Infiltration Rate (m/sec)	***8.58E-06***

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 1 of 2

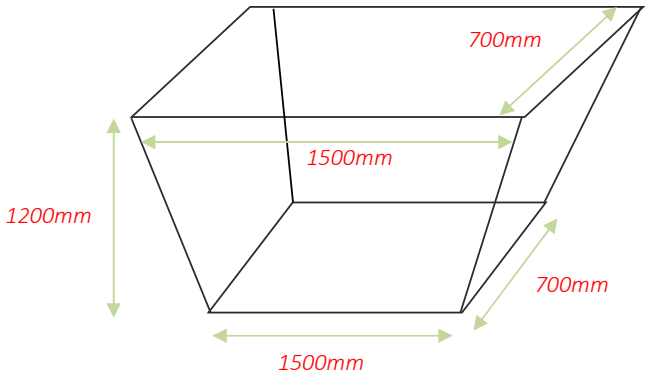
Date of Test: 27/04/2022

POSITION: SuDS2
TEST 3

Weather: Sunny, clear

Engineer: *A White*
Checked: *R Wyatt*

Trial Pit Measurements



Pit Depth (mm):	1200
Pit Details:	Open with no stone filling
Groundwater Level:	NGW

Test Data

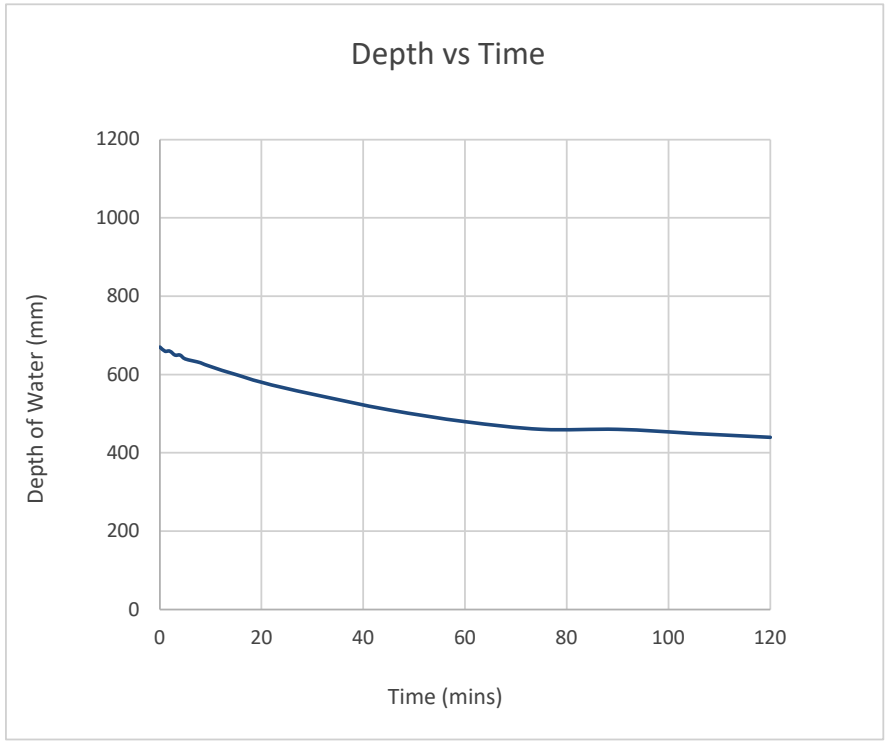
Time Elapsed (mins)	Depth to Water Level (mm)
0	540
1	540
2	540
3	550
4	550
5	560
8	570
10	580
15	600
20	620
30	650
45	690
60	720
75	740
90	740
105	750
120	760

ROUGHBIRCHWORTH LANE, OXSPRING
GRO-22118
SOURCED

SOIL PERCOLATION TEST

Sheet 2 of 2

POSITION: SuDS2
TEST 3



Volume of Pit (m^3)	1.26
Void Ratio of Infill	1
Volume of Infill (m^3)	N/A
Volume of Water in Pit (m^3)	0.7035

Compliancy Check:

Water Level at 75% effective depth (mm)	502.5
Water Level at 25% effective depth (mm)	167.5

Test not BRE 365 compliant with BRE 365 - insufficient time to drain past 25% effective depth

Soil Infiltration Rate Calculation

Water Level 1	670
Water Level 2	440
Time to Drain from Level 1 to Level 2 (mins)	120
Volume of water discharged (m^3)	0.2415

Discharge Area (m^2)	3.998
Soil Infiltration Rate (m/min)	0.0005034
Soil Infiltration Rate (m/sec)	***8.39E-06***

APPENDIX 10 - Generic Screening Values (Residential with Plant Uptake)

Generic Assessment Criteria (GAC)

