Site Condition Report

Home Farm Grange

November 2025

Project No.: SOL_25_P007_ENG

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Document Details	
Document Title	Site Condition Report
Document Subtitle	Home Farm Grange
Project No.	SOL_25_P007_ENG
Date	November 2025
Version	QMS_7.5.38_TEM – Template – Report Long Form – New Style (Perm) v5
Author	Rhys Morgan
Client Name	Engie Renewable Gases UK Ltd

Document History				
Version	Comments	Date	Author Initials	Reviewer Initials
I1	Issue to EA	November 2025	RM	EH
I2	Reissue following EA comments	January 2026	RM	EH

Signature Page

November 2025

Site Condition Report

Home Farm Grange



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CONTENTS

1. INTRODUCTION 3
2. SITE DETAILS 4
2.1 Site Location & Description 4
2.2 Context 4
3. CONDITION OF LAND AT PERMIT ISSUE 8
3.1 Environmental Setting 8
3.1.1 Geology 8
3.1.2 Hydrogeology 9
3.1.3 Surface Waters 10
3.1.4 Designated Sites 10
3.2 Pollution History 11
3.2.1 Environmental Database Records 11
3.2.2 Pollution Incidents 11
3.2.3 Potentially Contaminative Industrial Sites 11
3.2.4 Landfills and Waste Sites 11
3.2.5 Discharge Consents 11
3.2.6 Authorised or Permitted Processes 11
3.2.7 Radioactive Substance Authorisations 12
3.2.8 Historical Land Uses 12
3.3 Evidence of Historic Contamination 13
3.4 Supporting Information 15
4. PERMITTED ACTIVITIES 16
4.1 Proposed Activities Undertaken at the Installation 16
4.1.1 Proposed Permitted Wastes 17
4.1.2 Drainage System 19
4.1.3 Hardstanding 19
4.1.4 Potential for Fugitive Releases to Soil, Groundwater and Surface Water 20
4.2 Non-permitted Activities 27
4.3 Site Plan 27
4.4 Environmental and Climate Change Risk Assessment 27
5. CHANGES TO THE ACTIVITY 28
6. MEASURES TAKEN TO PROTECT LAND 29
7. POLLUTION INCIDENTS AND REMEDIATION 30
8. SOIL, GAS AND WATER QUALITY MONITORING 31
9. DECOMMISSIONING AND REMOVAL OF POLLUTION RISK 32
10. REFERENCE DATA AND REMEDIATION 33
11. STATEMENT OF SITE CONDITION 34

List of Tables

Table 2.1 Site Setting 4
Table 3.1 - Summary of Historical Land Use 12
Table 3.2 Potentially Contaminative Land Uses 12
Table 3.3 Baseline Ground Conditions 14
Table 4.1 - Proposed Permitted Wastes 17
Table 4.2 Hazardous Substances Inventory 21

Table 4.3 Conceptual Site Model.....25

List of Figures

Figure 2.1 - Installation Boundary 6
Figure 2.2 - Installation Layout Plan 7

Acronyms and Abbreviations

Name	Description
AD	Anaerobic Digestion
BGS	British Geological Survey
CHP	Combined Heat and Power
EA	Environment Agency
EPR	Environmental Permitting (England and Wales) Regulations 2016 (as amended)
EWC	European Waste Catalogue
SCR	Site Condition Report

1. INTRODUCTION

This Application Site Condition Report (ASCR) has been prepared by Sol Environment Ltd on the behalf of Engie Renewable Gases UK Ltd (hereafter referred to as "*Engie*") in support of a bespoke permit application for their proposed site located on land east of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW.

This document represents the ASCR submitted to the Environment Agency as part of the permit application package and relies on information supplied by the site and various third-party information sources (See Section 2).

Engie is planning to undertake the construction, development, and eventual operation of an Agricultural Anaerobic Digestion (AD) Facility. This project aligns with the broader goal of promoting sustainable energy solutions and reducing reliance on fossil fuels while supporting local agricultural practices.

Engie's proposed AD plant will accept up to 100,000 tonnes per annum of feedstock including manures and slurries, maize, silage, whole crop rye, vegetable waste and potato rejects from Home Farm and other local farms. Biogas produced by the digestion process will primarily be upgraded to biomethane for injection into the local distribution network, with onsite utilisation in a biogas boiler to provide energy to the site processes at start up and at times of extreme cold weather. Additionally carbon dioxide removed from the biogas during upgrading will be exported for use in the food and drinks industry. Energy required onsite will be provided by two onsite natural gas generators (250kWth).

The AD facility will meet the definition of an 'Installation' under the EPR Regulations by virtue of Schedule 1, namely;

Section 5.4 Part A(1)(b)(i) *Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving Biological Treatment*

The site will also operate a number of Directly Associated Activities (DAA's) onsite which will include all waste storage, biogas upgrading, raw material storage and handling, combustion plant operation, emergency flare, carbon dioxide liquefaction, wastewater management and surface water discharge.

This document has been prepared in accordance with the Environment Agency's (EA's) Guidance Document H5 Site Condition Reports Guidance and Templates (Version 5.0, dated October 2014). This report provides baseline information in relation to the site.

2. SITE DETAILS

Table 2.1: Site Details	
Name of the Applicant:	Engie Renewable Gases UK Ltd
Activity Address:	land east of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW
Grid Reference:	SE 50420 32210

Document References:	EP Application Site Condition Report, Engie Renewable Gases UK Ltd Document reference and date: SOL_25_P007_ENG November 2025
Annexes:	Annex A: Figures Annex B: Groundsure Report Annex C: Ground Investigation Report

2.1 Site Location & Description

The proposed site is located at Land East of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW.

The National Grid Reference for the centre of the proposed site is SE 50420 32210.

The site currently comprises an undeveloped agricultural field, bound by Mill Dike to the west, an existing Anaerobic Digestion Facility to the northeast and a railway line to the south.

2.2 Context

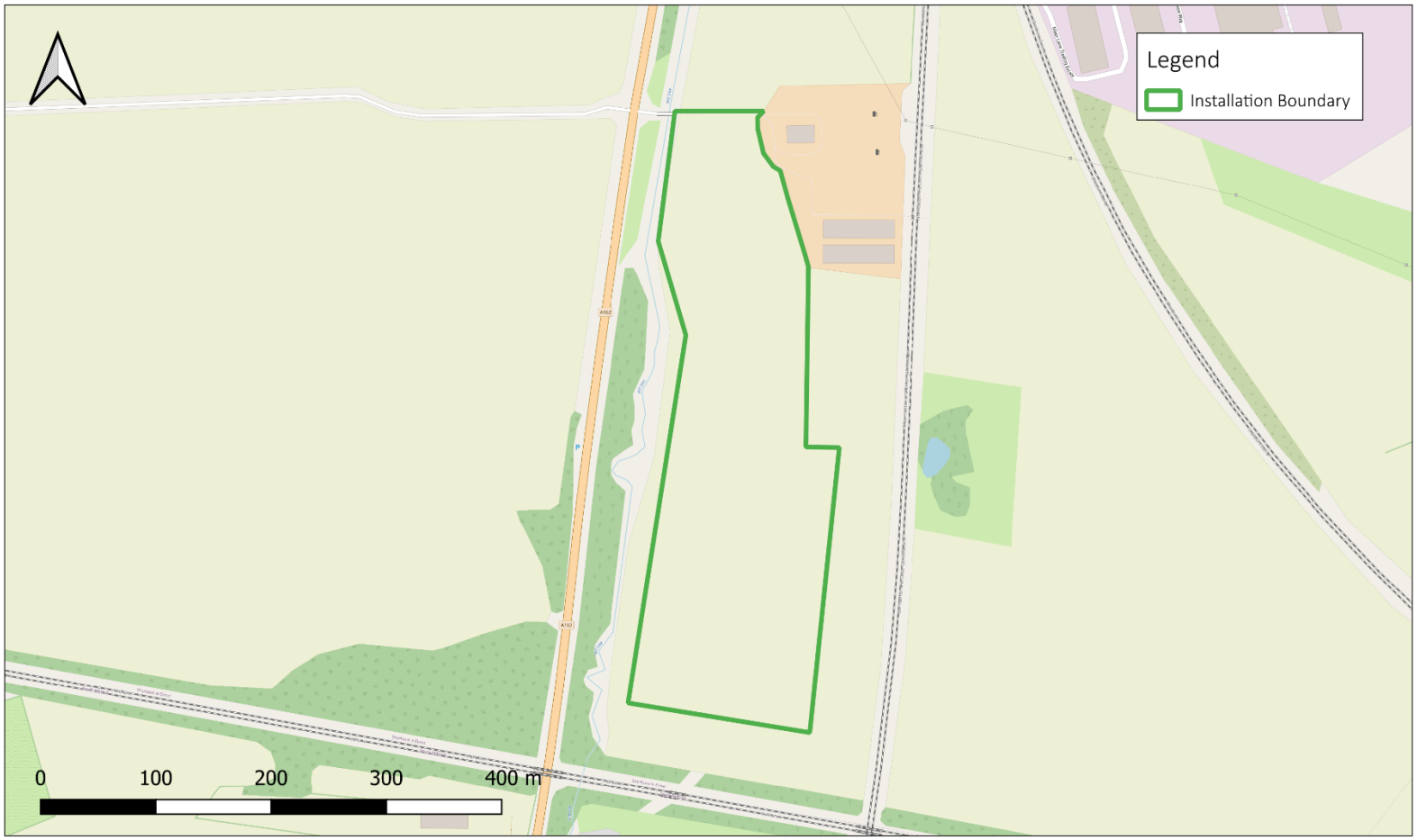
The site is located in a predominantly agricultural landscape, with industrial and commercial units to the north and the villages of Sherburn in Elmet to the north and South Milford to the south. Table 2.1 outlines the surrounding site setting in greater detail, including features in the immediate vicinity, within 500m and beyond 500m of the proposed site.

Table 2.1 Site Setting

Direction	Description
North	Immediate Vicinity: Agricultural Land, Low Farm Energy AD Plant Within 500m: Agricultural Land, Bypass Park Estate, Commercial Units including YDL Distribution, David Wattson Transport, and Bishop's Move York Beyond 500m: Agricultural Land, Residential housing and local amenities in Sherburn in Elmet, A162 Road, Surface Water Lagoon, commercial units including The Great Bear, Esterform Packaging, and Sherburn Motor Spares
East	Immediate Vicinity: Agricultural Land, small woodland block Within 500m: Agricultural Land, Railway Line Beyond 500m: Agricultural Land, Sherburn in Elmet Airfield Airport (EGCJ), Breeze Aviation Services Ltd, Gascoigne Wood Power Plant
South	Immediate Vicinity: Agricultural Land, Railway Line Within 500m: Agricultural Land, Maltings Tea Rooms, Floosie Brow Artist, Woodhaven Boarding Kennels and Cattery Beyond 500m: Amur AD Plant, The Maltings Organic Treatment, Residential Housing and local amenities in South Milford, Agricultural Land, Railway Line
West	Immediate Vicinity: Mill Dike Within 500m: A162 road, Agricultural Land, small woodland

	Beyond 500m: Residential housing on Milford Road, Tadcaster Timber Products, Agriclutral Land, South Milford railway station, YWT Sherburn Willows Nature Reserve,

The nearest residential areas to the site are on Mill Lane, located approximately 150m south of the site boundary.



Project Number: SOL_25_P007_ENG Doc Ref: Annex B - Site Plans Map Title: Installation Boundary Date: 26/03/2025 Drawn by: RM Checked by: EH	Site Address: Land East of A162, Halstow Energy AD Facility Low Farm South Milford Sherburn in Elmet LS25 6FW	1. Do not scale off this drawing 2. All dimensions to be confirmed on site 3. This drawing is copyright of Sol Environment Ltd 4. This drawing is to be read in conjunction with relevant consultant drawings and specifications 5. QMS Reference: QMS_7.5.39_TEM - Template - GIS Drawing - Horizontal v1

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Figure 2.1 - Installation Boundary

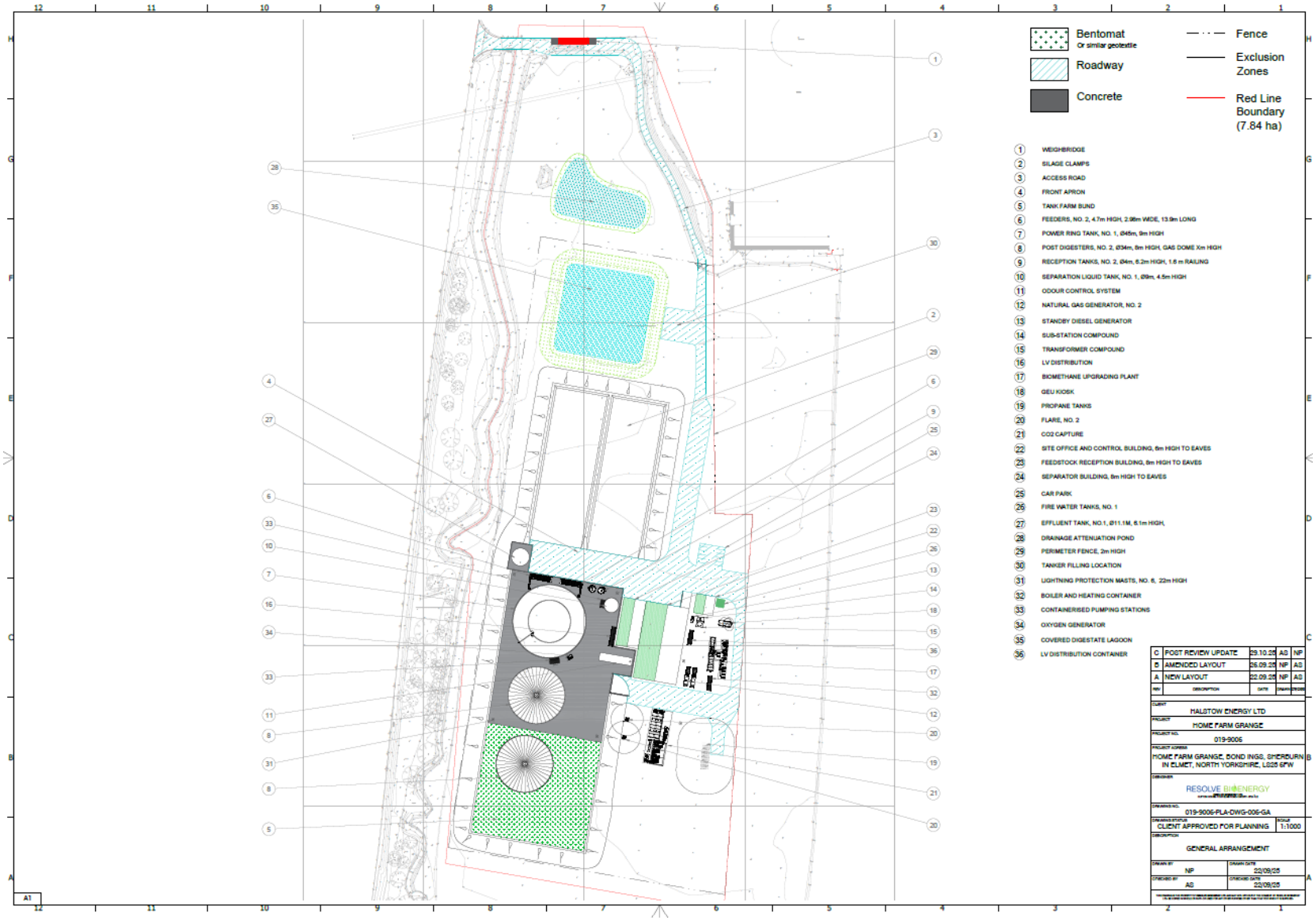


Figure 2.2 - Installation Layout Plan

3. CONDITION OF LAND AT PERMIT ISSUE

3.1 Environmental Setting

Desk-based research of the local geology, hydrogeology and surface waters has been carried out in order to establish the potential for migration of contamination onto or away from the Site, and to assess the surface water and groundwater sensitivity of the site area. Information was obtained from a number of sources, namely:

- *Environment Agency Flood Risk Map;*
- *Information provided by Groundsure Report (Annex B);*
- *Geological maps produced by the British Geological Survey (BGS) and the BGS Geology of Britain Viewer (http://maps.bgs.ac.uk/geologyviewer);*
- *MAGIC (http://magic.defra.gov.uk); and*
- *BGS Borehole Record Viewer (http://www.bgs.ac.uk/data/boreholescans/home.html).*

3.1.1 Geology

The British Geological Survey (BGS) states that the site is largely underlain by superficial geology of the Hemingbrough Glaciolacustrine Formation - Clay, Silty, Peaty, Sandy. This is described in the BGS Lexicon as *"unfossiliferous laminated clays, silts and sands with rare dropstones (typically fine-grained pale coloured sandstone, grey limestone and dark mudstone*)."

A small portion of the south-western area of the site is underlain by superficial geology of Alluvium - Clay, Silt, Sand And Gravel. This is described in the BGS Lexicon as "*a general term for clay, silt, sand and gravel. It is the unconsolidated detrital material deposited by a river, stream or other body of running water as a sorted or semi-sorted sediment in the bed of the stream or on its floodplain or delta, or as a cone or fan at the base of a mountain slope. Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present."*

The bedrock at the site comprises of the Brotherton Formation – Dolomitic Limestone. This is described in the BGS Lexicon as, *"limestone, dolomitic, grey with abundant Calcinema."*

A normal fault is present running east – west approximately central to the site.

Made Ground

No Made Ground is present on site, however 20 records have been found within 500m of the site. The closest of these can be found 30m north and is likely associated with the development of Low Farm.

Radon Potential

According to UKradon the site is in an area where some parts of the 1km square are in bands of elevated radon potential, maximum potential of 1-3%. The Groundsure dataset has a smaller scale (accurate to within 50m) and identifies that the site is in an area with less than 1% properties affected by radon. Radon protection measures are therefore not considered necessary.

Shrink Swell

The maximum shrink swell hazard rating identified on the application site is low.

Landslides

The maximum landslide hazard rating identified on the application site is very low.

Soluble Rocks

The maximum soluble rock hazard rating identified on the application site is low.

Compressible Ground

The maximum compressible ground hazard rating identified on the application site is moderate.

Collapsible Rocks

The maximum collapsible rocks hazard rating identified on the application site is very low.

Running Sands

The maximum running sand hazard rating identified on the application site is Negligible.

There are no mining or ground working records onsite, though it is noted that the site is in a coal mining area as defined by the Coal Authority.

3.1.2 Hydrogeology

The Hemingbrough Glaciolacustrine Formation superficial deposits at the site are classified by the EA as an "Unproductive Aquifer". This is defined as rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The Alluvium superficial deposits at the site are classified by the EA as a "Secondary A Aquifer". In contrast to an unproductive aquifer, a Secondary A Aquifer is defined as "permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers". This type of aquifer is formerly classified as a minor aquifer".

The bedrock is classified by the EA as a Principal Aquifer. This is defined as having "high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale." This type of aquifer is often strategically important rock units that have high permeability and water storage capacity.

The site has medium Groundwater Vulnerability.

The Wharfe Magnesian Limestone WFD Groundwater body on site is rated as 'poor' by the EA.

According to the latest Groundsure report, there are 38 recorded groundwater abstractions for over $20m^3$ per day located within 2 km of the site, though only 2 of these are actively licenced. The closest active licence is operated by Jane Elizabeth Ward and Kathryn Helen Parkin, located 363m south of the site and utilised for spray irrigation. The next closest is 1463m west of the site.

The site is not within a Groundwater Source Protection Zone.

The site lies within a Groundwater Nitrate Vulnerable Zone, namely *Yorkshire Mag Limestone.*

The majority of the site has a high groundwater flood risk.

The site is considered to have moderate to high sensitivity with regards to groundwater due to being underlain by a principal aquifers in a Nitrate Vulnerable Zone, and a high risk of groundwater flooding.

3.1.3 Surface Waters

The nearest surface water feature is Mill Dike, located 20m west of the site. The closest main water body is the River Aire located 1.6km to the west. The site is within the Wharfe and Ouse Lower Management Catchment.

There is 1 surface water abstraction on site. This abstraction is by J Bramley and Son and is for a maximum daily volume of 324m^3. This licence is due to expire 31st March 2026 and is licenced for the purpose of spray irrigation. There are 6 further recorded EA licensed surface water abstractions within 2km of the site, 3 of which are active. The closest of which is 604m north, licenced to J Bramley and Son for abstraction from a tributary of Mill Dike drain for the purposes of spray irrigation. This licence allows for up to 900m^3 per day.

The site is located with a surface water nitrate vulnerability zone, namely *Selby Dam from Conf. Fox Dike & Carr Dike to Ouse NVZ.*

The site is within a Flood Zone 1, with low probability of flooding from rivers or the sea.

The site is considered to be in an area of high sensitivity regarding surface water due to the proximity of watercourses and location within an NVZ.

3.1.4 Designated Sites

Environment Agency H1 and H5 guidance states that the potential impacts of the site should be assessed for the following habitat sites within 10km of the Installation:

- *Special Areas of Conservations (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive;*
- *Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive; and*
- *Ramsar Sites designated under the Convention of Wetlands of International Importance.*

It is also stated that within 2km of the Source:

- *Sites of Special Scientific Interest (SSSI) established by the 1981 Wildlife and Countryside Act;*
- *National Nature Reserves (NNR);*
- *Local Nature Reserves (LNR);*
- *Local Wildlife Sites (LWS), County Wildlife Sites (CWS) and potential wildlife sites (PWS);*
- *Sites of Importance for Nature Conservation (SINC); and*
- *Ancient Woodland.*

Information from the Multi Agency Geographic Information for the Countryside (MAGIC) website (http://magic.defra.gov.uk/) has been used to obtain the above information.

The only designated ecological receptor within the appropriate screening distance to the site is Sherburn Willows SSSI, located approximately 1.5km west of the site.

There are no European-level protected sites within 10km of the site.

The site is located within the South and West Yorkshire Green Belt.

The proposed operation will have little environmental emissions to land or controlled waters and emissions to atmosphere are well managed and controlled, therefore it is the conclusion of this assessment that there will be no direct or indirect effects on any of the statutory sites described above.

3.2 Pollution History

3.2.1 Environmental Database Records

The following information has been obtained from a search of a publicly available database of environmental information (Groundsure Report obtained is provided in Appendix B).

The database contains records of information from public registers held by environmental regulatory authorities and can be used to assess the site's sensitivity, the potential for neighbouring activities to pose a risk to the site and to determine whether specific records of pollution relate to the subject site.

3.2.2 Pollution Incidents

There are three record pollution incidents within 500m of the site, the closest of which is 348m northeast and involved the release of unidentified oil. This incident took place in 2002 and caused a category 3 (minor impact) water pollution event, and a category 4 (no impact) event to land and air. The most recent event took place in 2003, 453m south and involved the release of crude sewage. This incident caused a category 3 (minor impact) water pollution event, and a category 4 (no impact) event to land and air.

3.2.3 Potentially Contaminative Industrial Sites

There are 2 recorded potentially contaminative industrial sites within 250m of the application. These comprise the Biogas Power Station 38m northeast and a Telecommunication mast 48m south.

3.2.4 Landfills and Waste Sites

There are no active or historic landfills on site or within 500m of the site boundary.

There are 2 waste sites within 500m of the site, the closest of which is 24m north of the site. This waste site is an on-farm anaerobic digestion facility called Low Farm, permitted under EPR/EB3305FS.

There are 14 recorded waste exemptions within 500m of the site. The closest of these are for the disposal of agricultural waste at Ash Tree Farm located 252m southwest. Waste disposal exemptions held at Ash Tree Farm are for burning in the open, deposit of waste from dredging of inland waters and treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising.

3.2.5 Discharge Consents

There are no licenced discharges to controlled water within 500m of the site.

3.2.6 Authorised or Permitted Processes

Other than the Low Farm AD Facility (24m north) there are no other records of authorised or permitted processes within 500m of the site. The Low Farm AD permit limits the site to 25,000 tonnes per annum of farm wastes only.

3.2.7 Radioactive Substance Authorisations

There are no radioactive substance authorisations within 500m of the site.

3.2.8 Historical Land Uses

The historical development of the site has been determined by reference to historical plans and Google Earth imagery. Earliest available historical mapping covering the site dates back to 1850. Historical land uses are summarised in Table 3.1 below.

Table 3.1 - Summary of Historical Land Use

Date	On site	Within 500m
1850	Undeveloped agricultural land	York and North Midland Railway line situated approximately 100m to the west of the site, and Leeds and Selby Railway line situated approximately 100m to the south of the site. Surrounding land is agricultural.
1892	No change	Low Farm constructed adjacent to the site. No other significant changes.
1908	No change	Sewage Works Constructed approximately 350m south of the site. Football ground constructed approximately 400 southwest of the site. No other significant changes
1950	No change	Railway Wagon Works constructed approximately 350m northeast of the site. Airfield located beyond.
1957-1958	No change	Railway Wagon Works expanded in size to the north. Airfield noted as disused.
1967	No change	No significant changes
1981-1986	No change	Residential properties constructed near Mill Lane approximately 150m south of the site. Railway Wagon Works becomes Moor Lane Trading Estate. No other significant changes
1992-1994	No change	A162 constructed adjacent the site. This is the first significant development in close proximity since the construction of Low Farm. Moor Lane Trading Estate expands with the addition a several new buildings.
2001	No change	No significant changes
2010	No change	No significant changes
2025	No change	Access road constructed to the north of the site and stretching westward from the A162.

Potentially contaminative historical land uses have been summarised in the table below. Please refer to Annex B for the historical maps.

Table 3.2 Potentially Contaminative Land Uses

Activity	Contaminants
Onsite	
None	N/A
Offsite	

Railway Line	Various contaminants including heavy metals, organic and inorganics
Low Farm AD Facility	Various contaminants predominantly organics
Airfield	UXO

The site has remained undeveloped agricultural land since the earliest historical mapping, as such it is considered highly unlikely that there has been any potential for land contamination as a result of onsite historical uses.

3.3 Evidence of Historic Contamination

A geo-environmental ground investigation has been undertaken by Rogers Geotechnical Services in July 2025 in order to provide baseline environmental data in relation to the site. The scope of works [excluding geotechnical testing] comprised:

- 5 no. cable percussive boreholes to a maximum depth of 15mbGL;
- 23 no. window sample boreholes to a maximum depth of 7mBGL;
- 22 no. trial pits to a maximum depth of 3mbGL;
- Installation of 5 groundwater monitoring wells; and
- Environmental Sampling of 5 number of soil samples.

The locations of the boreholes and trial pits were situated so as to provide wide site coverage.

The suite of chemical analysis was based upon potential contaminants of concern (CoCs) due to site history and soil samples were tested for asbestos, pH, metals, sulphate, cyanide, PAHs, TPH and soil organic matter.

Please refer to the report provided in Annex C of this report for detailed results of the fieldwork investigation. A brief summary of the baseline conditions at the site is provided below.

Ground Conditions

Investigations at the site encountered superficial deposits comprising alluvium to a maximum depth of 1.5mBGL, underlain by the Hemingbrough Glaciolacustrine Formation comprising clay, silt and sand to a maximum depth of 6.45 mBGL. Further bedrock underlying this was identified as the Brotherton Formation comprising grey dolomitic limestone.

No Made Ground was identified onsite.

Groundwater

Groundwater was generally encountered at the interface of the superficial glaciolacustrine deposits and underling granular weather bedrock at depths of around 6mBGL. Groundwater rose to within 0.5 of the surface suggesting the potentio-metric groundwater head may be at or close to the surface and indicating that the glaciolacustrine deposits may be acting as a confining layer to the underlying groundwater.

Soil Chemical Analysis Results

Five samples were subject to chemical analysis. No widespread evidence of contamination was observed, with results compared to the relevant screening values for commercial end use. Summary baseline ground conditions are provided in the table below.

Table 3.3 Baseline Ground Conditions

Contaminant	Unit	Min Result	Max Result
Asbestos	-	Not Detected	Not Detected
Inorganics			
pH	pH Units	7.9	8.2
Free Cyanide	mg/kg	<1	<1
Total Sulphate	mg/kg	330	1000
Phenols			
Total Phenols	mg/kg	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)			
Total PAHs	mg/kg	<0.8	<0.8
Total Petroleum Hydrocarbons (TPH)			
TPH C5 - C35	mg/kg	<10	<10
Volatile Organic Compounds (VOCs)			
MTBE	µg/kg	<5	<5
BTEX	µg/kg	<5	<5
Heavy Metals			
Arsenic	mg/kg	8.2	11
Cadmium	mg/kg	0.6	0.6
Chromium IV	mg/kg	<1.8	<1.8
Chromium	mg/kg	21	42
Copper	mg/kg	20	37
Lead	mg/kg	16	28
Mercury	mg/kg	<0.3	<0.3
Nickel	mg/kg	29	52
Selenium	mg/kg	<1	<1

Vanadium	mg/kg	29	43
Zinc	mg/kg	58	96

For further detail please see the report in Annex C.

3.4 Supporting Information

The supporting documentation consists of:

- Figures detailing the location, boundary and layouts of the Installation are shown in Annex A;
- Groundsure Report is provided in Annex B;
- Ground Investigation Report is provided in Annex C.

4. PERMITTED ACTIVITIES

4.1 Proposed Activities Undertaken at the Installation

Engie are making a bespoke permit application for their proposed operation of an agricultural Anaerobic Digestion (AD) plant on a new site located on land east of A162, Low Farm, South Milford, Sherburn in Elmet, LS25 6FW.

Engie's proposed AD plant will accept up to 100,000 tonnes per annum of feedstock including manures and slurries, maize, silage, whole crop rye, vegetable waste and potato rejects from Home Farm and other local farms. Biogas produced by the digestion process will primarily be upgraded to biomethane for injection into the local distribution network, with onsite utilisation in a biogas boiler to provide heat to the site processes when required. Additionally carbon dioxide removed from the biogas during upgrading will be exported for use in the food and drinks industry.

The AD facility will meet the definition of an 'Installation' under the EPR Regulations by virtue of Schedule 1, namely;

Section 5.4 Part A(1)(b)(i) *Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving Biological Treatment*

The site will also operate a number of Directly Associated Activities (DAA's) onsite which will include all waste storage, biogas upgrading, raw material storage and handling, combustion plant operation, emergency flare, carbon dioxide liquefaction, wastewater management and surface water discharge.

The proposed anaerobic digestion process can be summarised as follows:

- *Feedstock Reception and Storage:* All wastes will be subject to the sites waste pre-acceptance, acceptance and rejection procedures. Incoming wastes such as manures will be delivered to and stored within the feedstock reception building. Energy crops and silage will be stored externally within the silage clamps while liquid feedstocks, such as slurries, will be stored in sealed reception tanks:
- *Digestion:* Solid feedstocks are fed to a sealed unit via hoppers, where they are mixed with the liquid feedstocks and recirculated liquids to create a substrate which is pumped into the processing vessels (digesters). Within the digesters, the substrate is mixed and heated to allow the bacteria to break down the organic matter in the absence of oxygen. During digestion, biogas is continuously produced in the vessels, typically around 55% methane and 45% carbon dioxide:
- *Digestate Separation:* Following digestion, the residual digestate material containing indigestible fibre and nutrients is pumped to a separation system, where the solid fraction is separated from the liquid fraction. Solid digestate is then stored within a segregated Digestate Storage area of the enclosed Separator building and liquid digestate is stored in the engineered covered digestate lagoon prior to being spread to land as fertiliser at the appropriate time;
- *Biogas Upgrading:* The majority of the biogas produced during the process is upgraded to remove CO2 and convert to pure biomethane. Biomethane is a clean renewable gas that is

compliant with the gas grid specifications and regulations. The biomethane is continuously monitored and metered prior to injection into the gas grid;

- *Carbon Dioxide Recovery:* During biogas upgrading, a side stream of clean compressed CO2 is produced. This will be recovered and liquified before being sent offsite to an end user, likely the food and drinks industry;
- *Electricity Production:* Two natural gas generator sets will be utilised to provide electrical power for onsite use; and
- *Biogas Combustion:* A small portion of the gas produced will be combusted in an onsite biogas boiler (560kWth). This will produce heat for start-up and in periods of extreme cold weather when required.

4.1.1 Proposed Permitted Wastes

The European Waste Catalogue (EWC) codes of wastes that will be accepted by the site is provided in **Table 4.2.**

Table 4.1 - Proposed Permitted Wastes

Waste Code	Description
02	**Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing**
02 01	Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 01	Sludges from washing and cleaning – vegetables, fruit and other crops
02 01 03	Plant-tissue waste
02 01 06	Animal faeces, urine and manure (including spoiled fully biodegradable animal bedding)
02 01 07	Wastes from forestry
02 01 99	Wastes not otherwise specified – spent mushroom compost from commercial mushroom growing only
02 03	**Wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation**
02 03 01	Sludges from washing, cleaning peeling, centrifuging and separation (including sludge from production of edible fats and oils, seasoning residues, molasses residues, residues from production of potato, corn or rice starch only)
02 03 04	Materials unsuitable for consumption or processing (including waste from production of edible fats and oils, seasoning residues, molasses residues, residues from production of potato, corn or rice starch only)
02 03 05	Sludges from on-site effluent treatment (including sludge from production of edible fats and oils, seasoning residues, molasses residues, residues from production of potato, corn or rice starch only)
02 04	**Wastes from sugar processing**
02 04 01	Soils from washing and cleaning beet
02 04 03	Sludges from on-site effluent treatment; sludges from the processing of sugar
02 05	**Wastes from the dairy products industry**

02 05 01	Materials unsuitable for consumption or processing – biodegradable wastes derived from the processing of dairy products only
02 05 02	Sludges from on-site effluent treatment
02 06	**Wastes from the baking and confectionery industry**
02 06 01	Materials unsuitable for consumption or processing – biodegradable wastes from the processing of materials used in bakery and confectionery
02 06 03	Sludges from on-site effluent treatment; sludges from the processing of materials used in baking and confectionery
02 07	**Wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)**
02 07 01	Wastes from washing, cleaning and mechanical reduction of raw materials Wastes from washing, cleaning and mechanical reduction of raw materials – biodegradable wastes from the processing of the raw materials used in the production of such beverages only (wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa))
02 07 02	Wastes from spirits distillation – spent grains, hops and whisky filter sheets and cloths, yeast and yeast like residues, sludge from production process, or malt husks, malt sprouts, yeasts and yeast-like residues only
02 07 04	Material unsuitable for consumption or processing – biodegradable wastes from the processing of the raw materials used in the production of such beverages only (wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa))
02 07 05	Sludges from on-site effluent treatment – sludges from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)
16	**Wastes not otherwise specified in the list**
16 10	**Aqueous liquid waste destined for off-site treatment**
16 10 02	Untreated wash waters from cleaning fruit and vegetables on farm only
16 10 02	Sludges from washing and cleaning fruit and vegetables on farm only
16 10 02	Milk and dairy waste milk from agricultural premises only
16 10 02	Liquor or leachate from a composting or anaerobic process that accepts waste input types listed in these standard rules or composting and anaerobic digestion standard rules only, and in compliance with Animal By-Products Regulations
19	**Wastes from waste management facilities, off-site wastewater treatment plants and preparation of water intended for human consumption/industrial use**
19 02	**Wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation**
19 02 10	Glycerol not designated as hazardous – excludes 19 02 08
19 06	**Waste from the anaerobic treatment of waste**
19 06 03	Liquor from anaerobic treatment of municipal waste (from a process that accepts wastes listed in these standard rules or anaerobic digestion standard rules only) and made up of previously pasteurised and stabilised batches only
19 06 04	Digestate from anaerobic treatment of source segregated biodegradable waste (from a process that treats wastes which are listed in these standard rules only and pasteurised)
19 06 05	Liquor from anaerobic treatment of animal and vegetable waste from a process that accepts wastes listed in these standard rules or anaerobic digestion standard rule permits and made up of previously pasteurised and stabilised batches only
19 08	**Wastes from wastewater treatment works**

19 08 09	Grease and oil mixture from oil and water separation containing only edible oils and fats
19 08 12	Sludges from biological treatment of industrial waste water (from a process that treats wastes which are listed in these standard rules only)
20	**Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions**
20 01	**Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions)**
20 01 25	Edible oils and fats
20 02	**Garden and park wastes (including cemetery waste)**
20 02 01	Biodegradable waste
20 03	**Other municipal wastes**
20 03 02	Waste from markets, allowed only if source segregated biodegradable fractions, such as plant material, fruit and vegetables

4.1.2 Drainage System

The site will operate a segregated drainage system.

Domestic effluent from site welfare facilities will be treated at the onsite package treatment plant and discharged to water course under consent.

Leachate generated during feedstock storage will be collected in a dedicated tank and recirculated through the digestion process. The leachate tank will be an above ground tank, constructed to an approved standard and fitted with leak detection.

Liquid digestate from the process is collected within the digestate lagoon prior to appropriate use as fertiliser. The lagoon will be appropriately engineered, lined, fitted with leak detection and covered in accordance with BAT and appropriate measures. The lagoon will be constructed in accordance with CIRIA 376.

Surface water run-off onsite will be managed in two separate areas dependent upon contamination risk. Run-off from process areas will collect within an attenuation tank and tested prior to discharge to Mill Dike. Run-off from clean areas of site will be directed to the detention basin prior to discharge to Mill Dike. Both surface water discharge outfall are fitted with penstock valves.

4.1.3 Hardstanding

Site surfacing will comprise concrete along all site roadways and process area, with an impermeable bentomat in the area of the post digester.

4.1.4 Tanks And Bunds

All storage tanks will be installed with secondary containment and be designed to comply with the following standards and guidance requirements;

- *Environment Agency Pollution Prevention Guideline Note 2: Above Ground Oil Tanks (PPG2);*
- *Environment Agency Pollution Prevention Guideline Note 11: Preventing Pollution on Industrial Sites (PPG11);*

- *Environment Agency Pollution Prevention Guideline Note 26: Pollution Prevention in the Storage and Handling Drums and Intermediate Bulk Containers (IBC's);*
- *CIRIA 736: Design of Containment Systems for the prevention of pollution;*
- *CIRIA C958: Chemical Storage Tank Systems – Good Practice;*
- *CIRIA 738: Design of Containment Systems for the Prevention of Water Pollution from Industrial Sites;*
- *Environment Agency, Biological Waste Treatment: appropriate measures for permitted facilities.*

The sites process tanks (i.e. reception tanks, digester and post digesters) are located within a bunded area (three sided) to afford additional containment in accordance with CIRIA 736.

4.1.5 Potential for Fugitive Releases to Soil, Groundwater and Surface Water

Stage 1 – 3 Assessment

Stage 1

Tabel 4.2 below identifies all potentially hazardous substances utilised or produced onsite. All incoming wastes to the site will be non-hazardous.

Material Safety Data Sheets (MSDS's) are provided in Appendix D.

Table 4.2 Hazardous Substances Inventory

Material	Chemical Characteristics and Toxicity	Environmental Fate and Behaviour	Nature and Quantity of Storage	Use / Fate	Contamination of Concern?
Diesel	Flammable Liquids Cat 4 Acute Tox (Inh) Cat 4 Skin Corr Cat 2 Carc. Cat 2 STOT RE Cat 2 (bone marrow, lover, thymus) Aspiration Haz Cat 1 Haz Statement Codes: H227 H304 H315 H351 H373	Persistent in soil and water Aspiration hazard	10,000 litres stored in double skinned bunded tank	Utilised for emergency generators and onsite vehicles / mobile plant	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
Activated Carbon	Non-hazardous	N/A	25,000 kg (5 x 500 kg sacks stored in covered sealed yard area on bunded tray	Utilised in abatement plant and Biogas Upgrade System	Not classified as hazardous substance in accordance with the regulations.
Vegetable Oil	Non – hazardous	Not toxic Persistent and not readily biodegrable	100 litre drum stored in covered sealed yard area on bunded tray	Anti-foaming agent	Not classified as hazardous substance in accordance with the regulations.
Odorant	Aquatic Chronic Cat 2 Flam. Liq. Cat 2 Skin Sens. Cat 1 Hazard Statement Codes: H411 H225 H317	Flammable liquid and vapour Insoluble in water, readily absorbed into soil. Not expected to bioaccumulate. Tocis to aquatic organisms & may taint water	50 litre drum on bunded tray within GEU	Utilised for odouring biomethane prior to injection into the grid	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.

LPG	Flammable Gases Cat 1A Compressed Gases Hazard Statement Codes: H220 H280	Flammable gas Asphyxiant Released LPG vaporises into a gas cloud heavier than air so does not disperse, creating fire & explosion & asphyxiation hazards	12 tonnes in dedicated sealed area in the yard	Use for process	Concern mainly relates to health hazards, air pollution and explosion. Risk of pollution to soil and groundwater is minimal.
Lubricating Oils	Alpha SP 220 Not classified Hyspin AWS 32 Not classified Hyspin AWS 220 Not classified Sentron CG 40 Not classified	Non-soluble in water May be skin irritant	2,500 litres (205 litre drums) kept in a covered sealed yard area on bunded tray	Utilised in plant maintenance activities.	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
Anti freeze	Chevron: Havoline Xtended Life Antifreeze / Coolant Acute Oral Toxicity Cat 4 STOT, RE Cat 2 (Ingestion - kidneys) Reproductive Toxicant Cat 2 (ingestion) Hazard Statement codes: H302 H373	Harmful if swallowed Causes damage to kidneys through prolonged or repeated exposure if swallowed Low volatility and water soluble so high potential for mobility Readily biodegradable - Not persistent in the environment	1,000 litres in IBC in covered sealed yard area on bunded tray	Utilised in plant maintenance activities.	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
Nitrogen	Compressed Gas Hazard Statement Code: H280	Asphyxiant Explosion risk	4 cylinders within gas cage	Used for purging systems & recaptured	Risk of pollution to soil and groundwater is negligible.

Raw Biogas Mixture	Components of methane, carbon dioxide, hydrogen sulphide & ammonia Flam Gas 1 Press Gas Hazard Statement Codes: H220 H280	Key hazards are explosion & fire	5,634.5m3 (total biogas onsite) stored in double membrane gas holder	Produced by the digestion process and utilised in the biogas upgrading plant for injection into the grid	Hazards relate primarily to air pollution and fire and explosion risk. Risk to soil and groundwater is negligible.
Glycol	Acute Oral Tox. Cat 4 STOT RE Cat 2 Hazard Statement Codes: H302 H373	Harmful if swallowed No environmental hazard identified Not persistent or bioaccumulative. Readily biodegradable. Highly mobile in soil & water	2,000 litres stored in 2 x IBCs in covered sealed yard area on bunded tray	Used in the digestion process	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
Ferric Chloride	Skin Corrosive Cat 1 Serious Eye Damage Car 1	Corrosive Soluble in water & readily biodegradable	25,000kgs stored in bags in covered sealed yard area	Used in the digestion process	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
Enzymes	Agratech SRL: Enzymax Not classified as hazardous	Light grey powder, stable	1,000 kgs stored in bags in indoor sealed area	Used in the digestion process	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.
BTL Nutrients	BTL Type BCM & BCN Resp Sens. Cat 1 Skin Sens. Cat 1 Germ Cell Mutagenic. Cat 2 Carcino (Inhalation) Cat 1A Reproductive Tox Cat 1B STOT, RE Cat 2	Liquid and mobile in the water environment.	100 litres stored in drum in indoor sealed area	Used in the digestion process	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.

	Acute Aquatic Tox Cat 1 Chronic Aquatic Toc Cat 1 Hazard Statement Codes: H334 H317 H341 H350 H360 H373 H400 H410				
Digestate	Non-hazardous – will meet PAS110 requirements	Harmful to the aquatic environment – high BOD/COD and nutrient input	Liquid digestate stored within onsite lagoon engineered in accordance with CIRIA 736. Solid digestate stored internally within the Separator Building.	Utilised offsite as fertiliser	Site containment and handling procedures and controls are implemented on site, however there is still a potential risk of contamination in case of mishandling which would have an affect on soil and groundwater if released.

Stage 2

Relevant hazardous materials from Table 4.2 above have been identified. These are materials and substances which may have potential to cause ground or groundwater contamination if not managed effectively. Those that are incapable of contaminating soil and groundwater have been discounted from further assessment. These and a justification for their exclusion are provided below:

- Activated carbon – not classified as hazardous in accordance with the regulations;
- Vegetable oil– not classified as hazardous in accordance with the regulations;
- LPG – gaseous air pollution hazard, risk to soil and groundwater considered negligible;
- Nitrogen – gaseous air pollution hazard, risk to soil and groundwater considered negligible; and
- Raw Biogas– gaseous air pollution hazard, risk to soil and groundwater considered negligible.