Proposed End Use	Unit	Residential with Plant Uptake			Commercial			Source
SOM	%	1	2.5	6	1	2.5	6	
Arsenic	mg/kg	32	32	32	640	640	640	SGVs
Beryllium	mg/kg	1.7	1.7	1.7	12	12	12	LQM S4ULs
Boron (water soluble)	mg/kg	290	290	290	240000	240000	240000	LQM S4ULs
Cadmium	mg/kg	10	10	10	230	230	230	SGVs
Chromium (Total)	mg/kg	910	910	910	8600	8600	8600	LQM S4ULs
Chromium (VI)	mg/kg	21	21	21	49	49	49	DEFRA C4SLs
Copper	mg/kg	2400	2400	2400	68000	68000	68000	LQM S4ULs
Lead	mg/kg	200	200	200	2300	2300	2300	DEFRA C4SLs
Organic Mercury	mg/kg	1.2	1.2	1.2	26	26	26	LQM S4ULs
Nickel	mg/kg	130	130	130	980	980	980	LQM S4ULs
Selenium	mg/kg	350	350	350	13000	13000	13000	SGVs
Vanadium	mg/kg	410	410	410	9000	9000	9000	LQM S4ULs
Zinc	mg/kg	3700	3700	3700	730000	730000	730000	LQM S4ULs
Aliphatic EC 5 - 6	mg/kg	42	78	160	3200 (304) sol	5900 (558) sol	12000 (1150) sol	LQM S4ULs
Aliphatic EC 6 - 8	mg/kg	100	230	530	7800 (144) sol	17000 (322) sol	40000 (736) sol	LQM S4ULs
Aliphatic EC 8 - 10	mg/kg	27	65	150	2000 (78) sol	4800 (190) sol	11000 (451) vap	LQM S4ULs
Aliphatic EC 10 - 12	mg/kg	130 (48) vap	330 (118) vap	760 (283) vap	9700 (48) sol	23000 (118) vap	47000 (283) vap	LQM S4ULs
Aliphatic EC 12 - 16	mg/kg	1100 (24) sol	2400 (59) sol	4300 (142) sol	59000 (24) sol	82000 (59) sol	90000 (142) sol	LQM S4ULs
Aliphatic EC 16 - 35	mg/kg	65000 (8.48) f,sol	92000 (21) f,sol	110000 f	1600000 f	1700000 f	1800000 f	LQM S4ULs
Aliphatic EC 35 - 44	mg/kg	65000 (8.48) f,sol	92000 (21) f,sol	110000 f	1600000 f	1700000 f	1800000 f	LQM S4ULs
Aromatic EC 5 - 7	mg/kg	70	140	300	26000 (1220) sol	46000 (2260) sol	86000 (4710) sol	LQM S4ULs
Aromatic EC 7 - 8	mg/kg	130	290	660	56000 (869) vap	110000 (1920)	180000 (4360)	LQM S4ULs
Aromatic EC 8 - 10	mg/kg	34	83	190	3500 (613) vap	8100 (1500) vap	17000 (3580)	LQM S4ULs
Aromatic EC 10 - 12	mg/kg	74	180	380	16000 (364) sol	28000 (899) sol	34000 (2150) sol	LQM S4ULs
Aromatic EC 12 -16	mg/kg	140	330	660	36000 (169) sol	37000	38000	LQM S4ULs
Aromatic EC 16 - 21	mg/kg	260 f	540 f	930 f	28000 f	28000 f	28000 f	LQM S4ULs
Aromatic EC 21 - 35	mg/kg	1100 f	1500 f	1700 f	28000 f	28000 f	28000 f	LQM S4ULs
Aromatic EC 35 - 44	mg/kg	1100 f	1500 f	1700 f	28000 f	28000 f	28000 f	LQM S4ULs
Benzene	mg/kg	0.33	0.33	0.33	95	95	95	SGVs
Toluene	mg/kg	610	610	610	4400	4400	4400	SGVs
Ethyl Benzene	mg/kg	350	350	350	2800	2800	2800	SGVs
Xylene - o	mg/kg	250	250	250	2600	2600	2600	SGVs
Xylene - m	mg/kg	240	240	240	3500	3500	3500	SGVs
Xylene - p	mg/kg	230	230	230	3200	3200	3200	SGVs
MTBE (methyl tert-butyl ether)	mg/kg	49	84	160	7900	13000	24000	CL:AIRE 2010
Acenaphthene	mg/kg	210	510	1100	84000 (57) sol	97000 (141) sol	100000	LQM SAULs
Acenaphthylene	mg/kg	170	420	920	83000 (86.1) sol	97000 (212) sol	100000	LQM S4ULs
Anthracene	mg/kg	2400	5400	11000	520000	540000	540000	LQM S4ULs
Benz(a)anthracene	mg/kg	7.2	11	13	170	170	180	LQM S4ULs
Benzo(a)pyrene	mg/kg	2.2	2.7	5*	35	35	77*	DEFRA C4SL*/LQM
Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	44	44	45	LQM S4ULs
Benzo(ghi)perylene	mg/kg	320	340	350	3900	4000	4000	LQM S4ULs
Benzo(k)fluoranthene	mg/kg	77	93	100	1200	1200	1200	LQM S4ULs
Chrysene	mg/kg	15	22	27	350	350	350	LQM S4ULs
Dibenz(ah)anthracene	mg/kg	0.24	0.28	0.3	3.5	3.6	3.6	LQM S4ULs
Fluoranthene	mg/kg	280	560	890	23000	23000	23000	LQM S4ULs
Fluorene	mg/kg	170	400	860	63000 (30.9) sol	68000	71000	LQM S4ULs
Indeno(123-cd)pyrene	mg/kg	27	36	41	500	510	510	LQM S4ULs
Naphthalene	mg/kg	2.3 f	5.6 f	13 f	190 f (76.4) sol	460 f (183) sol	1100 f (432) sol	LQM S4ULs
Phenanthrene	mg/kg	95	220	440	22000	22000	23000	LQM S4ULs
Pyrene	mg/kg	620	1200	2000	54000	54000	54000	LQM S4ULs

Generic Assessment Criteria (GAC)

Proposed End Use	Unit	Residential with Plant Uptake			Commercial			Source
SOM	%	1	2.5	6	1	2.5	6	
Phenol	*mg/kg*	*420*	*420*	*420*	*3200*	*3200*	*3200*	*SGVs*
Chlorophenols	*mg/kg*	*0.87* [g]	*2*	*4.5*	*3500*	*4000*	*4300*	*LQM S4ULs*
Pentachlorophenol	*mg/kg*	*0.22*	*0.52*	*1.2*	*400*	*400*	*400*	*LQM S4ULs*
Carbon disulphide	*mg/kg*	*0.14*	*0.29*	*0.62*	*11*	*22*	*47*	*LQM S4ULs*
Hexachlorobutadiene	*mg/kg*	*0.29*	*0.7*	*1.6*	*31*	*66*	*120*	*LQM S4ULs*
1,1,1,2 Tetrachloroethane	*mg/kg*	*1.6*	*3.4*	*7.5*	*270*	*550*	*1100*	*LQM S4ULs*
1,1,1 Trichloroethane	*mg/kg*	*8.8*	*18*	*39*	*660*	*1300*	*3000*	*LQM S4ULs*
Trichloroethene	*mg/kg*	*0.016*	*0.034*	*0.075*	*1.2*	*2.6*	*5.7*	*LQM S4ULs*
Tetrachoromethane (Carbon Tetrachloride)	*mg/kg*	*0.026*	*0.056*	*0.13*	*2.9*	*6.3*	*14*	*LQM S4ULs*
1,2-Dichloroethane	*mg/kg*	*0.0071*	*0.011*	*0.019*	*0.67*	*0.97*	*1.7*	*LQM S4ULs*
Chloroethene (Vinyl chloride)	*mg/kg*	*0.00064*	*0.00087*	*0.0014*	*0.059*	*0.077*	*0.12*	*LQM S4ULs*
Trichloromethane (Chloroform)	*mg/kg*	*0.91*	*1.7*	*3.4*	*99*	*170*	*350*	*LQM S4ULs*
Tetrachloroethene	*mg/kg*	*0.18*	*0.39*	*0.9*	*19*	*42*	*95*	*LQM S4ULs*
Hexachlorobenzene	*mg/kg*	*1.8 (0.2)* [vap]	*3.3 (0.5)* [vap]	*4.9*	*110 (0.2)* [vap]	*120*	*120*	*LQM S4ULs*
Pentachlorobenzene	*mg/kg*	*5.8*	*12*	*22*	*640 (43)* [sol]	*770 (107)* [sol]	*830*	*LQM S4ULs*
1,2,4,5-Tetrachlorobenzene	*mg/kg*	*0.33*	*0.77*	*1.6*	*42 (19.7)* [sol]	*72 (49.1)* [sol]	*96*	*LQM S4ULs*
1,2,3,5-Tetrachlorobenzene	*mg/kg*	*0.66*	*1.69*	*3.7*	*49 (39.4)* [vap]	*120 (98.1)* [vap]	*240 (235)* [vap]	*LQM S4ULs*
1,2,3,4-Tetrachlorobenzene	*mg/kg*	*15*	*36*	*78*	*1700 (122)* [vap]	*3080 (304)* [vap]	*4400 (728)* [vap]	*LQM S4ULs*
1,3,5-Trichlorobenzene	*mg/kg*	*0.33*	*0.81*	*1.9*	*23*	*55*	*130*	*LQM S4ULs*
1,2,4-Trichlorobenzene	*mg/kg*	*2.6*	*6.4*	*15*	*220*	*530*	*1300*	*LQM S4ULs*
1,2,3-Trichlorobenzene	*mg/kg*	*1.5*	*3.6*	*8.6*	*102*	*250*	*590*	*LQM S4ULs*
1,4-dichlorobenzene	*mg/kg*	*61* [f]	*150* [f]	*350* [f]	*4400* [f] *(224)* [vap]	*10000* [f] *(540)*	*25000* [f] *(1280)*	*LQM S4ULs*
1,3-dichlorobenzene	*mg/kg*	*0.4*	*1*	*2.3*	*30*	*73*	*170*	*LQM S4ULs*
1,2-Dichlorobenzene	*mg/kg*	*23*	*55*	*130*	*2000 (571)* [sol]	*4800 (1370)* [sol]	*11000 (3240)* [sol]	*LQM S4ULs*
Chlorobenzene	*mg/kg*	*0.46*	*1*	*2.4*	*56*	*130*	*290*	*LQM S4ULs*
Gamma-Hexachlorocyclohexane	*mg/kg*	*0.06*	*0.14*	*0.33*	*67*	*69*	*70*	*LQM S4ULs*
Beta-Hexachlorocyclohexane	*mg/kg*	*0.085*	*0.2*	*0.46*	*65*	*65*	*65*	*LQM S4ULs*
Alpha -Hexachlorocyclohexane	*mg/kg*	*0.23*	*0.55*	*1.2*	*170*	*180*	*180*	*LQM S4ULs*
Beta -Endosulfan	*mg/kg*	*7*	*17*	*39*	*6300 (0.00007)*	*7800 (0.0002)*	*8700*	*LQM S4ULs*
Alpha-Endosulfan	*mg/kg*	*7.4*	*18*	*41*	*5600 (0.003)* [vap]	*7400 (0.007)* [vap]	*8400 (0.016)* [vap]	*LQM S4ULs*
Dichlorvos	*mg/kg*	*0.032*	*0.066*	*0.14*	*140*	*140*	*140*	*LQM S4ULs*
Atrazine	*mg/kg*	*3.3*	*7.6*	*17.4*	*9300*	*9400*	*9400*	*LQM S4ULs*
Dieldrin	*mg/kg*	*0.97*	*2*	*3.5*	*170*	*170*	*170*	*LQM S4ULs*
Aldrin	*mg/kg*	*5.7*	*6.6*	*7.1*	*170*	*170*	*170*	*LQM S4ULs*
HMX	*mg/kg*	*5.7*	*13*	*26*	*110000*	*110000*	*110000*	*LQM S4ULs*
2,4,6-Trinitrotoulene	*mg/kg*	*1.6*	*3.7*	*8.1*	*1000*	*1000*	*1000*	*LQM S4ULs*
RDX	*mg/kg*	*120*	*250*	*540*	*210000*	*210000*	*210000*	*LQM S4ULs*