The following measures have been incorporated into the design of the facility to protect groundwater and soil from all onsite substances;

- The entire area will consist of good quality hardstanding;
- All waste storage will be located internally with a waste reception building;
- External feedstock storage is within SSAFFO compliant storage clamps upon a sealed drainage system and covered;
- The AD process is in a sealed reactor unit that offers no opportunity for release;
- Sealed drainage system, fitted with a penstock-type valve, allows for any spills to be contained prior to release;
- Emergency Spill kits will be provided throughout the site and strategically placed in locations;
- All surface water is tested for contamination prior to discharge to Mill Dike. Contaminated runoff and leachate produced is reused in the AD process, and,
- Bunding is present on the western, southern and eastern boundary to prevent uncontrolled runoff from site entering the surrounding environment. This is inline with the assessed topography.

Stage 3

Due to the protection measures mentioned above, the risk to soil and groundwater from the development is considered to be low. In the unlikely event that any of the above measures fail, due to all activities being carried out on impermeable hard standing with a penstock-fitted drainage system, there would be no impact to soil, groundwater and surface water.

Please see the simplified Conceptual Site Model provided below.

Table 4.3 Conceptual Site Model

Contaminant Source	Contaminants of Concern	Receptor	Exposure Pathway Present?	Likelihood of Risk
Historical soil contamination	Specific contaminants	Construction Workers	Yes – Potential pathway during construction of the	Very Low – Lack of historical development onsite and

	associated with nearby railway and AD plant – considered very low risk as none detected during ground investigation July 2025		site, full PPE will be worn by workers during the construction phase to limit contact.	distance to potentially contaminative uses (i.e. >100m) limits potential for contamination to have migrated onto site. Use of control measures during construction work should minimise potential exposure. Future works will include appropriate PPE.
		Future Site Users	Yes – Areas of soft landscaping are present in the wider site area.	Very Low – Hardstanding will cover the majority of the site and contamination anywhere onsite is considered unlikely.
		Groundwater	Yes – Leaching of contaminants (if present) by infiltrating rainfall is possible in areas of soft landscaping.	Very Low– Not considered that contamination is present to migrate to underlying principal aquifer
		Surface Water	Yes – Areas of soft landscaping are present in the wider site area allowing dissolution of contaminants into surface water run-off.	Very Low– Not considered that contamination is present to migrate to adjacent surface water body (Mill Dike).
Substances either stored on site, used or generated during processing	Polluting substances stored onsite include: leachate, digestate and diesel	Soil	No – All potentially polluting materials on site will be stored and processed on hardstanding or within sealed tanks / engineered lagoons, with secondary containment where appropriate essentially removing the potential for contamination of this receptor.	Low – All potentially polluting substances used at the facility are controlled by following strict risk assessment and guidance surrounding the storage, use and removal, thus reducing the risk. The storage areas of the site are covered in hard standing also greatly reducing the risk of pollution.
		Human Receptors	Yes – There is a pathway present for this pollution to occur, with the operation utilising potentially polluting substances.	Low – The management and guidance surrounding storage and use of contaminants helps to reduce this risk to low.
		Surface Water	Yes – There is a pathway present for this pollution to occur, with surface water runoff from the site having the potential to contain polluting substances.	Low – The site will adhere to strict control measures as outline within its EMS to reduce the risk of contamination of surface water run-off. Testing of the surface water discharge prior to release to Mill Dike will be undertaken, ensuring only clean surface water is released. The outfall is further fitted with a penstock valve. Bunding along eth site western boundary further protects Mill Dike.

		Ground Water	No – All potentially polluting materials on site will be stored and processed on hardstanding or within sealed tanks / engineered lagoons, with secondary containment where appropriate essentially removing the potential for contamination of this receptor. However, it must be noted that should integrity of primary containment such as hardstanding be compromised, a number of field drains present within the site area will create a direct pathway along which contamination can travel.	Low - All potentially polluting substances used at the facility are controlled by following strict risk assessment and guidance surrounding the storage, use and removal, thus reducing the risk. The storage areas of the site are covered in hard standing also greatly reducing the risk of pollution. It is recommended that prior to construction, land drains within the site area are removed to negate the potential for pathways to be created should primary containment systems fail.

In addition, the site operates in accordance with the environmental management system. The management system includes visual inspections of:

- All storage areas, processing areas and hard standing will be physically inspected to detect any signs of deterioration, leaks or spillage. Any corrective action required is reported to and implemented by the Site Manager; and
- All equipment is a part of the company's planned/predictive maintenance programme.

Based on this assessment, the potential for the varied site to impact on soil and groundwater underlying the installation is considered to be low.

4.2 Non-permitted Activities

There are no non-permitted activities undertaken on site.

4.3 Site Plan

The site layout plan is provided in **Section 2** of this SCR report and Appendix A at the end of the document.

4.4 Environmental and Climate Change Risk Assessment

A full Environmental and Climate Change Risk Assessment has been undertaken as part of the permit application. The risk assessment is held and maintained by Engie and will be regularly reviewed and updated when necessary. The document reference is SOL_25_P007_ENG – Environmental and Climate Change Risk Assessment.

5. CHANGES TO THE ACTIVITY

This section will be updated in accordance with any required permit variations.

6. MEASURES TAKEN TO PROTECT LAND

The site has a number of pollution prevention and mitigation measures in place, and has implemented the following measures to protect the land:

- Sealed, impermeable hardstanding covering all areas of the site to prevent any accidental or incidental releases of contaminates to land.
- The site is subject to regular inspections by the site manager to ensure the concrete hardstanding remains in good condition and, where signs of degradation are detected, the necessary repairs will be undertaken. This is to ensure the site surface remains impermeable to contaminants, therefore preventing contamination of land.
- A comprehensive spills and leakages procedure is in operation on site to clean up any minor or major spills or leaks that may occur.
- All tanks will be bunded and installed with secondary containment which are designed to comply with EA guidance and CIRIA 736 and CIRIA C598.

This section will be updated throughout the life of the permit with any pollution and mitigation measures that have been implemented on site.

7. POLLUTION INCIDENTS AND REMEDIATION

This section will be completed throughout the life of the permit following any pollution incidents.

Currently there have been no pollution incidents or remediation work onsite.

8. SOIL, GAS AND WATER QUALITY MONITORING

This section will be completed throughout the life of the permit with any soil, gas and water quality monitoring.

9. DECOMMISSIONING AND REMOVAL OF POLLUTION RISK

This section will be completed upon site surrender.

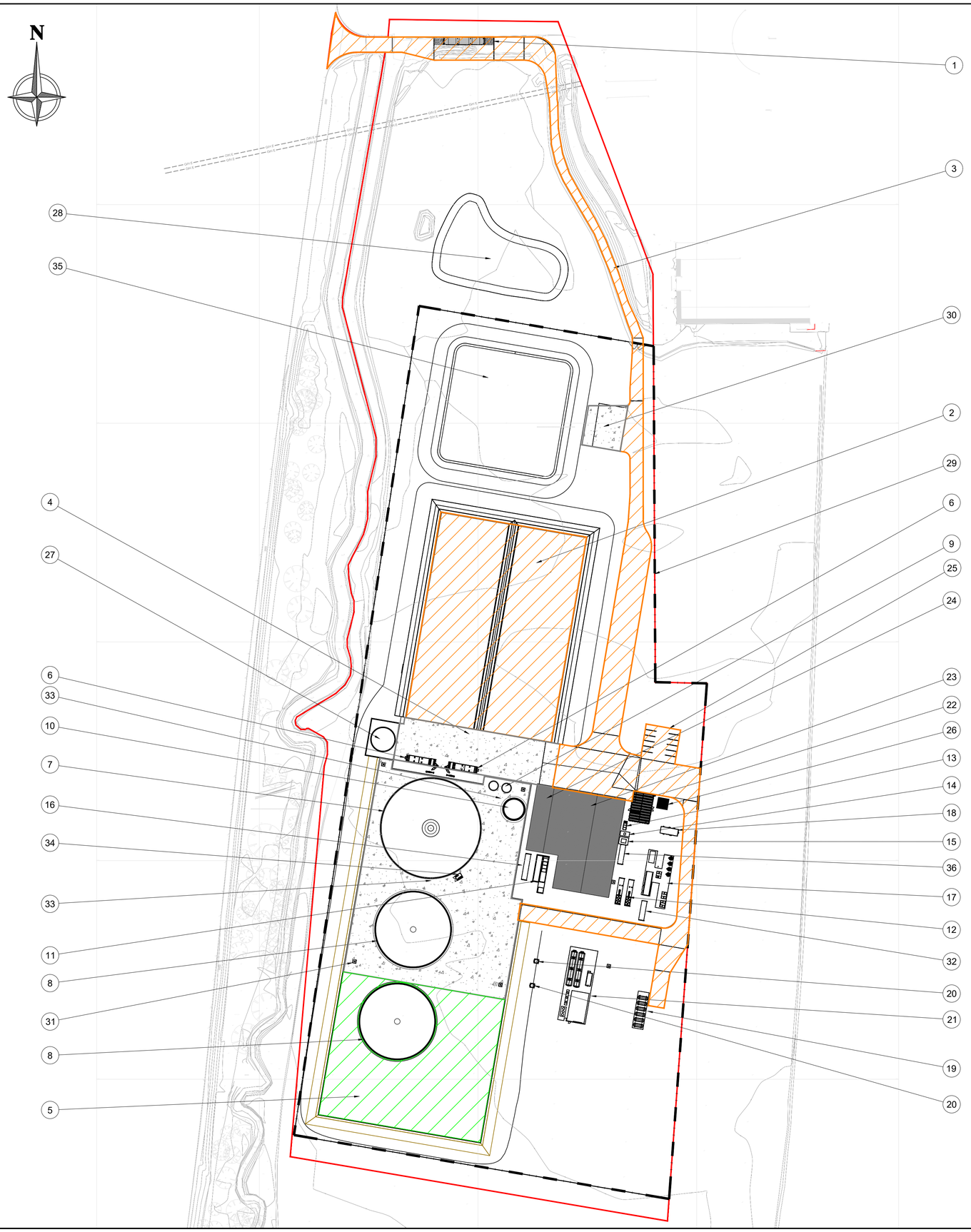
10. REFERENCE DATA AND REMEDIATION

This section will be completed upon site surrender.

11. STATEMENT OF SITE CONDITION

This section will be completed upon site surrender.

APPENDIX A FIGURES AND DRAWINGS



1. WEIGHBRIDGE
2. SILAGE CLAMPS
3. ACCESS ROAD
4. FRONT APRON
5. BUND
6. FEEDERS, NO. 2, 4.7m HIGH, 2.98m WIDE, 13.9m LONG
7. POWER RING TANK, NO. 1, Ø45m, 9m HIGH
8. POST DIGESTERS, NO. 2, Ø34m, 6m HIGH, 14.4m HIGH
9. RECEPTION TANKS, NO. 2, Ø4m, 6.2m HIGH, 1.6 m RAILING
10. SEPARATION LIQUID TANK, NO. 1, Ø9m, 4.5m HIGH
11. ODOUR CONTROL SYSTEM
12. NATURAL GAS GENERATOR, NO. 2
13. STANDBY DIESEL GENERATOR
14. SUB-STATION COMPOUND
15. TRANSFORMER COMPOUND
16. LV DISTRIBUTION
17. BIOMETHANE UPGRADING PLANT
18. GEU KIOSK
19. PROPANE TANKS
20. FLARE, NO. 2
21. CO2 BUILDING 6.1m HIGH, VENT STACK 7.5m HIGH
22. SITE OFFICE AND CONTROL BUILDING, 7m HIGH
23. FEEDSTOCK RECEPTION BUILDING, 12.06m HIGH
24. SEPARATOR BUILDING, 10.72m HIGH
25. CAR PARK
26. FIRE WATER TANKS, NO. 1
27. EFFLUENT TANK, NO.1, Ø11.1M, 6.1m HIGH,
28. DRAINAGE ATTENUATION POND
29. PERIMETER FENCE, 2m HIGH
30. TANKER FILLING LOCATION
31. LIGHTNING PROTECTION MASTS, NO. 6, 22m HIGH
32. BOILER AND HEATING CONTAINER
33. CONTAINERISED PUMPING STATIONS
34. OXYGEN GENERATOR
35. COVERED DIGESTATE LAGOON
36. LV DISTRIBUTION CONTAINER

0 10 20 30 40 50m

Scale 1:1000

NOTES

GRAVEL TRACK
Type 3 gravel

CONCRETE
PAV2 according to BS8500-1

ASPHALT
Agricultural mix

SITE FENCE

HOLDS

REV	DRAWN	DATE	APP. ENG.	DETAILS OF REVISION
4	TF	12/01/26	BP	BUILDING HEIGHTS UPDATED
3	TF	15/12/25	BP	ISSUED FOR PLANNING
2	TF	02/12/25	BP	FOR CLIENT APPROVAL
1	SJH	19/11/24	BP	ISSUED FOR PLANNING

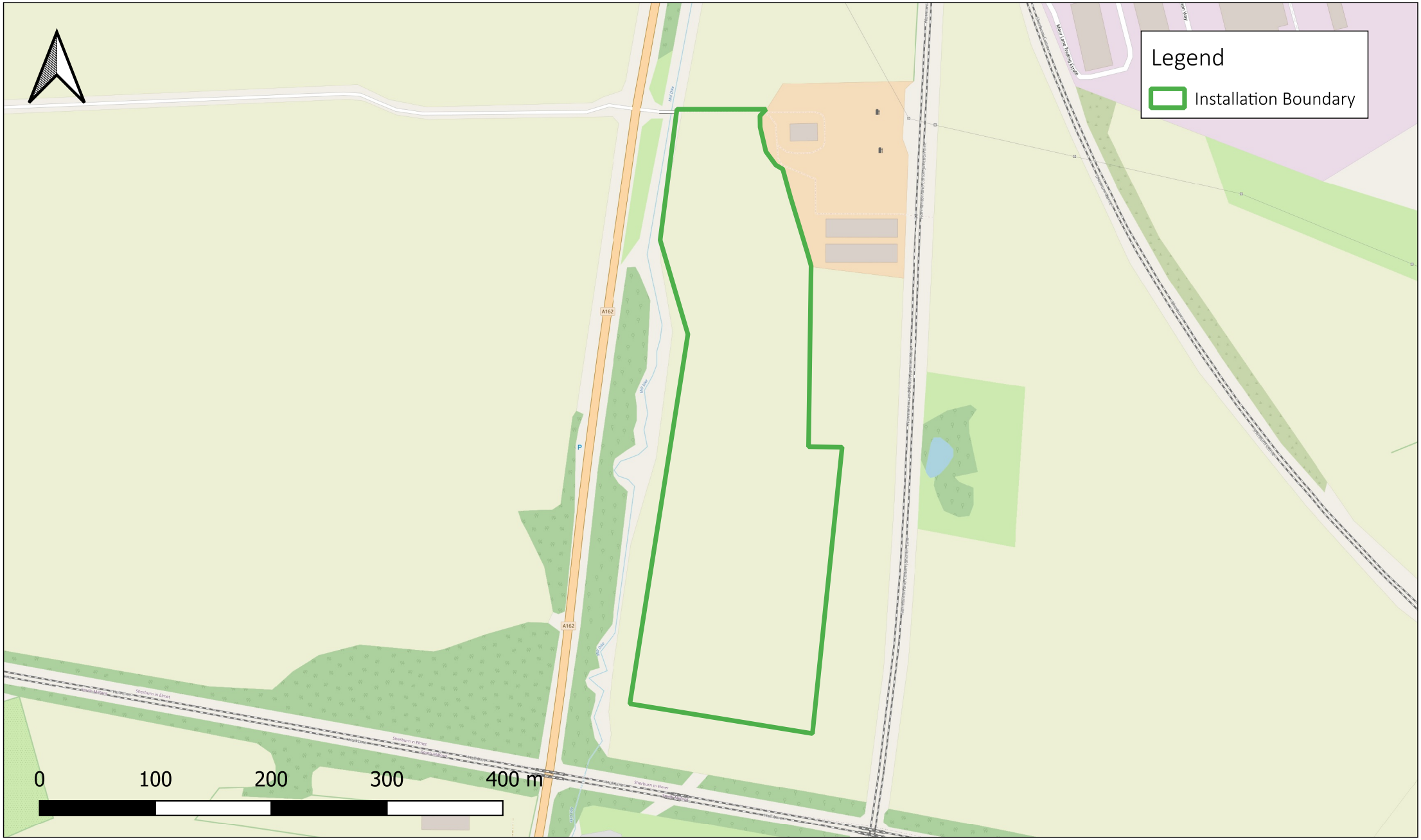
IPDS Intelligent Project Design Services
Cardiff House, Cardiff Road, Barry
Vale of Glamorgan, CF63 2AW

Halstow Energy Ltd

Proposed Agricultural Anaerobic Digestion Facility
Land East of A162, Home Farm, Bond Ings
Sherburn in Elmet, LS25 6EP

CLIENT DRG. No.	TBA
AUTHOR: SJH	APPROVED BY: A SHIRANI
DATE: 14/11/24	APPROVED DATE: 19/11/24
PROJ No.	RBL-0409 Plant 3d
TITLE:	RBL HOME FARM GRANGE PLANNING SITE PLAN
SCALE: 1:1000	IPDS DRG. No. 0409-DWG-RBL-50-1001
REV	4

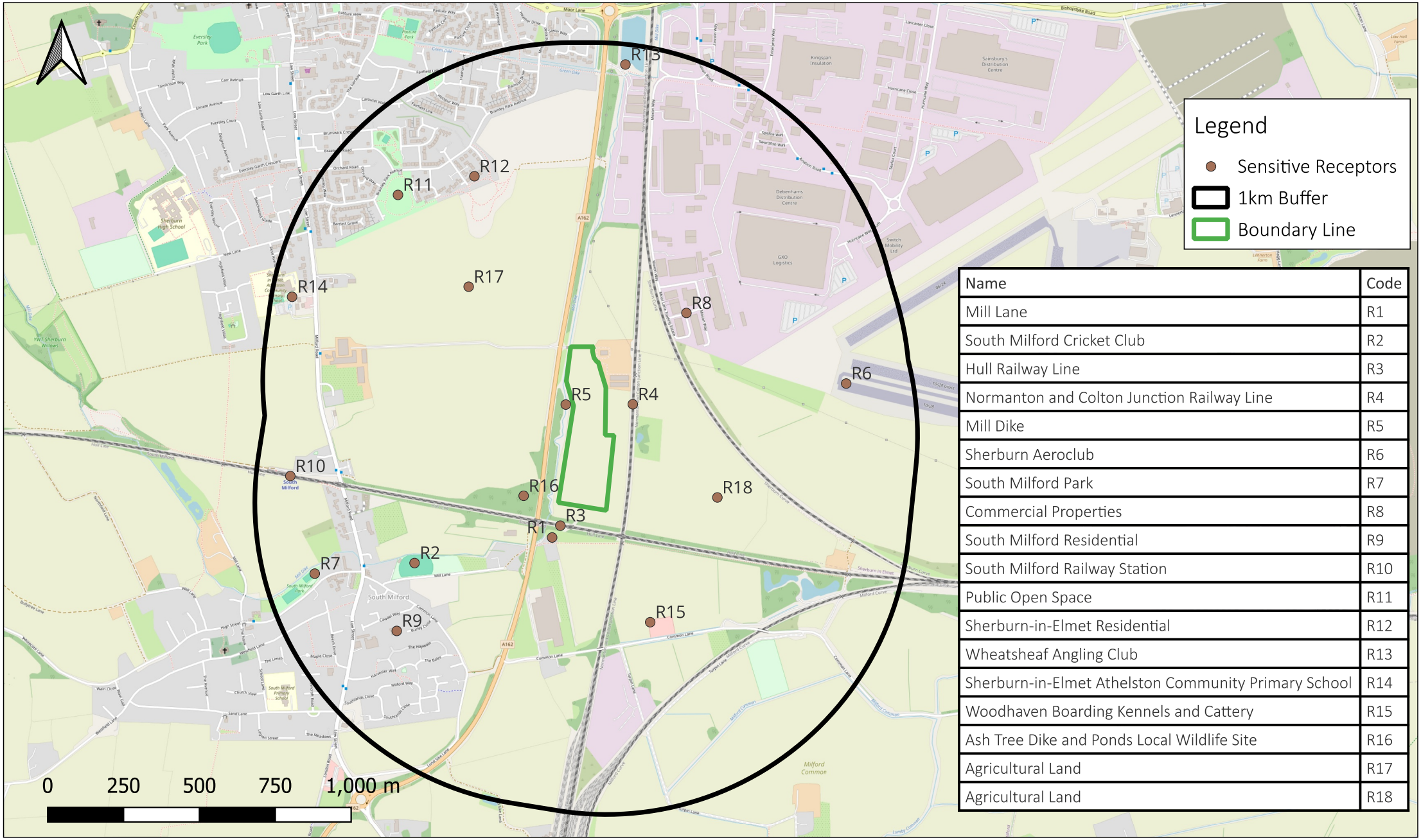
C:\Users\trystan.foote\AppData\Local\Autodesk\AutoCAD Plant 3D\CollaborationCache\RBL-0409 Plant 3d\Orthos\DWGs\50 - Planning\0409-DWG-RBL-50-1001.dwg



Project Number: SOL_25_P007_ENG Doc Ref: Annex B - Site Plans Map Title: Installation Boundary Date: 26/03/2025 Drawn by: RM Checked by: EH	Site Address: Land East of A162, Halstow Energy AD Facility Low Farm South Milford Sherburn in Elmet LS25 6FW	1. Do not scale off this drawing 2. All dimensions to be confirmed on site 3. This drawing is copyright of Sol Environment Ltd 4. This drawing is to be read in conjunction with relevant consultant drawings and specifications 5. QMS Reference: QMS_7.5.39_TEM - Template - GIS Drawing - Horizontal v1

sol environment

a: Unit 5.3 The Paintworks, Bath Road, Bristol, BS4 3EH
w: www.sol-environment.co.uk
e: enquiries@sol-environment.co.uk
t: 01684 572727



Name	Code
Mill Lane	R1
South Milford Cricket Club	R2
Hull Railway Line	R3
Normanton and Colton Junction Railway Line	R4
Mill Dike	R5
Sherburn Aeroclub	R6
South Milford Park	R7
Commercial Properties	R8
South Milford Residential	R9
South Milford Railway Station	R10
Public Open Space	R11
Sherburn-in-Elmet Residential	R12
Wheatsheaf Angling Club	R13
Sherburn-in-Elmet Athelston Community Primary School	R14
Woodhaven Boarding Kennels and Cattery	R15
Ash Tree Dike and Ponds Local Wildlife Site	R16
Agricultural Land	R17
Agricultural Land	R18

Project Number: SOL_25_P007_ENG
Doc Ref: Annex A - Site Plans
Map Title: Sensitive Receptors (Home Farm Grange)
Date: 03/04/2025
Drawn by: RM
Checked by: EH

Site Address:
Land East of A162, Halstow Energy AD Facility
Low Farm
South Milford
Sherburn in Elmet
LS25 6FW

1. Do not scale off this drawing
2. All dimensions to be confirmed on site
3. This drawing is copyright of Sol Environment Ltd
4. This drawing is to be read in conjunction with relevant consultant drawings and specifications
5. QMS Reference: QMS_7.5.39_TEM - Template - GIS Drawing - Horizontal v1

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APPENDIX B GROUNDSURE REPORT 2025

Groundsure LOCATION INTELLIGENCE

Enviro+Geo Insight

Home Farm Grange

Order Details

Date: 24/03/2025

Your ref: SOL_25_P007_ENG - Home Farm Grange

Our Ref: GS-WW2-W5C-P3H-UI8

Site Details

Location: 450410 432189

Area: 6.96 ha

Authority: The North Yorkshire Council ↗



Summary of findings p. 2 >

Aerial image p. 9 >

OS MasterMap site plan p.14 >

Insight User Guide ↗

Contact us with any questions at:
info@groundsure.com ↗
01273 257 755

Certified B Corporation

Summary of findings

Page	Section	Past land use >	On site	0-50m	50-250m	250-500m	500-2000m
15 >	1.1 >	Historical industrial land uses >	0	0	7	18	-
17 >	1.2 >	Historical tanks >	0	1	0	1	-
17	1.3	Historical energy features	0	0	0	0	-
17	1.4	Historical petrol stations	0	0	0	0	-
18	1.5	Historical garages	0	0	0	0	-
18	1.6	Historical military land	0	0	0	0	-
Page	Section	Past land use - un-grouped >	On site	0-50m	50-250m	250-500m	500-2000m
19 >	2.1 >	Historical industrial land uses >	0	0	8	24	-
21 >	2.2 >	Historical tanks >	0	3	0	1	-
21	2.3	Historical energy features	0	0	0	0	-
21	2.4	Historical petrol stations	0	0	0	0	-
22	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
23	3.1	Active or recent landfill	0	0	0	0	-
23	3.2	Historical landfill (BGS records)	0	0	0	0	-
24	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
24	3.4	Historical landfill (EA/NRW records)	0	0	0	0	-
24	3.5	Historical waste sites	0	0	0	0	-
24 >	3.6 >	Licensed waste sites >	0	2	0	1	-
25 >	3.7 >	Waste exemptions >	0	0	0	14	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
27 >	4.1 >	Recent industrial land uses >	0	2	0	-	-
28	4.2	Current or recent petrol stations	0	0	0	0	-
28	4.3	Electricity cables	0	0	0	0	-
28	4.4	Gas pipelines	0	0	0	0	-
28	4.5	Sites determined as Contaminated Land	0	0	0	0	-

28 >	4.6 >	Control of Major Accident Hazards (COMAH) >	0	0	0	2	-
29	4.7	Regulated explosive sites	0	0	0	0	-
29 >	4.8 >	Hazardous substance storage/usage >	0	0	0	1	-
29	4.9	Historical licensed industrial activities (IPC)	0	0	0	0	-
30	4.10	Licensed industrial activities (Part A(1))	0	0	0	0	-
30 >	4.11 >	Licensed pollutant release (Part A(2)/B) >	0	0	0	1	-
30	4.12	Radioactive Substance Authorisations	0	0	0	0	-
30	4.13	Licensed Discharges to controlled waters	0	0	0	0	-
31	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
31	4.15	Pollutant release to public sewer	0	0	0	0	-
31	4.16	List 1 Dangerous Substances	0	0	0	0	-
31	4.17	List 2 Dangerous Substances	0	0	0	0	-
31 >	4.18 >	Pollution Incidents (EA/NRW) >	0	0	0	3	-
32	4.19	Pollution inventory substances	0	0	0	0	-
32	4.20	Pollution inventory waste transfers	0	0	0	0	-
32	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
33 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
35 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
37 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
38 >	5.4 >	Groundwater vulnerability- soluble rock risk >	Identified (within 0m)				
39	5.5	Groundwater vulnerability- local information	None (within 0m)				
40 >	5.6 >	Groundwater abstractions >	0	0	0	6	32
50 >	5.7 >	Surface water abstractions >	1	0	0	0	6
52	5.8	Potable abstractions	0	0	0	0	0
52	5.9	Source Protection Zones	0	0	0	0	-
52	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
53 >	6.1 >	Water Network (OS MasterMap) >	0	4	6	-	-

54 >	6.2 >	Surface water features >	0	3	6	-	-
55 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
55 >	6.4 >	WFD Surface water bodies >	1	0	0	-	-
55 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	River and coastal flooding >	On site	0-50m	50-250m	250-500m	500-2000m
57 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
58	7.2	Historical Flood Events	0	0	0	-	-
58	7.3	Flood Defences	0	0	0	-	-
58	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
58	7.5	Flood Storage Areas	0	0	0	-	-
59 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
60 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	Surface water flooding >					
61 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	Groundwater flooding >					
63 >	9.1 >	Groundwater flooding >	High (within 50m)				
Page	Section	Environmental designations >	On site	0-50m	50-250m	250-500m	500-2000m
64 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	0	0	1
65	10.2	Conserved wetland sites (Ramsar sites)	0	0	0	0	0
65	10.3	Special Areas of Conservation (SAC)	0	0	0	0	0
65	10.4	Special Protection Areas (SPA)	0	0	0	0	0
65	10.5	National Nature Reserves (NNR)	0	0	0	0	0
66	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
66	10.7	Designated Ancient Woodland	0	0	0	0	0
66	10.8	Biosphere Reserves	0	0	0	0	0
66	10.9	Forest Parks	0	0	0	0	0
67	10.10	Marine Conservation Zones	0	0	0	0	0
67 >	10.11 >	Green Belt >	1	0	0	0	0
67	10.12	Proposed Ramsar sites	0	0	0	0	0

67	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
68	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
68	10.15	Nitrate Sensitive Areas	0	0	0	0	0
68 >	10.16 >	Nitrate Vulnerable Zones >	2	0	0	0	1
69 >	10.17 >	SSSI Impact Risk Zones >	1	-	-	-	-
70 >	10.18 >	SSSI Units >	0	0	0	0	3
Page	Section	Visual and cultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
72	11.1	World Heritage Sites	0	0	0	-	-
73	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
73	11.3	National Parks	0	0	0	-	-
73 >	11.4 >	Listed Buildings >	0	0	1	-	-
74	11.5	Conservation Areas	0	0	0	-	-
74	11.6	Scheduled Ancient Monuments	0	0	0	-	-
74	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
75 >	12.1 >	Agricultural Land Classification >	Grade 3 (within 250m)				
76	12.2	Open Access Land	0	0	0	-	-
76	12.3	Tree Felling Licences	0	0	0	-	-
76	12.4	Environmental Stewardship Schemes	0	0	0	-	-
76 >	12.5 >	Countryside Stewardship Schemes >	2	2	2	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
78 >	13.1 >	Priority Habitat Inventory >	0	0	3	-	-
79	13.2	Habitat Networks	0	0	0	-	-
79	13.3	Open Mosaic Habitat	0	0	0	-	-
79	13.4	Limestone Pavement Orders	0	0	0	-	-
Page	Section	Geology 1:10,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
80 >	14.1 >	10k Availability >	Identified (within 500m)				
81 >	14.2 >	Artificial and made ground (10k) >	0	2	8	10	-
83 >	14.3 >	Superficial geology (10k) >	3	0	0	3	-

84	14.4	Landslip (10k)	0	0	0	0	-
85 >	14.5 >	Bedrock geology (10k) >	2	1	0	4	-
86 >	14.6 >	Bedrock faults and other linear features (10k) >	1	0	1	3	-
Page	Section	Geology 1:50,000 scale >	On site	0-50m	50-250m	250-500m	500-2000m
87 >	15.1 >	50k Availability >	Identified (within 500m)				
88 >	15.2 >	Artificial and made ground (50k) >	0	0	0	2	-
89	15.3	Artificial ground permeability (50k)	0	0	-	-	-
90 >	15.4 >	Superficial geology (50k) >	2	0	2	1	-
91 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
91	15.6	Landslip (50k)	0	0	0	0	-
91	15.7	Landslip permeability (50k)	None (within 50m)				
92 >	15.8 >	Bedrock geology (50k) >	2	1	2	1	-
93 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
93 >	15.10 >	Bedrock faults and other linear features (50k) >	1	0	2	3	-
Page	Section	Boreholes >	On site	0-50m	50-250m	250-500m	500-2000m
95 >	16.1 >	BGS Boreholes >	1	4	13	-	-
Page	Section	Natural ground subsidence >					
97 >	17.1 >	Shrink swell clays >	Low (within 50m)				
98 >	17.2 >	Running sands >	Low (within 50m)				
100 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
101 >	17.4 >	Collapsible deposits >	Very low (within 50m)				
102 >	17.5 >	Landslides >	Very low (within 50m)				
103 >	17.6 >	Ground dissolution of soluble rocks >	Low (within 50m)				
Page	Section	Mining and ground workings >	On site	0-50m	50-250m	250-500m	500-2000m
105	18.1	BritPits	0	0	0	0	-
106 >	18.2 >	Surface ground workings >	0	1	2	-	-
106	18.3	Underground workings	0	0	0	0	0
106	18.4	Underground mining extents	0	0	0	0	-
106	18.5	Historical Mineral Planning Areas	0	0	0	0	-

107	18.6	Non-coal mining	0	0	0	0	0
107	18.7	JPB mining areas	None (within 0m)				
107	18.8	The Coal Authority non-coal mining	0	0	0	0	-
107	18.9	Researched mining	0	0	0	0	-
108	18.10	Mining record office plans	0	0	0	0	-
108	18.11	BGS mine plans	0	0	0	0	-
108 >	**18.12 >**	**Coal mining >**	Identified (within 0m)				
108	18.13	Brine areas	None (within 0m)				
109	18.14	Gypsum areas	None (within 0m)				
109	18.15	Tin mining	None (within 0m)				
109	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
110	19.1	Natural cavities	0	0	0	0	-
110	19.2	Mining cavities	0	0	0	0	0
110	19.3	Reported recent incidents	0	0	0	0	-
110	19.4	Historical incidents	0	0	0	0	-
Page	Section	**Radon >**					
112 >	**20.1 >**	**Radon >**	Less than 1% (within 0m)				
Page	Section	**Soil chemistry >**	On site	0-50m	50-250m	250-500m	500-2000m
114 >	**21.1 >**	**BGS Estimated Background Soil Chemistry >**	5	9	-	-	-
115	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
115	21.3	BGS Measured Urban Soil Chemistry	0	0	-	-	-
Page	Section	**Railway infrastructure and projects >**	On site	0-50m	50-250m	250-500m	500-2000m
116	22.1	Underground railways (London)	0	0	0	-	-
116	22.2	Underground railways (Non-London)	0	0	0	-	-
117	22.3	Railway tunnels	0	0	0	-	-
117 >	**22.4 >**	**Historical railway and tunnel features >**	0	0	1	-	-
117	22.5	Royal Mail tunnels	0	0	0	-	-
117	22.6	Historical railways	0	0	0	-	-

118 >	22.7 >	Railways >	0	0	31	-	-
119	22.8	Crossrail 2	0	0	0	0	-
119	22.9	HS2	0	0	0	0	-

Recent aerial photograph



Capture Date: 04/04/2023

Site Area: 6.96ha

Recent site history - 2020 aerial photograph



Capture Date: 24/06/2020

Site Area: 6.96ha

Recent site history - 2017 aerial photograph



Capture Date: 19/09/2017

Site Area: 6.96ha

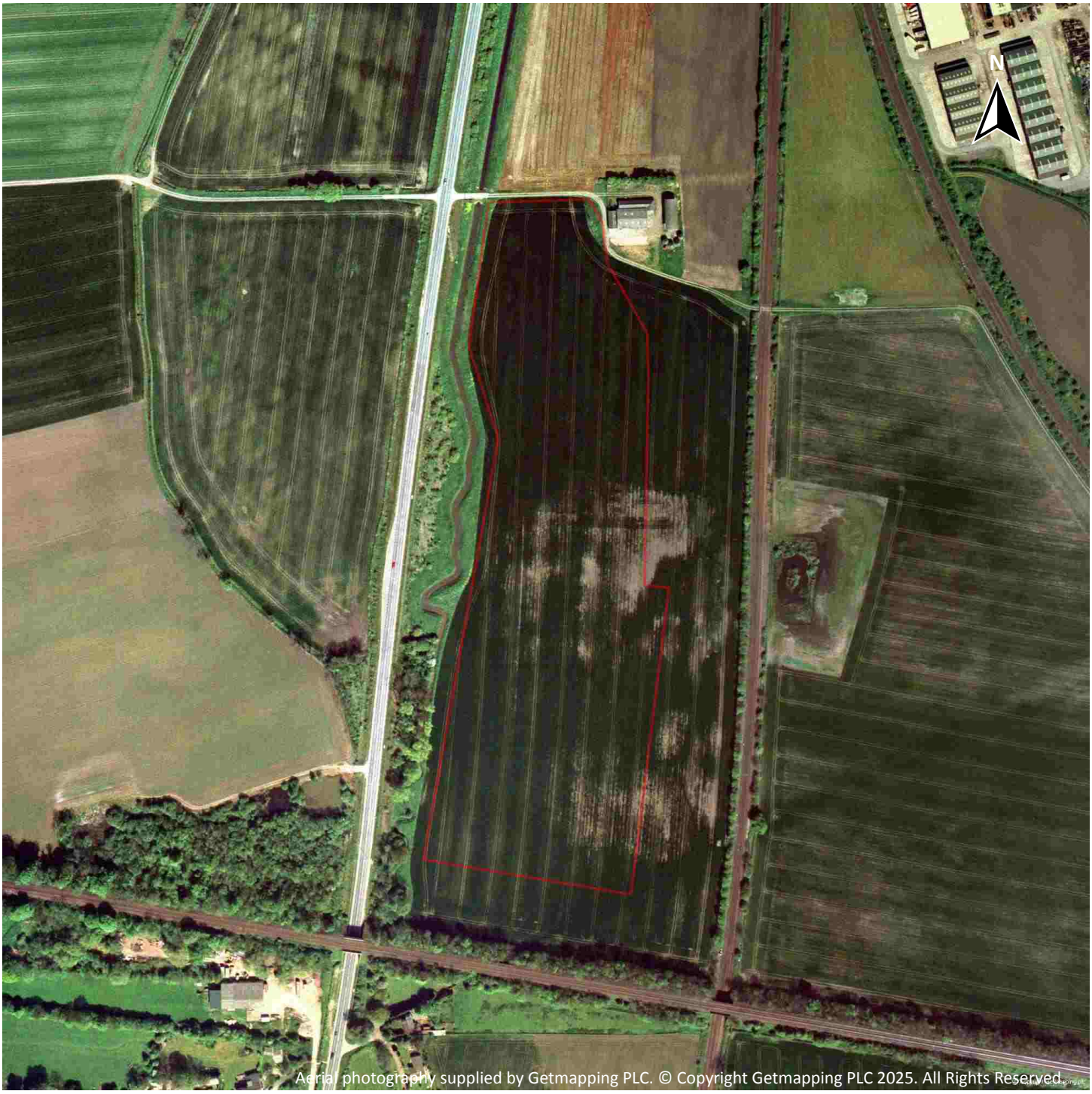
Recent site history - 2007 aerial photograph



Capture Date: 24/08/2007

Site Area: 6.96ha

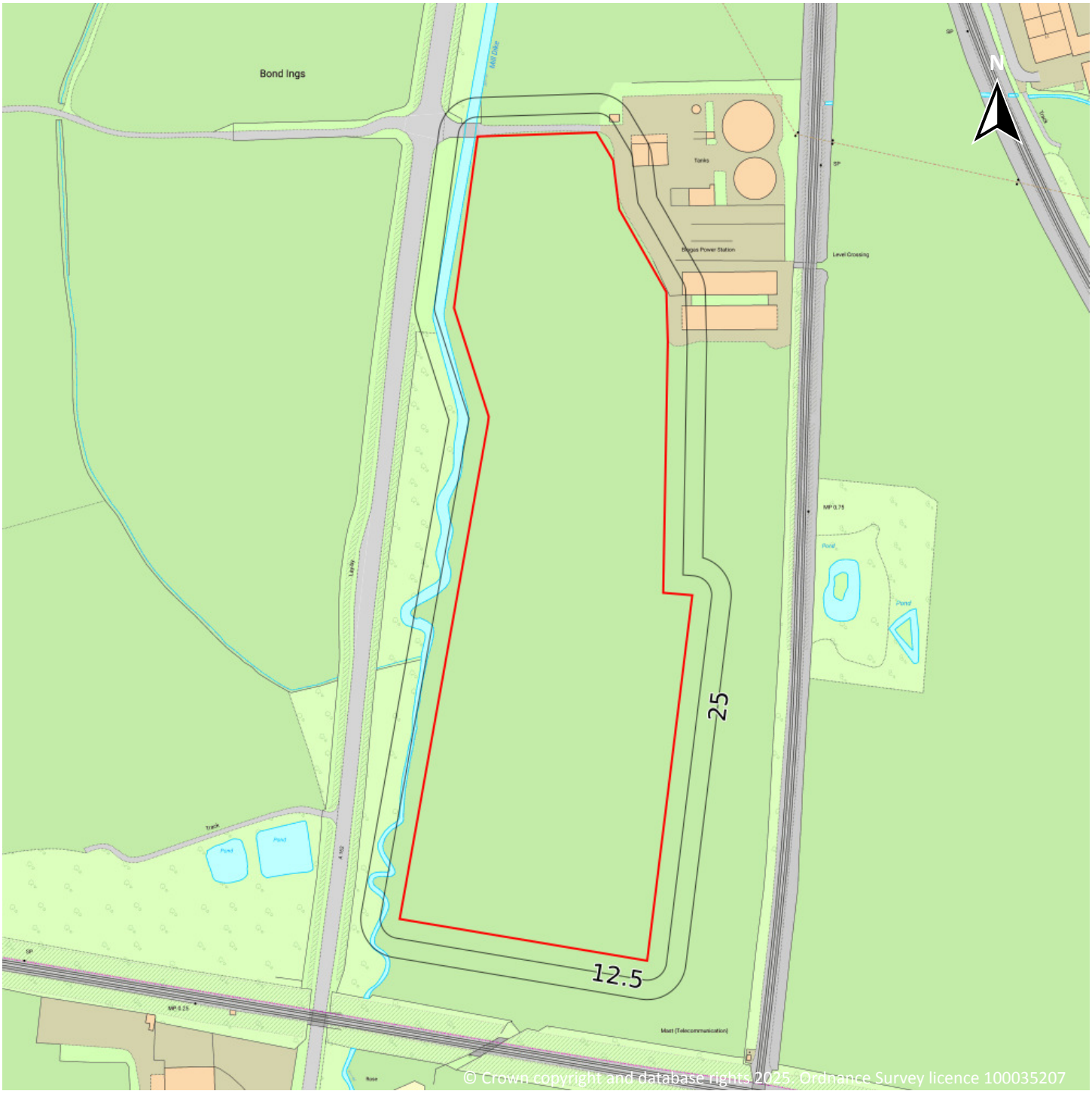
Recent site history - 1999 aerial photograph



Capture Date: 03/05/1999

Site Area: 6.96ha

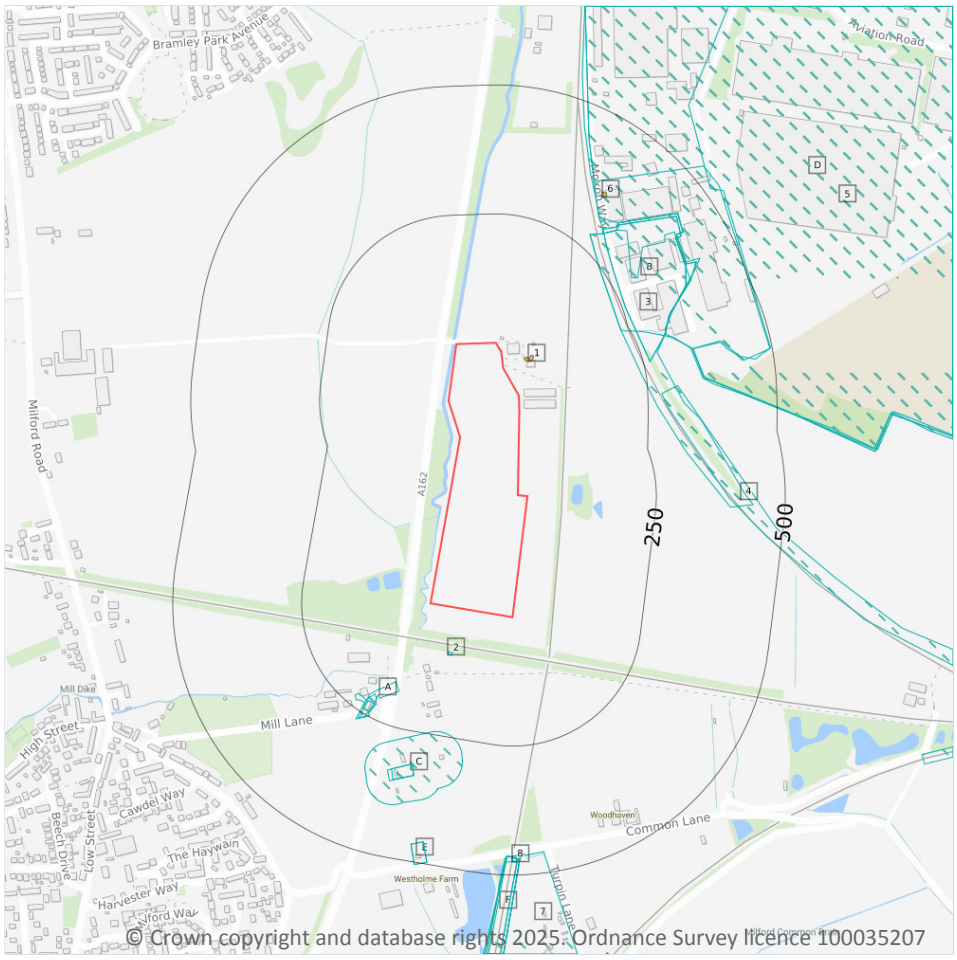
OS MasterMap site plan



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Site Area: 6.96ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

1.1 Historical industrial land uses

Records within 500m	25

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 1:10,560 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
2	87m S	Railway Buildings	1950	1436280

ID	Location	Land use	Dates present	Group ID
A	166m SW	Unspecified Mill	1950 - 1957	1503292
A	206m SW	Unspecified Mill	1908	1552732
A	223m SW	Unspecified Mill	1967	1534587
3	233m NE	Railway Sidings	1950	1574083
B	233m NE	Railway Wagon Works	1950	1454642
C	243m S	Unspecified Works	1967	1460800
B	256m NE	Railway Sidings	1957 - 1967	1514028
B	256m NE	Unspecified Works	1957 - 1967	1571250
4	277m NE	Railway Sidings	1957	1528261
D	297m NE	Airfield	1950	1493773
D	309m NE	Disused Airfield	1957 - 1967	1511088
C	312m S	Sewage Works	1950	1543769
C	313m S	Sewage Works	1908	1539884
5	349m NE	Disused Airfield	1986	1582887
D	349m NE	Airfield	1994	1505581
E	458m S	Pumping Station	1994	1506369
E	458m S	Pumping Station	1986	1546461
7	459m S	Unspecified Works	1967	1460295
F	460m S	Railway Sidings	1950	1491188
F	463m S	Railway Sidings	1986 - 1994	1493977
F	463m S	Railway Sidings	1957	1504268
F	463m S	Railway Sidings	1967	1551826
8	465m S	Railway Building	1908 - 1950	1517662
F	474m S	Railway Sidings	1908	1534640

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	2

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use map on **page 15 >**

ID	Location	Land use	Dates present	Group ID
1	42m N	Tanks	1985 - 1995	255138
6	351m N	Unspecified Tank	1960	237644

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

1.5 Historical garages

Records within 500m	0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale, intelligently grouped into contiguous features. To prevent misrepresentation of the size of historical features at any given time, features are only grouped if they have similar geometries within immediately preceding or succeeding map editions. See section 2 for a breakdown of grouping if required. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

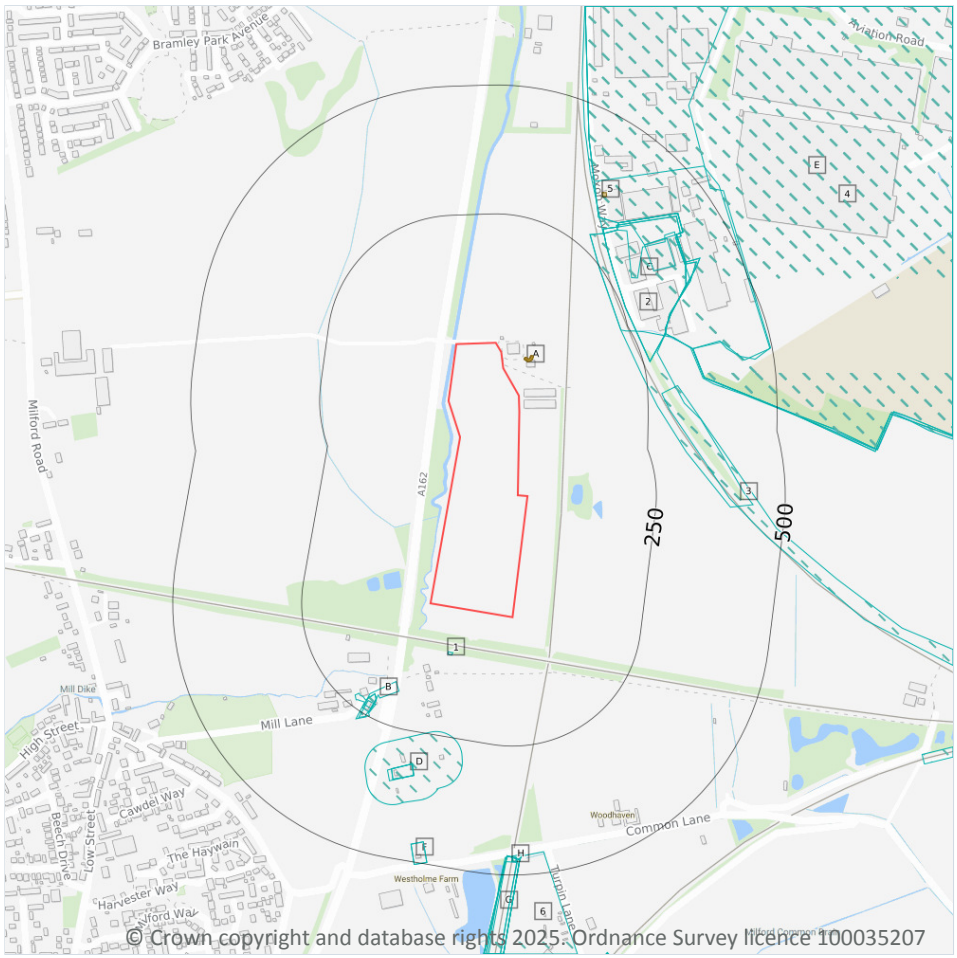
1.6 Historical military land

Records within 500m	0

Areas of military land digitised from multiple sources including the National Archives, local records, MOD records and verified other sources, intelligently grouped into contiguous features.

This data is sourced from Ordnance Survey / Groundsure / other sources.

2 Past land use - un-grouped



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

2.1 Historical industrial land uses

Records within 500m	32

Potentially contaminative land use features digitised from historical Ordnance Survey mapping at 1:10,000 and 10,560 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
1	87m S	Railway Buildings	1950	1436280
B	166m SW	Unspecified Mill	1957	1503292
B	206m SW	Unspecified Mill	1908	1552732

ID	Location	Land Use	Date	Group ID
B	206m SW	Unspecified Mill	1950	1503292
B	223m SW	Unspecified Mill	1967	1534587
2	233m NE	Railway Sidings	1950	1574083
C	233m NE	Railway Wagon Works	1950	1454642
D	243m S	Unspecified Works	1967	1460800
C	256m NE	Railway Sidings	1967	1514028
C	256m NE	Railway Sidings	1957	1514028
C	256m NE	Unspecified Works	1957	1571250
3	277m NE	Railway Sidings	1957	1528261
E	297m NE	Airfield	1950	1493773
E	309m NE	Disused Airfield	1967	1511088
E	309m NE	Disused Airfield	1957	1511088
D	312m S	Sewage Works	1950	1543769
D	313m S	Sewage Works	1908	1539884
D	313m S	Sewage Works	1908	1539884
C	335m NE	Unspecified Works	1967	1571250
4	349m NE	Disused Airfield	1986	1582887
E	349m NE	Airfield	1994	1505581
F	458m S	Pumping Station	1986	1546461
F	458m S	Pumping Station	1994	1506369
6	459m S	Unspecified Works	1967	1460295
G	460m S	Railway Sidings	1950	1491188
G	463m S	Railway Sidings	1967	1551826
G	463m S	Railway Sidings	1957	1504268
G	463m S	Railway Sidings	1986	1493977
G	463m S	Railway Sidings	1994	1493977
H	465m S	Railway Building	1950	1517662
H	466m S	Railway Building	1908	1517662

ID	Location	Land Use	Date	Group ID
G	474m S	Railway Sidings	1908	1534640

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	4

Tank features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

Features are displayed on the Past land use - un-grouped map on **page 19 >**

ID	Location	Land Use	Date	Group ID
A	42m N	Tanks	1985	255138
A	42m N	Tanks	1993	255138
A	44m N	Tanks	1995	255138
5	351m N	Unspecified Tank	1960	237644

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	0

Energy features digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

2.4 Historical petrol stations

Records within 500m	0

Petrol stations digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

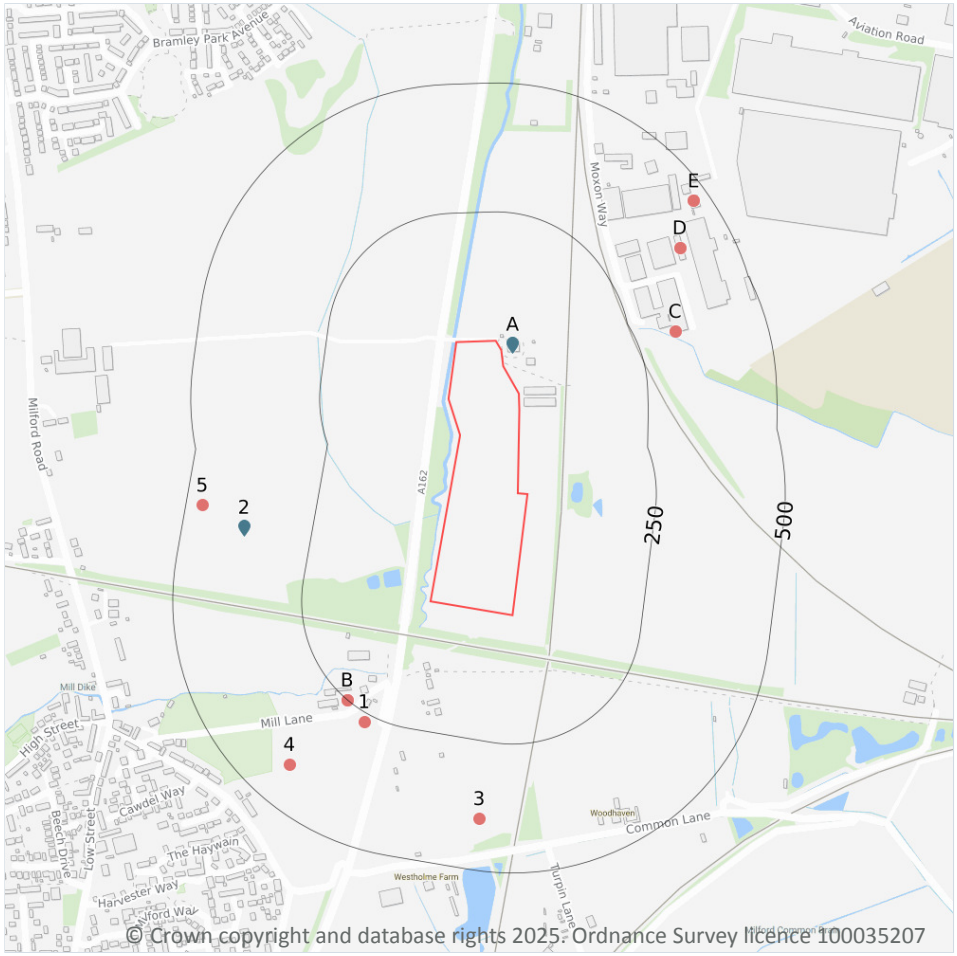
2.5 Historical garages

Records within 500m	0

Garages digitised from historical Ordnance Survey mapping at high-detail 1:1,250 and 1:2,500 scale. Any records shown are available intelligently grouped in section 1. Grouped and the original un-grouped features can be cross-referenced across sections 1 and 2 using the 'Group ID'.

This data is sourced from Ordnance Survey / Groundsure.

3 Waste and landfill



Site Outline

Search buffers in metres (m)

Licensed waste sites

Waste exemptions

3.1 Active or recent landfill

Records within 500m	0

Active or recently closed landfill sites under Environment Agency/Natural Resources Wales regulation.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.2 Historical landfill (BGS records)

Records within 500m	0

Landfill sites identified on a survey carried out on behalf of the DoE in 1973. These sites may have been closed or operational at this time.

This data is sourced from the British Geological Survey.

3.3 Historical landfill (LA/mapping records)

Records within 500m	0

Landfill sites identified from Local Authority records and high detail historical mapping.

This data is sourced from the Ordnance Survey/Groundsure and Local Authority records.

3.4 Historical landfill (EA/NRW records)

Records within 500m	0

Known historical (closed) landfill sites (e.g. sites where there is no PPC permit or waste management licence currently in force). This includes sites that existed before the waste licensing regime and sites that have been licensed in the past but where a licence has been revoked, ceased to exist or surrendered and a certificate of completion has been issued.

This data is sourced from the Environment Agency and Natural Resources Wales.

3.5 Historical waste sites

Records within 500m	0

Waste site records derived from Local Authority planning records and high detail historical mapping.

This data is sourced from Ordnance Survey/Groundsure and Local Authority records.

3.6 Licensed waste sites

Records within 500m	3

Active or recently closed waste sites under Environment Agency/Natural Resources Wales regulation.

Features are displayed on the Waste and landfill map on **page 23 >**

ID	Location	Details		
A	24m N	Site Name: Low Farm Energy Ltd Site Address: Low Farm, Sherburn In Elmet, Leeds, West Yorkshire, LS25 6EP Correspondence Address: -	Type of Site: On-farm anaerobic digestion - farm wastes only Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: LFE001 EPR reference: EA/EPR/EB3305FS/A001 Operator: Low Farm Energy Ltd Waste Management licence No: 403432 Annual Tonnage: 36499	Issue Date: 01/08/2016 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

ID	Location	Details		
A	24m N	Site Name: Low Farm Energy Ltd Site Address: Low Farm, Sherburn In Elmet, Leeds, West Yorkshire, LS25 6EP Correspondence Address: -	Type of Site: On-farm anaerobic digestion - farm wastes only Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: 627934 EPR reference: EA/EPR/EB3305FS Operator: Low Farm Energy Ltd Waste Management licence No: 403432 Annual Tonnage: 36499	Issue Date: 01/08/2016 Effective Date: 01/08/2016 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
2	382m W	Site Name: Newthorpe Quarry Site Address: Newthorpe Quarry, Newthorpe, Sheburn In Elmet, North Yorkshire, LS25 6AA Correspondence Address: -	Type of Site: Physico-Chemical Treatment Facility Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: 660639 EPR reference: EA/EPR/KB3104TV Operator: Newthorpe Aggregates Limited Waste Management licence No: 407505 Annual Tonnage: 150000	Issue Date: 27/01/2022 Effective Date: 27/01/2022 Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

This data is sourced from the Environment Agency and Natural Resources Wales.

3.7 Waste exemptions

Records within 500m **14**

Activities involving the storage, treatment, use or disposal of waste that are exempt from needing a permit. Exemptions have specific limits and conditions that must be adhered to.

Features are displayed on the Waste and landfill map on **page 23 >**

ID	Location	Site	Reference	Category	Sub-Category	Description
B	252m SW	Ash Tree Farm Mill Lane Leeds Ls25 5bn	EPR/JE5257YW/A001	Disposing of waste exemption	Agricultural waste only	Burning waste in the open
B	252m SW	Ash Tree Farm Mill Lane Leeds Ls25 5bn	EPR/JE5257YW/A001	Disposing of waste exemption	Agricultural waste only	Deposit of waste from dredging of inland waters

ID	Location	Site	Reference	Category	Sub-Category	Description
B	252m SW	Ash Tree Farm Mill Lane Leeds Ls25 5bn	EPR/JE5257YW/A001	Treating waste exemption	Agricultural waste only	Treatment of waste wood and waste plant matter by chipping, shredding, cutting or pulverising
B	252m SW	Ash Tree Farm Mill Lane Leeds Ls25 5bn	EPR/JE5257YW/A001	Using waste exemption	Agricultural waste only	Use of waste for a specified purpose
1	268m SW	Burley House Farm, South Milford, Leeds, Ls25 5as	WEX131830	Storing waste exemption	On a farm	Storage of sludge
C	325m NE	31, Moor Lane Trading Estate, Sherburn In Elmet, Leeds, Ls25 6es	WEX111161	Storing waste exemption	Not on a farm	Storage of waste in a secure place
C	325m NE	31, Moor Lane Trading Estate, Sherburn In Elmet, Leeds, Ls25 6es	WEX111161	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
D	398m NE	Unit 31 Moxon Way, Moor Lane Trading Estate, Sherburn In Elmet, Leeds, Ls256es	WEX256248	Storing waste exemption	Not on a farm	Storage of waste in a secure place
D	398m NE	Unit 31 Moxon Way, Moor Lane Trading Estate, Sherburn In Elmet, Leeds, Ls256es	WEX256248	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
3	401m S	Burley House Farm South Milford Ls25 5as	EPR/HF0136QJ/A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge
4	420m SW	Burley House Farm South Milford Ls25 5as	EPR/TF0636QD/A001	Storing waste exemption	Non-agricultural waste only	Storage of sludge
5	469m W	-	WEX344485	Storing waste exemption	On a farm	Storage of sludge
E	469m NE	Unit 26 Moor Lane Trading Estate Leeds West Yorkshire Ls25 6es	EPR/WF0005SK/A001	Storing waste exemption	Both agricultural and non-agricultural waste	Storage of waste in a secure place
E	469m NE	Unit 26 Moor Lane Trading Estate Leeds West Yorkshire Ls25 6es	EPR/WF0005SK/A001	Treating waste exemption	Both agricultural and non-agricultural waste	Preparatory treatments (baling, sorting, shredding etc)

This data is sourced from the Environment Agency and Natural Resources Wales.

4 Current industrial land use



Site Outline

Search buffers in metres (m)

Recent industrial land uses

Control of Major Accident Hazards

Hazardous substance storage/usage

Licensed pollutant release (Part A(2)/B)

Pollution Incidents (EA/NRW)

4.1 Recent industrial land uses

Records within 250m	2

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 27 >**

ID	Location	Company	Address	Activity	Category
1	38m NE	Biogas Power Station	North Yorkshire, LS25	Energy Production	Industrial Features
2	48m S	Mast (Telecommunication)	North Yorkshire, LS25	Telecommunications Features	Infrastructure and Facilities

This data is sourced from Ordnance Survey.

4.2 Current or recent petrol stations

Records within 500m	0

Open, closed, under development and obsolete petrol stations.

This data is sourced from Experian.

4.3 Electricity cables

Records within 500m	0

High voltage underground electricity transmission cables.

This data is sourced from National Grid.

4.4 Gas pipelines

Records within 500m	0

High pressure underground gas transmission pipelines.

This data is sourced from National Grid.

4.5 Sites determined as Contaminated Land

Records within 500m	0

Contaminated Land Register of sites designated under Part 2a of the Environmental Protection Act 1990.

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	2

Control of Major Accident Hazards (COMAH) sites. This data includes upper and lower tier sites, and includes a historical archive of COMAH sites and Notification of Installations Handling Hazardous Substances (NIHHS) records.

Features are displayed on the Current industrial land use map on **page 27 >**

ID	Location	Company	Address	Operational status	Tier
A	269m NE	Lansdowne Chemicals Plc	Lansdowne Chemicals Plc, Sherburn in Elmet, Leeds, Moor Lane Trading Estate, Sherburn in Elmet, Leeds, West Yorkshire, LS25 6ES	Historical NIHHS Site	-
A	269m NE	Gower Chemicals Limited	Gower Chemicals Limited, Sherburn in Elmet, Leeds, Cygnus House, Moxon Way, Moor Lane Trading Estate, Sherburn in Elmet, Leeds, West Yorkshire, LS25 6ES	Current COMAH Site	COMAH Upper Tier Operator

This data is sourced from the Health and Safety Executive.

4.7 Regulated explosive sites

Records within 500m	0

Sites registered and licensed by the Health and Safety Executive under the Manufacture and Storage of Explosives Regulations 2005 (MSER). The last update to this data was in April 2011.

This data is sourced from the Health and Safety Executive.

4.8 Hazardous substance storage/usage

Records within 500m	1

Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

Features are displayed on the Current industrial land use map on **page 27 >**

ID	Location	Details	
4	469m NE	Application reference number: No Details Application status: Approved Application date: No Details Address: Gower Chemicals Ltd, Moor Lane Trading Estate, Sherburn in Elmet, North Yorkshire, England, LS25 6ES	Details: No Details Enforcement: No Details Date of enforcement: No Details Comment: No Details

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	0

Integrated Pollution Control (IPC) records of substance releases to air, land and water. This data represents a historical archive as the IPC regime has been superseded.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.10 Licensed industrial activities (Part A(1))

Records within 500m	0

Records of Part A(1) installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.11 Licensed pollutant release (Part A(2)/B)

Records within 500m	1

Records of Part A(2) and Part B installations regulated under the Environmental Permitting (England and Wales) Regulations 2016 for the release of substances to the environment.

Features are displayed on the Current industrial land use map on **page 27 >**

ID	Location	Address	Details	
A	436m NE	Moxon Leyland Daf Truck Services, Moor Lane Trading Estate, Sherburn-In-Elmete, LS25 6ES	Process: Waste Oil Burner 0.4MW Status: Revoked Permit Type: Part B	Enforcement: No Enforcements Notified Date of enforcement: No Enforcements Notified Comment: No Enforcements Notified

This data is sourced from Local Authority records.

4.12 Radioactive Substance Authorisations

Records within 500m	0

Records of the storage, use, accumulation and disposal of radioactive substances regulated under the Radioactive Substances Act 1993.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.13 Licensed Discharges to controlled waters

Records within 500m	0

Discharges of treated or untreated effluent to controlled waters under the Water Resources Act 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.14 Pollutant release to surface waters (Red List)

Records within 500m	0

Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulations 1991.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.15 Pollutant release to public sewer

Records within 500m	0

Discharges of Special Category Effluents to the public sewer.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.16 List 1 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List I of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.17 List 2 Dangerous Substances

Records within 500m	0

Discharges of substances identified on List II of European Directive E 2006/11/EC, and regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015.

This data is sourced from the Environment Agency and Natural Resources Wales.

4.18 Pollution Incidents (EA/NRW)

Records within 500m	3

Records of substantiated pollution incidents. Since 2006 this data has only included category 1 (major) and 2 (significant) pollution incidents.

Features are displayed on the Current industrial land use map on **page 27 >**

ID	Location	Details	
3	348m NE	Incident Date: 12/04/2002 Incident Identification: 71065 Pollutant: Oils and Fuel Pollutant Description: Unidentified Oil	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	453m S	Incident Date: 14/07/2003 Incident Identification: 173611 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
B	465m S	Incident Date: 10/12/2001 Incident Identification: 47525 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

This data is sourced from the Environment Agency and Natural Resources Wales.

4.19 Pollution inventory substances

Records within 500m	0

The pollution inventory (substances) includes reporting on annual emissions of certain regulated substances to air, controlled waters and land. A reporting threshold for each substance is also included. Where emissions fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

4.20 Pollution inventory waste transfers

Records within 500m	0

The pollution inventory (waste transfers) includes reporting on annual transfers and recovery/disposal of controlled wastes from a site. A reporting threshold for each waste type is also included. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

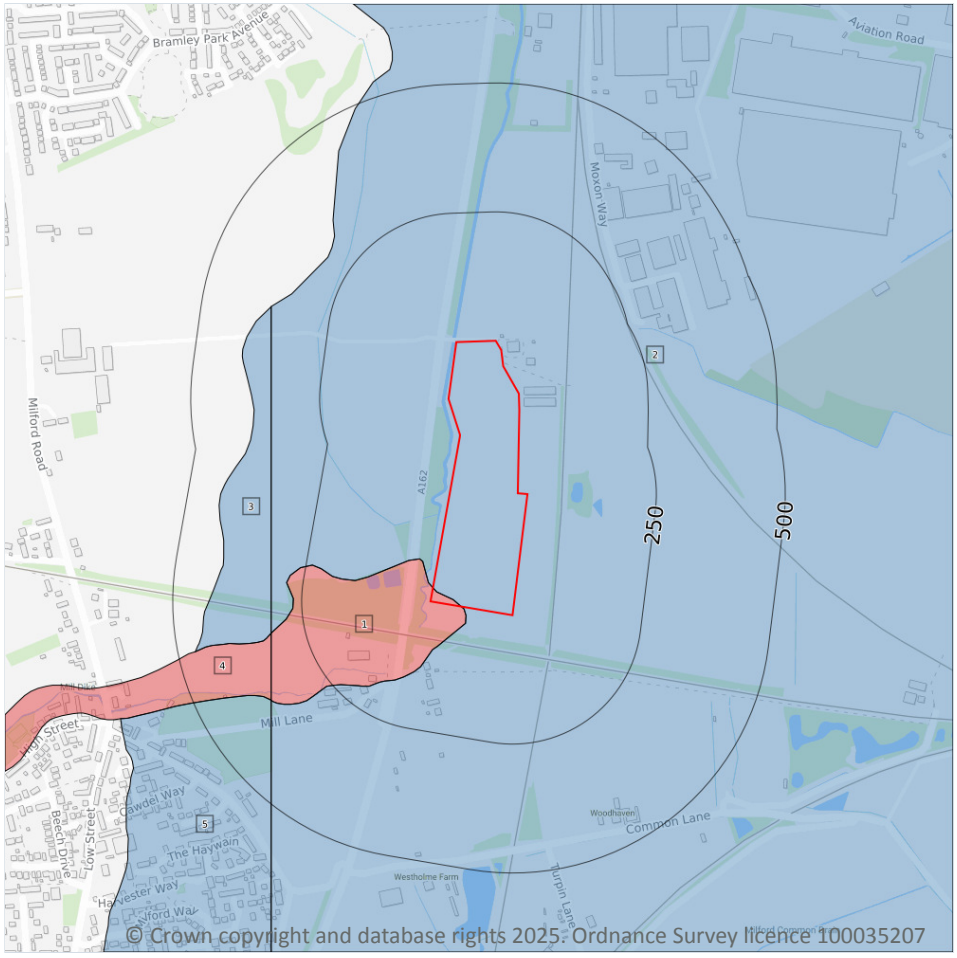
4.21 Pollution inventory radioactive waste

Records within 500m	0

The pollution inventory (radioactive wastes) includes reporting on annual releases of radioactive substances from a site, including the means of release. Where releases fall below the reporting threshold, no value will be given. The data is given for the most recent complete year available.

This data is sourced from the Environment Agency and the Scottish Environment Protection Agency.

5 Hydrogeology - Superficial aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive
- Unknown

5.1 Superficial aquifer

Records within 500m	5

Aquifer status of groundwater held within superficial geology.

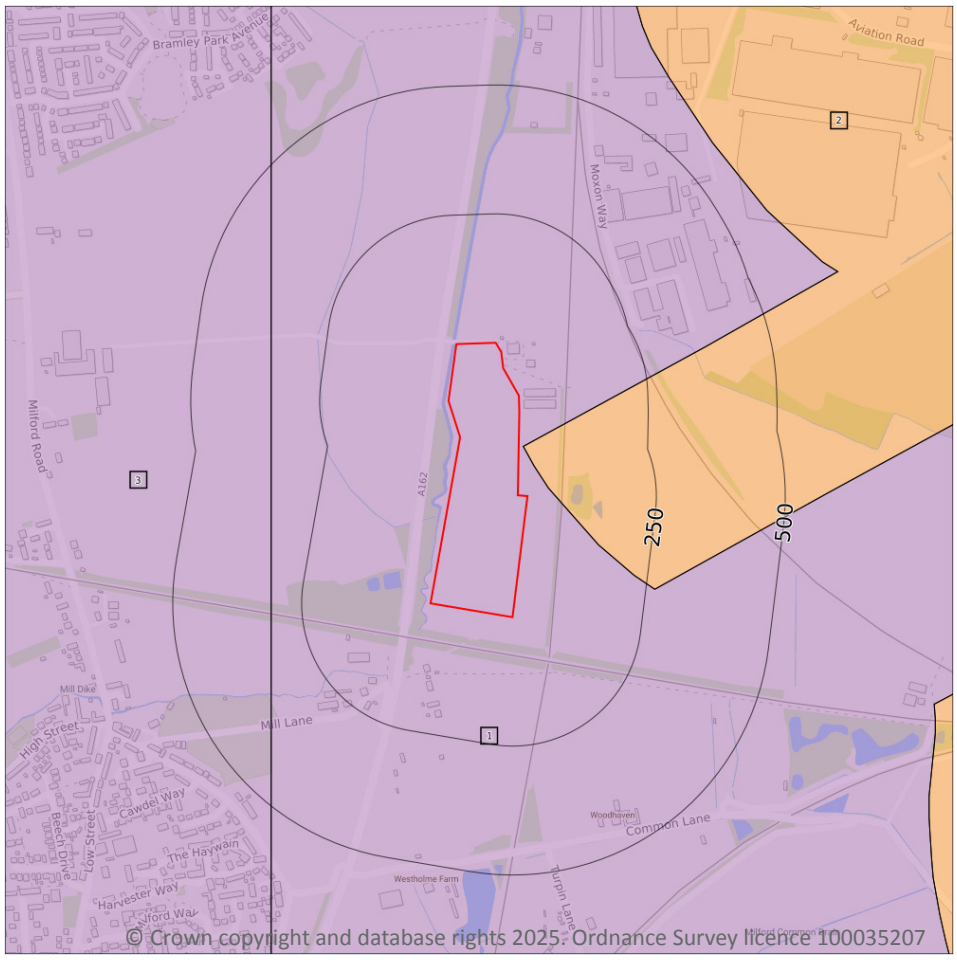
Features are displayed on the Hydrogeology map on **page 33 >**

ID	Location	Designation	Description
1	On site	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
2	On site	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

ID	Location	Designation	Description
3	309m SW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow
4	315m SW	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers
5	364m SW	Unproductive	These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Bedrock aquifer



Site Outline

Search buffers in metres (m)

- Principal
- Secondary A
- Secondary B
- Secondary Undifferentiated
- Unproductive

5.2 Bedrock aquifer

Records within 500m	3

Aquifer status of groundwater held within bedrock geology.

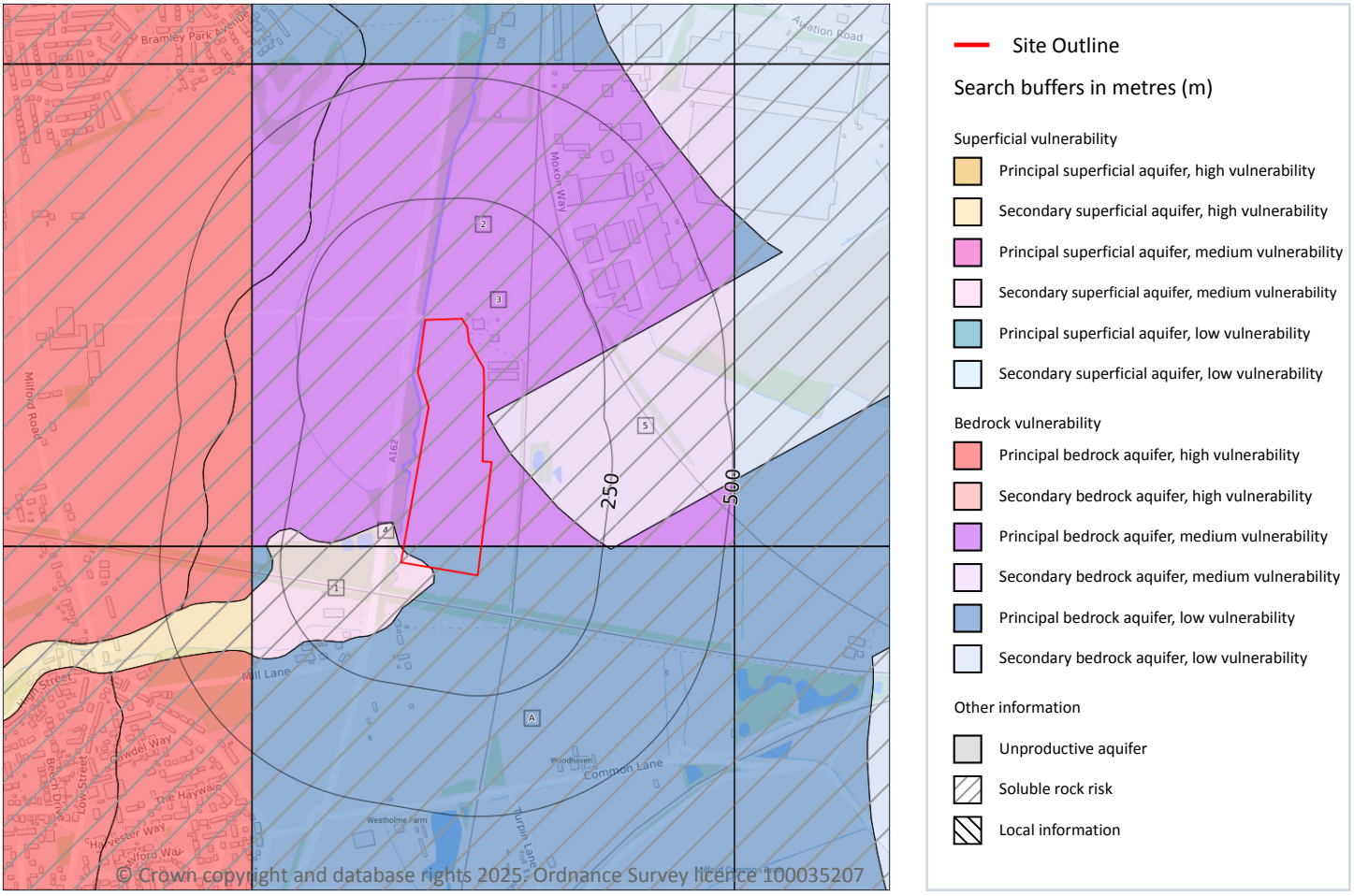
Features are displayed on the Bedrock aquifer map on **page 35 >**

ID	Location	Designation	Description
1	**On site**	**Principal**	**Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers**
2	9m NE	Secondary B	Predominantly lower permeability layers which may store/yield limited amounts of groundwater due to localised features such as fissures, thin permeablehorizons and weathering. These are generally the water-bearing parts of the former non-aquifers

ID	Location	Designation	Description
3	309m SW	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

Groundwater vulnerability



5.3 Groundwater vulnerability

Records within 50m	5

An assessment of the vulnerability of groundwater to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a one kilometre square grid. Groundwater vulnerability is described as High, Medium or Low as follows:

- High - Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits.
- Medium - Intermediate between high and low vulnerability.
- Low - Areas that provide the greatest protection from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability.

Features are displayed on the Groundwater vulnerability map on **page 37 >**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	**On site**	**Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer**	**Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: >90% Recharge potential: Low**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures**
2	**On site**	**Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer**	**Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Unproductive Aquifer type: Unproductive Thickness: 3-10m Patchiness value: <90% Recharge potential: Low**	**Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures**
A	**On site**	**Summary Classification: Principal bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer**	**Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year**	**Vulnerability: Unproductive Aquifer type: Unproductive Thickness: 3-10m Patchiness value: >90% Recharge potential: Low**	**Vulnerability: Low Aquifer type: Principal Flow mechanism: Well connected fractures**
4	7m SW	Summary Classification: Secondary superficial aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Productive Superficial Aquifer	Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Medium Aquifer type: Secondary Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
5	9m NE	Summary Classification: Secondary bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: Low Infiltration value: 40-70% Dilution value: <300mm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: 3-10m Patchiness value: <90% Recharge potential: Low	Vulnerability: Medium Aquifer type: Secondary Flow mechanism: Well connected fractures

This data is sourced from the British Geological Survey, the Environment Agency and Natural Resources Wales.

5.4 Groundwater vulnerability- soluble rock risk

Records on site	2

This dataset identifies areas where solution features that enable rapid movement of a pollutant may be present within a 1km grid square.

ID	Maximum soluble risk category	Percentage of grid square covered by maximum risk
3	**Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.**	**100.0%**
A	**Significant soluble rocks are likely to be present. Low possibility of localised subsidence or dissolution-related degradation of bedrock occurring naturally, but may be possible in adverse conditions such as high surface or subsurface water flow.**	**100.0%**

This data is sourced from the British Geological Survey and the Environment Agency.

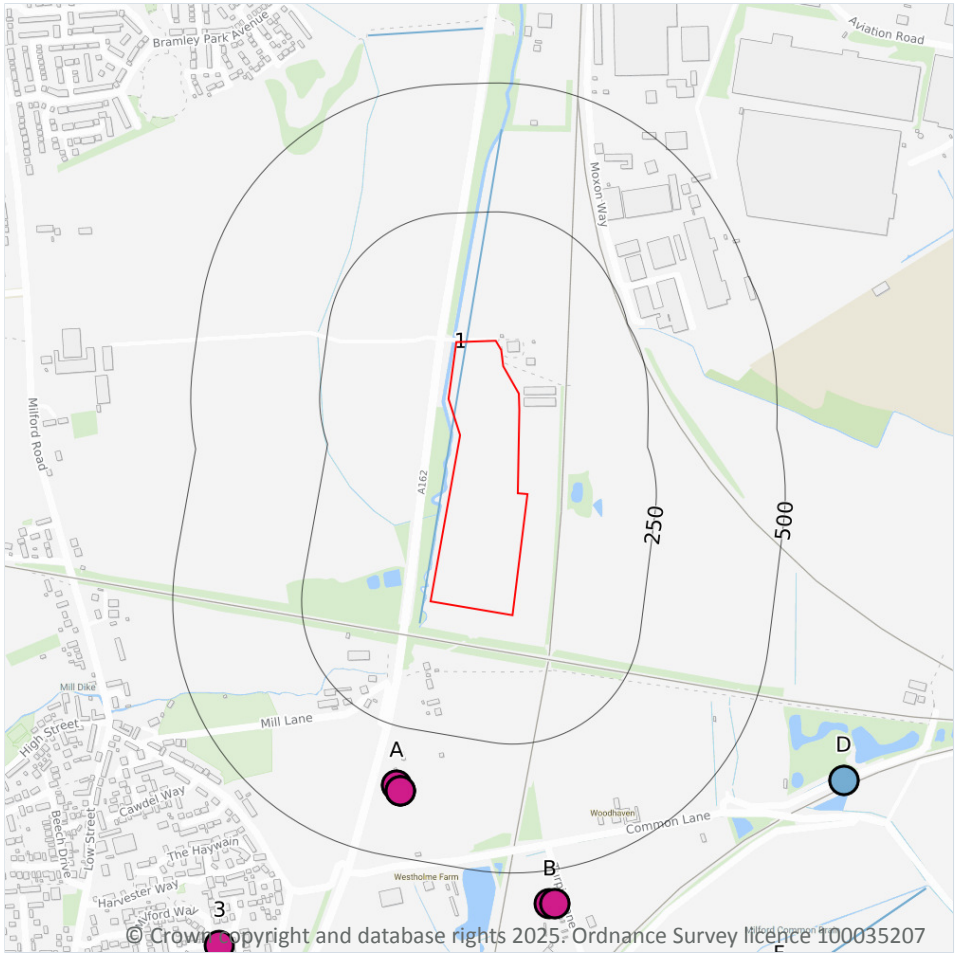
5.5 Groundwater vulnerability- local information

Records on site	**0**

This dataset identifies areas where additional local information affecting vulnerability is held by the Environment Agency. Further information can be obtained by contacting the Environment Agency local Area groundwater team through the Environment Agency National Customer Call Centre on 03798 506 506 or by email on enquiries@environment-agency.gov.uk ↗.

This data is sourced from the British Geological Survey and the Environment Agency.