[sol] S4UL exceeds the solubility saturation limit (which is presented in brackets)

[vap] S4ULS presented exceeds the vapour saturation limit, which is presented in brackets

[f] For naphthalene, the S4UL is based on a comparison of inhalation exposure with the TDI_{inhal} for localised affects

[f] S4UL based on comparison of inhalation exposure with inhalation TDI for localised effects

[dir] S4ULs based on a threshold protecive direct skin contact with phenol (guideline in brackets based on health effects following long term exposure provided for illustation only

APPENDIX 11 - CIRIA Risk Assessment Methodology

Contaminated Land Risk Assessment

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification ⇨ Hazard Assessment ⇨ Risk Estimation ⇨ Risk Evaluation

LCRM outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process.

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552:

- High likelihood: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;

- Likely: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

- Low likelihood: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term;

- Unlikely: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

The severity is also classified using a system based on CIRIA C552. The terms and definitions are:

- Severe: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse;

- Medium: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve;

- Mild: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment;
  Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

- Minor: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.
  Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

- Very high: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required;

- High: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term;

- Moderate: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;

- Low: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild;

- Very Low: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

APPENDIX 12 - JIWG Receptor Decision Tool

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Decision Support Tool for Receptor Risk Ranking

Stage 1

Hazard Identification		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	0
Extent of degradation of ACMs	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Asbestos fibre type	Chrysotile alone	0
Sub-total		**4**
Hazard ranking		**Very Low**

Version 2, February 2017

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Stage 2

Emission Factors		Score
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Moderate quantities - 0.05 to <0.1 %wt/wt	3
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Low	2
Activity type and effect on deterioration of ACMs	Low disturbance, minimal deterioration expected	2
Best description of primary host material matrix	Fine Silt and/or Clay	1
Sub-total		**8**
Exposure ranking		**Low**

Stage 3

Pathway and Receptor Sensitivity		Score	
Receptor category	Residential	No score required	
Age of Receptor	Infant (under 5)	4	
Duration of exposure/site occupancy	< 1 hour in any single day (e.g. frequent but short exposure event)	1	
Receptor ranking		**5**	**Medium**
Combined hazard, exposure and receptor ranking			**Low**
Pathway: Distance of Receptor from Source	In or within 10m of area of disturbance	4	
Pathway: Depth to impacted material	Material buried at shallow depth, potential to be disturbed by excavation	C	
Pathway ranking		4C	**Low**
Overall ranking			**Very Low**

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	GRO-22118

Site Name	Roughbirchworth Lane, Oxspring
Client	Sourced

Run by	RW
Date	30-Jun-22
Reviewed by	JD

Characterisation of scenario being evaluated	

Interpretation of scenario ranking by DST	

JIWG

Joint Industry Working Group

Asbestos in Soil and Construction & Demolition Materials

Project Reference	GRO-22118
Site Name	Roughbirchworth Lane, Oxspring
Client	Sourced
Run by	RW
Date	30-Jun-22
Scenario details	

Decision Support Tool for CAR2012 Work Categories

Stage 1

Hazard Factors

		Score
Select ACM type (run model for each type to generate 'Worst Case' output)	Bonded ACMs: cement, vinyl, composites, textured decorative coatings, bitumen products	1
Extent of degradation of ACMs at outset of work	Degraded (Significant degradation in ACM; material has lost its basic integrity)	3
Friability and degree of bonding by matrix (ACM matrix, not ground materials)	Non-friable ACM or ACM with fibres firmly linked in a matrix	0
Distribution of Visible Asbestos Across Affected Area	Occasional/random occurrences of visible contamination by ACMs	1
Amount of asbestos fibre in selected ACM/fibre type as % of host material	Moderate quantities - >0.05 to <0.1 %wt/wt	3
Sub-total		**8**

Note: the asbestos licensing regime is unaffected by the type of asbestos fibre present in ACMs

Hazard ranking **Low**

Stage 2

Exposure Factors

			Score
Anticipated airborne fibre concentration - Control Limit or SALI?	<0.001 fibres/ml		0
Anticipated duration of exposure to asbestos	< 2 hours in a 7 day period for all persons involved (e.g. Short Duration Work)		1
Activity type and effect on deterioration of ACMs during work	Sampling, manual or mechanical (significant deterioration expected)		2
Best description of primary host material matrix (soil/made ground)	Fine Silt and/or Clay		1
Respirable fibre index for ACM - RIVM report 711701034 (2003)	Very low		1
Sub-total			**5**
Exposure ranking			Very low
Combined hazard and exposure ranking		**13**	Low