Abstractions and Source Protection Zones



Site Outline

Search buffers in metres (m)

- Source Protection Zone 1 — Inner catchment
- Source Protection Zone 2 — Outer catchment
- Source Protection Zone 3 — Total catchment
- Source Protection Zone 4 — Zone of Special Interest
- Source Protection Zone 1c — Inner catchment - confined aquifer
- Source Protection Zone 2c — Outer catchment - confined aquifer
- Source Protection Zone 3c — Total catchment - confined aquifer
- Drinking water abstraction licences
- Drinking water abstraction licences — Polygon features
- Drinking water abstraction licences — Linear features
- Groundwater abstraction licence (point)
- Groundwater abstraction licence (area)
- Groundwater abstraction licence (linear)
- Surface Water Abstractions (point)
- Surface Water Abstractions (area)
- Surface Water Abstractions (linear)

5.6 Groundwater abstractions

Records within 2000m	38

Licensed groundwater abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, between two points (line data) or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40 >**

ID	Location	Details	
A	363m S	Status: Active Licence No: 2/27/24/458/R01 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: Jane Elizabeth Ward and Kathryn Helen Parkin Easting: 450243 Northing: 431610	Annual Volume (m^3): 9000 Max Daily Volume (m^3): 100 Original Application No: NPS/WR/037876 Original Start Date: 01/04/2018 Expiry Date: 31/03/2030 Issue No: 2 Version Start Date: 25/02/2021 Version End Date: -
A	363m S	Status: Historical Licence No: 2/27/24/458 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: LUNN BROS Easting: 450243 Northing: 431610	Annual Volume (m^3): 9000 Max Daily Volume (m^3): 100 Original Application No: - Original Start Date: 01/01/2007 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 01/01/2007 Version End Date: -
A	371m S	Status: Historical Licence No: 2/27/24/347 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: LUNN BROS Easting: 450250 Northing: 431600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 16/06/1997 Expiry Date: 31/12/2006 Issue No: 100 Version Start Date: 16/06/1997 Version End Date: -
A	371m S	Status: Historical Licence No: 2/27/24/347 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: LUNN BROS Easting: 450250 Northing: 431600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 16/06/1997 Expiry Date: 31/12/2006 Issue No: 100 Version Start Date: 16/06/1997 Version End Date: -

ID	Location	Details	
A	371m S	Status: Historical Licence No: 2/27/24/347 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: LUNN BROS Easting: 450250 Northing: 431600	Annual Volume (m^3): 9000 Max Daily Volume (m^3): 50 Original Application No: - Original Start Date: 16/06/1997 Expiry Date: 31/12/2006 Issue No: 100 Version Start Date: 16/06/1997 Version End Date: -
A	371m S	Status: Historical Licence No: 2/27/24/458 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: LUNN BROS Easting: 450250 Northing: 431600	Annual Volume (m^3): 9000 Max Daily Volume (m^3): 100 Original Application No: - Original Start Date: 01/01/2007 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 01/01/2007 Version End Date: -
B	564m S	Status: Historical Licence No: 2/27/24/118 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (2) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: BAIRDS MALT LTD Easting: 450540 Northing: 431380	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 101 Version Start Date: 01/01/1996 Version End Date: -
B	566m S	Status: Active Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE 2 - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450550 Northing: 431380	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: 1655 Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -

ID	Location	Details	
B	566m S	Status: Historical Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (2) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450550 Northing: 431380	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -
-	710m S	Status: Active Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE 3 - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450490 Northing: 431230	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: 1655 Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -
-	710m S	Status: Historical Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (3) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450490 Northing: 431230	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -
3	782m SW	Status: Historical Licence No: 2/27/24/167 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: LUNN BROS Easting: 449900 Northing: 431300	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 20/08/1974 Expiry Date: - Issue No: 100 Version Start Date: 01/01/1997 Version End Date: -

ID	Location	Details	
-	792m S	Status: Active Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE 1 - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450520 Northing: 431150	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: 1655 Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -
-	792m S	Status: Historical Licence No: 2/27/24/118 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (1) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: CARRIE Easting: 450520 Northing: 431150	Annual Volume (m^3): 136380 Max Daily Volume (m^3): 373.64 Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 103 Version Start Date: 25/05/2005 Version End Date: -
-	800m S	Status: Historical Licence No: 2/27/24/118 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (1) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: BAIRDS MALT LTD Easting: 450480 Northing: 431140	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 28/04/1966 Expiry Date: - Issue No: 101 Version Start Date: 01/01/1996 Version End Date: -
-	943m N	Status: Historical Licence No: 2/27/24/207 Details: General Washing/Process Washing Direct Source: GROUNDWATERS Point: MAGNESIAN LIMESTONE Data Type: Point Name: LINPAC LEYLAND DAF Easting: 450600 Northing: 433400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 09/03/1977 Expiry Date: - Issue No: 100 Version Start Date: 16/02/1998 Version End Date: -

ID	Location	Details	
-	943m N	Status: Historical Licence No: 2/27/24/207 Details: General Washing/Process Washing Direct Source: GROUNDWATERS Point: WELL - MAGNESIAN LIMESTONE- SHERBURN IN ELMET Data Type: Point Name: LINPAC LEYLAND DAF Easting: 450600 Northing: 433400	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 09/03/1977 Expiry Date: - Issue No: 100 Version Start Date: 16/02/1998 Version End Date: -
-	1223m NW	Status: Historical Licence No: 2/27/24/142 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: SPRING Data Type: Point Name: QUALTER Easting: 449700 Northing: 433500	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 24/04/1968 Expiry Date: - Issue No: 100 Version Start Date: 24/04/1968 Version End Date: -
-	1348m W	Status: Historical Licence No: 2/27/24/384 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: H A & L BATTY Easting: 448980 Northing: 431740	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 11/03/1999 Expiry Date: - Issue No: 100 Version Start Date: 11/03/1999 Version End Date: -
-	1348m W	Status: Historical Licence No: 2/27/24/384 Details: General Farming & Domestic Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: H A & L BATTY Easting: 448980 Northing: 431740	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 11/03/1999 Expiry Date: - Issue No: 100 Version Start Date: 11/03/1999 Version End Date: -
-	1463m W	Status: Active Licence No: 2/27/24/445/R01 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD 'A' Data Type: Point Name: R T Batty & Son Easting: 448887 Northing: 431625	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: NPS/WR/021502 Original Start Date: 01/04/2017 Expiry Date: 31/03/2030 Issue No: 1 Version Start Date: 01/04/2017 Version End Date: -

ID	Location	Details	
-	1463m W	Status: Historical Licence No: 2/27/24/445 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD 'A' Data Type: Point Name: R T Batty & Son Easting: 448887 Northing: 431625	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: - Original Start Date: 01/04/2005 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 01/04/2005 Version End Date: -
-	1497m W	Status: Historical Licence No: 2/27/24/445 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: R T Batty & Son Easting: 448850 Northing: 431630	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: - Original Start Date: 01/04/2005 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 01/04/2005 Version End Date: -
-	1553m W	Status: Historical Licence No: 2/27/24/309 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE Data Type: Point Name: H A & L BATTY Easting: 448800 Northing: 431600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 15/06/1995 Expiry Date: 30/09/2004 Issue No: 100 Version Start Date: 15/06/1995 Version End Date: -
-	1553m W	Status: Historical Licence No: 2/27/24/309 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: H A & L BATTY Easting: 448800 Northing: 431600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 15/06/1995 Expiry Date: 30/09/2004 Issue No: 100 Version Start Date: 15/06/1995 Version End Date: -

ID	Location	Details	
-	1792m SW	Status: Historical Licence No: 2/27/24/420 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: H A & L BATTY Easting: 448840 Northing: 430940	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 25/10/2002 Expiry Date: 30/09/2004 Issue No: 1 Version Start Date: 25/10/2002 Version End Date: -
-	1792m SW	Status: Historical Licence No: 2/27/24/445 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: R T Batty & Son Easting: 448840 Northing: 430940	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: - Original Start Date: 01/04/2005 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 01/04/2005 Version End Date: -
-	1823m SW	Status: Active Licence No: 2/27/24/445/R01 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER MAGNESIAN LIMESTONE - SOUTH MILFORD 'B' Data Type: Point Name: R T Batty & Son Easting: 448815 Northing: 430922	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: NPS/WR/021502 Original Start Date: 01/04/2017 Expiry Date: 31/03/2030 Issue No: 1 Version Start Date: 01/04/2017 Version End Date: -
-	1823m SW	Status: Historical Licence No: 2/27/24/445 Details: Spray Irrigation - Direct Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER MAGNESIAN LIMESTONE - SOUTH MILFORD 'B' Data Type: Point Name: R T Batty & Son Easting: 448815 Northing: 430922	Annual Volume (m^3): 43165 Max Daily Volume (m^3): 1233 Original Application No: - Original Start Date: 01/04/2005 Expiry Date: 31/03/2017 Issue No: 1 Version Start Date: 01/04/2005 Version End Date: -

ID	Location	Details	
-	1961m N	Status: Historical Licence No: 2/27/24/154 Details: General Use Relating To Secondary Category (High Loss) Direct Source: GROUNDWATERS Point: BOREHOLE - LOWER MAGNESIAN LIMESTONE - SHERBURN IN ELMET Data Type: Point Name: BPB United Kingdom Ltd Easting: 451000 Northing: 434350	Annual Volume (m^3): 358410 Max Daily Volume (m^3): 981.94 Original Application No: - Original Start Date: 17/02/1969 Expiry Date: - Issue No: 101 Version Start Date: 29/07/2009 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: Dust suppression Direct Source: GROUNDWATERS Point: BOREHOLE (3) Data Type: Point Name: RJB MINING (UK) LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 100 Version Start Date: 17/11/1997 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (3) Data Type: Point Name: RJB MINING (UK) LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 100 Version Start Date: 17/11/1997 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: Dust suppression Direct Source: GROUNDWATERS Point: BOREHOLE (3) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: UK COAL MINING LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): 600000 Max Daily Volume (m^3): 2718 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 102 Version Start Date: 01/01/2004 Version End Date: -

ID	Location	Details	
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: General use relating to Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (3) - MAGNESIAN LIMESTONE - SOUTH MILFORD Data Type: Point Name: UK COAL MINING LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): 600000 Max Daily Volume (m^3): 2718 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 102 Version Start Date: 01/01/2004 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: Dust Suppression Direct Source: GROUNDWATERS Point: BOREHOLE (3) - SHERWOOD SANDSTONE - SOUTH MILFORD Data Type: Point Name: UK COAL MINING LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): 290000 Max Daily Volume (m^3): 582 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 102 Version Start Date: 01/01/2004 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE (3) - SHERWOOD SANDSTONE - SOUTH MILFORD Data Type: Point Name: UK COAL MINING LTD Easting: 452450 Northing: 431860	Annual Volume (m^3): 290000 Max Daily Volume (m^3): 582 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 102 Version Start Date: 01/01/2004 Version End Date: -
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: Dust Suppression Direct Source: GROUNDWATERS Point: BOREHOLE 3 - SHERWOOD SANDSTONE - SOUTH MILFORD Data Type: Point Name: Harworth Estates (Agricultural Land) Ltd Easting: 452450 Northing: 431860	Annual Volume (m^3): 290000 Max Daily Volume (m^3): 582 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 103 Version Start Date: 03/09/2013 Version End Date: -

ID	Location	Details	
-	1977m E	Status: Historical Licence No: 2/27/24/171 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: GROUNDWATERS Point: BOREHOLE 3 - SHERWOOD SANDSTONE - SOUTH MILFORD Data Type: Point Name: Harworth Estates (Agricultural Land) Ltd Easting: 452450 Northing: 431860	Annual Volume (m^3): 290000 Max Daily Volume (m^3): 582 Original Application No: - Original Start Date: 21/07/1976 Expiry Date: - Issue No: 103 Version Start Date: 03/09/2013 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.7 Surface water abstractions

Records within 2000m	**7**

Licensed surface water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

Features are displayed on the Abstractions and Source Protection Zones map on **page 40 >**

ID	Location	Details	
1	**On site**	**Status: Active** **Licence No: NE/027/0024/081** **Details: Spray Irrigation - Direct** **Direct Source: SURFACE WATER** **Point: REACH AT MILL DYKE, SHERBURN IN ELEMT** **Data Type: Line** **Name: J Bramley and Son** **Easting: 450447** **Northing: 432882**	**Annual Volume (m^3): 24000** **Max Daily Volume (m^3): 324** **Original Application No: NPS/WR/030616** **Original Start Date: 24/05/2023** **Expiry Date: 31/03/2026** **Issue No: 1** **Version Start Date: 24/05/2023** **Version End Date: -**
2	604m N	Status: Active Licence No: NE/027/0024/078 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: REACH ON TRIBUTARY OF MILL DIKE DRAIN Data Type: Line Name: J Bramley and Son Easting: 450188 Northing: 433064	Annual Volume (m^3): 24000 Max Daily Volume (m^3): 900 Original Application No: NPS/WR/039120 Original Start Date: 09/07/2019 Expiry Date: 31/03/2030 Issue No: 2 Version Start Date: 08/03/2023 Version End Date: -

ID	Location	Details	
D	717m SE	Status: Historical Licence No: 2/27/24/433 Details: Make-Up Or Top Up Water Direct Source: SURFACE WATER Point: UNNAMES DRAIN - SOUTH MILFORD Data Type: Point Name: VAIRY Easting: 451110 Northing: 431620	Annual Volume (m^3): 3002 Max Daily Volume (m^3): 200 Original Application No: - Original Start Date: 23/03/2004 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 23/03/2004 Version End Date: -
D	717m SE	Status: Historical Licence No: 2/27/24/433 Details: Make-Up Or Top Up Water Direct Source: SURFACE WATER Point: DRAIN - SOUTH MILFORD Data Type: Point Name: VAIRY Easting: 451110 Northing: 431620	Annual Volume (m^3): 3002 Max Daily Volume (m^3): 200 Original Application No: - Original Start Date: 23/03/2004 Expiry Date: 31/03/2018 Issue No: 1 Version Start Date: 23/03/2004 Version End Date: -
F	890m SE	Status: Active Licence No: 2/27/24/017 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: LUMBY COMMON DRAIN AND MILFORD COMMON DRAIN Data Type: Line Name: R T Batty & Son Easting: 450700 Northing: 431020	Annual Volume (m^3): 5818 Max Daily Volume (m^3): 291 Original Application No: NPS/WR/02467 Original Start Date: 14/12/1965 Expiry Date: - Issue No: 102 Version Start Date: 11/10/2016 Version End Date: -
F	890m SE	Status: Historical Licence No: 2/27/24/017 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: LUMBY COMMON DRAIN & MILFORD COMMON DRAIN Data Type: Line Name: H A & L BATTY Easting: 450700 Northing: 431020	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 14/12/1965 Expiry Date: - Issue No: 100 Version Start Date: 02/03/1999 Version End Date: -
-	1316m W	Status: Active Licence No: 2/27/24/044 Details: Spray Irrigation - Direct Direct Source: SURFACE WATER Point: NEWTHORPE BECK TO MILL DYKE Data Type: Line Name: ASPINALL Easting: 446500 Northing: 432300	Annual Volume (m^3): 13640 Max Daily Volume (m^3): 168 Original Application No: 1454 Original Start Date: 20/01/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/04/2024 Version End Date: -

This data is sourced from the Environment Agency and Natural Resources Wales.

5.8 Potable abstractions

Records within 2000m	0

Licensed potable water abstractions for sites extracting more than 20 cubic metres of water a day and includes active and historical records. The data may be for a single abstraction point, a stretch of watercourse or a larger area.

This data is sourced from the Environment Agency and Natural Resources Wales.

5.9 Source Protection Zones

Records within 500m	0

Source Protection Zones define the sensitivity of an area around a potable abstraction site to contamination.

This data is sourced from the Environment Agency and Natural Resources Wales.

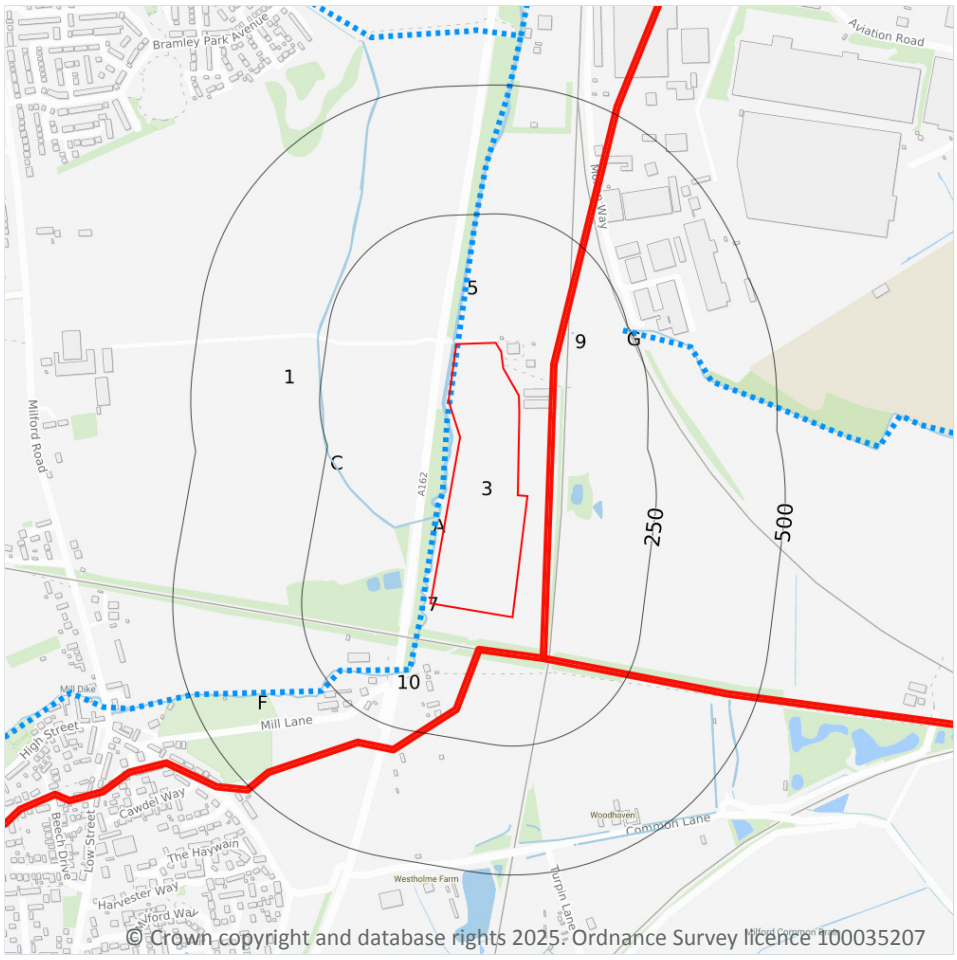
5.10 Source Protection Zones (confined aquifer)

Records within 500m	0

Source Protection Zones in the confined aquifer define the sensitivity around a deep groundwater abstraction to contamination. A confined aquifer would normally be protected from contamination by overlying geology and is only considered a sensitive resource if deep excavation/drilling is taking place.

This data is sourced from the Environment Agency and Natural Resources Wales.

6 Hydrology



Site Outline

Search buffers in metres (m)

Water Network (OS MasterMap)

Surface water features (wider than 5m)

Surface water features (narrower than 5m)

WFD River, canal and surface water transfer water bodies

WFD Lake water bodies

WFD Transitional and coastal water bodies

WFD Surface water body catchments boundaries

WFD Groundwater body boundaries

6.1 Water Network (OS MasterMap)

Records within 250m	10

Detailed water network of Great Britain showing the flow and precise central course of every river, stream, lake and canal.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type of water feature	Ground level	Permanence	Name
5	4m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Mill Dike

ID	Location	Type of water feature	Ground level	Permanence	Name
7	10m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Mill Dike
A	14m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
A	43m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	-
C	66m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
9	141m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
10	144m SW	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Mill Dike
F	163m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Mill Dike
G	239m NE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Bond Ings Drain
G	244m NE	Inland river not influenced by normal tidal action.	Underground	Watercourse contains water year round (in normal circumstances)	Bond Ings Drain

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	**9**

Covering rivers, streams and lakes (some overlap with OS MasterMap Water Network data in previous section) but additionally covers smaller features such as ponds. Rivers and streams narrower than 5m are represented as a single line. Lakes, ponds and rivers or streams wider than 5m are represented as polygons.

Features are displayed on the Hydrology map on **page 53 >**

This data is sourced from the Ordnance Survey.

6.3 WFD Surface water body catchments

Records on site	1

The Water Framework Directive is an EU-led framework for the protection of inland surface waters, estuaries, coastal waters and groundwater through river basin-level management planning. In terms of surface water, these basins are broken down into smaller units known as management, operational and water body catchments.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
1	**On site**	**River**	**Mill Dike from Source to Bishop Dike**	**GB104027063640**	**Ouse Lower Yorkshire**	**Wharfe and Ouse Lower**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.4 WFD Surface water bodies

Records identified	1

Surface water bodies under the Directive may be rivers, lakes, estuary or coastal. To achieve the purpose of the Directive, environmental objectives have been set and are reported on for each water body. The progress towards delivery of the objectives is then reported on by the relevant competent authorities at the end of each six-year cycle. The river water body directly associated with the catchment listed in the previous section is detailed below, along with any lake, canal, coastal or artificial water body within 250m of the site. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each water body listed.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
2	**On site**	**River**	**Mill Dike from Source to Bishop Dike**	**GB104027063640 ↗**	**Poor**	**Fail**	**Poor**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

6.5 WFD Groundwater bodies

Records on site	1

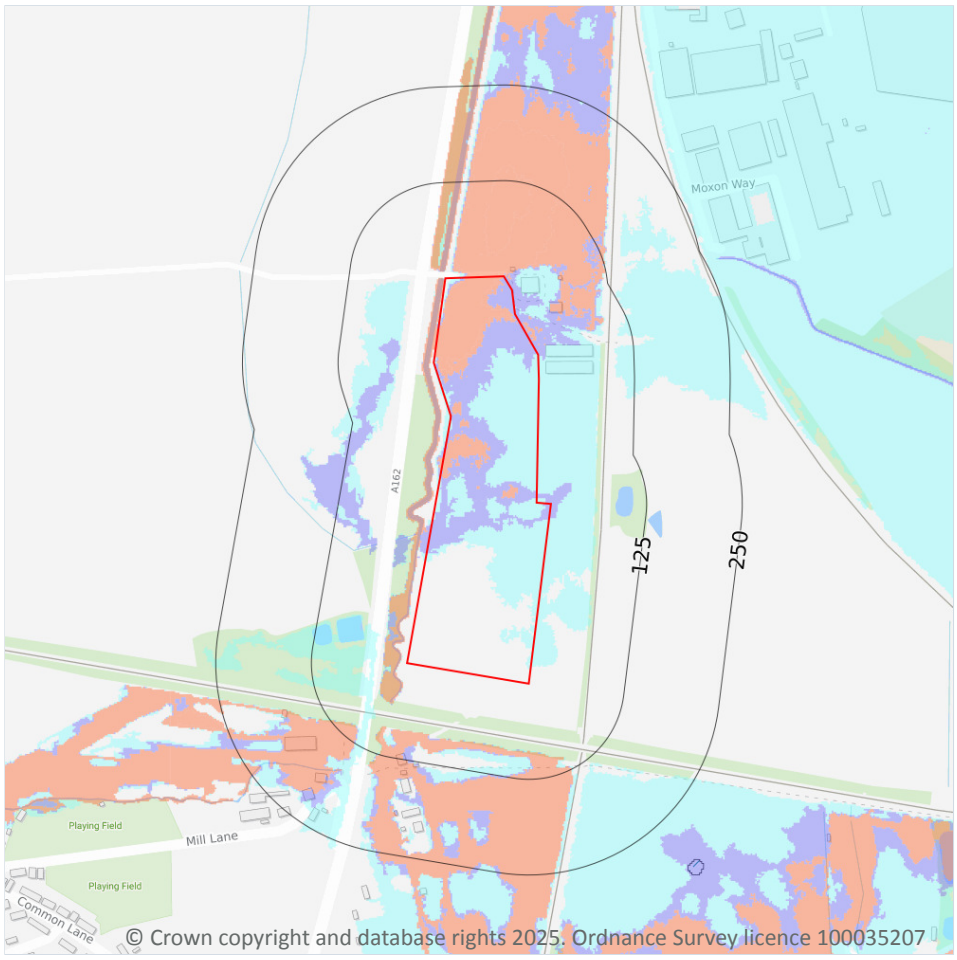
Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 53 >**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
3	**On site**	**Wharfe Magnesian Limestone**	**GB40401G701100** ↗	**Poor**	**Poor**	**Good**	**2019**

This data is sourced from the Environment Agency and Natural Resources Wales.

7 River and coastal flooding



Site Outline

Search buffers in metres (m)

River and coastal flooding:

- High
- Medium
- Low
- Very Low
- Historical Flood Events
- Areas Used for Flood Storage
- Areas Benefiting from Flood Defences
- Flood Defences

7.1 Risk of flooding from rivers and the sea

Records within 50m	12

The chance of flooding from rivers and/or the sea in any given year, based on cells of 50m within the Risk of Flooding from Rivers and Sea (RoFRaS)/Flood Risk Assessment Wales (FRAW) models. Each cell is allocated one of four flood risk categories, taking into account flood defences and their condition. The risk categories for RoFRaS for rivers and the sea and FRAW for rivers are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 100 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 100 chance) or High (greater than or equal to 1 in 30 chance). The risk categories for FRAW for the sea are; Very low (less than 1 in 1000 chance in any given year), Low (less than 1 in 200 but greater than or equal to 1 in 1000 chance), Medium (less than 1 in 30 but greater than or equal to 1 in 200 chance) or High (greater than or equal to 1 in 30 chance).

Features are displayed on the River and coastal flooding map on **page 57 >**

Distance	Flood risk category
On site	**High**
0 - 50m	High

This data is sourced from the Environment Agency and Natural Resources Wales.

7.2 Historical Flood Events

Records within 250m	**0**

Records of historic flooding from rivers, the sea, groundwater and surface water. Records began in 1946 when predecessor bodies started collecting detailed information about flooding incidents, although limited details may be included on flooding incidents prior to this date. Takes into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding, and includes flood extents that may have been affected by overtopping, breaches or blockages.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.3 Flood Defences

Records within 250m	**0**

Records of flood defences owned, managed or inspected by the Environment Agency and Natural Resources Wales. Flood defences can be structures, buildings or parts of buildings. Typically these are earth banks, stone and concrete walls, or sheet-piling that is used to prevent or control the extent of flooding.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.4 Areas Benefiting from Flood Defences

Records within 250m	**0**

Areas that would benefit from the presence of flood defences in a 1 in 100 (1%) chance of flooding each year from rivers or 1 in 200 (0.5%) chance of flooding each year from the sea.

This data is sourced from the Environment Agency and Natural Resources Wales.

7.5 Flood Storage Areas

Records within 250m	**0**

Areas that act as a balancing reservoir, storage basin or balancing pond to attenuate an incoming flood peak to a flow level that can be accepted by the downstream channel or to delay the timing of a flood peak so that its volume is discharged over a longer period.

This data is sourced from the Environment Agency and Natural Resources Wales.

River and coastal flooding - Flood Zones



Site Outline

Search buffers in metres (m)

Flood zone 2

Flood zone 3

7.6 Flood Zone 2

Records within 50m	1

Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land between Flood Zone 3 (see next section) and the extent of the flooding from rivers or the sea with a 1 in 1000 (0.1%) chance of flooding each year.

Features are displayed on the River and coastal flooding map on **page 57 >**

Location	Type
1m N	Zone 2 - (Fluvial /Tidal Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

7.7 Flood Zone 3

Records within 50m	1

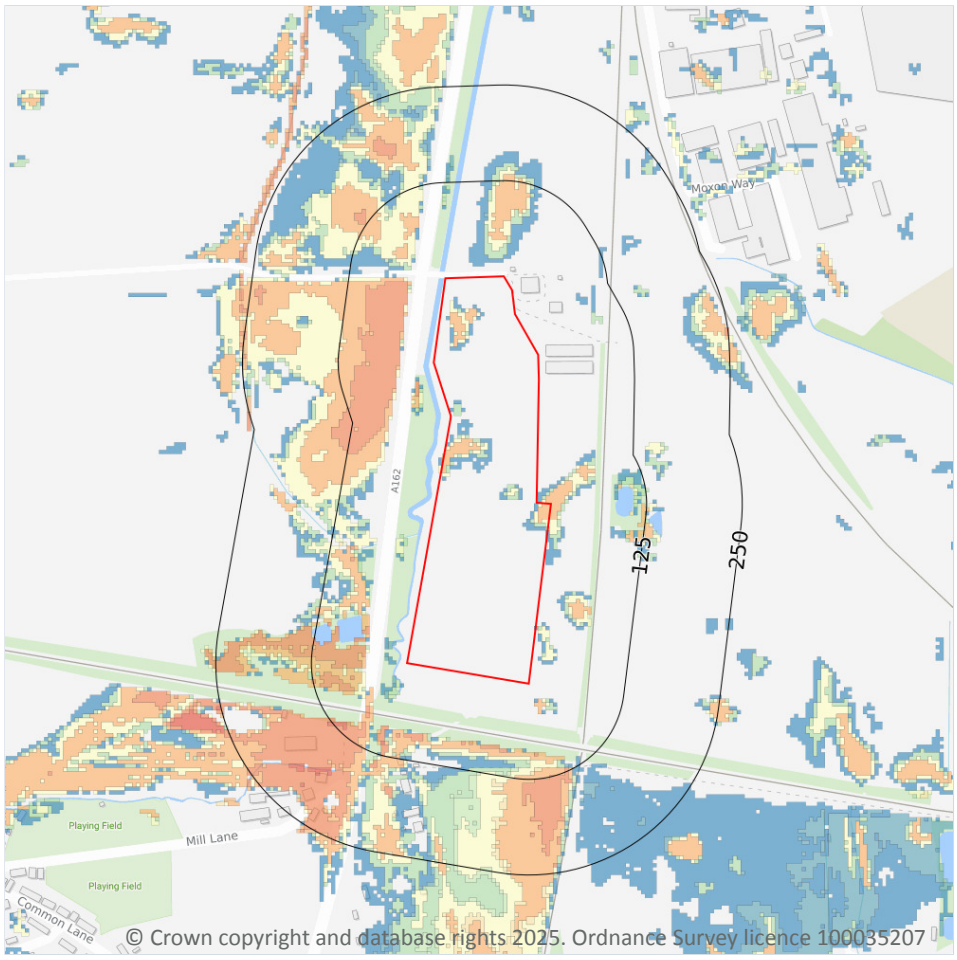
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 57 >**

Location	Type
1m N	Zone 3 - (Fluvial Models)

This data is sourced from the Environment Agency and Natural Resources Wales.

8 Surface water flooding



Site Outline
Search buffers in metres (m)

1 in 1000 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 250 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 100 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

1 in 30 return period
- Depth between 0.1m - 0.3m
- Depth between 0.3m - 1.0m
- Depth greater than 1.0m

8.1 Surface water flooding

Highest risk on site	**1 in 30 year, 0.1m - 0.3m**
Highest risk within 50m	**1 in 30 year, 0.3m - 1.0m**

Ambiental Risk Analytics surface water (pluvial) FloodMap identifies areas likely to flood as a result of extreme rainfall events, i.e. land naturally vulnerable to surface water ponding or flooding. This data set was produced by simulating 1 in 30 year, 1 in 100 year, 1 in 250 year and 1 in 1,000 year rainfall events. Modern urban drainage systems are typically built to cope with rainfall events between 1 in 20 and 1 in 30 years, though some older ones may flood in a 1 in 5 year rainfall event.

Features are displayed on the Surface water flooding map on **page 61 >**

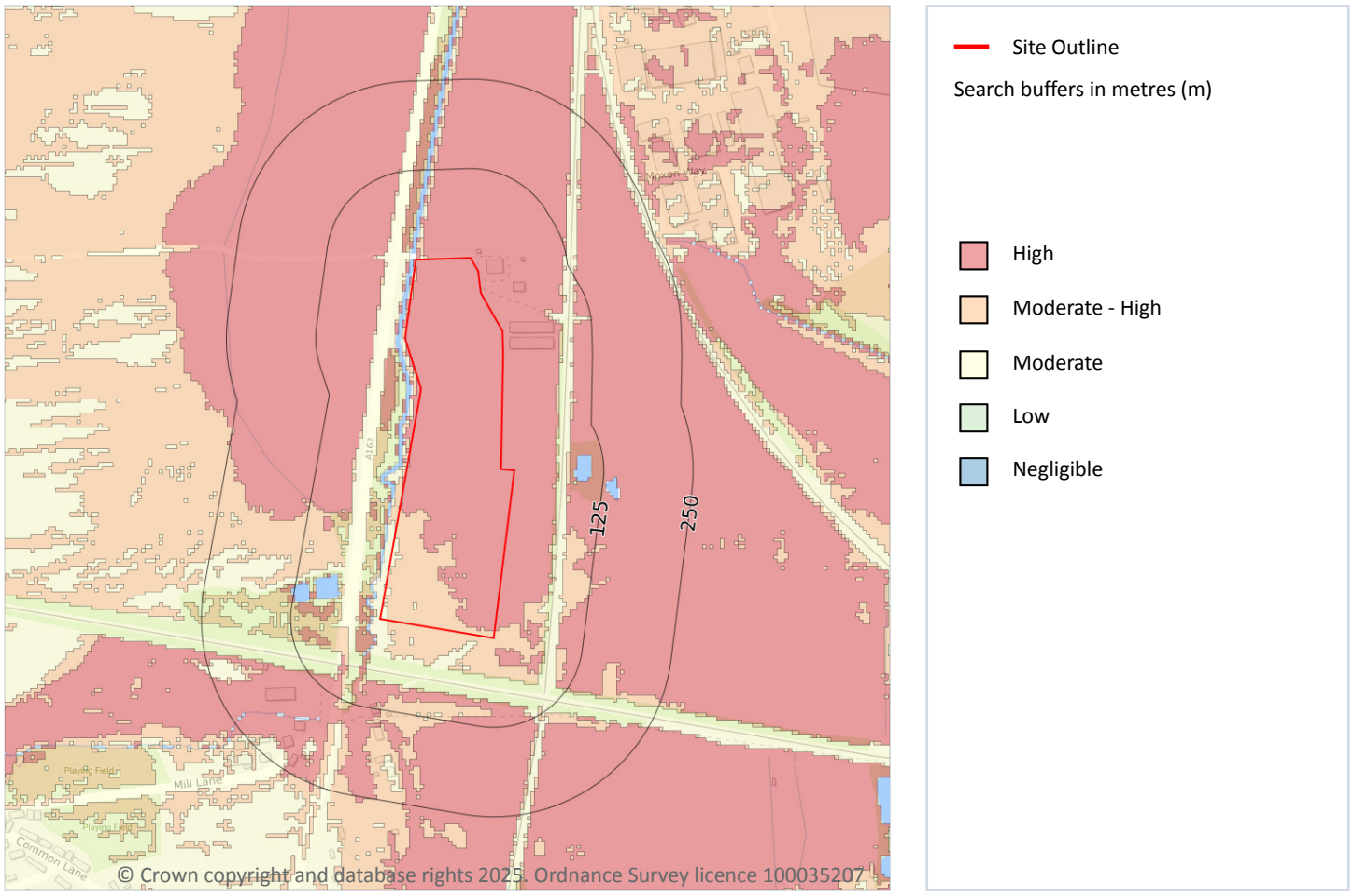
The data shown on the map and in the table above shows the highest likelihood of flood events happening at the site. Lower likelihood events may have greater flood depths and hence a greater potential impact on a site.

The table below shows the maximum flood depths for a range of return periods for the site.

Return period	Maximum modelled depth
1 in 1000 year	Between 0.3m and 1.0m
1 in 250 year	Between 0.3m and 1.0m
1 in 100 year	Between 0.3m and 1.0m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding



9.1 Groundwater flooding

Highest risk on site	**High**
Highest risk within 50m	**High**

Groundwater flooding is caused by unusually high groundwater levels. It occurs when the water table rises above the ground surface or within underground structures such as basements or cellars. Groundwater flooding tends to exhibit a longer duration than surface water flooding, possibly lasting for weeks or months, and as a result it can cause significant damage to property. This risk assessment is based on a 1 in 100 year return period and a 5m Digital Terrain Model (DTM).

Features are displayed on the Groundwater flooding map on **page 63 >**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Green Belt

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	1

Sites providing statutory protection for the best examples of UK flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs were re-notified under the Wildlife and Countryside Act 1981. Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and (in Scotland) by the Nature Conservation (Scotland) Act 2004 and the Wildlife and Natural Environment (Scotland) Act 2010.

Features are displayed on the Environmental designations map on **page 64 >**

ID	Location	Name	Data source
-	1526m W	Sherburn Willows	Natural England

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.2 Conserved wetland sites (Ramsar sites)

Records within 2000m	0

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. They cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. These sites cover a broad definition of wetland; marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, and even some marine areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.3 Special Areas of Conservation (SAC)

Records within 2000m	0

Areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.4 Special Protection Areas (SPA)

Records within 2000m	0

Sites classified by the UK Government under the EC Birds Directive, SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.5 National Nature Reserves (NNR)

Records within 2000m	0

Sites containing examples of some of the most important natural and semi-natural terrestrial and coastal ecosystems in Great Britain. They are managed to conserve their habitats, provide special opportunities for scientific study or to provide public recreation compatible with natural heritage interests.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.6 Local Nature Reserves (LNR)

Records within 2000m	0

Sites managed for nature conservation, and to provide opportunities for research and education, or simply enjoying and having contact with nature. They are declared by local authorities under the National Parks and Access to the Countryside Act 1949 after consultation with the relevant statutory nature conservation agency.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.7 Designated Ancient Woodland

Records within 2000m	0

Ancient woodlands are classified as areas which have been wooded continuously since at least 1600 AD. This includes semi-natural woodland and plantations on ancient woodland sites. 'Wooded continuously' does not mean there is or has previously been continuous tree cover across the whole site, and not all trees within the woodland have to be old.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.8 Biosphere Reserves

Records within 2000m	0

Biosphere Reserves are internationally recognised by UNESCO as sites of excellence to balance conservation and socioeconomic development between nature and people. They are recognised under the Man and the Biosphere (MAB) Programme with the aim of promoting sustainable development founded on the work of the local community.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.9 Forest Parks

Records within 2000m	0

These are areas managed by the Forestry Commission designated on the basis of recreational, conservation or scenic interest.

This data is sourced from the Forestry Commission.

10.10 Marine Conservation Zones

Records within 2000m	0

A type of marine nature reserve in UK waters established under the Marine and Coastal Access Act (2009). They are designated with the aim to protect nationally important, rare or threatened habitats and species.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

10.11 Green Belt

Records within 2000m	1

Areas designated to prevent urban sprawl by keeping land permanently open.

Features are displayed on the Environmental designations map on **page 64 >**

ID	Location	Name	Local Authority name
1	**On site**	**South and West Yorkshire Green Belt**	**North Yorkshire**

This data is sourced from the Ministry of Housing, Communities and Local Government.

10.12 Proposed Ramsar sites

Records within 2000m	0

Ramsar sites are areas listed as a Wetland of International Importance under the Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention) 1971. The sites here supplied have a status of 'Proposed' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.13 Possible Special Areas of Conservation (pSAC)

Records within 2000m	0

Special Areas of Conservation are areas which have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the EC Habitats Directive. Those sites supplied here are those with a status of 'Possible' having been identified for potential adoption under the framework.

This data is sourced from Natural England and Natural Resources Wales.

10.14 Potential Special Protection Areas (pSPA)

Records within 2000m	0

Special Protection Areas (SPAs) are areas designated (or 'classified') under the European Union Wild Birds Directive for the protection of nationally and internationally important populations of wild birds. Those sites supplied here are those with a status of 'Potential' having been identified for potential adoption under the framework.

This data is sourced from Natural England.

10.15 Nitrate Sensitive Areas

Records within 2000m	0

Areas where nitrate concentrations in drinking water sources exceeded or was at risk of exceeding the limit of 50 mg/l set by the 1980 EC Drinking Water Directive. Voluntary agricultural measures as a means of reducing the levels of nitrate were introduced by DEFRA as MAFF, with payments being made to farmers who complied. The scheme was started as a pilot in 1990 in ten areas, later implemented within 32 areas. The scheme was closed to further new entrants in 1998, although existing agreements continued for their full term. All Nitrate Sensitive Areas fell within the areas designated as Nitrate Vulnerable Zones (NVZs) in 1996 under the EC Nitrate Directive (91/676/EEC).

This data is sourced from Natural England.

10.16 Nitrate Vulnerable Zones

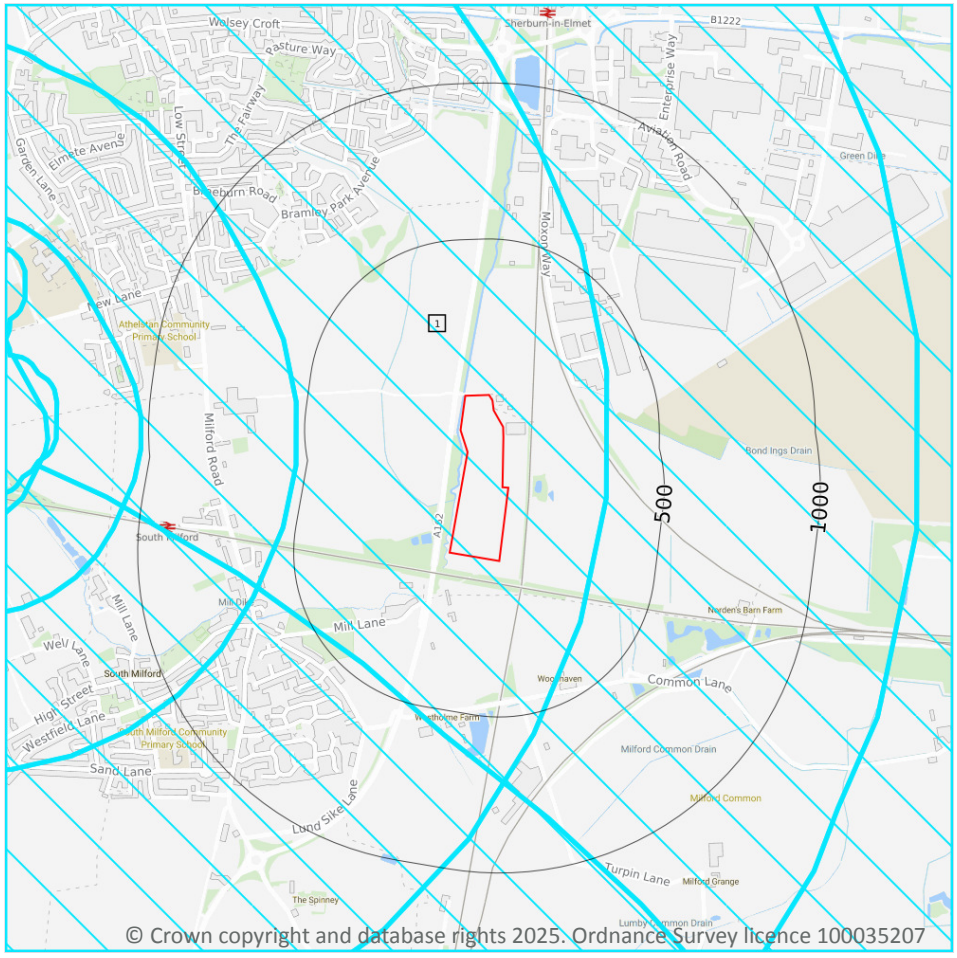
Records within 2000m	3

Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	**Selby Dam from Conf. Fox Dike & Carr Dike to Ouse NVZ**	**Surface Water**	**287**	**Existing**
On site	**Yorkshire Mag Limestone**	**Groundwater**	**101**	**Existing**
1590m SE	The Fleet from Source to River Aire NVZ	Surface Water	272	Existing

This data is sourced from Natural England and Natural Resources Wales.

SSSI Impact Zones and Units



Site Outline

Search buffers in metres (m)

SSSI Impact Risk Zones

SSSI Units

- Not recorded
- Favourable
- Unfavourable - Recovering
- Unfavourable - No change
- Unfavourable - Declining
- Partially destroyed
- Destroyed

10.17 SSSI Impact Risk Zones

Records on site	1

Developed to allow rapid initial assessment of the potential risks to SSSIs posed by development proposals. They define zones around each SSSI which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could potentially have adverse impacts.

Features are displayed on the SSSI Impact Zones and Units map on **page 69 >**

ID	Location	Type of developments requiring consultation
1	On site	**Infrastructure - Pipelines and underground cables, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals. Wind and Solar - Solar schemes with footprint > 0.5ha, all wind turbines. Minerals, Oil and Gas - Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction. Air pollution - Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 200m², manure stores > 250t). Combustion - General combustion processes >20MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Landfill. Incl: inert landfill, non-hazardous landfill, hazardous landfill. Composting - Any composting proposal with more than 75000 tonnes maximum annual operational throughput. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Water supply - Large infrastructure such as warehousing / industry where total net additional gross internal floorspace following development is 1,000m² or more.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	3

Divisions of SSSIs used to record management and condition details. Units are the smallest areas for which Natural England gives a condition assessment, however, the size of units varies greatly depending on the types of management and the conservation interest.

Features are displayed on the SSSI Impact Zones and Units map on **page 69 >**

ID: -
Location: 1526m W
SSSI name: Sherburn Willows
Unit name: 1
Broad habitat: Calcareous Grassland - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Lowland calcareous grassland (CG3-5)	Favourable	16/07/2014

ID: -
Location: 1601m W
SSSI name: Sherburn Willows
Unit name: 2
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Valley fen (lowland)	Favourable	01/10/2010

ID: -
Location: 1692m W
SSSI name: Sherburn Willows
Unit name: 3
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Favourable
Reportable features:

Feature name	Feature condition	Date of assessment
Valley fen (lowland)	Favourable	01/10/2010

This data is sourced from Natural England and Natural Resources Wales.

11 Visual and cultural designations



Site Outline

Search buffers in metres (m)

Listed buildings

Conservation areas

Conservation areas - no data

National Parks

Areas of Outstanding Natural Beauty

Registered parks and gardens

Scheduled Monuments

World Heritage Sites

11.1 World Heritage Sites

Records within 250m	0

Sites designated for their globally important cultural or natural interest requiring appropriate management and protection measures. World Heritage Sites are designated to meet the UK's commitments under the World Heritage Convention.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.2 Area of Outstanding Natural Beauty

Records within 250m	0

Areas of Outstanding Natural Beauty (AONB) are conservation areas, chosen because they represent 18% of the finest countryside. Each AONB has been designated for special attention because of the quality of their flora, fauna, historical and cultural associations, and/or scenic views. The National Parks and Access to the Countryside Act of 1949 created AONBs and the Countryside and Rights of Way Act, 2000 added further regulation and protection. There are likely to be restrictions to some developments within these areas.

This data is sourced from Natural England, Natural Resources Wales and Scottish Natural Heritage.

11.3 National Parks

Records within 250m	0

In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them. In Scotland National Parks have the additional purpose of promoting the sustainable use of the natural resources of the area and the sustainable social and economic development of its communities. The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales, and The National Parks (Scotland) Act 2000 in Scotland.

This data is sourced from Natural England, Natural Resources Wales and the Scottish Government.

11.4 Listed Buildings

Records within 250m	1

Buildings listed for their special architectural or historical interest. Building control in the form of 'listed building consent' is required in order to make any changes to that building which might affect its special interest. Listed buildings are graded to indicate their relative importance, however building controls apply to all buildings equally, irrespective of their grade, and apply to the interior and exterior of the building in its entirety, together with any curtilage structures.

Features are displayed on the Visual and cultural designations map on **page 72 >**

ID	Location	Name	Grade	Reference Number	Listed date
1	109m S	Common Lane Bridge, Hul3/4	II	1419073	05/03/2015

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.5 Conservation Areas

Records within 250m	0

Local planning authorities are obliged to designate as conservation areas any parts of their own area that are of special architectural or historic interest, the character and appearance of which it is desirable to preserve or enhance. Designation of a conservation area gives broader protection than the listing of individual buildings. All the features within the area, listed or otherwise, are recognised as part of its character. Conservation area designation is the means of recognising the importance of all factors and of ensuring that planning decisions address the quality of the landscape in its broadest sense.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

11.6 Scheduled Ancient Monuments

Records within 250m	0

A scheduled monument is an historic building or site that is included in the Schedule of Monuments kept by the Secretary of State for Digital, Culture, Media and Sport. The regime is set out in the Ancient Monuments and Archaeological Areas Act 1979. The Schedule of Monuments has c.20,000 entries and includes sites such as Roman remains, burial mounds, castles, bridges, earthworks, the remains of deserted villages and industrial sites. Monuments are not graded, but all are, by definition, considered to be of national importance.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

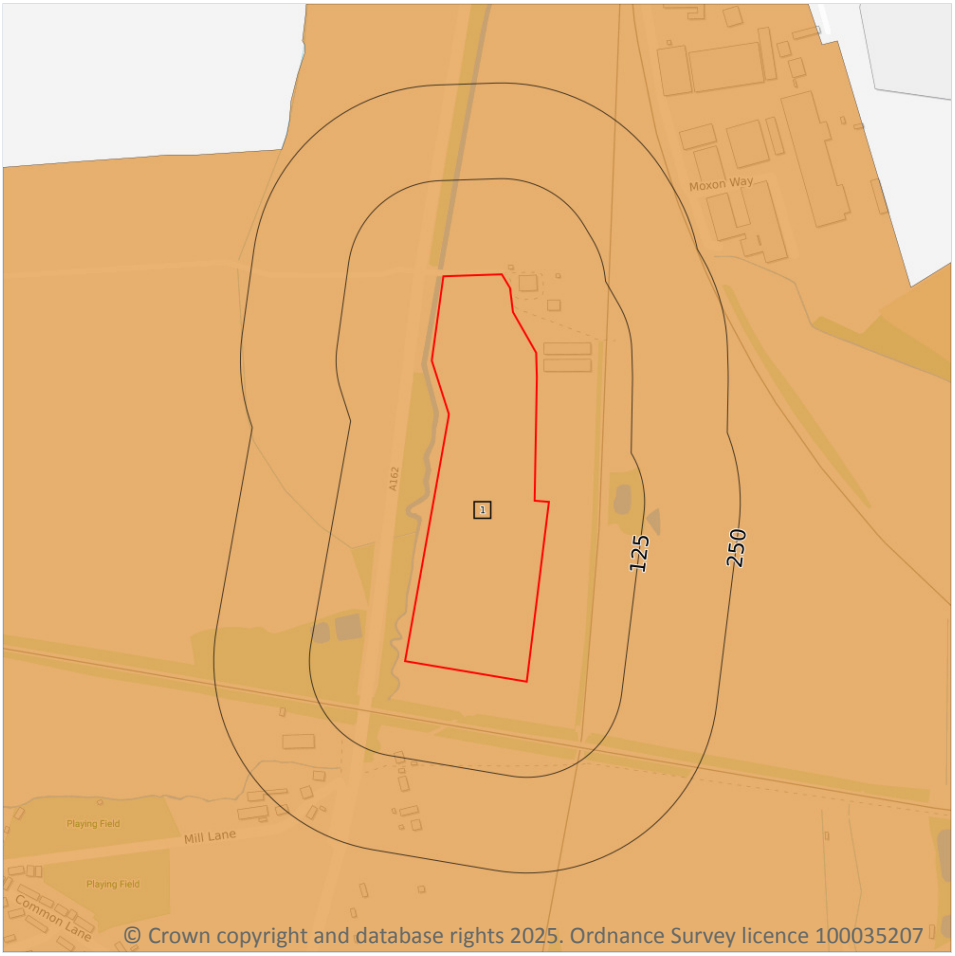
11.7 Registered Parks and Gardens

Records within 250m	0

Parks and gardens assessed to be of particular interest and of special historic interest. The emphasis being on 'designed' landscapes, rather than on planting or botanical importance. Registration is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the special character of the landscape.

This data is sourced from Historic England, Cadw and Historic Environment Scotland.

12 Agricultural designations



Site Outline

Search buffers in metres (m)

- Grade 1 - excellent quality
- Grade 2 - very good quality
- Grade 3 - good to moderate quality
- Grade 3a - good quality
- Grade 3b - moderate quality
- Grade 4 - poor quality
- Grade 5 - very poor quality
- Non-agricultural land
- Urban land
- Exclusion land
- Tree felling licences
- Open Access land

12.1 Agricultural Land Classification

Records within 250m	1

Classification of the quality of agricultural land taking into consideration multiple factors including climate, physical geography and soil properties. It should be noted that the categories for the grading of agricultural land are not consistent across England, Wales and Scotland.

Features are displayed on the Agricultural designations map on **page 75 >**

ID	Location	Classification	Description
1	On site	Grade 3	**Good to moderate quality agricultural land. Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown yields are generally lower or more variable than on land in Grades 1 and 2.**

This data is sourced from Natural England.

12.2 Open Access Land

Records within 250m	0

The Countryside and Rights of Way Act 2000 (CROW Act) gives a public right of access to land without having to use paths. Access land includes mountains, moors, heaths and downs that are privately owned. It also includes common land registered with the local council and some land around the England Coast Path. Generally permitted activities on access land are walking, running, watching wildlife and climbing.

This data is sourced from Natural England and Natural Resources Wales.

12.3 Tree Felling Licences

Records within 250m	0

Felling Licence Application (FLA) areas approved by Forestry Commission England. Anyone wishing to fell trees must ensure that a licence or permission under a grant scheme has been issued by the Forestry Commission before any felling is carried out or that one of the exceptions apply.

This data is sourced from the Forestry Commission.

12.4 Environmental Stewardship Schemes

Records within 250m	0

Environmental Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. The schemes identified may be historical schemes that have now expired, or may still be active.

This data is sourced from Natural England.

12.5 Countryside Stewardship Schemes

Records within 250m	6

Countryside Stewardship covers a range of schemes that provide financial incentives to farmers, foresters and land managers to look after and improve the environment. Main objectives are to improve the farmed environment for wildlife and to reduce diffuse water pollution.

Location	Reference	Scheme	Start Date	End Date
On site	**1453714**	**Countryside Stewardship (Middle Tier)**	**01/01/2023**	**31/12/2027**
On site	**1453714**	**Countryside Stewardship (Middle Tier)**	**01/01/2023**	**31/12/2027**
47m NW	1453714	Countryside Stewardship (Middle Tier)	01/01/2023	31/12/2027
50m N	1453714	Countryside Stewardship (Middle Tier)	01/01/2023	31/12/2027

Location	Reference	Scheme	Start Date	End Date
78m E	1453714	Countryside Stewardship (Middle Tier)	01/01/2023	31/12/2027
129m S	821924	Countryside Stewardship (Middle Tier)	01/01/2020	31/12/2024

This data is sourced from Natural England.

13 Habitat designations



Site Outline

Search buffers in metres (m)

Priority Habitat Inventory
Open Mosaic Habitat
Limestone Pavement Orders

Habitat Networks
Primary Habitat
Restorable Habitat
Associated Habitats
Habitat Restoration-Creation
Network Enhancement Zone 1
Network Enhancement Zone 2

13.1 Priority Habitat Inventory

Records within 250m	3

Habitats of principal importance as named under Natural Environment and Rural Communities Act (2006) Section 41.

Features are displayed on the Habitat designations map on **page 78 >**

ID	Location	Main Habitat	Other habitats
1	57m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%); Additional: LFENS (INV 50%); RBEDS (INV 50%)
2	60m SW	Lowland fens	Main habitat: LFENS (INV > 50%); RBEDS (INV > 50%)
3	73m SW	Deciduous woodland	Main habitat: DWOOD (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	0

Habitat networks for 18 priority habitat networks (based primarily, but not exclusively, on the priority habitat inventory) and areas suitable for the expansion of networks through restoration and habitat creation.

This data is sourced from Natural England.

13.3 Open Mosaic Habitat

Records within 250m	0

Sites verified as Open Mosaic Habitat. Mosaic habitats are brownfield sites that are identified under the UK Biodiversity Action Plan as a priority habitat due to the habitat variation within a single site, supporting an array of invertebrates.

This data is sourced from Natural England.

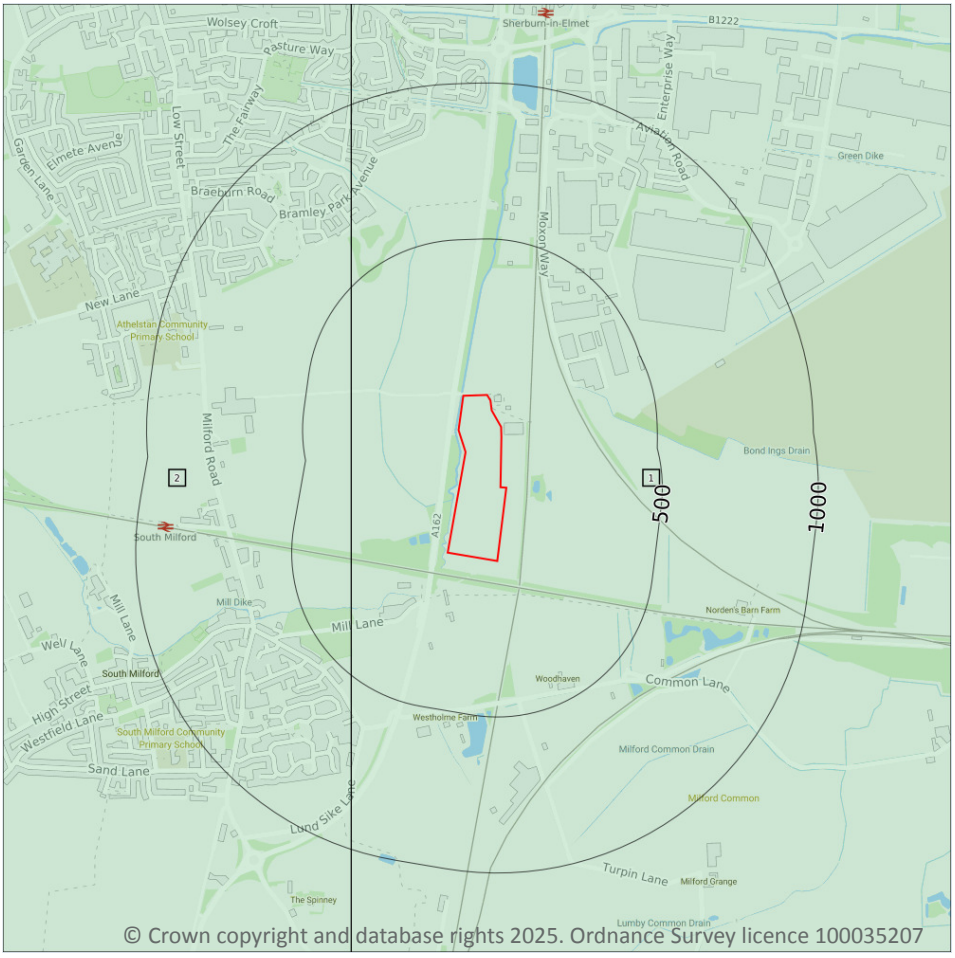
13.4 Limestone Pavement Orders

Records within 250m	0

Limestone pavements are outcrops of limestone where the surface has been worn away by natural means over millennia. These rocks have the appearance of paving blocks, hence their name. Not only do they have geological interest, they also provide valuable habitats for wildlife. These habitats are threatened due to their removal for use in gardens and water features. Many limestone pavements have been designated as SSSIs which affords them some protection. In addition, Section 34 of the Wildlife and Countryside Act 1981 gave them additional protection via the creation of Limestone Pavement Orders, which made it a criminal offence to remove any part of the outcrop. The associated Limestone Pavement Priority Habitat is part of the UK Biodiversity Action Plan priority habitat in England.

This data is sourced from Natural England.

14 Geology 1:10,000 scale - Availability



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Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	2

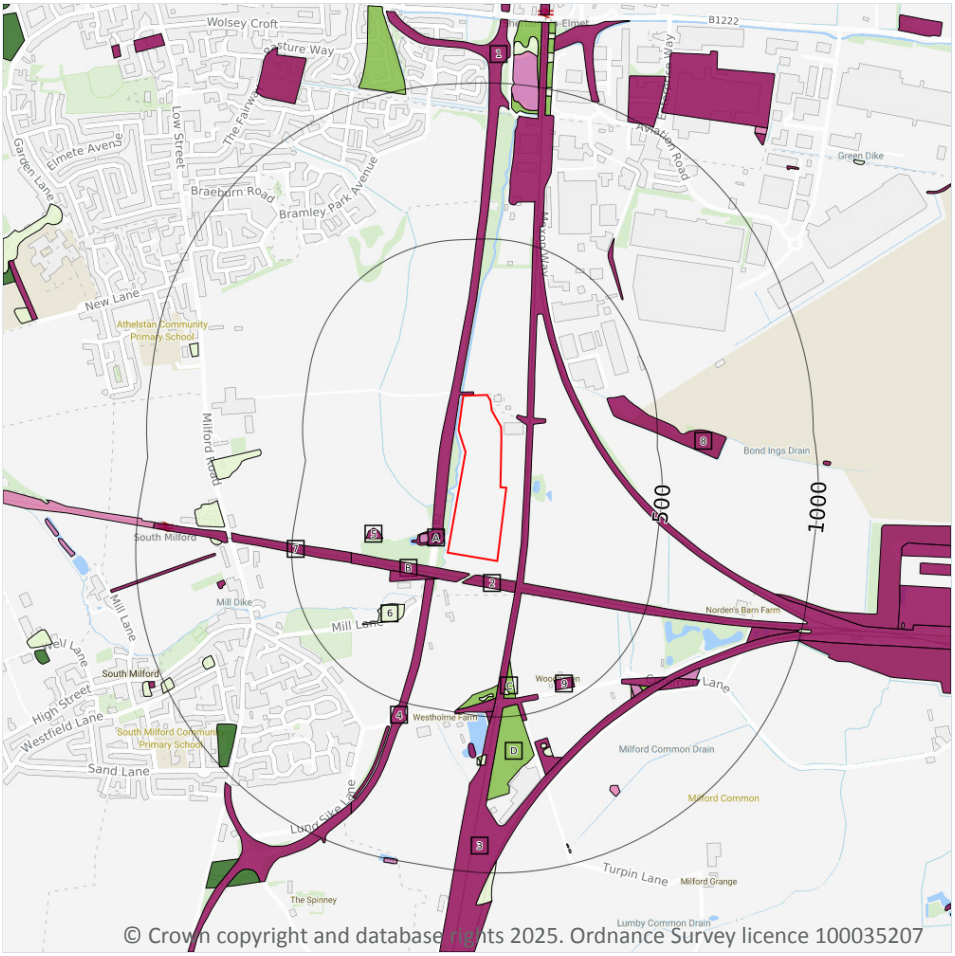
An indication on the coverage of 1:10,000 scale geology data for the site, the most detailed dataset provided by the British Geological Survey. Either 'Full', 'Partial' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:10,000 scale - Availability map on **page 80 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**SE53SW**
2	309m SW	Full	Full	Full	Full	SE43SE

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Artificial and made ground



Site Outline

Search buffers in metres (m)

- Reclaimed ground
- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

14.2 Artificial and made ground (10k)

Records within 500m	20

Details of made, worked, infilled, disturbed and landscaped ground at 1:10,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

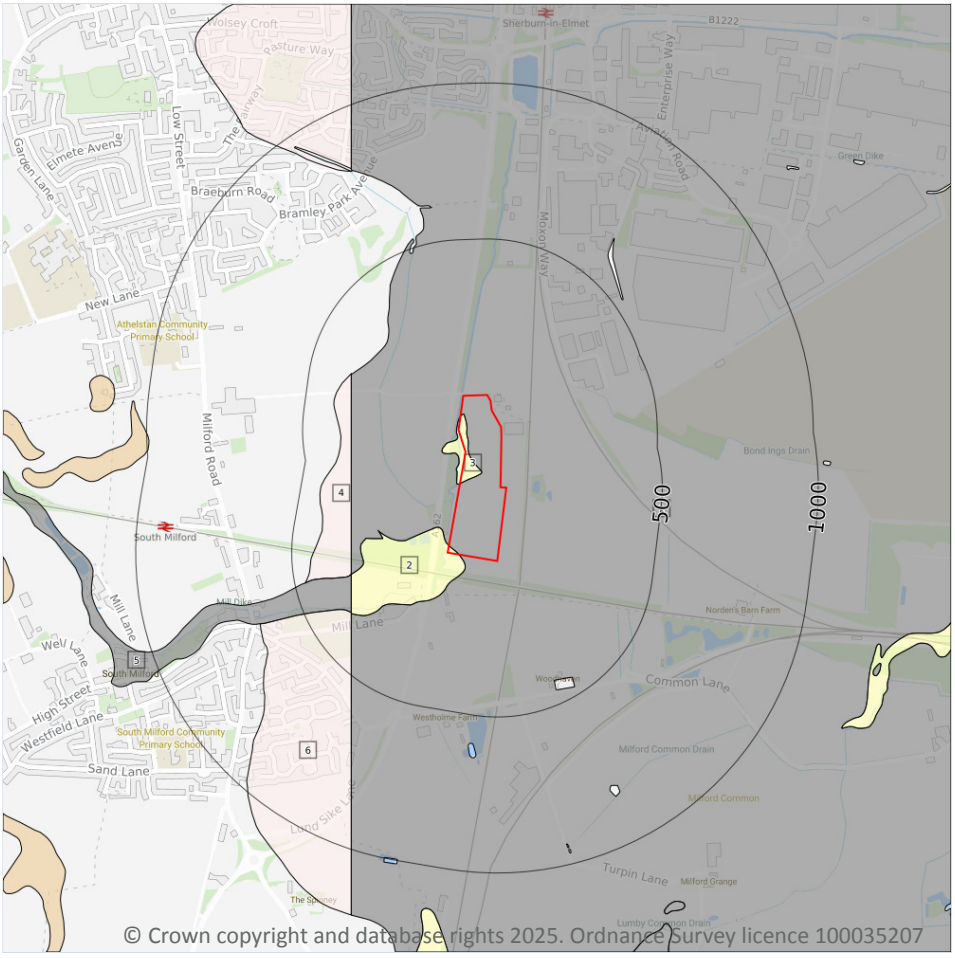
Features are displayed on the Geology 1:10,000 scale - Artificial and made ground map on **page 81 >**

ID	Location	LEX Code	Description	Rock description
1	3m N	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	33m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
B	54m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
2	55m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

ID	Location	LEX Code	Description	Rock description
3	57m E	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
A	67m SW	WGR-VOID	Worked Ground (Undivided)	Void
B	89m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
4	94m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
5	213m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
6	217m SW	WMGR-ARTDP	Infilled Ground	Artificial Deposit
7	309m SW	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	320m S	DDGR-UKNOWN	Disturbed Ground (Undivided)	Unknown/unclassified Entry
8	351m NE	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	397m S	DDGR-UKNOWN	Disturbed Ground (Undivided)	Unknown/unclassified Entry
C	411m S	WMGR-ARTDP	Infilled Ground	Artificial Deposit
9	424m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
C	426m S	WMGR-ARTDP	Infilled Ground	Artificial Deposit
C	439m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit
D	464m S	DDGR-UKNOWN	Disturbed Ground (Undivided)	Unknown/unclassified Entry
C	483m S	MGR-ARTDP	Made Ground (Undivided)	Artificial Deposit

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (10k)

Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m	6

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on **page 83 >**

ID	Location	LEX Code	Description	Rock description
1	On site	HEM-CZPS	Hemingbrough Glaciolacustrine Formation - Clay, Silty, Peaty, Sandy (unlithified Deposits Coding Scheme)	Clay, Silty, Peaty, Sandy
2	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
3	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel

ID	Location	LEX Code	Description	Rock description
4	309m SW	GLLD-XCZ	Glaciolacustrine Deposits - Clay And Silt	Clay And Silt
5	317m SW	ALV-CZ	Alluvium - Silty Clay	Clay, Silty
6	364m SW	GLLD-XCZ	Glaciolacustrine Deposits - Clay And Silt	Clay And Silt

This data is sourced from the British Geological Survey.

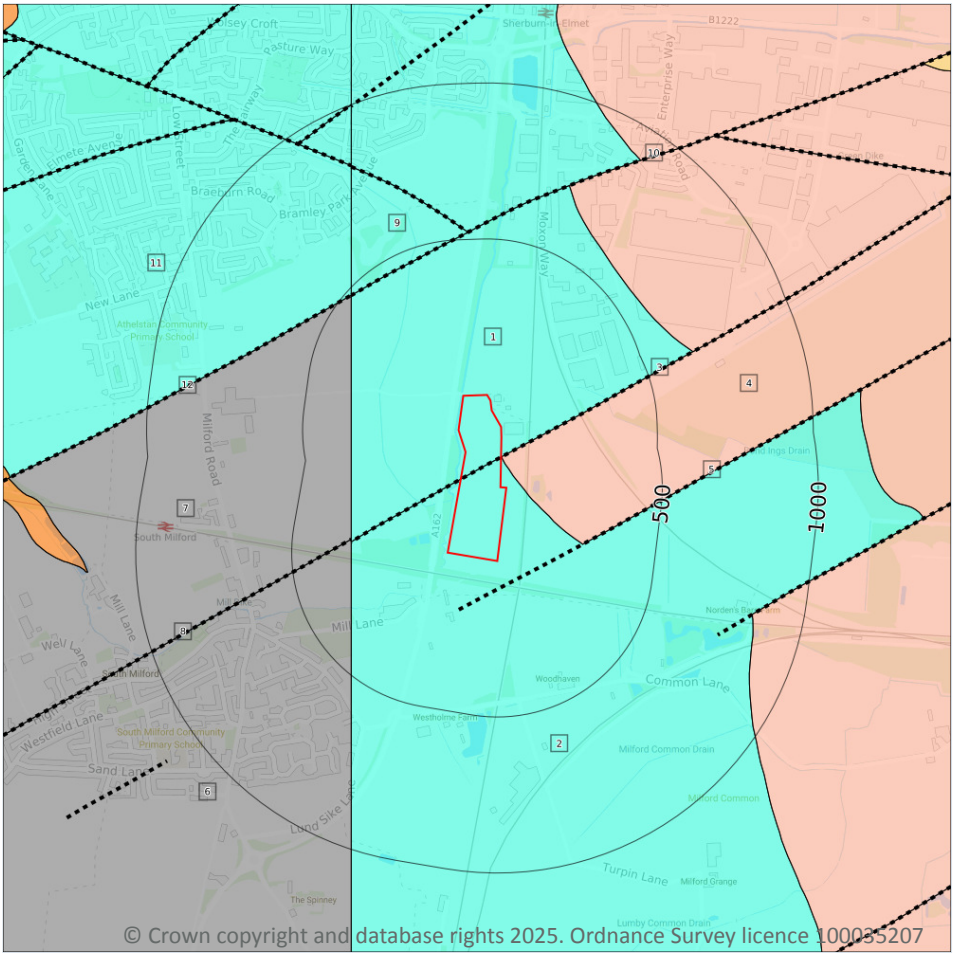
14.4 Landslip (10k)

Records within 500m	**0**

Mass movement deposits on BGS geological maps at 1:10,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Bedrock



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Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (10k)

Bedrock geology (10k)
Please see table for more details.

14.5 Bedrock geology (10k)

Records within 500m **7**

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 85 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**BTH-DOLMST**	**Brotherton Formation - Dolomitic Limestone**	**Late Permian Epoch [Obsolete name]**
2	**On site**	**BTH-DOLMST**	**Brotherton Formation - Dolomitic Limestone**	**Late Permian Epoch [Obsolete name]**

ID	Location	LEX Code	Description	Rock age
4	1m NE	ROX-CAMDST	Roxby Formation - Calcareous Mudstone	Early Triassic Epoch - Late Permian Epoch [Obsolete name]
6	309m SW	BTH-DOLO	Brotherton Formation - Dolostone	Late Permian Epoch [Obsolete name]
7	312m SW	BTH-DOLO	Brotherton Formation - Dolostone	Late Permian Epoch [Obsolete name]
9	457m N	BTH-DOLMST	Brotherton Formation - Dolomitic Limestone	Late Permian Epoch [Obsolete name]
11	483m NW	BTH-DOLMST	Brotherton Formation - Dolomitic Limestone	Late Permian Epoch [Obsolete name]

This data is sourced from the British Geological Survey.

14.6 Bedrock faults and other linear features (10k)

Records within 500m	**5**

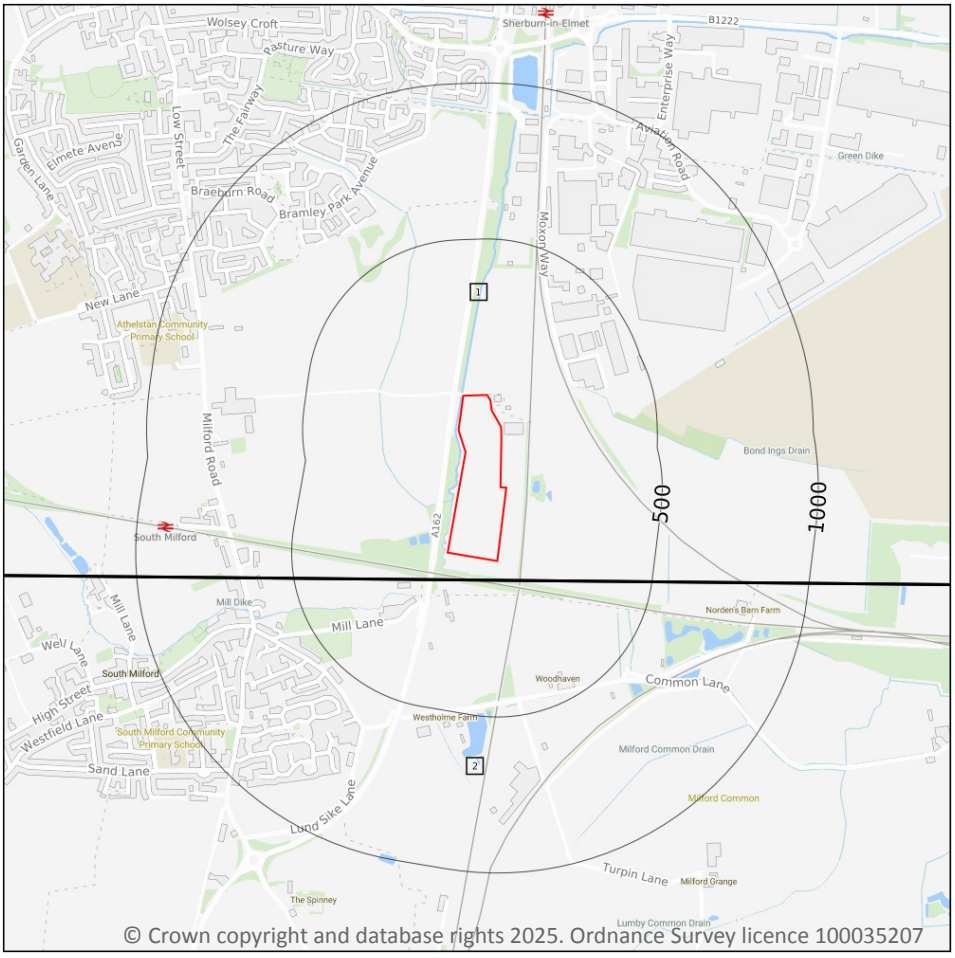
Linear features at the ground or bedrock surface at 1:10,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on **page 85 >**

ID	Location	Category	Description
3	**On site**	**FAULT**	**Normal fault, inferred; crossmarks on downthrow side**
5	80m S	FAULT	Normal fault, inferred; crossmarks on downthrow side
8	312m SW	FAULT	Normal fault, inferred
10	457m N	FAULT	Normal fault, inferred; crossmarks on downthrow side
12	483m NW	FAULT	Normal fault, inferred

This data is sourced from the British Geological Survey.

15 Geology 1:50,000 scale - Availability



Site Outline

Search buffers in metres (m)

Geological map tile

15.1 50k Availability

Records within 500m	2

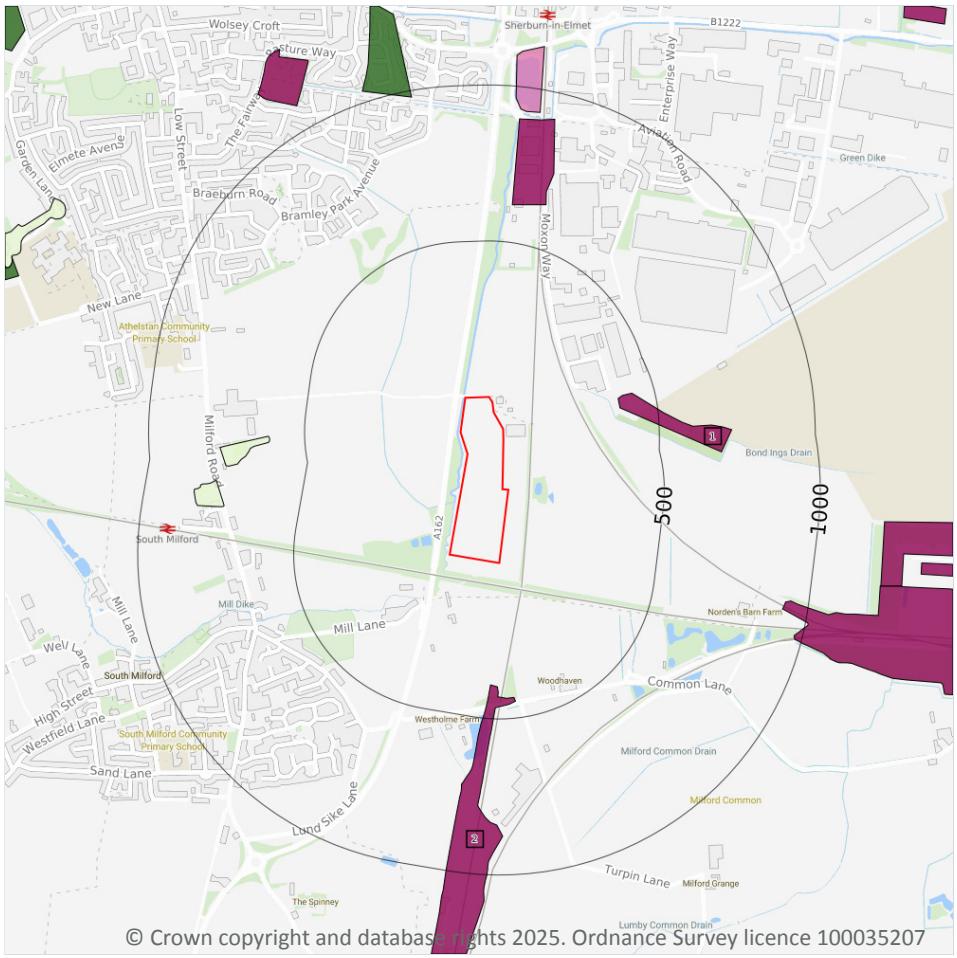
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 87 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**Full**	**EW070_leeds_v4**
2	62m S	Full	Full	Full	Full	EW078_wakefield_v4

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Artificial and made ground



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Site Outline

Search buffers in metres (m)

- Made ground
- Worked ground
- Infilled ground
- Disturbed ground
- Landscaped ground

15.2 Artificial and made ground (50k)

Records within 500m	2

Details of made, worked, infilled, disturbed and landscaped ground at 1:50,000 scale. Artificial ground can be associated with potentially contaminated material, unpredictable engineering conditions and instability.

Features are displayed on the Geology 1:50,000 scale - Artificial and made ground map on **page 88 >**

ID	Location	LEX Code	Description	Rock description
1	381m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
2	392m S	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

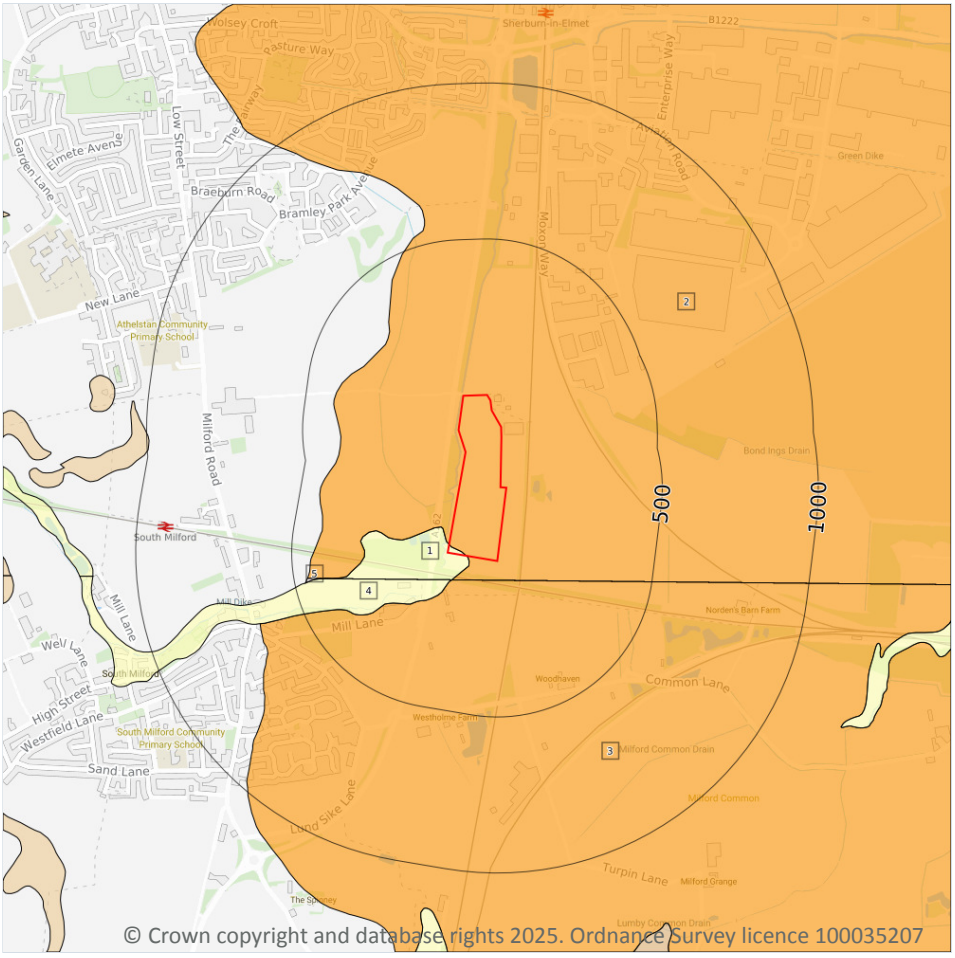
15.3 Artificial ground permeability (50k)

Records within 50m	0

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any artificial deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Superficial



Site Outline

Search buffers in metres (m)

Landslip (50k)

Superficial geology (50k)
Please see table for more details.

15.4 Superficial geology (50k)

Records within 500m **5**

Superficial geological deposits at 1:50,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:50,000 scale - Superficial map on **page 90 >**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**ALV-XCZSV**	**ALLUVIUM**	**CLAY, SILT, SAND AND GRAVEL**
2	**On site**	**HEM-CZ**	**HEMINGBROUGH GLACIOLACUSTRINE FORMATION**	**CLAY, SILTY**
3	62m S	HEM-CZ	HEMINGBROUGH GLACIOLACUSTRINE FORMATION	CLAY, SILTY
4	84m S	ALV-XCZSV	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

ID	Location	LEX Code	Description	Rock description
5	414m SW	GLLDD-XCZ	GLACIOLACUSTRINE DEPOSITS, DEVENSIAN	CLAY AND SILT

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	**2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any superficial deposits (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Intergranular**	**High**	**Very Low**
On site	**Mixed**	**Low**	**Very Low**

This data is sourced from the British Geological Survey.

15.6 Landslip (50k)

Records within 500m	**0**

Mass movement deposits on BGS geological maps at 1:50,000 scale. Primarily superficial deposits that have moved down slope under gravity to form landslips. These affect bedrock, other superficial deposits and artificial ground.

This data is sourced from the British Geological Survey.

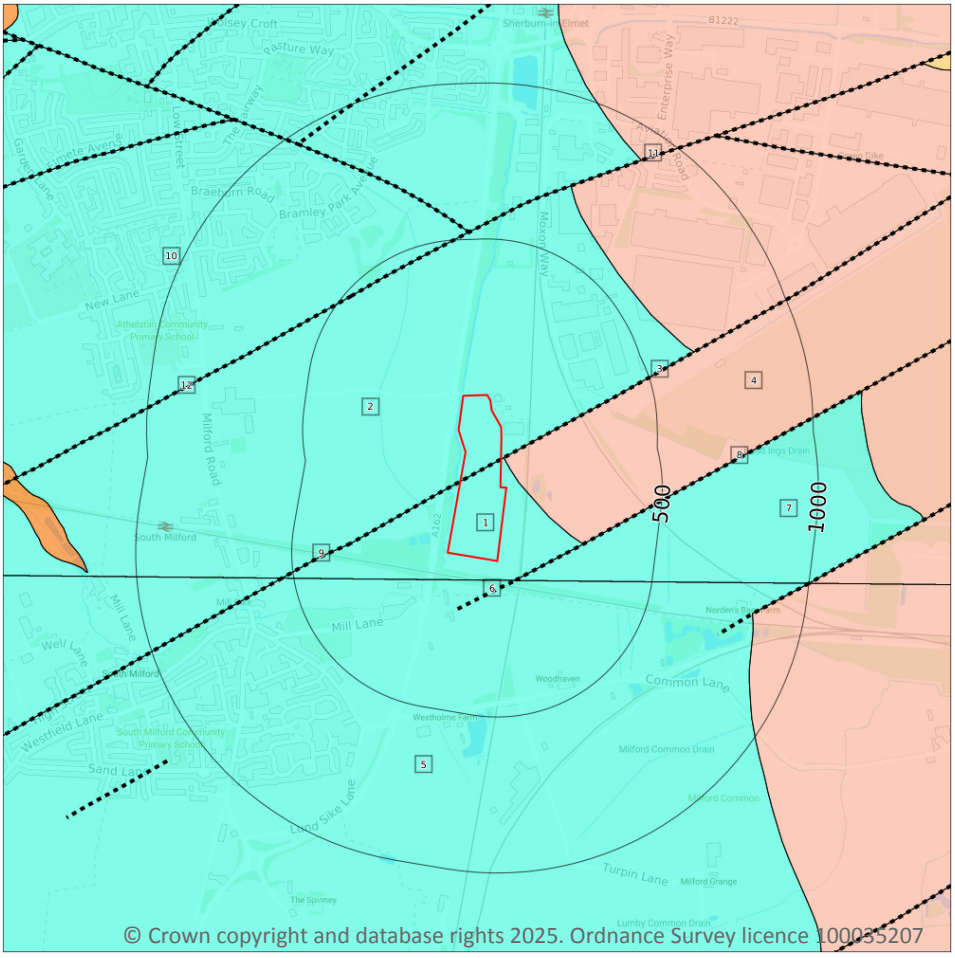
15.7 Landslip permeability (50k)

Records within 50m	**0**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of any landslip deposits (the zone between the land surface and the water table).

This data is sourced from the British Geological Survey.

Geology 1:50,000 scale - Bedrock



Site Outline

Search buffers in metres (m)

Bedrock faults and other linear features (50k)

Bedrock geology (50k)
Please see table for more details.

15.8 Bedrock geology (50k)

Records within 500m	6

Bedrock geology at 1:50,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92 >**

ID	Location	LEX Code	Description	Rock age
1	On site	BTH-DOLMST	BROTHERTON FORMATION - LIMESTONE, DOLOMITIC	-
2	On site	BTH-DOLMST	BROTHERTON FORMATION - LIMESTONE, DOLOMITIC	-

ID	Location	LEX Code	Description	Rock age
4	9m NE	ROX-CAMDST	ROXBY FORMATION - MUDSTONE, CALCAREOUS	-
5	62m S	BTH-DOLMST	BROTHERTON FORMATION - LIMESTONE, DOLOMITIC	-
7	85m S	BTH-DOLMST	BROTHERTON FORMATION - LIMESTONE, DOLOMITIC	-
10	455m N	BTH-DOLMST	BROTHERTON FORMATION - LIMESTONE, DOLOMITIC	-

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m **2**

A qualitative classification of estimated rates of vertical movement of water from the ground surface through the unsaturated zone of bedrock (the zone between the land surface and the water table).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Fracture**	**Very High**	**High**
9m NE	Fracture	Very High	Low

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m **6**

Linear features at the ground or bedrock surface at 1:50,000 scale of six main types; rock, fault, fold axis, mineral vein, alteration area or landform. Features are either observed or inferred, and relate primarily to bedrock.

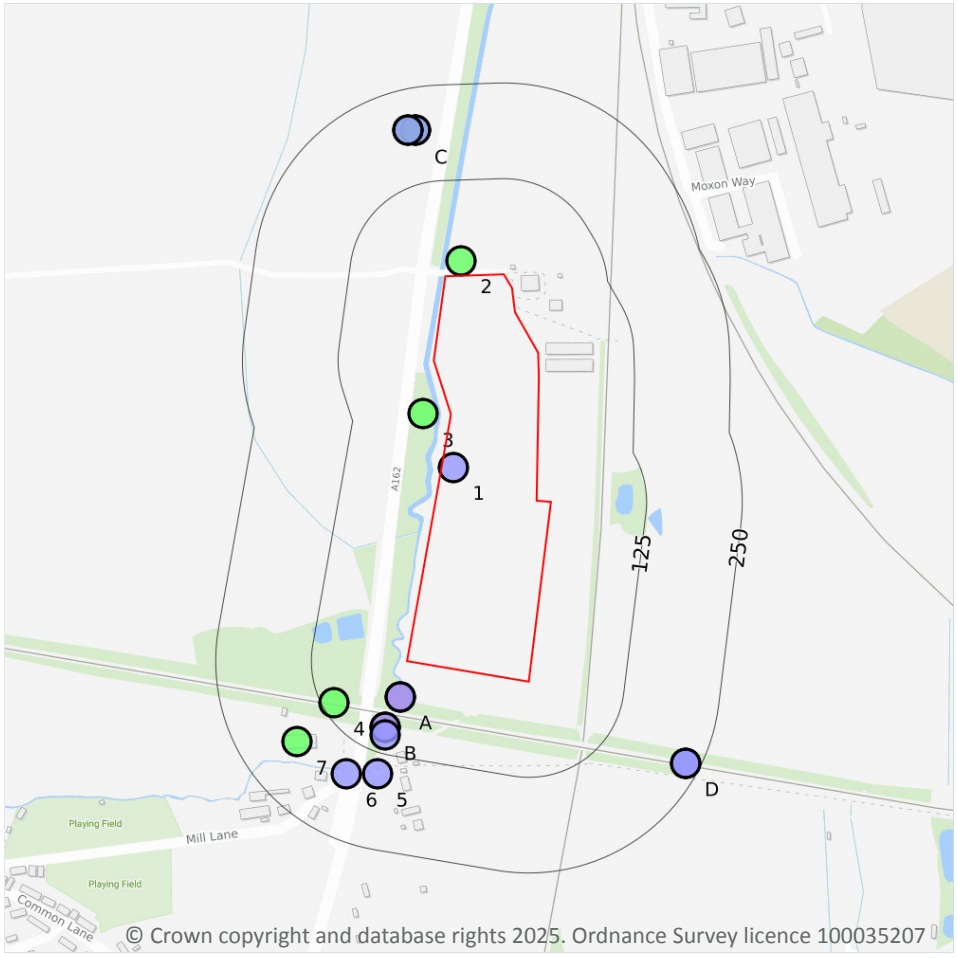
Features are displayed on the Geology 1:50,000 scale - Bedrock map on **page 92 >**

ID	Location	Category	Description
3	**On site**	**FAULT**	**Fault, inferred**
6	81m S	FAULT	Fault, inferred
8	85m S	FAULT	Fault, inferred
9	313m SW	FAULT	Fault, inferred

ID	Location	Category	Description
11	455m N	FAULT	Fault, inferred
12	481m NW	FAULT	Fault, inferred

This data is sourced from the British Geological Survey.

16 Boreholes



Site Outline

Search buffers in metres (m)

Confidential

0 - 10m

10 - 30m

30m+

Unknown

16.1 BGS Boreholes

Records within 250m	18

The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several thousand metres deep.