Stage 3

Risk Assessment Outputs

Probable Licensing Status	Non-Licensed Work
RPE*	EN149 type FFP3 disposable
Dust Suppression**	Manual/localised dust suppression
Hygiene/Decontamination***	Localised and basic personal decontamination facilities

*Where RPE has to be worn continuously for long periods (e.g. more than 1-hour), then powered RPE may be necessary.
**Reduction in control measures possible if natural mitigation factors are present (e.g. raining, wet ground)
***Guide only; suitability of selected personal hygiene measures may be reviewed on a site/contamination-specific basis

APPENDIX 13 – Waste Classification Report

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

2BQ8R-9M7KU-WQDMV

Job name

22-57014_HWOL_Results

Description/Comments

Project

GRO-22118

Site

Roughbirchworth Lane, Oxspring

Classified by

Name:
James Doyle
Date:
05 Jul 2022 18:18 GMT
Telephone:
0800 1613730

Company:
Groundtech Consulting Limited
PO Box 499 Salford, Manchester M28 8EE

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: -

Course	Date
Hazardous Waste Classification	50% complete

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	Page
1	WS01--27042022-0.20	0.2	Non Hazardous		2
2	WS02--27042022-0.20	0.2	Non Hazardous		4
3	WS03--27042022-0.20	0.2	Non Hazardous		7
4	WS04--27042022-0.20	0.2	Hazardous	HP 7, HP 11	9
5	WS05--27042022-0.20	0.2	Non Hazardous		12
6	WS07--27042022-0.20	0.2	Non Hazardous		14
7	WS08--27042022-0.20	0.2	Non Hazardous		17
8	WS10--27042022-0.20	0.2	Non Hazardous		19
9	WS12--27042022-0.20	0.2	Non Hazardous		21
10	HP01--28042022-0.20	0.2	Non Hazardous		23
11	HP02--28042022-0.20	0.2	Hazardous	HP 7, HP 14	26
12	HP03--28042022-0.20	0.2	Non Hazardous		28

Related documents

#	Name	Description
1	22-57014_HWOL_Results.hwol	i2 Analytical .hwol file used to create the Job
2	Example waste stream template for contaminated soils	waste stream template used to create this Job

Report

Created by: James Doyle

Created date: 05 Jul 2022 18:18 GMT

Classification of sample: WS01--27042022-0.20

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

Sample details

Sample name:
WS01--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
12%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.105	mg/kg	0.00151 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		18	mg/kg	1.462	26.308	mg/kg	0.00263 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		19	mg/kg	1.126	18.825	mg/kg	0.00188 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	61	mg/kg	1.56	83.731	mg/kg	0.00537 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		11	mg/kg	2.976	28.81	mg/kg	0.00288 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		71	mg/kg	2.774	173.329	mg/kg	0.0173 %	✓	
11	pH			PH		7.7	pH		7.7	pH	7.7 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
14	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
15	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
16	phenanthrene		201-581-5	85-01-8		0.52	mg/kg		0.458	mg/kg	0.0000458 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		anthracene				0.18	mg/kg		0.158	mg/kg	0.0000158 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				1.2	mg/kg		1.056	mg/kg	0.000106 %	✓	
			205-912-4	206-44-0									
19		pyrene				1.1	mg/kg		0.968	mg/kg	0.0000968 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				0.8	mg/kg		0.704	mg/kg	0.0000704 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				0.64	mg/kg		0.563	mg/kg	0.0000563 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				0.72	mg/kg		0.634	mg/kg	0.0000634 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				0.47	mg/kg		0.414	mg/kg	0.0000414 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				0.66	mg/kg		0.581	mg/kg	0.0000581 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				0.28	mg/kg		0.246	mg/kg	0.0000246 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				0.31	mg/kg		0.273	mg/kg	0.0000273 %	✓	
			205-883-8	191-24-2									
										Total:	0.033 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS02--27042022-0.20

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

Sample details

Sample name:
WS02--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
13%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20 mg/kg	1.32	22.974 mg/kg	0.0023 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		21 mg/kg	1.462	30.693 mg/kg	0.00307 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37 mg/kg	1.126	36.242 mg/kg	0.00362 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	130 mg/kg	1.56	176.415 mg/kg	0.0113 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14 mg/kg	2.976	36.251 mg/kg	0.00363 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		170 mg/kg	2.774	410.296 mg/kg	0.041 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		110 mg/kg		95.7 mg/kg	0.00957 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17		pH				7.8	pH		7.8	pH	7.8 pH		
				PH									
18		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
19		acenaphthylene				0.44	mg/kg		0.383	mg/kg	0.0000383 %	✓	
			205-917-1	208-96-8									
20		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
21		fluorene				0.41	mg/kg		0.357	mg/kg	0.0000357 %	✓	
			201-695-5	86-73-7									
22		phenanthrene				3	mg/kg		2.61	mg/kg	0.000261 %	✓	
			201-581-5	85-01-8									
23		anthracene				1.2	mg/kg		1.044	mg/kg	0.000104 %	✓	
			204-371-1	120-12-7									
24		fluoranthene				7.5	mg/kg		6.525	mg/kg	0.000653 %	✓	
			205-912-4	206-44-0									
25		pyrene				6.5	mg/kg		5.655	mg/kg	0.000566 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				4.6	mg/kg		4.002	mg/kg	0.0004 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				3.6	mg/kg		3.132	mg/kg	0.000313 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				5.1	mg/kg		4.437	mg/kg	0.000444 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				1.7	mg/kg		1.479	mg/kg	0.000148 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				3.8	mg/kg		3.306	mg/kg	0.000331 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31		indeno[123-cd]pyrene				1.6	mg/kg		1.392	mg/kg	0.000139 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.59	mg/kg		0.513	mg/kg	0.0000513 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33		benzo[ghi]perylene				1.7	mg/kg		1.479	mg/kg	0.000148 %	✓	
			205-883-8	191-24-2									
										Total:	0.0789 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Not present in free phase

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00957%)

Classification of sample: WS03--27042022-0.20

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

Sample details

Sample name:
WS03--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
7.6%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 7.6% Wet Weight Moisture Correction applied (MC)