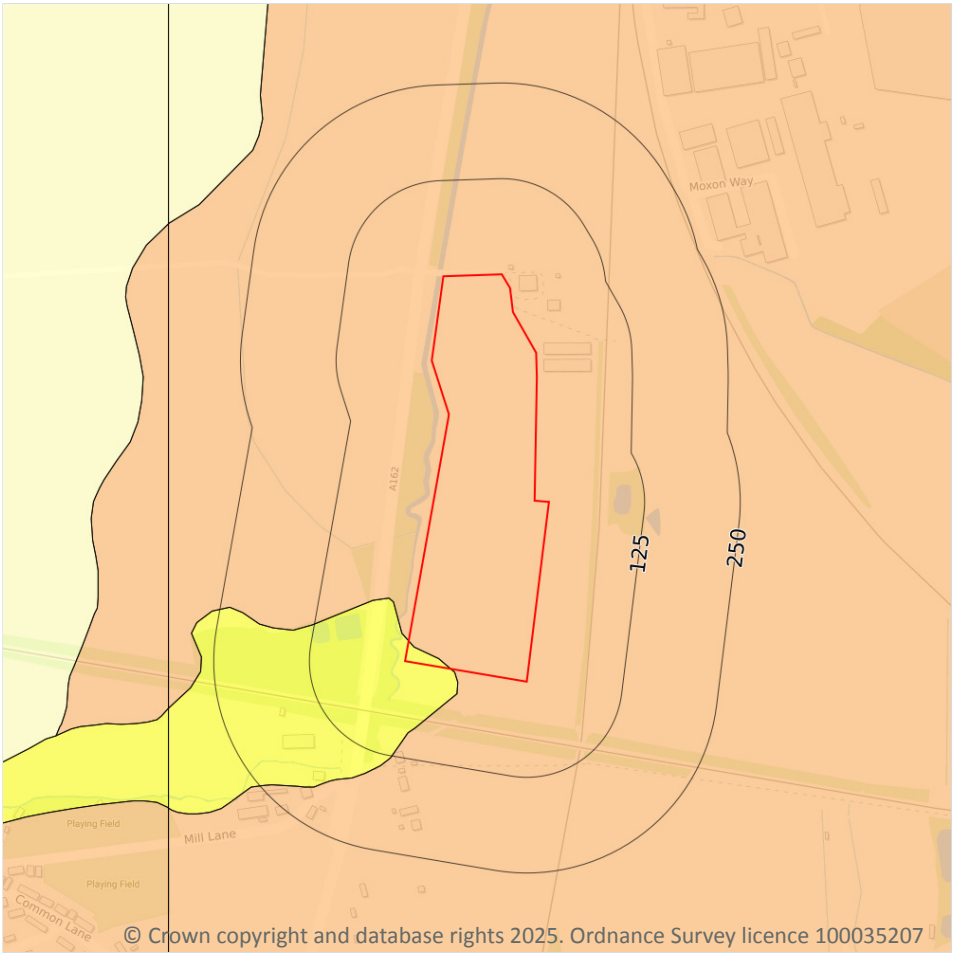
Features are displayed on the Boreholes map on **page 95 >**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	**On site**	**450370 432220**	**SHERBURN/S.MILFORD BYPASS BH9**	**10.0**	**N**	**118519** ↗
2	20m N	450380 432490	SHERBURN/S.MILFORD BYPASS BH11	12.0	N	118521 ↗
3	34m NW	450330 432290	SHERBURN/S.MILFORD BYPASS BH10	17.0	N	118520 ↗

ID	Location	Grid reference	Name	Length	Confidential	Web link
A	48m S	450300 431920	SHERBURN/S.MILFORD BYPASS BH8	30.2	N	118518 ↗
A	48m S	450300 431920	SHERBURN/S.MILFORD BYP BH8A	5.7	N	118542 ↗
B	91m SW	450280 431880	SHERBURN/S.MILFORD BYPASS BH7	31.3	N	118517 ↗
B	91m SW	450280 431880	SHERBURN/S.MILFORD BYP BH7A	5.7	N	118541 ↗
B	101m S	450280 431870	SHERBURN/S.MILFORD BYPASS BH6	10.0	N	118516 ↗
4	110m SW	450214 431912	PECKFIELD COLLIERY NO.3 U.G.BH	24.84	N	118310 ↗
5	152m S	450270 431820	SHERBURN-IN-ELMET DRAIN 22	3.35	N	118496 ↗
6	167m SW	450230 431820	SHERBURN/S.MILFORD BYPASS BH5	10.0	N	118515 ↗
7	179m SW	450165 431861	PECKFIELD COLLIERY NO.1 U.G.B.H.	23.16	N	118293 ↗
C	195m N	450320 432660	SHERBURN/S.MILFORD BYP BH34	25.0	N	118539 ↗
C	195m N	450320 432660	SHERBURN/S.MILFORD BYP BH34A	5.0	N	118540 ↗
C	197m N	450310 432660	SHERBURN/S.MILFORD BYPASS BH33	26.0	N	118537 ↗
C	197m N	450310 432660	SHERBURN/S.MILFORD BYP BH33A	6.0	N	118538 ↗
D	231m SE	450673 431833	Garforth to Hull Contract 1 L2H-P1-GH01-007	9.99	N	21195346 ↗
D	231m SE	450673 431833	Garforth to Hull Contract 1 L2H-P1-GH01-007_IP	1.2	N	21195347 ↗

This data is sourced from the British Geological Survey.

17 Natural ground subsidence - Shrink swell clays



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.1 Shrink swell clays

Records within 50m	2

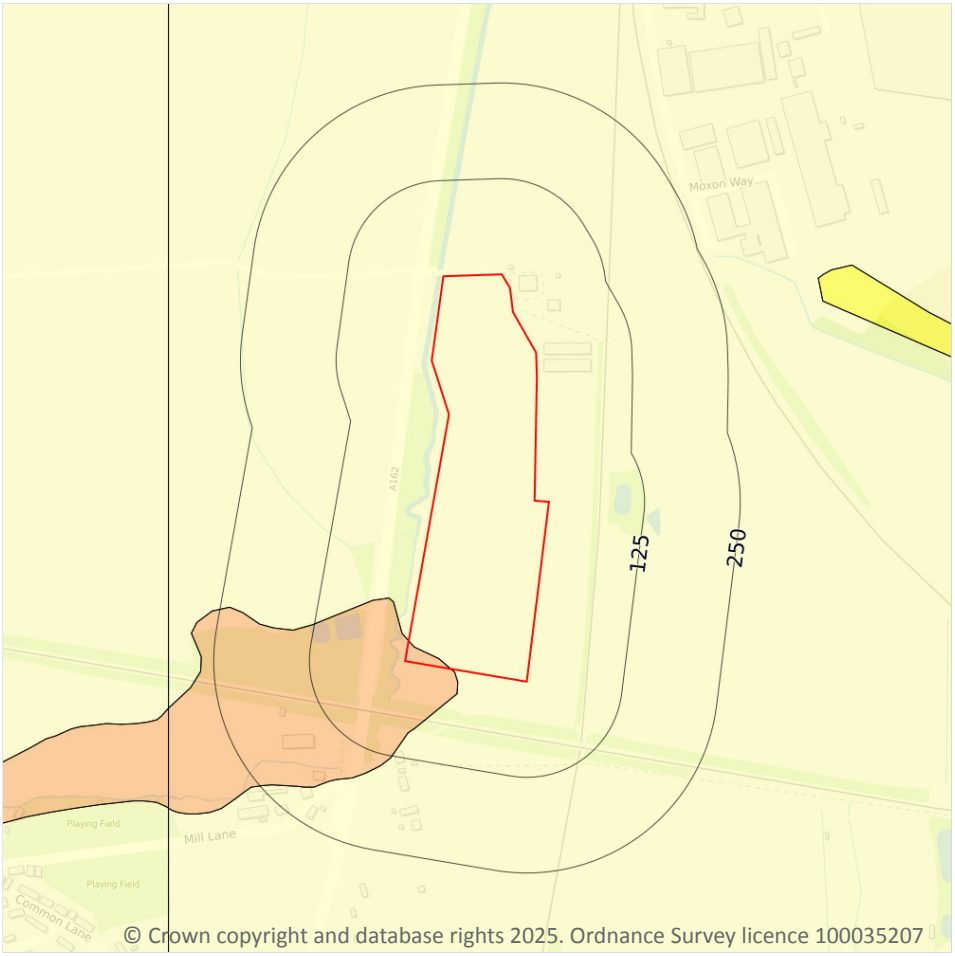
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 97 >**

Location	Hazard rating	Details
On site	**Very low**	**Ground conditions predominantly low plasticity.**
On site	**Low**	**Ground conditions predominantly medium plasticity.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Running sands



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.2 Running sands

Records within 50m	2

The potential hazard presented by rocks that can contain loosely-packed sandy layers that can become fluidised by water flowing through them. Such sands can 'run', removing support from overlying buildings and causing potential damage.

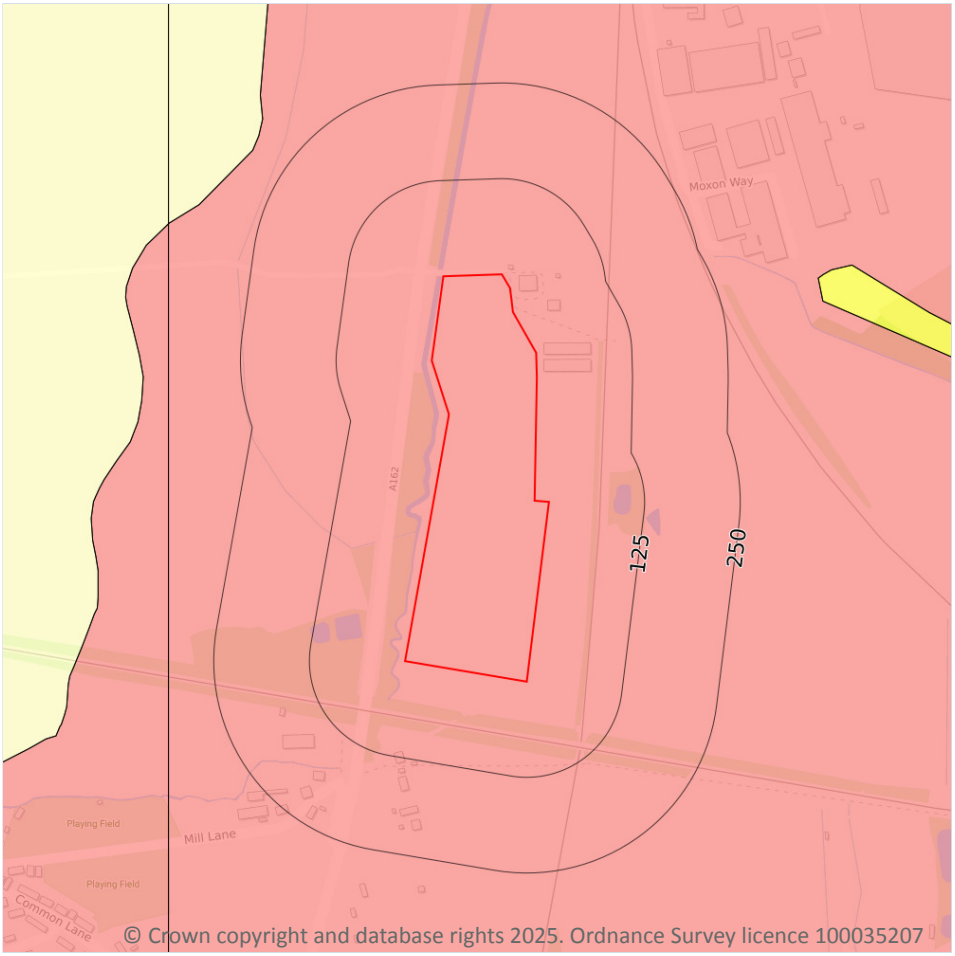
Features are displayed on the Natural ground subsidence - Running sands map on **page 98 >**

Location	Hazard rating	Details
On site	**Negligible**	**Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions.**

Location	Hazard rating	Details
On site	**Low**	**Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Compressible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.3 Compressible deposits

Records within 50m	1

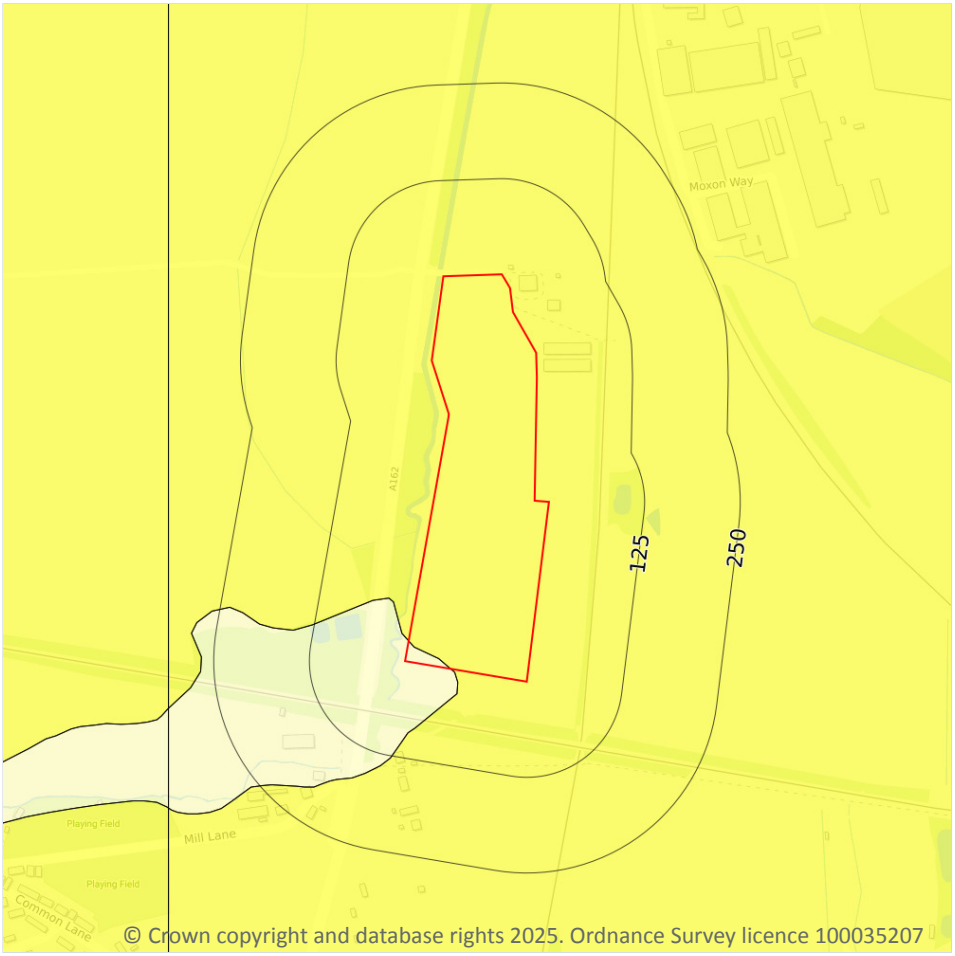
The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat and may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

Features are displayed on the Natural ground subsidence - Compressible deposits map on **page 100 >**

Location	Hazard rating	Details
On site	**Moderate**	**Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the site.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.4 Collapsible deposits

Records within 50m	2

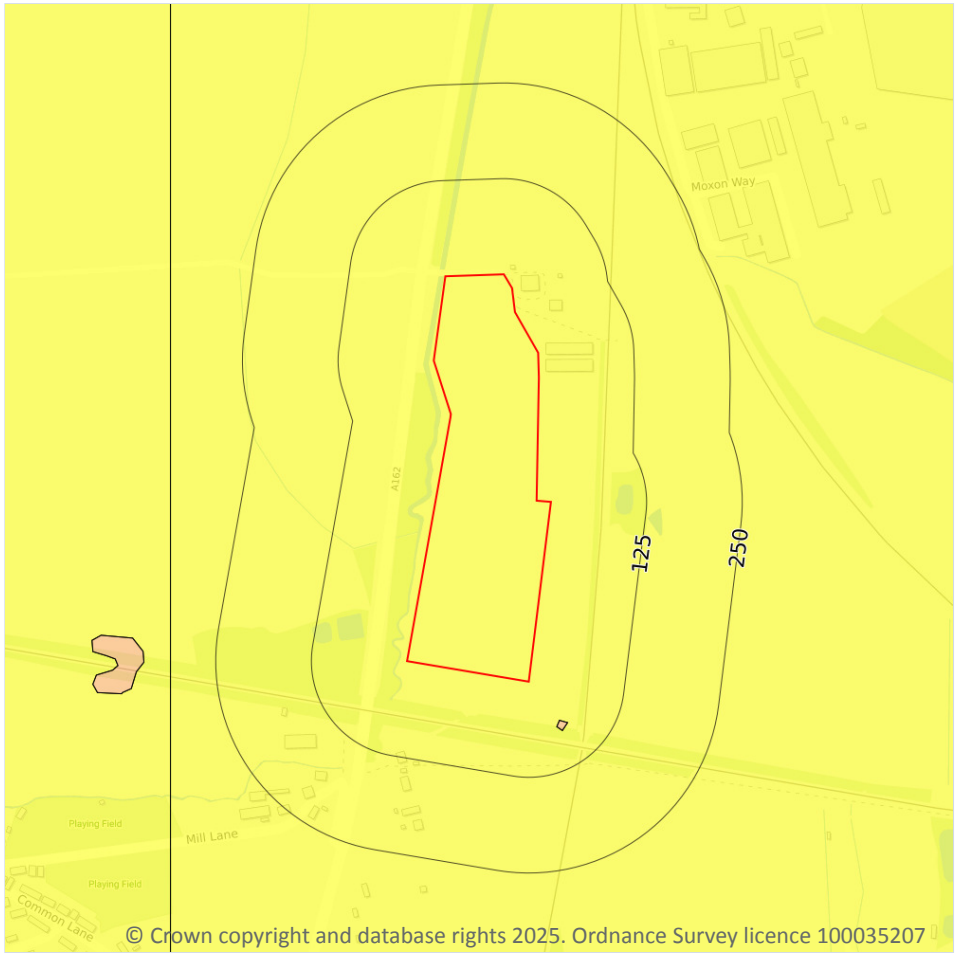
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 101 >**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not to be present.**
On site	**Very low**	**Deposits with potential to collapse when loaded and saturated are unlikely to be present.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Landslides



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.5 Landslides

Records within 50m	1

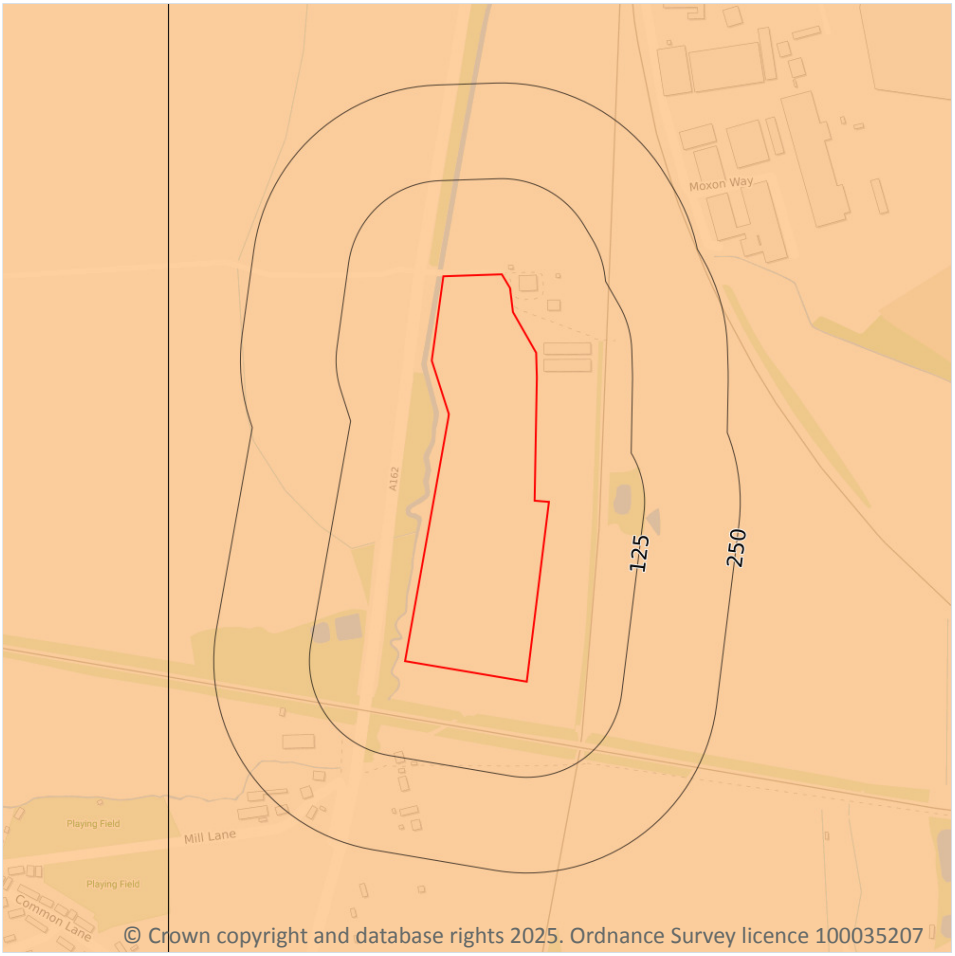
The potential for landsliding (slope instability) to be a hazard assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

Features are displayed on the Natural ground subsidence - Landslides map on **page 102 >**

Location	Hazard rating	Details
On site	**Very low**	**Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.**

This data is sourced from the British Geological Survey.

Natural ground subsidence - Ground dissolution of soluble rocks



Site Outline

Search buffers in metres (m)

- No data
- Negligible
- Very low
- Low
- Moderate
- High

17.6 Ground dissolution of soluble rocks

Records within 50m	1

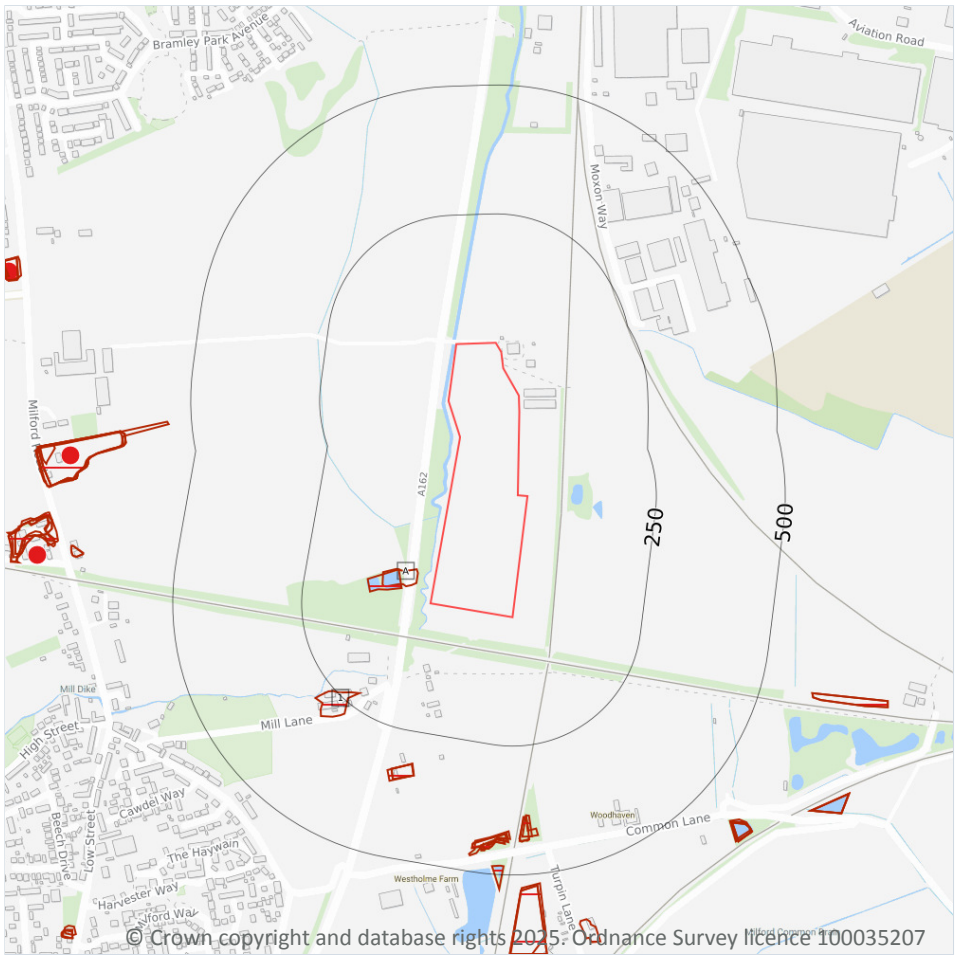
The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

Features are displayed on the Natural ground subsidence - Ground dissolution of soluble rocks map on **page 103 >**

Location	Hazard rating	Details
On site	**Low**	**Soluble rocks are present within the ground. Some dissolution features may be present. Potential for difficult ground conditions are at a level where they may be considered, localised subsidence need not be considered except in exceptional circumstances.**

This data is sourced from the British Geological Survey.

18 Mining and ground workings



Site Outline

Search buffers in metres (m)

- BritPits
- Surface ground workings
- Underground workings
- Underground mining extents
- Historical mineral planning areas
- TCA non-coal mining

Non Coal Mining

- Sporadic underground mining of restricted extent possible
- Localised small scale underground mining possible
- Small scale mining possible
- Underground mining known or likely within or in close proximity
- Underground mining known within or in very close proximity

18.1 BritPits

Records within 500m	0

BritPits (an abbreviation of British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings. Details of major mineral handling sites, such as wharfs and rail depots are also held in the database.

This data is sourced from the British Geological Survey.

18.2 Surface ground workings

Records within 250m	3

Historical land uses identified from Ordnance Survey mapping that involved ground excavation at the surface. These features may or may not have been subsequently backfilled.

Features are displayed on the Mining and ground workings map on **page 105 >**

ID	Location	Land Use	Year of mapping	Mapping scale
A	34m SW	Ponds	1986	1:10000
A	61m SW	Ponds	1994	1:10000
1	222m SW	Pond	1908	1:10560

This is data is sourced from Ordnance Survey/Groundsure.

18.3 Underground workings

Records within 1000m	0

Historical land uses identified from Ordnance Survey mapping that indicate the presence of underground workings e.g. mine shafts.

This is data is sourced from Ordnance Survey/Groundsure.

18.4 Underground mining extents

Records within 500m	0

This data identifies underground mine workings that could present a potential risk, including adits and seam workings. These features have been identified from BGS Geological mapping and mine plans sourced from the BGS and various collections and sources.

This data is sourced from Groundsure.

18.5 Historical Mineral Planning Areas

Records within 500m	0

Boundaries of mineral planning permissions for England and Wales. This data was collated between the 1940s (and retrospectively to the 1930s) and the mid 1980s. The data includes permitted, withdrawn and refused permissions.

This data is sourced from the British Geological Survey.

18.6 Non-coal mining

Records within 1000m	0

The potential for historical non-coal mining to have affected an area. The assessment is drawn from expert knowledge and literature in addition to the digital geological map of Britain. Mineral commodities may be divided into seven general categories - vein minerals, chalk, oil shale, building stone, bedded ores, evaporites and 'other' commodities (including ball clay, jet, black marble, graphite and chert).

This data is sourced from the British Geological Survey.

18.7 JPB mining areas

Records on site	0

Areas which could be affected by former coal and other mining. This data includes some mine plans unavailable to the Coal Authority.

This data is sourced from Johnson Poole and Bloomer.

18.8 The Coal Authority non-coal mining

Records within 500m	0

This data provides an indication of the potential zone of influence of recorded underground non-coal mining workings. Any and all analysis and interpretation of Coal Authority Data in this report is made by Groundsure, and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure prior to any re-use.

This data is sourced from The Coal Authority.

18.9 Researched mining

Records within 500m	0

This data indicates areas of potential mining identified from alternative or archival sources, including; BGS Geological paper maps, Lidar data, aerial photographs (from World War II onwards), archaeological data services, websites, Tithe maps, and various text/plans from collected books and reports. Some of this data is approximate and Groundsure have interpreted the resultant risk area and, where possible, specific areas of risk have been captured.

This data is sourced from Groundsure.

18.10 Mining record office plans

Records within 500m	0

This dataset is representative of Mining Record Office and/or plan extents held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.11 BGS mine plans

Records within 500m	0

This dataset is representative of BGS mine plans held by Groundsure and should be considered approximate. Where possible, plans have been located and any specific areas of risk they depict have been captured.

This data is sourced from Groundsure.

18.12 Coal mining

Records on site	1

Areas which could be affected by past, current or future coal mining.

Location	Details
On site	**The site is located within a coal mining area as defined by the Coal Authority. A Consultants Coal Mining Report is recommended to further assess coal mining issues at the site. This can be ordered directly through Groundsure or your preferred search provider.**

This data is sourced from the Coal Authority.

18.13 Brine areas

Records on site	0

The Cheshire Brine Compensation District indicates areas that may be affected by salt and brine extraction in Cheshire and where compensation would be available where damage from this mining has occurred. Damage from salt and brine mining can still occur outside this district, but no compensation will be available.

This data is sourced from the Cheshire Brine Subsidence Compensation Board.

18.14 Gypsum areas

Records on site	0

Generalised areas that may be affected by gypsum extraction.

This data is sourced from British Gypsum.

18.15 Tin mining

Records on site	0

Generalised areas that may be affected by historical tin mining.

This data is sourced from Groundsure.

18.16 Clay mining

Records on site	0

Generalised areas that may be affected by kaolin and ball clay extraction.

This data is sourced from the Kaolin and Ball Clay Association (UK).

19 Ground cavities and sinkholes

19.1 Natural cavities

Records within 500m	0

Industry recognised national database of natural cavities. Sinkholes and caves are formed by the dissolution of soluble rock, such as chalk and limestone, gulls and fissures by cambering. Ground instability can result from movement of loose material contained within these cavities, often triggered by water.

This data is sourced from Stantec UK Ltd.

19.2 Mining cavities

Records within 1000m	0

Industry recognised national database of mining cavities. Degraded mines may result in hazardous subsidence (crown holes). Climatic conditions and water escape can also trigger subsidence over mine entrances and workings.

This data is sourced from Stantec UK Ltd.

19.3 Reported recent incidents

Records within 500m	0

This data identifies sinkhole information gathered from media reports and Groundsure's own records. This data goes back to 2014 and includes relative accuracy ratings for each event and links to the original data sources. The data is updated on a regular basis and should not be considered a comprehensive catalogue of all sinkhole events. The absence of data in this database does not mean a sinkhole definitely has not occurred during this time.

This data is sourced from Groundsure.

19.4 Historical incidents

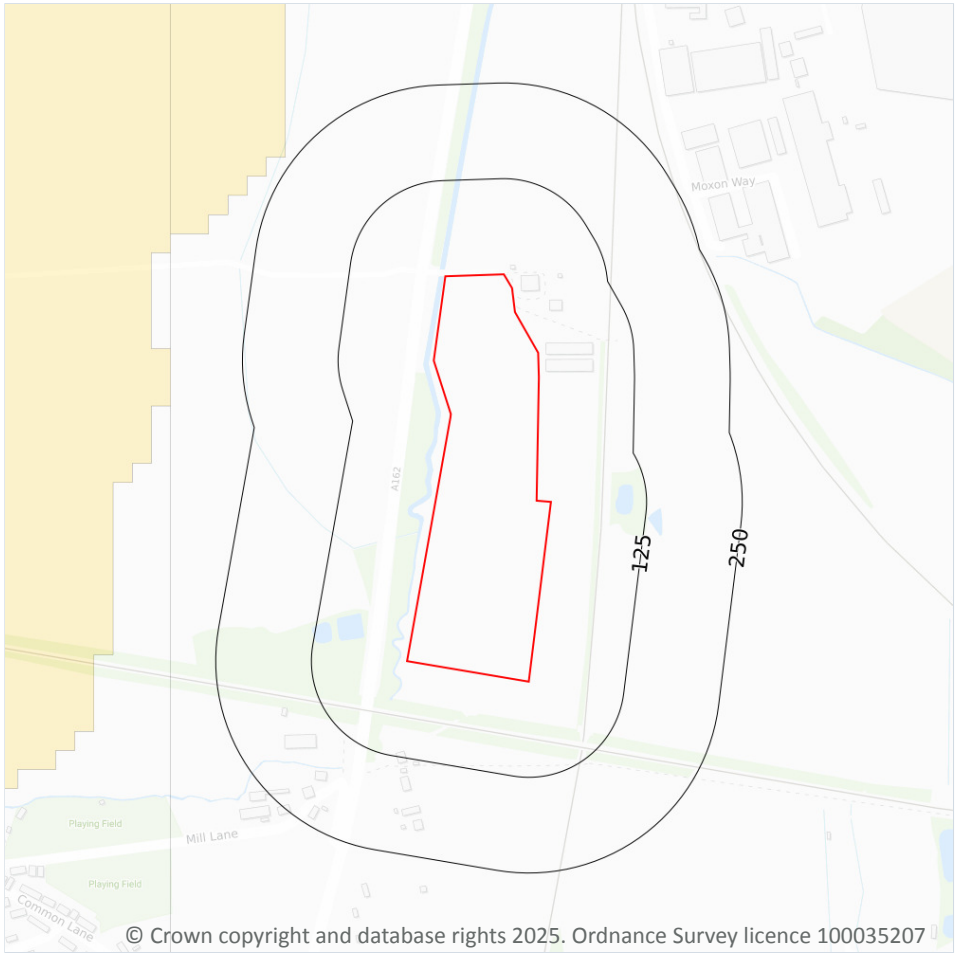
Records within 500m	0

This dataset comprises an extract of 1:10,560, 1:10,000, 1:2,500 and 1:1,250 scale historical Ordnance Survey maps held by Groundsure, dating back to the 1840s. It shows shakeholes, deneholes and other 'holes' as noted on these maps. Dene holes are medieval chalk extraction pits, usually comprising a narrow shaft with a number of chambers at the base of the shaft. Shakeholes are an alternative name for suffusion sinkholes, most commonly found in the limestone landscapes of North Yorkshire but also extensively noted around the Brecon Beacons National Park.

Not all 'holes' noted on Ordnance Survey mapping will necessarily be present within this dataset.

This data is sourced from Groundsure.

20 Radon



Site Outline

Search buffers in metres (m)

- Greater than 30%
- Between 10% and 30%
- Between 5% and 10%
- Between 3% and 5%
- Between 1% and 3%
- Less than 1%

20.1 Radon

Records on site	1

The Radon Potential data classifies areas based on their likelihood of a property having a radon level at or above the Action Level in Great Britain. The dataset is intended for use at 1:50,000 scale and was derived from both geological assessments and indoor radon measurements (more than 560,000 records). A minimum 50m buffer should be considered when searching the maps, as the smallest detectable feature at this scale is 50m. The findings of this section should supersede any estimations derived from the Indicative Atlas of Radon in Great Britain (1:100,000 scale).

Features are displayed on the Radon map on **page 112 >**

Location	Estimated properties affected	Radon Protection Measures required
On site	**Less than 1%**	**None**

This data is sourced from the British Geological Survey and UK Health Security Agency.

21 Soil chemistry

21.1 BGS Estimated Background Soil Chemistry

Records within 50m	14

The estimated values provide the likely background concentration of the potentially harmful elements Arsenic, Cadmium, Chromium, Lead and Nickel in topsoil. The values are estimated primarily from rural topsoil data collected at a sample density of approximately 1 per 2 km^2. In areas where rural soil samples are not available, estimation is based on stream sediment data collected from small streams at a sampling density of 1 per 2.5 km^2; this is the case for most of Scotland, Wales and southern England. The stream sediment data are converted to soil-equivalent concentrations prior to the estimation.

Location	Arsenic	Bioaccessible Arsenic	Lead	Bioaccessible Lead	Cadmium	Chromium	Nickel
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
On site	**15 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**60 - 90 mg/kg**	**15 - 30 mg/kg**
3m E	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
7m SW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
7m SW	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
9m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
19m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
20m NE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
24m SE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
24m SE	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg
28m N	15 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg

This data is sourced from the British Geological Survey.

21.2 BGS Estimated Urban Soil Chemistry

Records within 50m	0

Estimated topsoil chemistry of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc and bioaccessible Arsenic and Lead in 23 urban centres across Great Britain. These estimates are derived from interpolation of the measured urban topsoil data referred to above and provide information across each city between the measured sample locations (4 per km^2).

This data is sourced from the British Geological Survey.

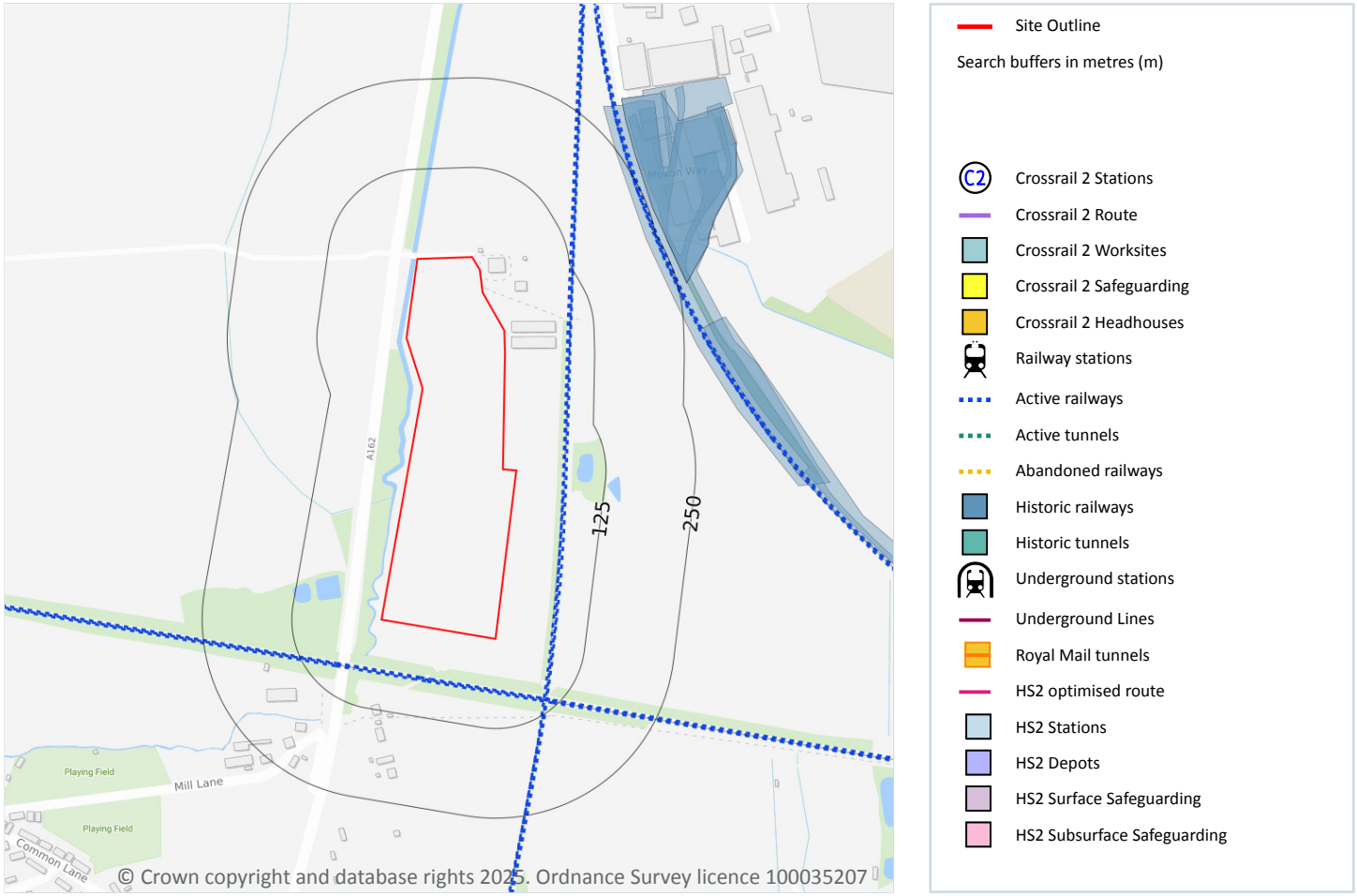
21.3 BGS Measured Urban Soil Chemistry

Records within 50m	0

The locations and measured total concentrations (mg/kg) of Arsenic, Cadmium, Chromium, Copper, Nickel, Lead, Tin and Zinc in urban topsoil samples from 23 urban centres across Great Britain. These are collected at a sample density of 4 per km^2.

This data is sourced from the British Geological Survey.

22 Railway infrastructure and projects



22.1 Underground railways (London)

Records within 250m	0

Details of all active London Underground lines, including approximate tunnel roof depth and operational hours.

This data is sourced from publicly available information by Groundsure.

22.2 Underground railways (Non-London)

Records within 250m	0

Details of the Merseyrail system, the Tyne and Wear Metro and the Glasgow Subway. Not all parts of all systems are located underground. The data contains location information only and does not include a depth assessment.

This data is sourced from publicly available information by Groundsure.

22.3 Railway tunnels

Records within 250m	0

Railway tunnels taken from contemporary Ordnance Survey mapping.

This data is sourced from the Ordnance Survey.

22.4 Historical railway and tunnel features

Records within 250m	1

Railways and tunnels digitised from historical Ordnance Survey mapping as scales of 1:1,250, 1:2,500, 1:10,000 and 1:10,560.

Features are displayed on the Railway infrastructure and projects map on **page 116 >**

Location	Land Use	Year of mapping	Mapping scale
233m NE	Railway Sidings	1950	10560

This data is sourced from Ordnance Survey/Groundsure.

22.5 Royal Mail tunnels

Records within 250m	0

The Post Office Railway, otherwise known as the Mail Rail, is an underground railway running through Central London from Paddington Head District Sorting Office to Whitechapel Eastern Head Sorting Office. The line is 10.5km long. The data includes details of the full extent of the tunnels, the depth of the tunnel, and the depth to track level.

This data is sourced from Groundsure/the Postal Museum.

22.6 Historical railways

Records within 250m	0

Former railway lines, including dismantled lines, abandoned lines, disused lines, historic railways and razed lines.

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	31

Currently existing railway lines, including standard railways, narrow gauge, funicular, trams and light railways.

Features are displayed on the Railway infrastructure and projects map on **page 116 >**

Location	Name	Type
66m E	Normanton and Colton Junction Line	rail
67m E	Not given	Multi Track
69m E	Not given	Multi Track
70m E	Normanton and Colton Junction Line	rail
70m S	Hull Line	rail
70m S	Hull Line	rail
70m S	Hull Line	rail
72m S	Not given	Multi Track
74m S	Hull Line	rail
74m S	Hull Line	rail
74m S	Hull Line	rail
75m SW	Hull Line	rail
79m SW	Hull Line	rail
82m SE	Normanton and Colton Junction Line	rail
85m SE	Normanton and Colton Junction Line	rail
88m SW	Hull Line	rail
91m SW	Hull Line	rail
100m S	Hull Line	rail
103m S	Hull Line	rail
108m S	Not given	Multi Track
114m S	Not given	Multi Track
114m S	Not given	Multi Track
117m S	Hull Line	rail
120m S	Hull Line	rail

Location	Name	Type
244m NE	Sherburn Curve	rail
245m NE	Not given	Multi Track
246m NE	Not given	Multi Track
246m NE	Not given	Multi Track
246m NE	Not given	Multi Track
247m NE	Not given	Multi Track
248m NE	Sherburn Curve	rail

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 2

Records within 500m	0

Crossrail 2 is a proposed railway linking the national rail networks in Surrey and Hertfordshire via an underground tunnel through London.

This data is sourced from publicly available information by Groundsure.

22.9 HS2

Records within 500m	0

HS2 is a proposed high speed rail network running from London to Manchester and Leeds via Birmingham. Main civils construction on Phase 1 (London to Birmingham) of the project began in 2019, and it is currently anticipated that this phase will be fully operational by 2026. Construction on Phase 2a (Birmingham to Crewe) is anticipated to commence in 2021, with the service fully operational by 2027. Construction on Phase 2b (Crewe to Manchester and Birmingham to Leeds) is scheduled to begin in 2023 and be operational by 2033.

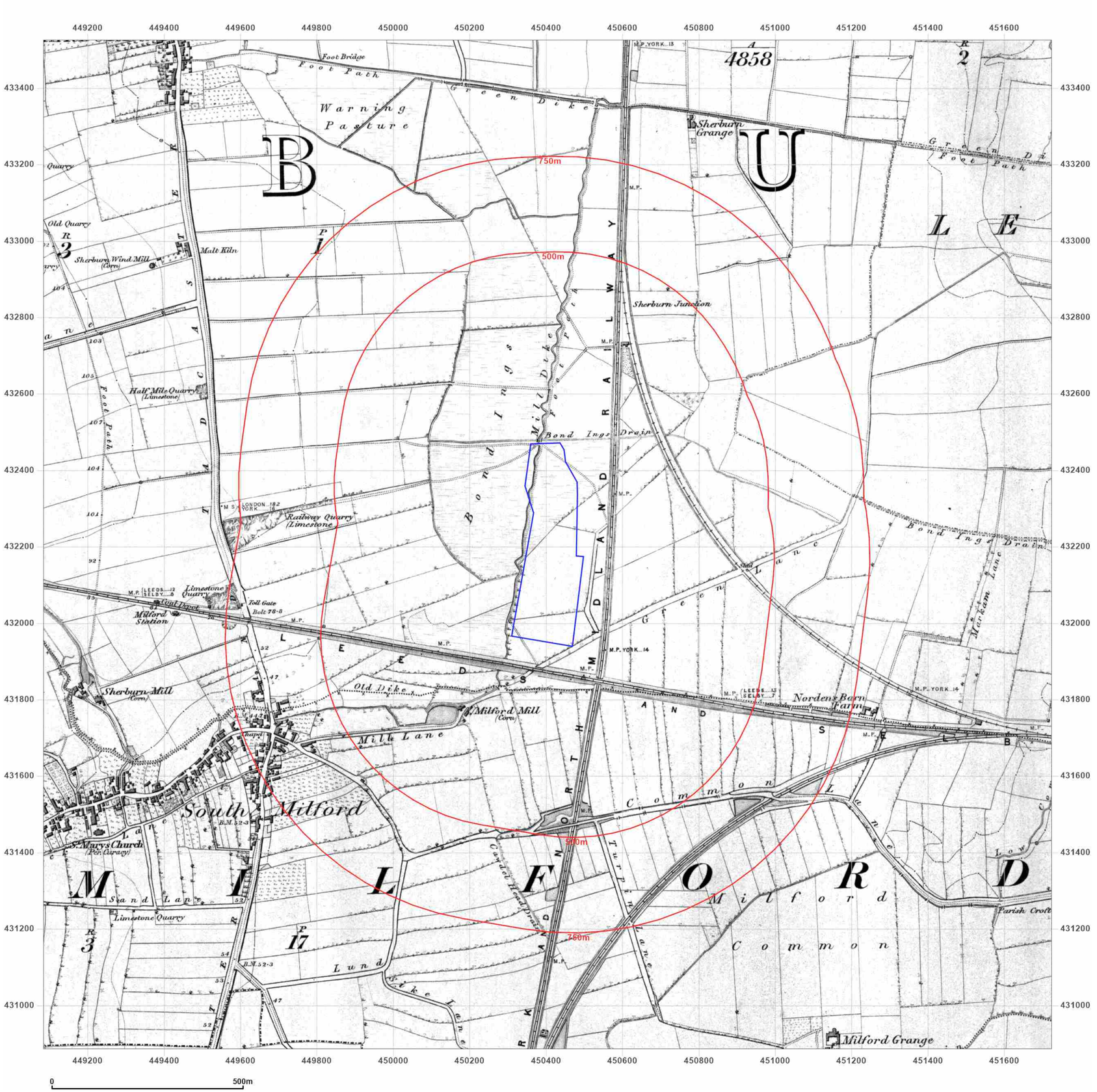
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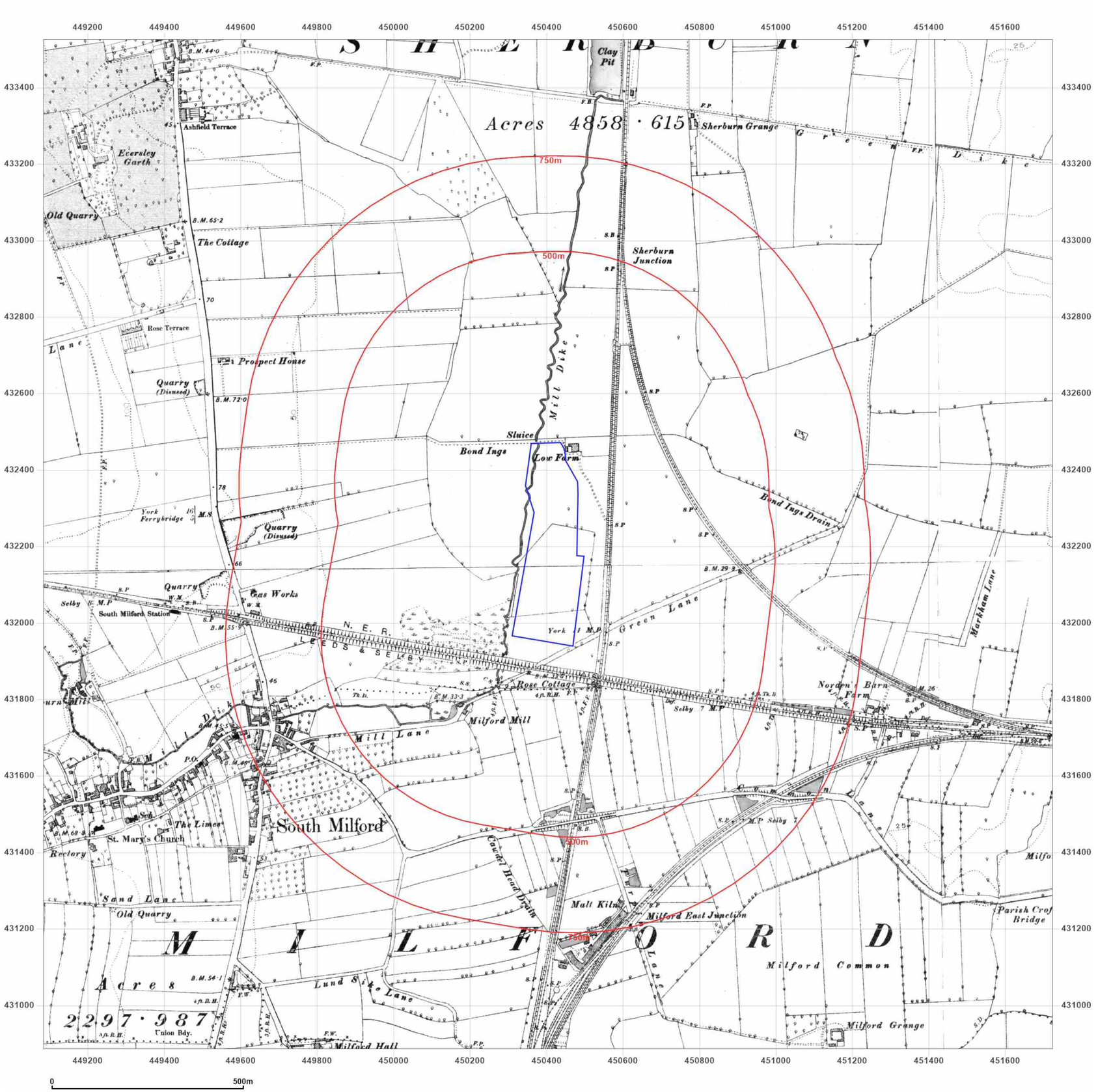
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750m
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Foot Bridge
Foot Path
Green Dike
Warning Pasture
Sherburn Grange
Quarry
Old Quarry
Sherburn Wind Mill (Corn)
Malt Kiln
Half Mile Quarry (Limestone)
Railway Quarry (Limestone)
Sherburn Junction
Bond Ings Drain
Milford Dike
Limestone Quarry
Toll Gate
Bolt 78-8
Milford Station
Old Dike
Milford Mill (Corn)
Nordens Barn Farm
Mill Lane
South Milford
S. Marys Church (Per Curacy)
Sand Lane
Limestone Quarry
Lund Syke Lane
Common Lane
Markam Lane
Parish Croft
Milford Grange
Sherburn Mill (Corn)
Chapel
Gas Tk
Tk
Sand Lane
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Cowden Head Drain
Turnpike Lane
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Old Lane
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Foot Path



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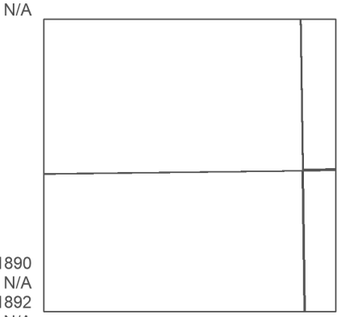
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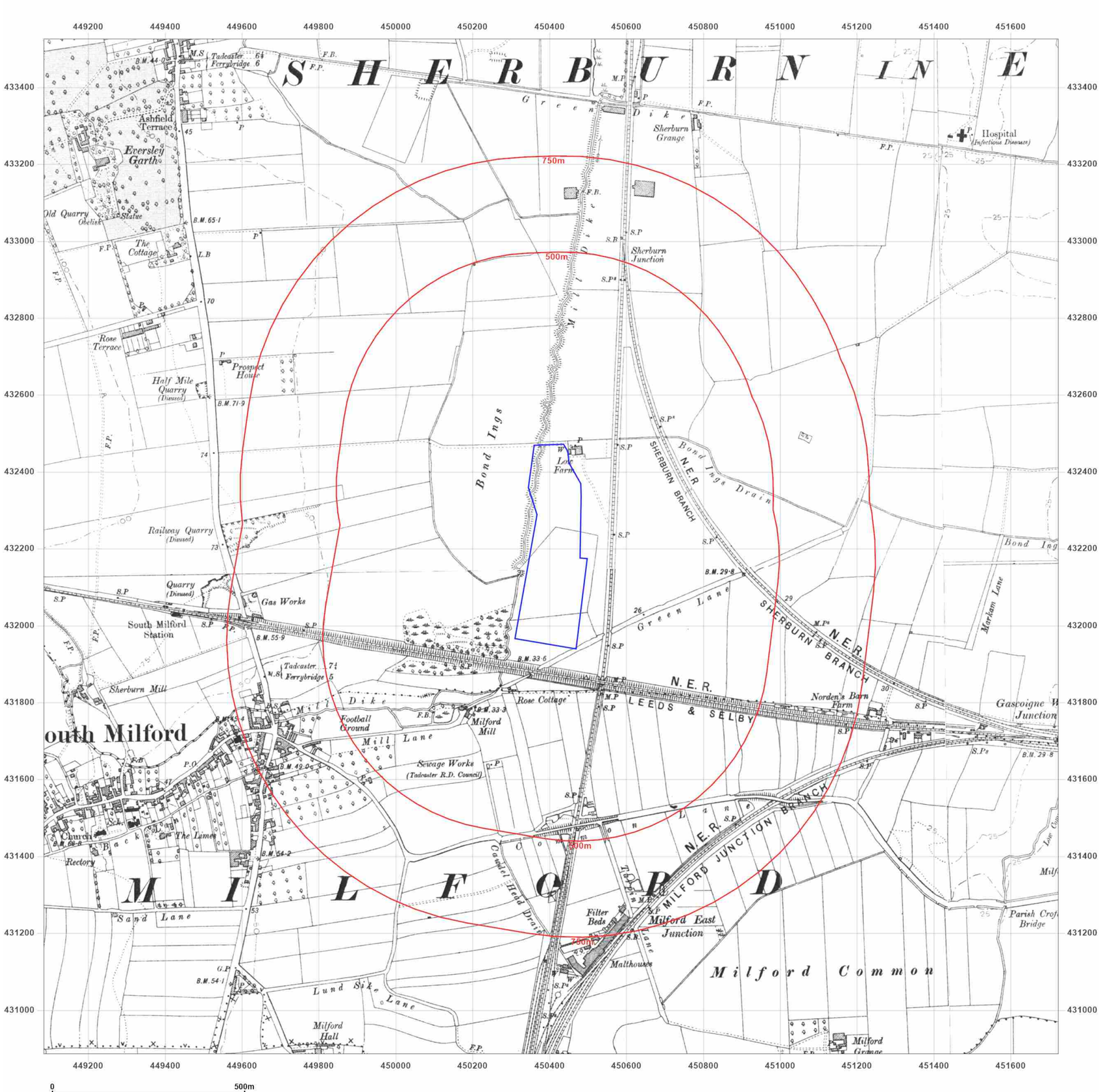
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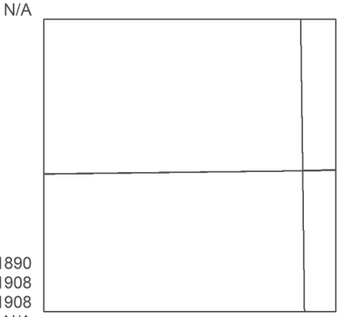
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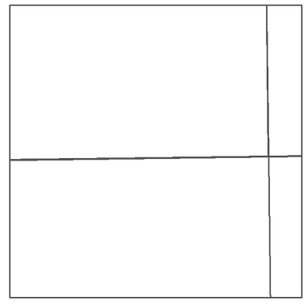
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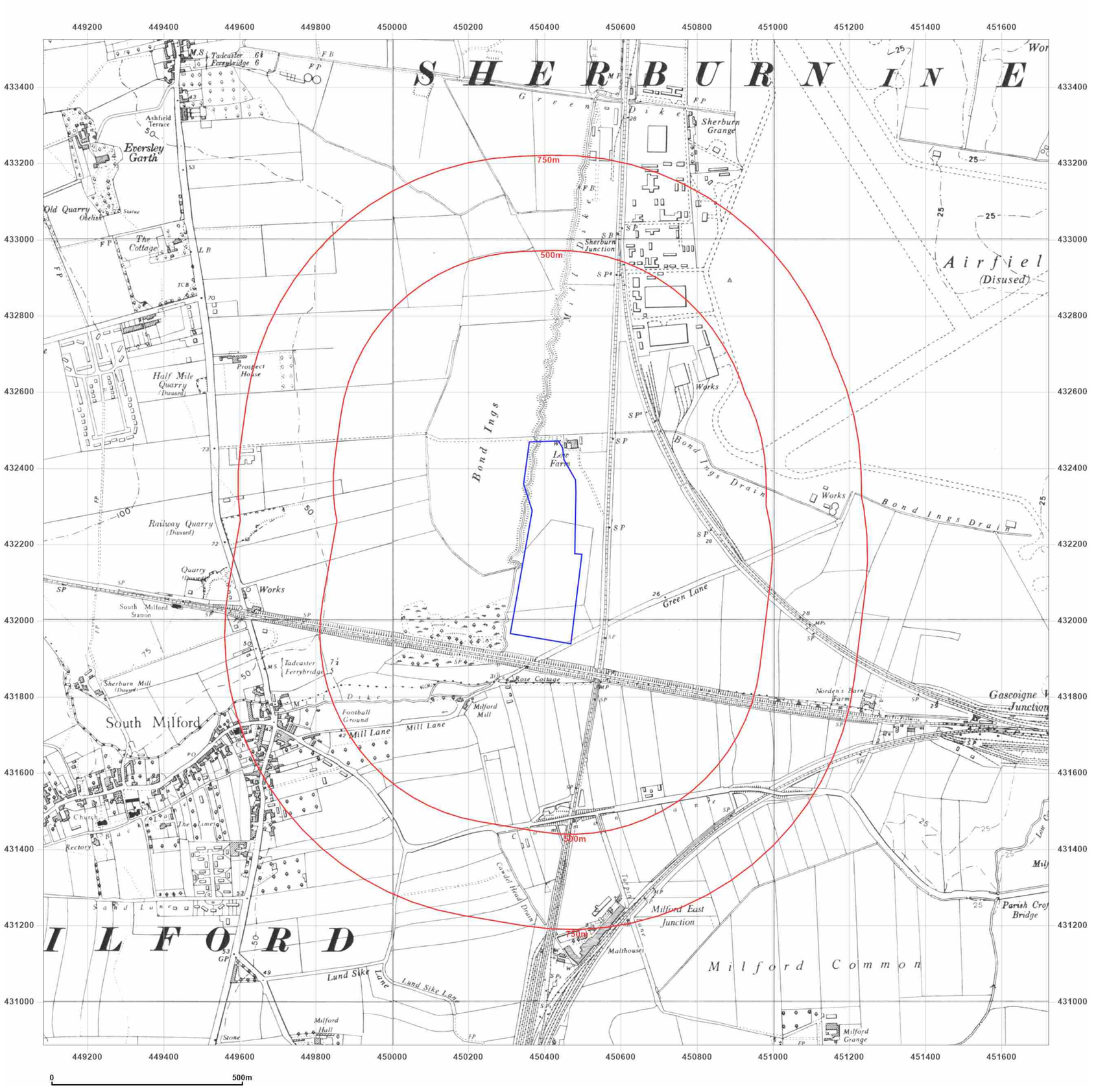
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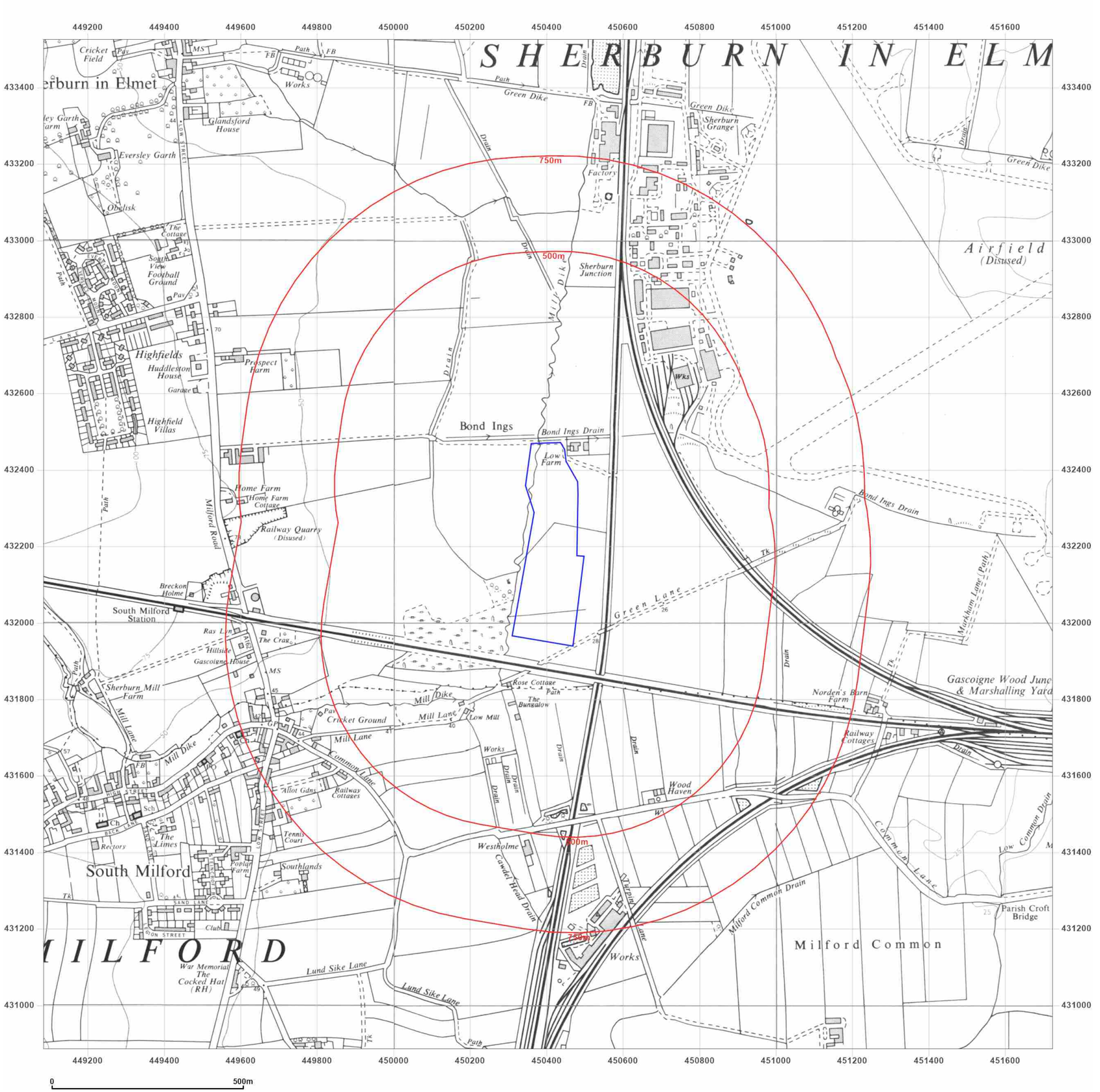
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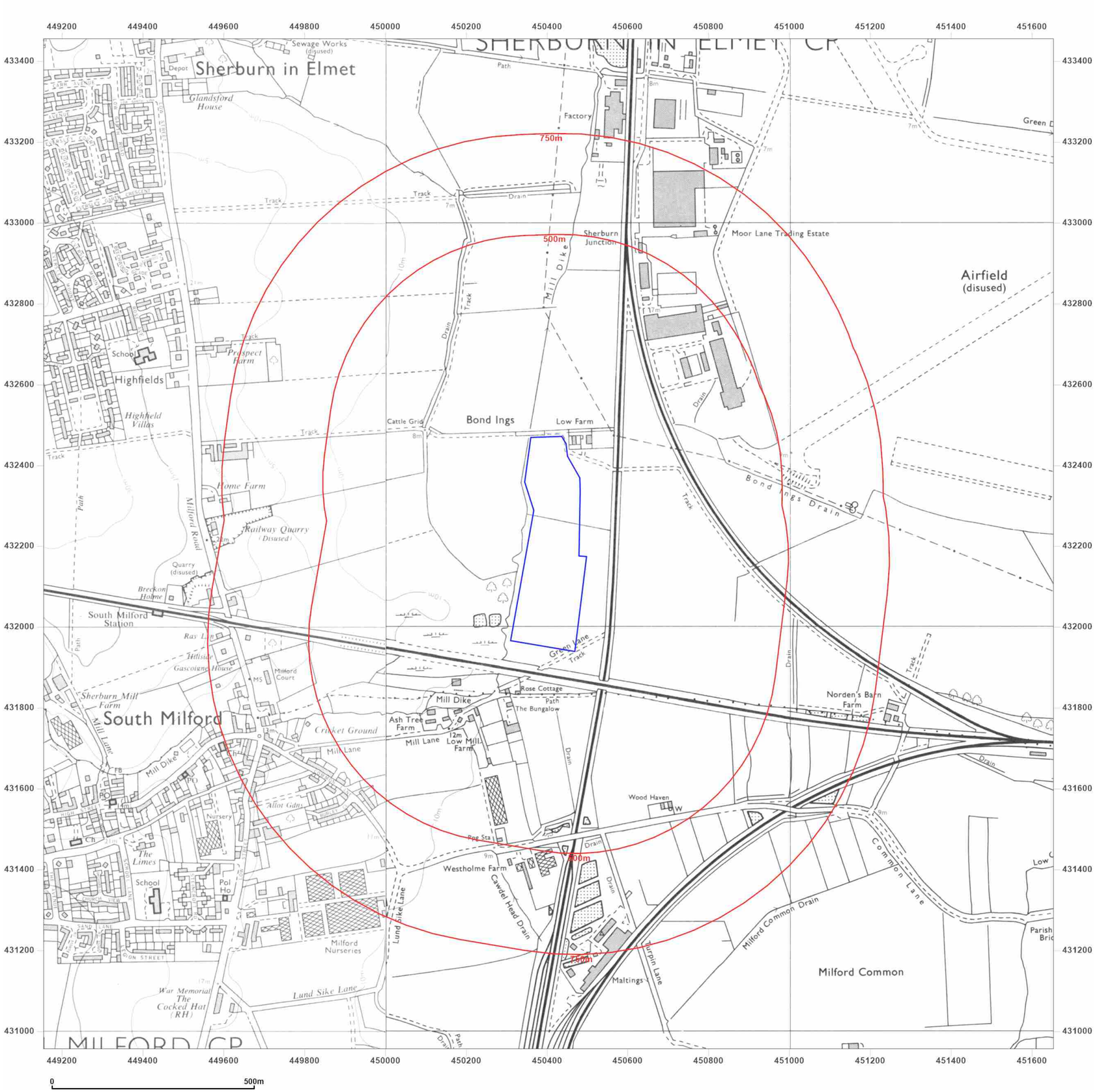
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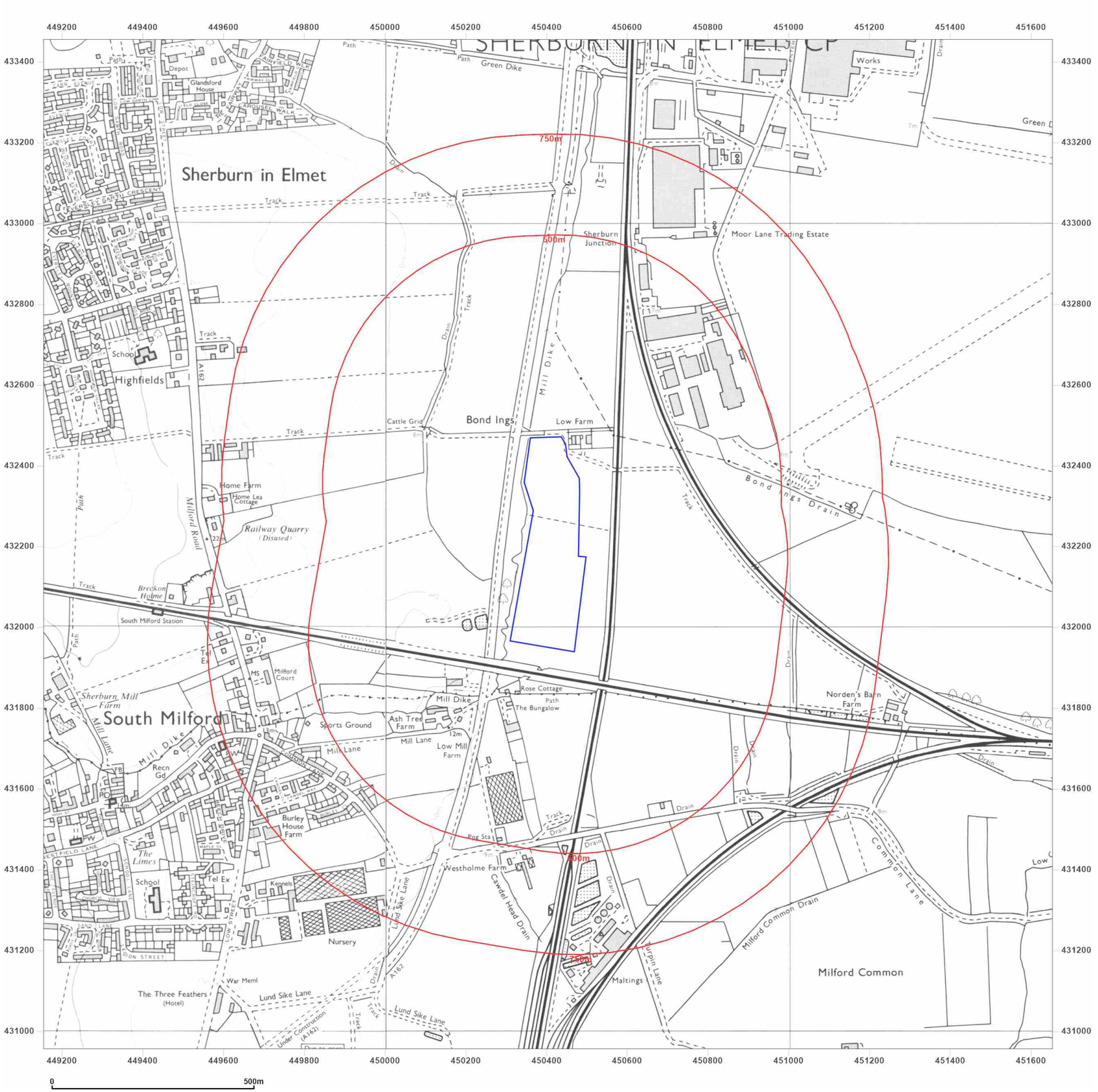
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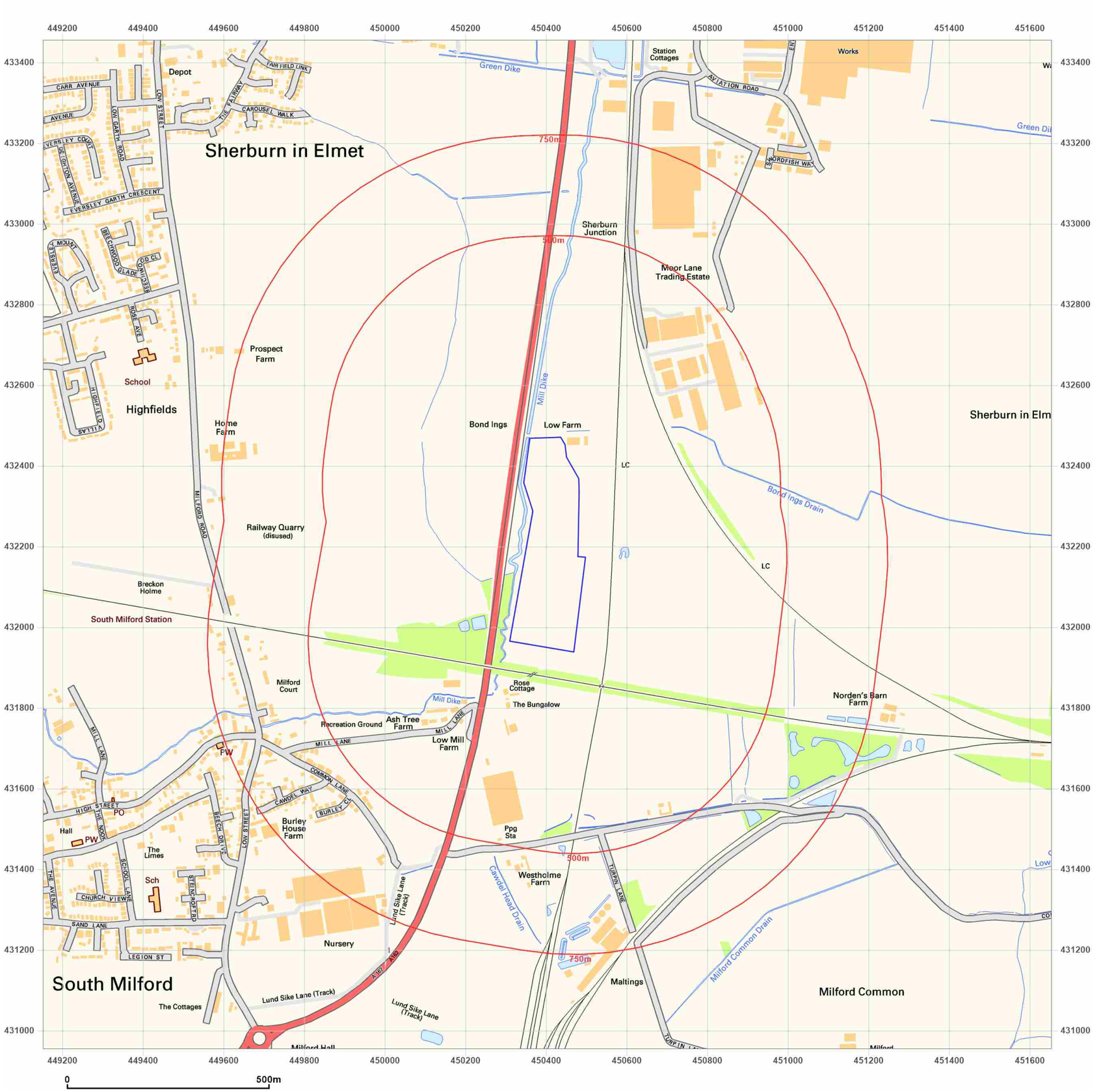
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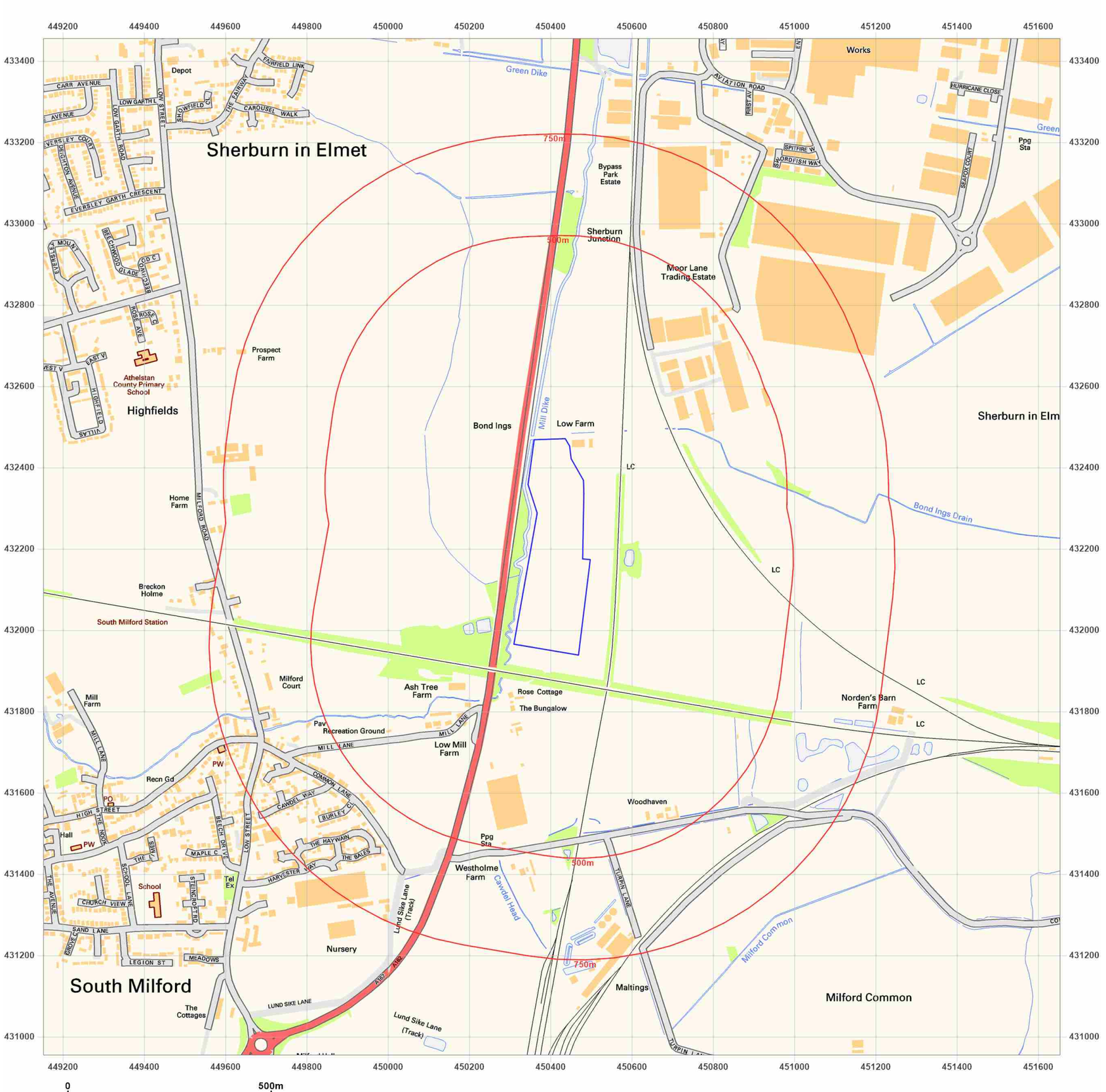
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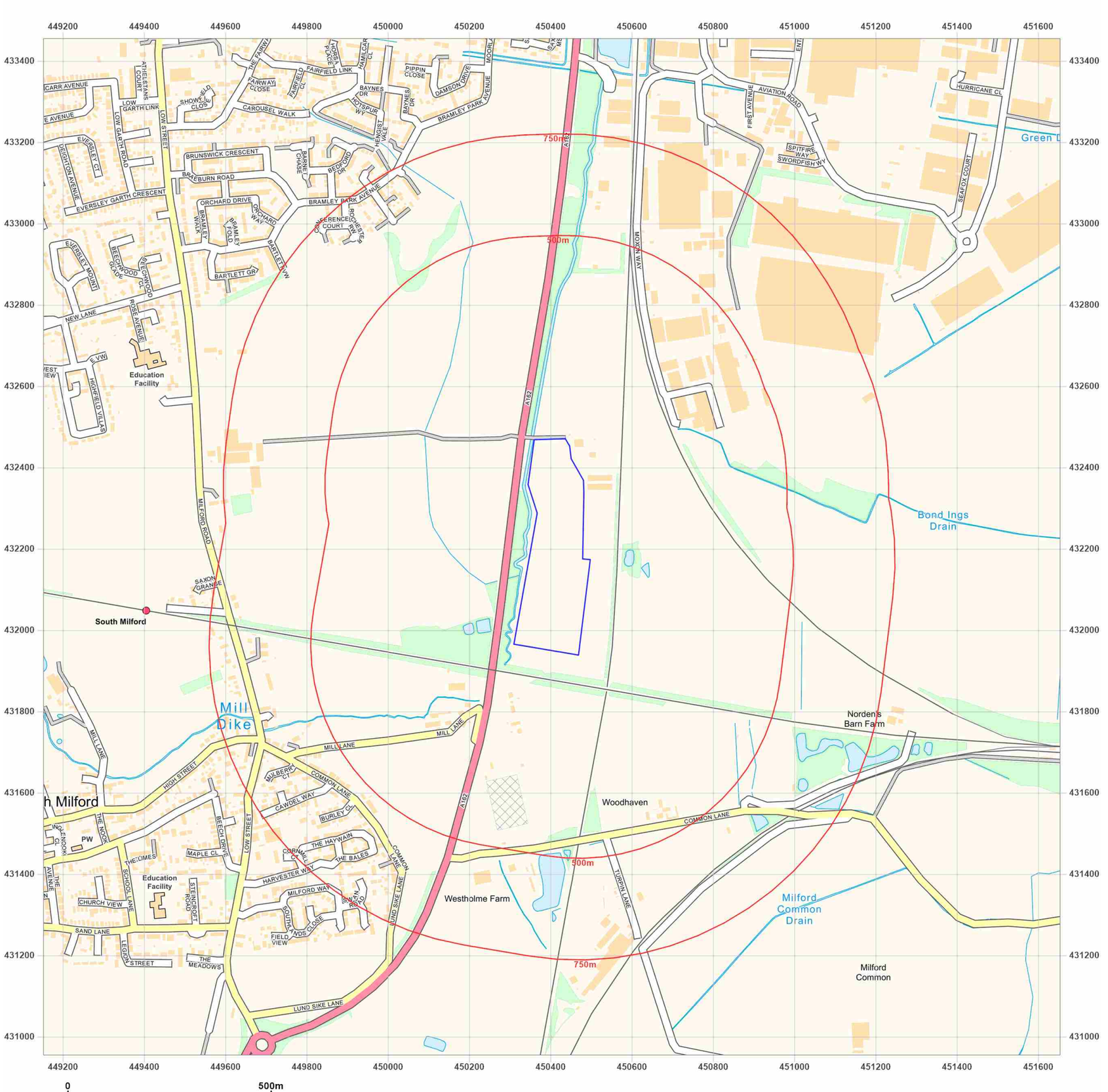
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APPENDIX C GROUND INVESTIGATION

Environmental
Geotechnical
Specialists

RGS

PHASE 2

GEO-ENVIRONMENTAL REPORT

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date	15.07.2025
site address	Home Farm Bond Ings Rise Sherburn-in-Elmet LS25 6FW
written by	S. Alexander
checked by	R. Palmer
issued by	R. Palmer

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Contents

			Page
1.		Introduction	2
2.		Limitations	2
3.		Desk Study	2
4.		Fieldworks	2
	4.1	Avoidance of Services	5
	4.2	GPS Survey	5
	4.3	Cable Percussive Boreholes	6
	4.4	Cable Percussive Boreholes with Rotary Follow-On	6
	4.5	Windowless Sample Boreholes	6
	4.6	Dynamic Probes	7
	4.7	Borehole Monitoring Standpipes	8
	4.8	Machine Excavated Trial Pits	8
	4.9	Machine Excavated Trial Pits with Soakaways	8
	4.10	Plate Load Tests	9
5.		Geology	9
6.		Strata Conditions & Groundwater	10
7.		Insitu Testing	10
	7.1	Standard Penetration Tests	10
	7.2	Dynamic Probe Tests	11
	7.3	Water Level Monitoring	12
	7.4	Soakaway Test Results	13
8.		Laboratory Testing – Geotechnical	14
	8.1	Geotechnical Properties	15
9.		Laboratory Testing – Environmental	15
10.		Discussion of Ground Conditions – Geotechnical	16
	10.1	Site Appraisal	16
	10.1.1	Digestion Tanks	16
	10.1.2	Shallow Pad Foundations	18
	10.1.3	Ground Bearing Concrete Slabs	19
	10.2	Volume Change Potential	20
	10.3	Hardstanding Areas and Pavements	20
	10.4	Groundwater	20
	10.5	Effect of Sulphates	21
11.		Discussion of Ground Conditions - Environmental	21
	11.1	Discussion of Test Results	21
	11.1.1	Soil Samples	21
	11.2	Fill Materials	22
12.		Recommendations for Further Work	23
13.		References	24

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Appendices	
1.	Site Plan
2.	Cable Percussive and Rotary Follow-on Borehole Records
3.	Windowless Sample Borehole Records
4.	Dynamic Probe Records
5.	Trial Pit Records
6.	Trial Pit Soakaway Records
7.	Plate Load Test Results
8.	Lab Testing
9.	Soil Screening Sheet

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Report on a Phase 2 Geo-environmental Investigation

Project Name:	Project Orchard		
Site Location:	Home Farm, Bond Ings Rise, Sherburn in Elmet, LS25 6FW		
Client:	Engie Renewable Gases UK Limited		
Consultant:	Mason Clark Associates		
RGS Report No.	C4826/24/E/7379	Report date:	July 2025

For and on behalf of **Rogers Geotechnical Services Ltd**

Engineer	Approver
Scott Alexander BSc FGS Senior Geo-environmental Engineer	**Rob Palmer** MSc FGS ACIEH Engineering Director

Document Revision History	
Revision Number: 0 DRAFT	Date: 23/05/25
Revision Number: 1 FINAL	Date: 14/07/25

1. Introduction

In order to provide data for the construction of an anaerobic digestion plant, a site investigation has been undertaken in accordance with the instruction from the client. The works have broadly been undertaken in accordance with the GI specification outlined within document 240301-1, Revision 0 Draft, issued 13th March 2024 by Integrity Energy Services Ltd 2024.

This work was required in order to determine the nature of the underlying soils, to assess their engineering properties and to assist in the design of safe and economical foundations for the proposed development. This investigation also takes into consideration the risk of any contamination present. This report describes the work undertaken, presents the data obtained and discusses the ground conditions in relation to the proposed works.

2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.

3. Desk Study

A Preliminary Risk Assessment has been undertaken by enzygo geo environmental and the results were presented as report number CRM.0174.002.GE.R.001.A in November 2024. This report has been used extensively during the current intrusive investigation. It should be appreciated that the assessment concluded that no significant contamination risks and no ground gas risks were identified. Moreover, the risk to controlled waters was dismissed due to the absence of a viable significant source.

4. Fieldworks

The fieldworks were undertaken between the 31st March and 14th May 2025 and comprised the following:

- GPS Survey – positions staked out.
- 5 No. cable percussive boreholes, 2 of which have been extended with rotary coring techniques.
- 23 No. borehole utilising a windowless sampling rig.
- Installation of 5 groundwater monitoring standpipes, including the provision of 4 divers for long term monitoring.
- Standard penetration tests within boreholes at regular depth increments.
- 12 dynamic probe tests, adjacent to WS01 to WS12.
- 22 mechanically excavated trial pits, 4 of which were utilised for soakaway tests.
- 12 plate load tests (CBR).

Investigatory locations were agreed with the consultant prior to the commencement of the works; the locations are presented on the site plan which is presented in Appendix 1 to this report.

Table 1: Depth Range of Exploratory Hole Locations			
Location Type	**Location Reference**	**Depth (m)**	**Comments**
Cable Percussive Borehole	BH01	11.10	Borehole terminated on refusal.
	BH02	12.00	Borehole terminated on refusal.
	BH05	12.50	Borehole terminated on refusal.
Cable Percussive Borehole with Rotary Core	BH03	15.00	Borehole terminated at target depth.
	BH04	15.00	Borehole terminated at target depth.
Windowless Sample Boreholes	WS01	3.45	Target depth obtained. Continued with dynamic probe.
	WS02	3.45	Target depth obtained. Continued with dynamic probe.
	WS03	3.45	Target depth obtained. Continued with dynamic probe.
	WS04	3.45	Target depth obtained. Continued with dynamic probe.
	WS05	3.45	Target depth obtained. Continued with dynamic probe.
	WS06	3.45	Target depth obtained. Continued with dynamic probe.
	WS07	3.45	Target depth obtained. Continued with dynamic probe.
	WS08	3.45	Target depth obtained. Continued with dynamic probe.
	WS09	3.45	Target depth obtained. Continued with dynamic probe.
	WS10	3.45	Target depth obtained. Continued with dynamic probe.
	WS11	3.45	Target depth obtained. Continued with dynamic probe.
	WS12	3.45	Target depth obtained. Continued with dynamic probe.
	WSA	7.00	Target Depth obtained.
	WSA2	4.00	Second hole drilled 1m south of WSA, for second installation.
	WSB	7.00	Target Depth obtained.
	WSC	5.45	Target Depth obtained.
	WSD	5.45	Target Depth obtained.
	WSE	5.45	Target Depth obtained.
	WSF	5.45	Target Depth obtained.
	WSG	5.45	Target Depth obtained.
	WSH	5.45	Target Depth obtained.
	WSI	5.45	Target Depth obtained.
	WSJ	5.45	Target Depth obtained.