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		31	mg/kg	1.32	37.819	mg/kg	0.00378 %	✓	
2		cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
3		chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		82	mg/kg	1.462	119.848	mg/kg	0.012 %		
4		chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5		copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		36	mg/kg	1.126	37.452	mg/kg	0.00375 %	✓	
6		lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	66	mg/kg	1.56	95.124	mg/kg	0.0061 %	✓	
7		mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8		nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		12	mg/kg	2.976	33.001	mg/kg	0.0033 %	✓	
9		selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10		zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		84	mg/kg	2.774	215.318	mg/kg	0.0215 %	✓	
11		pH			PH		8	pH		8	pH	8pH		
12		naphthalene	601-052-00-2	202-049-5	91-20-3		2.9	mg/kg		2.68	mg/kg	0.000268 %	✓	
13		acenaphthylene		205-917-1	208-96-8		6.1	mg/kg		5.636	mg/kg	0.000564 %	✓	
14		acenaphthene		201-469-6	83-32-9		7.9	mg/kg		7.3	mg/kg	0.00073 %	✓	
15		fluorene		201-695-5	86-73-7		8.9	mg/kg		8.224	mg/kg	0.000822 %	✓	
16		phenanthrene		201-581-5	85-01-8		67	mg/kg		61.908	mg/kg	0.00619 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		anthracene	204-371-1	120-12-7		23	mg/kg		21.252	mg/kg	0.00213 %	✓	
18		fluoranthene	205-912-4	206-44-0		93	mg/kg		85.932	mg/kg	0.00859 %	✓	
19		pyrene	204-927-3	129-00-0		91	mg/kg		84.084	mg/kg	0.00841 %	✓	
20		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3	82	mg/kg		75.768	mg/kg	0.00758 %	✓	
21		chrysene	601-048-00-0	205-923-4	218-01-9	60	mg/kg		55.44	mg/kg	0.00554 %	✓	
22		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2	70	mg/kg		64.68	mg/kg	0.00647 %	✓	
23		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9	47	mg/kg		43.428	mg/kg	0.00434 %	✓	
24		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8	77	mg/kg		71.148	mg/kg	0.00711 %	✓	
25		indeno[123-cd]pyrene	205-893-2	193-39-5		37	mg/kg		34.188	mg/kg	0.00342 %	✓	
26		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3	11	mg/kg		10.164	mg/kg	0.00102 %	✓	
27		benzo[ghi]perylene	205-883-8	191-24-2		41	mg/kg		37.884	mg/kg	0.00379 %	✓	
										Total:	0.118 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS04--27042022-0.20

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

Sample details

Sample name:
WS04--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
10%
(wet weight correction)

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

Hazard properties

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

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.182%)

HP 11: Mutagenic "waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell"

Hazard Statements hit:

Muta. 1B; H340 "May cause genetic defects [state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard]."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.182%)

Determinands

Moisture content: 10% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		17 mg/kg	1.32	20.201 mg/kg	0.00202 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7 mg/kg	1.142	0.72 mg/kg	0.000072 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		47 mg/kg	1.462	68.693 mg/kg	0.00687 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		100 mg/kg	1.126	101.33 mg/kg	0.0101 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	72 mg/kg	1.56	101.076 mg/kg	0.00648 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		26 mg/kg	2.976	69.645 mg/kg	0.00696 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
9		selenium { nickel selenate }				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
		028-031-00-5	239-125-2	15060-62-5									
10		zinc { zinc chromate }				150	mg/kg	2.774	374.51	mg/kg	0.0375 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
11		TPH (C6 to C40) petroleum group				2020	mg/kg		1818	mg/kg	0.182 %	✓	
				TPH									
12		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
13		benzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
14		toluene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
15		ethylbenzene				<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
16		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17		pH				8.8	pH		8.8	pH	8.8 pH		
				PH									
18		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
19		acenaphthylene				2.5	mg/kg		2.25	mg/kg	0.000225 %	✓	
			205-917-1	208-96-8									
20		acenaphthene				17	mg/kg		15.3	mg/kg	0.00153 %	✓	
			201-469-6	83-32-9									
21		fluorene				18	mg/kg		16.2	mg/kg	0.00162 %	✓	
			201-695-5	86-73-7									
22		phenanthrene				170	mg/kg		153	mg/kg	0.0153 %	✓	
			201-581-5	85-01-8									
23		anthracene				67	mg/kg		60.3	mg/kg	0.00603 %	✓	
			204-371-1	120-12-7									
24		fluoranthene				270	mg/kg		243	mg/kg	0.0243 %	✓	
			205-912-4	206-44-0									
25		pyrene				230	mg/kg		207	mg/kg	0.0207 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				160	mg/kg		144	mg/kg	0.0144 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				130	mg/kg		117	mg/kg	0.0117 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				160	mg/kg		144	mg/kg	0.0144 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				70	mg/kg		63	mg/kg	0.0063 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				150	mg/kg		135	mg/kg	0.0135 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31		indeno[123-cd]pyrene				63	mg/kg		56.7	mg/kg	0.00567 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				19	mg/kg		17.1	mg/kg	0.00171 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33		benzo[ghi]perylene				66	mg/kg		59.4	mg/kg	0.00594 %	✓	
			205-883-8	191-24-2									
										Total:	0.396 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Not present in free phase

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.182%)

Classification of sample: WS05--27042022-0.20

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

Sample details

Sample name:
WS05--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
5.4%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 5.4% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		15 mg/kg	1.32	18.735 mg/kg	0.00187 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.9 mg/kg	1.142	0.973 mg/kg	0.0000973 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		39 mg/kg	1.462	57.001 mg/kg	0.0057 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		46 mg/kg	1.126	48.994 mg/kg	0.0049 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	100 mg/kg	1.56	147.559 mg/kg	0.00946 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		43 mg/kg	2.976	121.068 mg/kg	0.0121 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		110 mg/kg	2.774	288.678 mg/kg	0.0289 %	✓	
11	pH			PH		8.6 pH		8.6 pH	8.6 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		1.9 mg/kg		1.797 mg/kg	0.00018 %	✓	
14	acenaphthene		201-469-6	83-32-9		13 mg/kg		12.298 mg/kg	0.00123 %	✓	
15	fluorene		201-695-5	86-73-7		19 mg/kg		17.974 mg/kg	0.0018 %	✓	
16	phenanthrene		201-581-5	85-01-8		140 mg/kg		132.44 mg/kg	0.0132 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		anthracene				60	mg/kg		56.76	mg/kg	0.00568 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				310	mg/kg		293.26	mg/kg	0.0293 %	✓	
			205-912-4	206-44-0									
19		pyrene				260	mg/kg		245.96	mg/kg	0.0246 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				170	mg/kg		160.82	mg/kg	0.0161 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				100	mg/kg		94.6	mg/kg	0.00946 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				150	mg/kg		141.9	mg/kg	0.0142 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				75	mg/kg		70.95	mg/kg	0.0071 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				130	mg/kg		122.98	mg/kg	0.0123 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				61	mg/kg		57.706	mg/kg	0.00577 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				15	mg/kg		14.19	mg/kg	0.00142 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				70	mg/kg		66.22	mg/kg	0.00662 %	✓	
			205-883-8	191-24-2									
28		asbestos				630	mg/kg		595.98	mg/kg	0.0596 %	✓	
		650-013-00-6	- - - - - - -	12001-28-4 132207-32-0 12172-73-5 77536-66-4 77536-68-6 77536-67-5 12001-29-5									
										Total:	0.272 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS07--27042022-0.20

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

Sample details

Sample name:
WS07--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
6%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 6% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		19 mg/kg	1.32	23.581 mg/kg	0.00236 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<LOD
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22 mg/kg	1.462	32.154 mg/kg	0.00322 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		54 mg/kg	1.126	57.15 mg/kg	0.00572 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	160 mg/kg	1.56	234.596 mg/kg	0.015 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		21 mg/kg	2.976	58.751 mg/kg	0.00588 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		240 mg/kg	2.774	625.847 mg/kg	0.0626 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		66 mg/kg		62.04 mg/kg	0.0062 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17	•	pH				10.6	pH		10.6	pH	10.6 pH		
				PH									
18		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
19	•	acenaphthylene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			205-917-1	208-96-8									
20	•	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
			201-469-6	83-32-9									
21	•	fluorene				0.29	mg/kg		0.273	mg/kg	0.0000273 %	✓	
			201-695-5	86-73-7									
22	•	phenanthrene				1.8	mg/kg		1.692	mg/kg	0.000169 %	✓	
			201-581-5	85-01-8									
23	•	anthracene				0.82	mg/kg		0.771	mg/kg	0.0000771 %	✓	
			204-371-1	120-12-7									
24	•	fluoranthene				5.3	mg/kg		4.982	mg/kg	0.000498 %	✓	
			205-912-4	206-44-0									
25	•	pyrene				4.5	mg/kg		4.23	mg/kg	0.000423 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				3.2	mg/kg		3.008	mg/kg	0.000301 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				1.9	mg/kg		1.786	mg/kg	0.000179 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				2.2	mg/kg		2.068	mg/kg	0.000207 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				2.2	mg/kg		2.068	mg/kg	0.000207 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				2.7	mg/kg		2.538	mg/kg	0.000254 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	•	indeno[123-cd]pyrene				1.2	mg/kg		1.128	mg/kg	0.000113 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.34	mg/kg		0.32	mg/kg	0.000032 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	•	benzo[ghi]perylene				1.2	mg/kg		1.128	mg/kg	0.000113 %	✓	
			205-883-8	191-24-2									
										Total:	0.104 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Not present in free phase

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0062%)

Classification of sample: WS08--27042022-0.20

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

Sample details

Sample name:
WS08--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
15%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		23	mg/kg	1.32	25.812	mg/kg	0.00258 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		63	mg/kg	1.126	60.291	mg/kg	0.00603 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	110	mg/kg	1.56	145.843	mg/kg	0.00935 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18	mg/kg	2.976	45.537	mg/kg	0.00455 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		200	mg/kg	2.774	471.605	mg/kg	0.0472 %	✓	
11	pH			PH		7.3	pH		7.3	pH	7.3 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
14	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
15	fluorene		201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
16	phenanthrene		201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		anthracene	204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
18		fluoranthene	205-912-4	206-44-0		0.64	mg/kg		0.544	mg/kg	0.0000544 %	✓	
19		pyrene	204-927-3	129-00-0		0.58	mg/kg		0.493	mg/kg	0.0000493 %	✓	
20		benzo[a]anthracene	200-280-6	56-55-3		0.43	mg/kg		0.366	mg/kg	0.0000366 %	✓	
		601-033-00-9											
21		chrysene	205-923-4	218-01-9		0.29	mg/kg		0.247	mg/kg	0.0000246 %	✓	
		601-048-00-0											
22		benzo[b]fluoranthene	205-911-9	205-99-2		0.32	mg/kg		0.272	mg/kg	0.0000272 %	✓	
		601-034-00-4											
23		benzo[k]fluoranthene	205-916-6	207-08-9		0.29	mg/kg		0.247	mg/kg	0.0000246 %	✓	
		601-036-00-5											
24		benzo[a]pyrene; benzo[def]chrysene	200-028-5	50-32-8		0.3	mg/kg		0.255	mg/kg	0.0000255 %	✓	
		601-032-00-3											
25		indeno[123-cd]pyrene	205-893-2	193-39-5		0.27	mg/kg		0.23	mg/kg	0.000023 %	✓	
26		dibenz[a,h]anthracene	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2											
27		benzo[ghi]perylene	205-883-8	191-24-2		0.29	mg/kg		0.247	mg/kg	0.0000246 %	✓	
										Total:	0.0739 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS10--27042022-0.20

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

Sample details

Sample name:
WS10--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
11%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13	mg/kg	1.32	15.276	mg/kg	0.00153 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		22	mg/kg	1.462	32.154	mg/kg	0.00322 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		61	mg/kg	1.126	61.124	mg/kg	0.00611 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	63	mg/kg	1.56	87.459	mg/kg	0.00561 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17	mg/kg	2.976	45.031	mg/kg	0.0045 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		170	mg/kg	2.774	419.728	mg/kg	0.042 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		<20	mg/kg		<20	mg/kg	<0.002 %		<**LOD**
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
17	●	pH		PH		6.1	pH		6.1	pH	6.1 pH		
18		naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19	●	acenaphthylene	205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20	●	acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21	●	fluorene	201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22	●	phenanthrene	201-581-5	85-01-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
23	●	anthracene	204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
24	●	fluoranthene	205-912-4	206-44-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
25	●	pyrene	204-927-3	129-00-0		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
26		benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
27		chrysene 601-048-00-0	205-923-4	218-01-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
28		benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
29		benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
30		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
31	●	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
32		dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
33	●	benzo[ghi]perylene	205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
										Total:	0.0657 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: WS12--27042022-0.20

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

Sample details

Sample name:
WS12--27042022-0.20
Sample Depth:
0.2 m
Moisture content:
16%
(wet weight correction)

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

Hazard properties

None identified

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21	mg/kg	1.32	23.291	mg/kg	0.00233 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2	mg/kg	1.142	<0.228	mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		25	mg/kg	1.462	36.539	mg/kg	0.00365 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		41	mg/kg	1.126	38.776	mg/kg	0.00388 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	110	mg/kg	1.56	144.127	mg/kg	0.00924 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		17	mg/kg	2.976	42.501	mg/kg	0.00425 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		130	mg/kg	2.774	302.937	mg/kg	0.0303 %	✓	
11	pH			PH		6.6	pH		6.6	pH	6.6 pH		
12	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
13	acenaphthylene		205-917-1	208-96-8		0.48	mg/kg		0.403	mg/kg	0.0000403 %	✓	
14	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
15	fluorene		201-695-5	86-73-7		0.36	mg/kg		0.302	mg/kg	0.0000302 %	✓	
16	phenanthrene		201-581-5	85-01-8		0.35	mg/kg		0.294	mg/kg	0.0000294 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
17		anthracene	204-371-1	120-12-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
18		fluoranthene	205-912-4	206-44-0		0.38	mg/kg		0.319	mg/kg	0.0000319 %	✓	
19		pyrene	204-927-3	129-00-0		0.37	mg/kg		0.311	mg/kg	0.0000311 %	✓	
20		benzo[a]anthracene	200-280-6	56-55-3		0.26	mg/kg		0.218	mg/kg	0.0000218 %	✓	
		601-033-00-9											
21		chrysene	205-923-4	218-01-9		0.23	mg/kg		0.193	mg/kg	0.0000193 %	✓	
		601-048-00-0											
22		benzo[b]fluoranthene	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-034-00-4											
23		benzo[k]fluoranthene	205-916-6	207-08-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-036-00-5											
24		benzo[a]pyrene; benzo[def]chrysene	200-028-5	50-32-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-032-00-3											
25		indeno[123-cd]pyrene	205-893-2	193-39-5		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
26		dibenz[a,h]anthracene	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-041-00-2											
27		benzo[ghi]perylene	205-883-8	191-24-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
										Total:	0.0546 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: HP01--28042022-0.20

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

Sample details

Sample name:
HP01--28042022-0.20
Sample Depth:
0.2 m
Moisture content:
14%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 14% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14	mg/kg	1.32	15.897	mg/kg	0.00159 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7	mg/kg	1.142	0.688	mg/kg	0.0000688 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		32	mg/kg	1.462	46.77	mg/kg	0.00468 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8	mg/kg	2.27	<4.086	mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		42	mg/kg	1.126	40.667	mg/kg	0.00407 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	120	mg/kg	1.56	160.973	mg/kg	0.0103 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3	mg/kg	1.353	<0.406	mg/kg	<0.0000406 %		<**LOD**
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15	mg/kg	2.976	38.394	mg/kg	0.00384 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<**LOD**
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		270	mg/kg	2.774	644.157	mg/kg	0.0644 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		97	mg/kg		83.42	mg/kg	0.00834 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
17	●	pH		PH		7.7	pH		7.7	pH	7.7 pH		
18		naphthalene 601-052-00-2	202-049-5	91-20-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
19	●	acenaphthylene	205-917-1	208-96-8		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
20	●	acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
21	●	fluorene	201-695-5	86-73-7		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
22	●	phenanthrene	201-581-5	85-01-8		0.83	mg/kg		0.714	mg/kg	0.0000714 %	✓	
23	●	anthracene	204-371-1	120-12-7		0.26	mg/kg		0.224	mg/kg	0.0000224 %	✓	
24	●	fluoranthene	205-912-4	206-44-0		2.1	mg/kg		1.806	mg/kg	0.000181 %	✓	
25	●	pyrene	204-927-3	129-00-0		1.9	mg/kg		1.634	mg/kg	0.000163 %	✓	
26		benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		1.2	mg/kg		1.032	mg/kg	0.000103 %	✓	
27		chrysene 601-048-00-0	205-923-4	218-01-9		0.92	mg/kg		0.791	mg/kg	0.0000791 %	✓	
28		benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		1.1	mg/kg		0.946	mg/kg	0.0000946 %	✓	
29		benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		0.72	mg/kg		0.619	mg/kg	0.0000619 %	✓	
30		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		1	mg/kg		0.86	mg/kg	0.000086 %	✓	
31	●	indeno[123-cd]pyrene	205-893-2	193-39-5		0.57	mg/kg		0.49	mg/kg	0.000049 %	✓	
32		dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
33	●	benzo[ghi]perylene	205-883-8	191-24-2		0.74	mg/kg		0.636	mg/kg	0.0000636 %	✓	
										Total:	0.099 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Not present in free phase

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00834%)

Classification of sample: HP02--28042022-0.20

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

Sample details

Sample name:
HP02--28042022-0.20
Sample Depth:
0.2 m
Moisture content:
13%
(wet weight correction)

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

Hazard properties

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

Hazard Statements hit:

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

Because of determinand:

zinc chromate: (compound conc.: 0.362%)

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

Hazard Statements hit:

Aquatic Chronic 1; H410 "Very toxic to aquatic life with long lasting effects."

Because of determinand:

zinc chromate: (compound conc.: 0.362%)

Determinands

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

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		50 mg/kg	1.32	57.434 mg/kg	0.00574 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		<0.2 mg/kg	1.142	<0.228 mg/kg	<0.0000228 %		<**LOD**
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		39 mg/kg	1.462	57.001 mg/kg	0.0057 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<**LOD**
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		120 mg/kg	1.126	117.543 mg/kg	0.0118 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	790 mg/kg	1.56	1072.061 mg/kg	0.0687 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		0.9 mg/kg	1.353	1.06 mg/kg	0.000106 %	✓	
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		35 mg/kg	2.976	90.627 mg/kg	0.00906 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<**LOD**

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
10		zinc { zinc chromate }				1500	mg/kg	2.774	3620.261	mg/kg	0.362 %	✓	
		024-007-00-3	236-878-9	13530-65-9									
11		pH				7.6	pH		7.6	pH	7.6 pH		
				PH									
12		naphthalene				0.55	mg/kg		0.479	mg/kg	0.0000479 %	✓	
		601-052-00-2	202-049-5	91-20-3									
13		acenaphthylene				0.36	mg/kg		0.313	mg/kg	0.0000313 %	✓	
			205-917-1	208-96-8									
14		acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		**<LOD**
			201-469-6	83-32-9									
15		fluorene				0.52	mg/kg		0.452	mg/kg	0.0000452 %	✓	
			201-695-5	86-73-7									
16		phenanthrene				3.4	mg/kg		2.958	mg/kg	0.000296 %	✓	
			201-581-5	85-01-8									
17		anthracene				1	mg/kg		0.87	mg/kg	0.000087 %	✓	
			204-371-1	120-12-7									
18		fluoranthene				9.8	mg/kg		8.526	mg/kg	0.000853 %	✓	
			205-912-4	206-44-0									
19		pyrene				9.2	mg/kg		8.004	mg/kg	0.0008 %	✓	
			204-927-3	129-00-0									
20		benzo[a]anthracene				5.2	mg/kg		4.524	mg/kg	0.000452 %	✓	
		601-033-00-9	200-280-6	56-55-3									
21		chrysene				4.6	mg/kg		4.002	mg/kg	0.0004 %	✓	
		601-048-00-0	205-923-4	218-01-9									
22		benzo[b]fluoranthene				5.4	mg/kg		4.698	mg/kg	0.00047 %	✓	
		601-034-00-4	205-911-9	205-99-2									
23		benzo[k]fluoranthene				4.4	mg/kg		3.828	mg/kg	0.000383 %	✓	
		601-036-00-5	205-916-6	207-08-9									
24		benzo[a]pyrene; benzo[def]chrysene				5.8	mg/kg		5.046	mg/kg	0.000505 %	✓	
		601-032-00-3	200-028-5	50-32-8									
25		indeno[123-cd]pyrene				3	mg/kg		2.61	mg/kg	0.000261 %	✓	
			205-893-2	193-39-5									
26		dibenz[a,h]anthracene				0.96	mg/kg		0.835	mg/kg	0.0000835 %	✓	
		601-041-00-2	200-181-8	53-70-3									
27		benzo[ghi]perylene				3.1	mg/kg		2.697	mg/kg	0.00027 %	✓	
			205-883-8	191-24-2									
										Total:	0.469 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Hazardous result
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: HP03--28042022-0.20

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

Sample details

Sample name:
HP03--28042022-0.20
Sample Depth:
0.2 m
Moisture content:
18%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 18% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21 mg/kg	1.32	22.736 mg/kg	0.00227 %	✓	
2	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1 mg/kg	1.142	0.937 mg/kg	0.0000937 %	✓	
3	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		36 mg/kg	1.462	52.616 mg/kg	0.00526 %		
4	chromium in chromium(VI) compounds { chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex }	024-017-00-8				<1.8 mg/kg	2.27	<4.086 mg/kg	<0.000409 %		<LOD
5	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		68 mg/kg	1.126	62.78 mg/kg	0.00628 %	✓	
6	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	140 mg/kg	1.56	179.067 mg/kg	0.0115 %	✓	
7	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.3 mg/kg	1.353	<0.406 mg/kg	<0.0000406 %		<LOD
8	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		18 mg/kg	2.976	43.93 mg/kg	0.00439 %	✓	
9	selenium { nickel selenate }	028-031-00-5	239-125-2	15060-62-5		<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
10	zinc { zinc chromate }	024-007-00-3	236-878-9	13530-65-9		340 mg/kg	2.774	773.432 mg/kg	0.0773 %	✓	
11	TPH (C6 to C40) petroleum group			TPH		120 mg/kg		98.4 mg/kg	0.00984 %	✓	
12	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
13	benzene	601-020-00-8	200-753-7	71-43-2		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
14	toluene	601-021-00-3	203-625-9	108-88-3		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD
15	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001 mg/kg		<0.001 mg/kg	<0.0000001 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		EU CLP index number	EC Number	CAS Number									
16		xylene				<0.002	mg/kg		<0.002	mg/kg	<0.0000002 %		<**LOD**
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
17	●	pH				7.2	pH		7.2	pH	7.2 pH		
				PH									
18		naphthalene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<**LOD**
		601-052-00-2	202-049-5	91-20-3									
19	●	acenaphthylene				0.22	mg/kg		0.18	mg/kg	0.000018 %	✓	
			205-917-1	208-96-8									
20	●	acenaphthene				0.21	mg/kg		0.172	mg/kg	0.0000172 %	✓	
			201-469-6	83-32-9									
21	●	fluorene				0.28	mg/kg		0.23	mg/kg	0.000023 %	✓	
			201-695-5	86-73-7									
22	●	phenanthrene				3	mg/kg		2.46	mg/kg	0.000246 %	✓	
			201-581-5	85-01-8									
23	●	anthracene				0.89	mg/kg		0.73	mg/kg	0.000073 %	✓	
			204-371-1	120-12-7									
24	●	fluoranthene				9.1	mg/kg		7.462	mg/kg	0.000746 %	✓	
			205-912-4	206-44-0									
25	●	pyrene				8.6	mg/kg		7.052	mg/kg	0.000705 %	✓	
			204-927-3	129-00-0									
26		benzo[a]anthracene				5.5	mg/kg		4.51	mg/kg	0.000451 %	✓	
		601-033-00-9	200-280-6	56-55-3									
27		chrysene				4.4	mg/kg		3.608	mg/kg	0.000361 %	✓	
		601-048-00-0	205-923-4	218-01-9									
28		benzo[b]fluoranthene				7.4	mg/kg		6.068	mg/kg	0.000607 %	✓	
		601-034-00-4	205-911-9	205-99-2									
29		benzo[k]fluoranthene				3.7	mg/kg		3.034	mg/kg	0.000303 %	✓	
		601-036-00-5	205-916-6	207-08-9									
30		benzo[a]pyrene; benzo[def]chrysene				6.8	mg/kg		5.576	mg/kg	0.000558 %	✓	
		601-032-00-3	200-028-5	50-32-8									
31	●	indeno[123-cd]pyrene				3.5	mg/kg		2.87	mg/kg	0.000287 %	✓	
			205-893-2	193-39-5									
32		dibenz[a,h]anthracene				0.91	mg/kg		0.746	mg/kg	0.0000746 %	✓	
		601-041-00-2	200-181-8	53-70-3									
33	●	benzo[ghi]perylene				4.2	mg/kg		3.444	mg/kg	0.000344 %	✓	
			205-883-8	191-24-2									
										Total:	0.122 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

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

Force this Hazardous property to non hazardous because Not present in free phase

Hazard Statements hit:

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

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00984%)

Appendix A: Classifier defined and non GB MCL determinands

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pH (CAS Number: PH)

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

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2; H351

- **benzo[ghi]perylene** (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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

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

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

GB MCL index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
20 Nov 2021 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

Appendix B: Rationale for selection of metal species

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

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

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium (VI) compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex}

Worst case species based on hazard statements/molecular weight (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {nickel selenate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.2.GB - Oct 2021
HazWasteOnline Classification Engine Version: 2022.181.5224.9815 (30 Jun 2022)
HazWasteOnline Database: 2022.181.5224.9815 (30 Jun 2022)

This classification utilises the following guidance and legislation:
WM3 v1.2.GB - Waste Classification - 1st Edition v1.2.GB - Oct 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Waste 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
GB MCL List - version 1.1 of 09 June 2021

APPENDIX 14 – Relevant Legislative Background

Legislative Background

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

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

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

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

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

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

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

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

Relevant Guidance Documents

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

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

Relevant Legislative Documents

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

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

APPENDIX 15 - Limitations

Limitations

This report (Report) forms part of the Services and if applicable Additional Services undertaken by Groundtech Consulting Ltd pursuant to a written contract (Agreement) which contains detailed provisions including express limitations of the liability of Groundtech Consulting Ltd.

This Report was prepared using reasonable skill and care as stated in the Agreement for the purpose including intended end use stated by the Client (Purpose) and the liability of Groundtech Consulting Ltd in respect of the form and content of this Report is no greater than its liability under the Agreement. All records, measurements notes, or any other data (Data) obtained by or for the benefit of the Consultant were obtained at a specific point in time and it may not be assumed by the Client or any person relying on this Report that the Data will remain unaffected by the passage of time, the seasons, weather conditions, changes in the water table or the carrying out and completion of works at the Site.

Unless otherwise agreed this Report has been prepared exclusively for the use and reliance of the Client and may not be relied upon, by any other party except as provided for in the Agreement. A third party who relies on this Report, does so at their own and sole risk and Groundtech Consulting Ltd has no liability to such parties.

Groundtech Consulting Ltd that this Report is to be used for the Purpose. The Purpose was instrumental in determining the scope and of the Services provided. If the Purpose should change, the Client may not be able to rely on the Report without the separate agreement of Groundtech Consulting Ltd.

Since the Report was written, later changes in legislation, statutory requirements and industry best practices have not been considered and this should be allowed for. Ground conditions can also change (see below) and should be investigated if there is any significant delay in acting on the findings of this Report. The period of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the Report inaccurate or unreliable. The information and conclusions in this Report should not be relied upon in the future without written confirmation from Groundtech Consulting Ltd that it is safe to do so.

The observations and conclusions outlined in this Report are based exclusively on the services that were provided as set out in the agreement between the client and Groundtech Consulting Ltd.

Groundtech Consulting Ltd is not liable for the existence of any condition, the discovery of which would require additional investigation outside the agreed scope of works or core competency. The Report is based upon Groundtech Consulting Ltd's observations of existing physical conditions at the Site gained from site reconnaissance together with interpretation of information including documentation, obtained from third parties and from the Client on the history and usage of the Site. The findings and recommendations contained in this Report are based in part upon information provided by third parties, and Groundtech Consulting Ltd have relied upon such information assuming it to be correct.

Groundtech Consulting Ltd accepts no responsibility for errors or inaccuracies in third party information presented in this Report. Groundtech Consulting Ltd was not authorised to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services or Additional Services. Groundtech Consulting Ltd is not liable for any inaccurate information, misrepresentation of data or conclusions, which may inform the scope of investigation undertaken by Groundtech Consulting Ltd and forms the contract with the client.

Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions may also vary due to the ground's heterogeneous properties and because investigation exploratory locations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this Report, particularly between exploratory holes. The extent of the limited area depends on the soil and groundwater conditions, together with other constraints such as the position of any existing structures and underground utilities. If so stipulated in the Agreement, geo-environmental testing was carried out for a limited number of parameters based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

Any groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The groundwater level often has not had time to reach equilibrium and a monitoring period is required. Furthermore, groundwater levels are subject to seasonal variation or changes in local drainage conditions and groundwater levels may occur at other times of the year which are higher than were recorded during this investigation.

Any site drawings provided in this Report are preliminary and used to present the general relative locations of features on, and surrounding, the Site.