Dynamic Probe	DP01	10.00	Target Depth obtained. No refusal.
	DP02	10.00	Target Depth obtained. No refusal.
	DP03	10.00	Target Depth obtained. No refusal.
	DP04	10.00	Target Depth obtained. Effective refusal.
	DP05	10.00	Target Depth obtained. Effective Refusal.
	DP06	10.00	Target Depth obtained. No refusal.
	DP07	10.00	Target Depth obtained. Effective Refusal.
	DP08	10.00	Target Depth obtained. Effective Refusal
	DP09	10.00	Target Depth obtained. Effective Refusal.
	DP10	10.00	Target Depth obtained. Effective Refusal.
	DP11	10.00	Target Depth obtained. No refusal.
	DP12	10.00	Target Depth obtained. Effective Refusal.
Machine Excavated Trial pit	TP01	3.00	Target Depth obtained.
	TP02	3.00	Target Depth obtained.
	TP03	1.50	Target Depth obtained.
	TP04	1.50	Target Depth obtained.
	TP05	1.50	Target Depth obtained.
	TP06	1.50	Target Depth obtained.
	TP07	2.00	Target Depth obtained.
	TP08	2.00	Target Depth obtained.
	TP09	3.00	Target Depth obtained.
	TP10	3.00	Target Depth obtained.
	TP11	3.00	Target Depth obtained.
	TP12	3.00	Target Depth obtained.
	TP13	3.00	Target Depth obtained.
	TP14	3.00	Target Depth obtained.
	TP15	3.00	Target Depth obtained.
	TP16	3.00	Target Depth obtained.
	TP17	3.00	Target Depth obtained.
	TP18	3.00	Target Depth obtained.

Machine Excavated Trial Pits with Soakaway Tests	SA01	3.10	Target Depth obtained. Soakaway test to BRE 365.
	SA02	3.05	Target Depth obtained. Soakaway test to BRE 365.
	SA03	3.50	Target Depth obtained. Soakaway test to BRE 365.
	SA04	3.40	Target Depth obtained. Soakaway test to BRE 365.
Plate Load Tests	PT01	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT02	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT03	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT04	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT05	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT06	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT07	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT08	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT09	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT10	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT11	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.
	PT12	0.30	Surface topsoil removed. To obtain CBR Value to BS 1377:Part 9. 13T excavator used as kentledge.

4.1 Avoidance of Services.

Prior to breaking ground with mechanical plant, the following works were undertaken at each location.

- Location clearance utilising a CAT and Genny.

4.2 GPS Survey

A GeoMax Zenith 16 was employed during the fieldworks to record positions relevant to the investigation. During the investigation, the GPS system typically indicated 2D co-ordinate (X-axis & Y-axis) accuracies of +/-5mm, with 3D co-ordinate (X-axis, Y-axis & Z-axis) accuracy of +/-9mm. Whilst the system utilised Assisted-GPS (A-GPS) to improve initialisation time, it should be appreciated that clear view of the sky is required in order to obtain accuracy better than +/-3m. Therefore, in areas where tall obstructions are present, such as near tree canopies or buildings, it is not always possible to obtain accurate survey data. The locations of all investigation locations are presented in Appendix 1. The GPS coordinates are presented on the investigation logs within the relevant appendices.

4.3 Cable Percussive Boreholes

BH01 to BH05 were sunk using a 1.5 tonne capacity light cable percussive (shell and auger) drilling rig with 150mm diameter tools and casing.

During the boring operations, representative disturbed samples of the arisings were taken at intervals stated within GI Specification. Samples were sealed and sealed in bulk plastic bags and air tight containers. The recovered soil and rock cores were described in general accordance with BS5930: 2015, and full descriptions are given on the boreholes records which are presented in Appendix 2.

Standard penetration tests (SPTs) were undertaken at regular increments (unless specified otherwise by the Investigation Supervisor); except in cohesive materials where SPTs and undisturbed (U100) samples were alternated, where appropriate.

The SPTs were conducted in accordance with the procedures given in BS EN ISO 22476: Part 3: 2005 +A1: 2011, and the results are summarised on the borehole records. During this work an automatic trip hammer of 63.5kg falling through 760mm was employed to drive either a cone or split barrel sampler assembly into the ground, the barrel samples were retained in air tight plastic containers. The 100mm diameter undisturbed samples (U100) were sealed within a liner with wax and plastic caps.

Groundwater levels were recorded when struck and boring stopped for a period of 20 minutes to allow the water level to be monitored. Start and final depths are presented within the borehole records. In addition, chiselling was undertaken for a minimum of 30 minutes upon encountering obstructions or suspected rockhead.

4.4 Cable Percussive Boreholes with Rotary Follow-on

In BH03 and BH04 the boreholes were continued via rotary coring methods through the base of the existing cable percussive borehole to prove the competency of bedrock. Temporary 139mm rotary casing was installed through to the base of the cable percussive borehole and coring was undertaken using a Commacchio GEO205 recovering an 82mm core. The rotary was undertaken to obtain 3m of competent bedrock to prove the competency of the rock.

The recovered soil and rock cores were described in general accordance with BS5930: 2015, and full descriptions are given on the boreholes records which are presented in Appendix 2. Also included on these records are the sample depths, ground water levels, the percentages of *Total Core Recovery* (TCR) and, within rock, the *Solid Core Recovery* (SCR) and *Rock Quality Designation* (RQD).

4.5 Windowless Sample Boreholes.

WS01-WS12 and WSA to WSJ were sunk using a drive-in windowless sampler. The cores were undertaken in 1m lengths and reduced in diameter from 128mm to 57mm with increasing depth. Where necessary temporary casing was installed to support the borehole. An additional borehole was drilled adjacent to WSA, recorded as WSA2, to install an additional standpipe. No in-situ testing was undertaken in this location.

Standard penetration tests (SPTs) were undertaken at 1m increments, unless specified otherwise by the Investigation Supervisor. The SPTs were conducted in accordance with the procedures given in BS EN ISO 22476: Part 3: 2005 +A1: 2011, and the results are summarised on the borehole records.

Groundwater levels were recorded when struck and boring stopped for a period of 20 minutes to allow the water level to be monitored. Start and final depths are presented within the borehole records.

The recovered cores were sealed and returned to the laboratory for logging and subsequent testing. The soils were described in general accordance with BS5930: 2015, and full descriptions are given on the windowless sample records which are presented in Appendix 3. Also included on these records are the core diameters and percentages of core recovered.

4.6 Dynamic Probes

Dynamic penetration tests were undertaken adjacent in the locations as directed by the Investigation Supervisor in accordance with the procedure given in BS1377: 1990: Part 9, using the super heavy penetrometer (DPSH). This probe consists of a 63.5kg mass falling through 750mm onto an anvil, which drives a 50mm diameter cone into the ground. The number of blows required to drive the cone through successive 100mm increments are recorded as the N_{100} values. The results of the dynamic penetration tests are tabulated and presented as bar charts of N_{100} values versus depth in Appendix 4.

4.7 Borehole Monitoring Standpipes

Standpipes were installed in BH02, BH05. WSA, WSA2 and WSB. The details of all the installations are shown on the appropriate borehole records. The following table outlines the installation details:

Table 2: Installation Information

Location Type	Location Reference	Depth (m)	Comments
Ground Gas /Groundwater Monitoring Point	BH02	12.00	Plain Pipe to 1.00m, slotted to 12.00m. Response zone filled with clean pea gravel. Bentonite seal above. Flush cover installed. Continuous groundwater monitor installed
	BH05	12.50	Plain Pipe to 1.00m, slotted to 12.50m. Response zone filled with clean pea gravel. Bentonite seal above. Flush cover installed. Continuous groundwater monitor installed
	WSA	7.00	Plain Pipe to 2.00m, slotted to 7.00m. Response zone filled with gravel. Bentonite seal above. Flush cover installed. Continuous groundwater monitor installed
	WSA2	4.00	Plain Pipe to 2.00m, slotted to 4.00m. Response zone filled with gravel. Bentonite seal above. Flush cover installed.
	WSB	6.00	Plain Pipe to 1.00m, slotted to 6.00m. Response zone filled with gravel. Bentonite seal above. Flush cover installed. Continuous groundwater monitor installed

4.8 Machine Excavated Trial Pits

A series of machine excavated trial pits, TP01 to TP18, were undertaken at the locations as described by the Investigation Supervisor. The trial pits were commenced using a 13T tracked machine excavator to depths between 1.50m and 3.00m as required. At regular intervals throughout the excavation of the pits, bulk and disturbed samples were taken for chemical and geotechnical. The test specimens were retained in the appropriate bulk bags and air tight containers within cool boxes for onward transition to the laboratory. The recovered soils were described in general accordance with BS5930: 2015, and full descriptions are given on the boreholes records which are presented in Appendix 5.

Once excavations were completed, the trial pits were carefully re-instated with the arisings. Whilst every care was taken during the infilling process, including compacting of the infill at regular intervals with the back-acting arm of the excavator, it should be appreciated that some mounding of the surface may have resulted. Moreover, the infilled soils may be subjected to settlement over time, such that a depression in the surface may also occur. Therefore, the locations of any pits undertaken in this investigation should be conveyed to the current site user, as the mounds or depressions associated with the pits may present a risk to current site operations e.g. livestock or agricultural plant equipment. Furthermore, it must be realised that the infilled pits represent an area of disturbance within the site soils, thus the soils at the pit locations may vary characteristically compared to the undisturbed ground. As such, foundations placed in this disturbed material may not perform as anticipated.

4.9 Machine Excavated Trial Pits with Soakaway Tests

Four machine excavated trial pits, SA01 to SA04, were excavated to undertaken in-situ soakaway tests. At the elected test depths, the pit was trimmed and squared as much as practicable. Water was then pumped into the pit and the level monitored at timed intervals relative to a reference bar at ground level. These tests were conducted and calculated in general accordance with the method given by BRE Digest 365 and the results are presented in Appendix 6.

Trial pits were excavated in order to undertake soakaway testing using a 13T tracked excavator. The positions of the trial pits were specified by the Investigation Supervisor. The soils exposed in the trial pits were logged on site in general accordance with BS5930: 2015+A1: 2020, and full descriptions are given on the trial pit records which are attached to this letter along with the soakaway test results.

Once excavations were completed, the trial pits were carefully re-instated with the arisings. Whilst every care was taken during the infilling process, including compacting of the infill at regular intervals with the back-acting arm of the excavator, it should be appreciated that some mounding of the surface may have resulted. Moreover, the infilled soils may be subjected to settlement over time, such that a depression in the surface may also occur. Therefore, the locations of any pits undertaken in this investigation should be conveyed to the current site user, as the mounds or depressions associated with the pits may present a risk to current site operations e.g. livestock or agricultural plant equipment. Furthermore, it must be realised that the infilled pits represent an area of disturbance within the site soils, thus the soils at the pit locations may vary characteristically compared to the undisturbed ground. As such, foundations placed in this disturbed material may not perform as anticipated.

4.10 Plate Load Tests

A total of twelve plate load tests were undertaken using a 450mm diameter plate on the sub-base. The testing was conducted in accordance with BS 1377 (1990): Part 9: 4.1 and 4.2. CBR values have been derived in accordance with IAN 73/06 (HD25) Feb '06 along with moduli of subgrade reaction. The stated procedure utilises the constant penetration plate test method, in which the force taken to mobilise the plate through 1.25mm of penetration is used to calculate the CBR. It should be noted that a 13 tonne tracked excavator (which was also used to undertake the trial pits) was employed to provide the necessary kentledge for the test. The plate load test results are presented within Appendix 7.

5. Geology

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 3: Geological Data for the Site

Strata Type	Strata Name[1]	Previous Name[2]	Description[3]
Superficial Geology	Hemingbrough Glaciolacustrine Formation	-	Unfossiliferous laminated clays, silts and sands with rare dropstones (typically fine-grained pale coloured sandstone, grey limestone and dark mudstone).
Solid Geology	Brotherton Formation	-	Limestone, dolomitic, grey with abundant Calcinema.
	Roxby Formation (Central East only)	-	Mudstone and siltstone, reddish brown, with subordinate sandstone. Sulphates (gypsum, anhydrite) common towards base.

The geological maps indicate that several geological faults cross the site trending in an approximate south-west north-east orientation. The faults generally display a variation of throws with the Roxby Formation being downthrown against the Brotherton Formation beneath the east of the centre of the site.

The Roxby formation contains two named gypsum/anhydrite members named as the Sherburn Anhydrite, located towards the upper third of the unit, and the Billingham anhydrite located close to the base of the unit.

[1] Sources: British Geological Survey (NERC) Map Sheet 70; Leeds; Solid and Drift Edition, and Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[2] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

6. Strata Conditions & Groundwater

In accordance with the geology of the area, the succession has been shown to include the following:

Table 4: Generalised Strata Profile

Depth m below ground level to underside of layer	**Strata Type**	**Positions Encountered**	**Groundwater Strikes** m below ground level
0.10 to 0.50	TOPSOIL	ALL	None
0.80 – 1.50	Soft greyish brown slightly sandy slightly gravelly CLAY [ALLUVIUM]	ALL	None
5.00 to 6.45	Soft locally firm thinly laminated CLAY and SILT with sand partings. [HEMINGBOROUGH GLACIOLACUSTRINE FORMATION]	ALL	WS02 – 2m WSC - 3.00m (in gravel lens)
+2.50 – +3.30	Medium dense silty gravelly SAND. [HEMINGBOROUGH GLACIOLACUSTRINE FORMATION]	ALL BHs, WSA & WSB	BH02 – 5.40 BH03 – 6.10 BH04 – 6.00 BH05 – 6.45 WSA – 5.80 WSB – 6.00
+ 7.00 & 9.90	Firm to stiff laminated sandy gravelly CLAY.	BH01 & WSA	BH01 - 6.40
11.10 to 12.00	Reddish brown silty CLAY [WEATHERED ROXBY FORMATION]	ALL BHs except BH03	None
11.80 to 12.00	Hard dark grey silty CLAY [BROTHERTON FORMATION]	All BHs	BH01 – 11.00
+15.00	Grey dolomitic LIEMSTONE [BROTHERTON FOMRATION]	BH03 & BH05	None

7. In-Situ Testing

7.1 Standard Penetration Tests

The standard penetration tests carried out are summarised in the following table and full details are presented on the borehole logs in Appendix 2 and 3:

Table 5: Summary of Standard Penetration Tests

Strata	**Depth Range (m)**	**SPT 'N' (Blows/300mm)**		**Comments**
		Granular soils	**Cohesive soils**	
ALLUVIUM	1.0 to 1.2	–	6 to 10	SPT's indicate a soft locally firm in-situ condition
HEMINGBROUGH FORMATION	2.0 to 4.0 4.0 to 6.0	–- –-	6 to 12 8 to 14	SPT's indicate a soft becoming firm locally soft in-situ condition
Very clayey silty SAND	6.0 to 10.50	11 to 20	-	SPT's indicate a medium dense in-situ condition
Laminated CLAY	7.50	-	26	SPTs indicate a stiff in-situ condition
Weathered ROXBY FORMATION	9.00 to 10.5	-	22 to 27	SPTs indicate generally stiff in-situ condition
Weathered BROTHERTON FORMATION	10.0 to 12	-	50+	SPTS indicate very stiff in-situ condition
BROTHERTON FORMAITON	11.00 to 12.00	50+		SPTS indicate very dense in-situ condition becoming very weak rock.

7.2 Dynamic Probe Tests

The Dynamic Probe Tests carried out are summarised in the following table and full details are provided in Appendix 4:

Table 6: Summary of Dynamic Penetration Tests

Position	Blows/100mm			Refusal type (Effective/ Abrupt)[3]	Comments
	0 - 2	3 - 10	10+		
	Depth to which blow count range was observed (m)				
DP01	2.3	4.5	10	None	Low blow counts to 2.30m, increase to medium blow counts through to 4.50m with gradual increase in depth. High blow counts from 4.50m to termination at 10m.
DP02	2.0	4.8	10	None	Low blow counts to 2.00m, increase to medium blow counts through to 4.80m with gradual increase in depth. High blow counts from 4.50m to termination at 10m
DP03	3.6	4.8	10	None	Low blow counts to 3.60m, increase to medium blow counts through to 4.80m with rapid increase to High blow counts to termination at 10m
DP04	4.1	6.6 7.9	7.4 10	Effective	Low blow counts to 4.10m, increase to medium blow counts through to 7.90m with band of high blow counts between 6.60m and 7.40m. High blow counts from 7.90m to termination and effective refusal at 10m.
DP05	2.0	5.8	10	Effective	Low blow counts to 2.00m, increase to medium blow counts through to 5.80m with gradual increase in depth. Rapid increased to high blow counts from 5.80m remaining variably high to termination at 10m.
DP06	2.0	6	10	None	Low blow counts to 2.00m, increase to medium blow counts through to 6.00m with gradual increase in depth. High blow counts to termination at 10m with gradual increase on blow counts.
DP07	3.8	5.6 6.8	6.4 10	Effective	Low blow counts to 3.80m, increase to medium blow counts through to 6.80m with gradual increase in depth and band of high blow counts between 5.60m and 6.40m. High blow counts from 6.40m to termination and effective refusal at 10m.

[3] Abrupt refusal: obstruction or bedrock encountered. Effective refusal: +25 blows/100mm.

DP08	3.10	6.10	10	None	Low blow counts to 3.10m, increase to medium blow counts through to 6.10m with gradual increase in depth. Initial rapid increase to very high blow counts (>20) from 6.10m to 6.80m before remaining variably high with gradual increase in depth to termination at 10m.
DP09	4.00	6.60	10	Effective	Low blow counts to 4.00m, increase to medium blow counts through to 6.60m with gradual increase in depth. High blow counts from 6.60m to termination with effective refusal at 10m.
DP10	3.60	6.40	10	Effective	Low blow counts to 3.60m, increase to medium blow counts through to 6.40m with gradual increase in depth. Initial rapid increase to very high blow counts between 6.40m and 6.90m before remaining variably high counts to termination and effective refusal at 10m.
DP11	3.80	5.60 7.10 7.80	6.50 7.60 10	None	Low blow counts to 3.80m, increase to medium blow counts through to 5.60m with gradual increase in depth. Initial rapid increase in blow counts from 5.60m to 6.50m before blow counts varying between 8 and 12 to 7.80m before remaining variably high to termination at 10m
DP12	4.0	6.5	10	Effective	Low blow counts to 4.0m, increase to medium blow counts through to 6.50m with gradual increase in depth. Initial rapid increase to very high blow counts between 6.50m and 6.70m before returning to between 9 and 14 blow counts to 9.10m before rapid increase to very high blow counts and effective refusal and termination at 10m.

It is thought that the blow counts gradually increasing with depth to between 5.50ma and 6.50m are representative of increasing friction on the rods due to penetrating through laminated clay, silt and sand glacial lake deposits, as these results do not correlate with the in-situ SPT testing results or the lab, testing results. The initial rapid increases likely relate to a spike in friction caused by penetrating through a different stratum type, i.e. sand and gravel deposits recorded in the cable percussive boreholes and differing moisture profiles

7.3 Water Level Monitoring

The levels of the groundwater are being monitored by continuous in-situ monitors; results shall be taken for the next few months. Manual measurements of groundwater have also been taken and are presented below.

Table 7: Standpipe Monitoring			
Location	**Date**	**Water Level (m)**	**Standpipe Depth (m)**
BH02	07.05.2025	0.35	12.20
BH05	07.05.2025	0.08	11.20
WSA	07.05.2025	0.98	6.90
WSA2	14.05.2025	-	4.00
WSB	07.05.2025	0.77	5.90

7.4 Soakaway Test Results

On reaching the elected soakaway test depth, the pit was trimmed and squared as much as practicable. Water was then introduced into the pit at a controlled rate to prevent collapse of the sides and the level monitored at time intervals relative to a reference bar at ground level.

The results obtained from the soakaway tests are presented at Appendix 6 and are summarised below:

Table 8: Soakaway Test Results					
Location	**Soakage Area Dimensions (average) (m)**	**Depths of soaked strata (m)**	**Soil Description (of soaked strata)**	**Infiltration Rate (m/sec)**	***Drainage Characteristics**
SA01	0.45 * 1.8 * 3.10	3.10 to 2.65	Side – thinly laminated sandy silty CLAY. Base – thinly laminated sandy silty CLAY	N/A	Poor
SA02	0.45 * 1.80 * 3.50	3.50 to 2.74	Side – thinly laminated sandy silty CLAY Base – thinly laminated sandy silty CLAY	N/A	Poor
SA03	0.45 * 1.70 * 3.05	3.05 to 2.34	Side – thinly laminated sandy silty CLAY Base – thinly laminated sandy silty CLAY	N/A	Poor
SA04	0.45 * 1.80 * 3.45	3.45 to 2.81	Side – thinly laminated sandy silty CLAY Base – thinly laminated sandy silty CLAY	N/A	Poor

*Based on the most onerous results for each test.

During the soakaway tests the water level did not achieve a fall from 75% to 25% of the effective depth of the storage volume in both trial pits. In both tests, the water level movement ceased at around 50% effective depth. Indeed no mvoement was recorded in the water level during any of the tests. On this basis, the tests could not be completed within the scope of the method provided in BRE Digest 365 due to the poor soakage rate of the exposed soils. Due to the negligible water movement it was not possbile to extrapolate the results obtained in order to obtain a soil infiltration rate. It is considered that cohesive strata at the site can be classified as practically impermeable.

8. Laboratory Testing - Geotechnical

The following programme of laboratory testing has been undertaken on samples obtained during this investigation:

Table 9: Laboratory Testing – Geotechnical

Test Type	Lab House	Number of tests	Standard
Classification Tests			
Moisture content determinations	RGS	17	BS EN ISO 17892-1:2014
	GSTL	12	
Liquid limit, plastic limit and plasticity index (Four point)	RGS	17	BS EN ISO 17892-12:2018
	GSTL	12	
Particle Size Distribution (Dry Sieve)	RGS	2	BS EN ISO 17892-4:2016: 5.2
Sedimentation (Pipette)	RGS	1	BS EN ISO 17892-4:2016: 5.3 – 5.4
Compaction & CBR			
Dry Density/Water Content Relationship (2.5kg)	RGS	12	BS 1377-2: 2022, 11.3
California Bearing Ratio	RGS	12	BS 1377-2: 2022
Compressibility, Permeability and Durability			
One dimensional consolidation properties, test period 5 days	GSTL	18	BS 1377: 1990: Pt5: 3.0
Shear Strength (total stress)			
Undrained shear strength of a single 100mm diameter specimen in triaxial compression without the measurement of pore pressure	GSTL	18	BS1377: 1990: Pt7: 8.0

The results of the laboratory testing are presented within Appendix 8 and are summarised below.

Table 10: Summary of Geotechnical Test Results

Test type	Number of tests	Range of results		Comments
Water content determinations	12	23.6% to 34.1%		All moisture contents above plastic limits. Moisture variable with depth.
Index properties (4 Point)	12	LL PL PI	50 to 58% 18 to 23% 30 to 37%	Clay of High plasticity. Consistency index 0.63 to 0.83 NHBC Class - Medium
Particle size distribution (Dry sieve)	1	Gravel Sand Silt/Clay	57% 34% 9%	Clayey silty very gravelly SAND.
Particle size distribution (Dry sieve and sedimentation)	1	Gravel Sand Silt Clay	25% 55% 18% 2%	Slightly clayey silty very gravelly SAND.
Light compaction (2.5kg)	12	MDD OMC	1.57 to 1.72 Mg/m³ 17% to 24%	One outlier of 1.93Mg/m³ and 11% - discounted.
CBR on compacted soil	12	Top Base	3% to 43% 3.3% to 37%	Many results above 5%

One–dimensional consolidation	18	c_v m_v	0.66 to 6.90 m^2/yr 0.21 to 0.73 m^2/MN	Moderately slow to fast rate of settlement. Medium to high compressibility.
Undrained shear strength (Triaxial)	12	c_u γ	16 to 63 kN/m^2 19.82 to 17.36 kN/m^3	Cohesion increased with depth.
Soluble sulphate & pH	-	SO_4 pH	42.7 to 335mg/l 7.9 to 8.2	Natural ground conditions.

In cohesive soil the approximate cohesion, c_u, and coefficient of consolidation, m_v, may be obtained from the equivalent SPT 'N' value using the following expressions (Stroud 1975).

$c_u = f_1 N$

$m_v = \frac{1}{f_2 N}$

where:

c = cohesion (kN/m^2).
m_v = Coefficient of consolidation (m^2/MN).
f_1 & f_2 = factors based on plasticity index.
N = SPT 'N_{300}' value.

For the cohesive soils revealed at this site the highest (worst case) plasticity index[4] of 37% could be employed, which suggests an f_1 value of 4.2 and an f_2 value of 0.42.

8.1 Geotechnical Properties

The idealised geotechnical properties employed in design are summarised below.

Table 11: Summary of Geotechnical Properties

Property	Range of values		Comments
Volume change potential (NHBC)	Medium		Sandy silty CLAY.
Shear strength parameters (up to 6m)	c_u γ	32kN/m^2 17.4kN/m^3	Stroud (1974) where $c_u = f_1 N$ and triaxial test results. Lowest Density applied from lab testing
Consolidation characteristics	c_v m_v	0.66m^2/yr 0.73m^2/MN	m_v variable with depth and tends to increase with depth. Granular soils anticipated to have negligible long term settlement.
Concrete classification	ACEC AC-1, DS-1		Natural ground locations (Static water)

9. Laboratory Testing - Environmental

The following programme of laboratory testing has been undertaken on samples obtained during this investigation:

Table 12: Laboratory Testing – Environmental

Test Type	Lab House	Number of tests	Comments
RGS Contamination Suite	I2 Analytical	2	Result Pending
pH	I2 Analytical	3	Result Pending
Water Soluble Sulphate (2:1 ratio)	I2 Analytical	3	Result Pending

[4] See paragraph 6.2 'Index Property Tests'

Total Sulphate	I2 Analytical	3	Result Pending

The results of the laboratory testing are presented within Appendix 8.

10. Discussion of Ground Conditions - Geotechnical

It is understood that the site is to be developed by the construction of a new anaerobic digestion plant. The proposed development comprises several key components which are listed as follows:

- 4no. anaerobic digestion tanks of diameter 32m, by 14.40m high.
- 3no. further tanks, of diameter 14m, by 10m high
- Drainage attenuation pond, 29m wide by 70m long.
- Covered lagoon, 4.50m high, dimensions not provided.
- Flare stack, 11m high.
- Gas washing tower of diameter 2.3m and 8.4m high.
- Reception building, height 14m, dimensions not provided.
- Various ancillary and infrastructure buildings.
- Access Road

At the time of writing this report the precise method of construction is not known, and this report is to aid finalised construction designs. Although calculations are targeted to specific locations and structures, the results are generalised for the site as a whole. Particularly where proposed loadings have not been made available for review

10.1 Site Appraisal

In general the site can be classified as containing four predominant strata facies and are given as such:

- Topsoil and near surface alluvium deposits, comprising recent deposits of soft clay and silt.
- Glacio-lacustrine deposits, comprising soft high plasticity interlaminated clay and silt with localised sand and gravel bands.
- Deeper fluvial and alluvium deposits comprising, granular deposits more prevalent towards the south, and firm to stiff clay more prevalent to the north. Groundwater was generally recorded wherever this unit was encountered and rose close to the surface in all occasions.
- Residual soils of Roxby Formation comprising sift clay and Brotherton Formation comprising stiff clays before transition into weathered bedrock.

10.1.1 Digestion Tanks

As part of the development it is proposed to include 4no digestion tanks. In the specification for ground investigation provided by the client, analysis undertaken based on the diameter of the tanks and the proposed loadings are provided. It is estimated from the report that based on a diameter of 28m the influence from the tanks will penetrate to a depth of around 21m and the bulb of pressure is anticipated to extend a maximum width of around 18m from beyond the extents of the tank wall. It is estimated that the loadings on the tank at full capacity will be on the order of 85kPa to 90kPa for an evenly distributed load. It is not known if the loads provided include for the weight on the foundations. Given the extent of influence of each individual tank the report highlights that there will

be influence from neighbouring tanks such that loading should be able to achieve a bearing capacity of 40kPa at 7m.

However newer drawings provided have indicated that the tanks will now have a dimeter of 32m as opposed to 28m. Calculating the maximum anticipated load spread evenly over the footprint of the proposed structure a total force applied by the structure has been calculated to 55,417.7kN. To spread this load over the new diameter of 32m a new pressure of 80kN/m^2 has been assumed allowing for additional loads from extra contents and construction materials due to the larger size.

The client should be aware that the changes in diameter will completely change the extent of the bulb of influence from the tanks and the loadings at depth. Once a new load analysis has been completed it is likely that further settlement calculations will be required to qualify the analysis. The following table provides the anticipated allowable increases in stress for each 1m increment based on the in-situ and lab testing undertaken and for on a circular concrete raft of 32m diameter placed at depth of 1m below existing ground level to protect against volume change and heave from near surface cohesive material.

Table 13: Allowable Increase in Stress

Foundation Type		**Circular Raft Foundation of diameter 32m placed at 1m depth**											
Depth of influence below foundation	D (m)	0	1	2	3	4	5	6	7	8	9	10	11
Estimated max load a depth below foundation	(kN/m²)	80	80	80	80	72	72	72	64	64	64	56	56
Conservative shear strength[5]	(kN/m²)	Cu 21	Cu 25	Cu 29	Cu 33	Cu 50	Cu 65	Cu 23	N 15	N 11	N 11	N 13	N 50+
Allowable Increase in Stress	(kN/m²)	40	50	60	65	100	135	45	125	85	85	105	500
Net Allowable Bearing Capacity[6]	(kN/m²)	55	65	75	80	115	150	60	140	100	100	120	500

From the table, based on the proposed loadings and the shear strengths proven, there is not expected to be suitable load through the column to around 3m below the base of the foundation to support the loads anticipated, therefore a raft foundation placed directly upon this strata cannot be recommended.

In addition to the loadings above settlements based on the columns of material recovered from the boreholes and subjected to tested are estimated to be between 150mm and 225mm depending on localised variations in ground conditions. To reduce settlements below acceptable limits, ie less than 50mm, for the existing ground conditions based on a structure of these dimensions, surface loadings will need to be to less than 18kPa. It is estimated based of the coefficient of consolidation values that it will take between 3.5 years and 8 years to achieve 90% settlement based on the proposed loading and the variation in ground conditions between each tank. This introduces risks where tanks settle at different rates independently putting additional pressures on surrounding infrastructure.

[5] Uses F1N for cohesive and for granular stratum uses Terzaghi and Peck 1967
[6] Assumes bulk density of material removed from footing excavations to be 17kN/m³

Information from client indicates that a piled foundation solution is not viable therefore a different method of increasing bearing capacity and reducing long term settlements with be required. This could be done by deep soil mixing producing either batches or columns of improved ground or by implementation of rigid inclusions by displacement to attempt to improve the soil profile.

In the method of soil mixing, a mixer with a cement binder injector is lowered into the ground to a specified depth using a powerful drill, the soil is mixed usually up to an area of 4m by 4m and can be improved by introducing a strengthening agent such as lime or cement. Columns are produced using the same method, on a smaller diameter of between 1m and 1.5m but to greater depths up to 6m.

In the method of rigid inclusions or displacement ground improvement, a helical probe displacement auger or vibrating tube is placed into the ground to create a void and locally compacted the material around the location, then concrete or bound aggregates are pumped into the ground filling the cavity created to help stabilise and support the ground.

It is considered that following whichever method is selected a series of validation tests comprising both in-situ and laboratory tests will be required to ensure that the required stiffness of material has been obtained as well as desired improvements in soil settlement controls.

Both of these methods, are relatively shallow in situ methods, which can both improve ground bearing capacity and reduce and control settlements and produce minimal spoil which are better suited to environmentally sensitive environments. Irrespective of the method selected a working platform must be provided, the thickness of which will be determined by the type of rig employed, the forces imparted on the ground, and the strength of the near surface soils. The design of the platform should be undertaken in accordance with the procedures and specification given in the BRE publication entitled *Working platforms for tracked plant.*

10.1.2 Shallow Pad Foundations

There are a variety of structures proposed for the site which could be placed upon pad foundations, given the variability of designs and loadings across the site. The soils are relatively uniformly low strength across the site to a depth of around 6m where medium dense granular deposits are encountered. Given the sensitivity of the soils to settlement the limiting factor in this case is likely to be reducing the long-term settlements on the structures. It is of note that the cohesion of the ground to loading, is likely to exceed the maximum allowable load for which excessive settlements will occur. For pad foundations it estimated that maximum settlements will be required to be on the order of 25mm. The following table provides the allowable increases in settlement which will induce these levels of settlements based on the proven ground conditions and lab testing.

Table 14: Allowable Increase in Stress

Foundation Type		**Square Pad Foundations**					
Foundation Dimensions	B (m)	1.0	2.0	3.0	1.0	2.0	3.0
Foundation Depth	D (m)	1.0			2.0		
Net Allowable Bearing Capacity[7]	(kN/m²)	52	27	20	53	29	22
Allowable increase in stress	(kN/m²)	35	10	3	36	12	5

[7] Assumes bulk density of material removed from footing excavations to be 17kN/m³

The net allowable bearing capacities in the table above are likely to be very low, compared to the required loadings required. It is of note that for pads larger than 2.0m x 2.0m it estimated that the mass of the footings alone is likely to induce settlements exceeding the generally allowed guidelines for long term settlements.

An example in the specification report is given for the solid feeders, whereby the hopper at maximum capacity is likely to impart total loadings on the order of 200kN spread through 2m x 2m pad footing, producing 50kN/m^2 of pressure on the ground. It is estimated based on the data available that settlements beneath each footing would be on the order of 50mm. In addition, based on the worst-case rates of settlement to obtain 90% compaction, it is estimated settlements will continue almost 4 years. Indeed, these rates could actually be extended due to the cyclic loading of the hoppers, which are unlikely to be at maximum loading indefinitely.

Based on the information provided above it is considered that some ground improvement will be required to control settlements in these areas, and perhaps improve bearing capacity if required. The same modes of ground improvement such as soil mixing or inclusions could also be employed in these areas.

10.1.3 Ground Bearing Concrete Slabs

For ground bearing slabs, the actual dimensions required will depend on the size of the structure being supported, and the loadings imparted by these structures. As such for accurate estimations of bearing capacities and estimated settlements, the proposed dimensions of each structure, machine, plant or equipment will need to be provided and bespoke calculations be undertaken based on the ground conditions revealed at this location. As the depth of influence of the footing will depend upon the width/breadth of the raft required the magnitudes of settlements will vary for each individual building. In lieu of this Plate Load Tests have been undertaken at depths which likely represents the formation level to help inform slab design to from moduli of subgrade reaction. The following table outlines the proven moduli in selected locations relevant to the proposed structures:

Table 15: Moduli of Subgrade Reaction

Location Id	Depth (m)	Modulus of subgrade reaction (kN/m^2/m)	Comments
PT08	0.30	50,000	Equivalent of moist clay or loam, 3.7% CBR
PT09	0.40	11,000	Equivalent of soil, 0.3% CBR
PT10	0.40	16,800	Equivalent of soil, 0.6%
PT11	0.40	27,100	Equivalent of moist clay or loam, 1.3%
PT12	0.40	6,500	Equivalent of soil, 0.1%

From the above information is considered that the CBR is generally below 2% for the southern portion of the site, likely owing to the water contents which were observed higher than the plastic limits and the clays being highly plastic. These low values are consistent across the site, and combined with the low dynamic probe results which recorded between 0 and 1 blow usually through the uppermost 1m of material, are generally consistent with the findings across the site as a whole. It is considered that some improvement of the soils may be required to improve the soil moduli to allow for construction of raft or ground slab foundations, and given the low strength of the clays to depths up to six metres combined with the magnitudes of settlements, the depths of such improvements may need to extent to at least 1.5 times the proposed width of the slab or to the granular deposits at 6m whichever is shallower.

10.2 Volume Change Potential

It should be appreciated that the cohesive soils revealed at this site possess a medium volume change potential under the guidance of the NHBC standards. Therefore, foundations will need to be placed at a minimum depth of 0.90m below ground level to protect against heave in accordance with the Chapter 4.2 of the NHBC standards. Notwithstanding this no trees have been observed in the proposed construction area, therefore the most significant risk of volume change will be changes in moisture due to construction activity such as compaction or soil improvement.

10.3 Hardstanding Areas and Pavements

It is considered that any roads or hard-standing at the site could be constructed employing traditional pavement design. A design California Bearing Ratio (CBR) of <2% should be employed in the pavement design[8] based on the findings of the plate load test results. However as significantly higher loads are anticipated such as at the silage clamps a programme of surface ground improvement by means of dynamic compaction could be employed. The dynamic compaction may involve employing a non-spherical roller towed by tracked or wheeled plant to impart energy to the soils to compact the soils and reduce settlements followed by compaction with a vibrating roller.

It is recommended that due to the sensitivity of the soils that a trafficking trial be undertaken in a smaller section of the site first to confirm the required improvements can be attained. This would allow designers and contractors to utilise different weight rollers and numbers of passes to achieve the desired results on smaller controlled section before expanding to the site as a whole.

This should be taken in conjunction with a pre-improvement and post improvement survey comprising field and in-situ testing such as plate load tests, sand replacement or nuclear density tests, as well as topographical surveys to ensure the desired improvements have been achieved. A validation report of the improvements should be completed prior to construction of any hardstanding areas to inform suitable design. Such soil improvement methods could be more economical given the depth of weak soils across the site. Any hardstanding area, could contain geogrid to further stiffen and support the ground and evenly distribute settlements across the subgrade.

10.4 Groundwater

Groundwater was generally encountered at the interface of the glacial lake deposits and the underlying granular deposits at depths of around 6m. This was observed to rise to within 0.50m of the surface in all boreholes where this was encountered. This suggests that the potentio-metric head for groundwater may be at or close to the surface. The client should be aware that the period leading up to and following the groundworks have been exceedingly dry compared to national averages, and there exists a potential for groundwater to rise to the surface should the water table be punctured.

Furthermore, the glacial lake deposits appear to be acting as a confining layer to the groundwater in the sands at depth, based on the depth that the water was observed to rise to during the fieldworks, the upthrust pressure from the groundwater at this level can be calculated at around 60kN/m^2. Therefore, to prevent breakout of groundwater the pressure from the overlying units will need to exceed this value at all times. This may impact construction of the attenuation pond where

[8] Table 13/2 Design Manual for Roads and Bridges (1995), HA44/9: Volume 4 Section 1 Part 1, Highways Agency.

excavations will be required where should confining pressures not remain high enough leakage or seepage to the bottom of the tank may occur.

Localised shallow strikes were recorded in WSI where a gravel band was observed, and other gravel bands may allow groundwater seepage into excavations.

10.5 Effect of Sulphates

In view of the nature of the underlying soils it is considered that the design sulphate class be assessed with reference to Table C1[9], which is provided in BRE Special Digest 1, *Concrete in aggressive ground*: Part C. On the basis of this table and considering the soluble sulphate contents recorded, it can be shown that well compacted buried concrete should be designed in accordance with Class DS-1 requirements. Assuming mobile groundwater, the table also indicates that the aggressive chemical environment for concrete (ACEC) classification is AC-1.

In order to evaluate the design chemical (DC) class for the buried concrete at this site reference should be made to Table D1[10], which can be found in Part D, *Specifying concrete for general cast-in-situ use,* of BRE Special Digest 1. From this table it may be shown that for an intended working life of at least 50 years the concrete design class DC-1 is required.

11. Discussion of Ground Conditions - Environmental

11.1 Discussion of Test Results

In view of the low sensitivity of the site, screening values for a commercial end use have been adopted for contamination analyses.

11.1.1 Soil Samples

The results of the chemical testing undertaken on soil samples obtained during this investigation have been compared to the ATRISK soil screening values (SSVs) as compiled by WS Atkins plc. With respect to the results it should be appreciated that the soil organic matter (SOM) content for the samples tested was found to range between 1.6% and 2.9%. On this basis, it is considered that the screening values associated with 1% SOM should be adopted. These values have been derived in such a way as to adhere to the principles within the revised CLEA model and include the most current release of the SGVs. A list of subscribers is provided within the website[11] and these include many local authorities.

[9] Table C1, *Aggressive Chemical Environment for Concrete (ACEC) classification for green field locations*
[10] Table D1, *Selection of the DC Class and the number of APMs for concrete elements where the hydraulic gradient due to groundwater is 5 or less: for general in-situ use of concrete.*
[11] http://www.atrisksoil.co.uk/pages/general/subscribers.asp

A comparison of the results of the testing, together with the data given above, can be found within Appendix 9. These results indicate the following:

Table 16: Summary of Contaminated Areas

Location	Depth (m)	Contaminants found to be exceeding SSVs (Commercial)
WSD	0.4	None
WSI	0.3	None

Concentrations of chromium^{VI}, mercury, selenium, free cyanide, phenols (total), poly aromatic hydrocarbons (PAHs) and total petroleum hydrocarbons (TPHs) were below the detection limits for the tests. Detectable levels of all other contaminants were recorded, but these fell below the associated Atrisk Soil Screening Values. In addition, no asbestos was detected within the soils samples tested.

On the basis of the above information, the results of the investigation have concluded that the site is not contaminated. There is a limited risk to operatives, end users, neighbours and controlled waters.

11.2 Fill Materials

It should also be appreciated that any fill material, either site-won or imported, to be employed at the site should be subjected to the following assessment to determine its suitability.

Fill materials should be initially screened, by a suitably qualified engineer to establish that:

- It is a suitable growing media if it is to be employed as such, including compliance with BS3882 (2015)
- It is free from obvious contamination i.e. visual or olfactory evidence
- It has not come from areas where Japanese Knotweed or other invasive or injurious plants are suspected to be growing
- It is not a statutory nuisance, such as being odorous
- It is free from unsuitable material i.e. whole bricks, brick ties, timber or glass.

It should also be appreciated that any fill should be subjected to validation testing to assess its suitability. The following table has been taken from YALPAG[12] documentation and may be used as a guide. Depending on the origin and nature of the material, not all fill will require the sampling frequency and testing indicated, although this should be in agreement with any regulatory bodies (such as the Local Authority).

Table 17: Validation Sampling and Testing

Fill Type	Frequency	Minimum Determinands
Virgin Quarried Material	1 or 2 depending on the type of stone utilised, to confirm the inert nature of the material.	Standard metals/metalloids (should include as a minimum As, Cd, Cr, CrVI, Cu, Hg, Ni, Pb, Se, Zn)

[12] *YALPAG Technical Guidance for Developers, Landowners and Consultants – Verification Requirements for Cover Systems V4 .1* Appendix 1a, June 2021

Crushed Hardcore, Stone, Brick	Minimum 1 per 500m³	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, total TPH. Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE).
Greenfield/ Manufactured Soils	Minimum 3 Dependent on source and receptor, between 1 per 50m^3 and 1 per 250m^3	Standard metals/metalloids (as above), PAH (16 USEPA speciation), asbestos, pH and soil organic matter (SOM) (or calculated from total organic carbon (TOC)).
Brownfield/ Screened Soils	Minimum 6 Dependent on source and receptor, between 1 per 50m^3 and 1 per 100m^3	Standard metals/ metalloids (as above), PAH (16 USEPA speciation), TPH (CWG banded), asbestos, pH and SOM (or calculated from TOC). Any additional analysis dependant on the history of the donor site (e.g. phenol, total cyanide, BTEX, MTBE)..

Suitable screening values should be utilised and considered with respect to the Soil Organic Matter (SOM) of the subject material i.e. 1% SOM would be typical for granular fill and 6% SOM for topsoil. Testing should comply with UKAS and MCERTS, where applicable, and undertaken by an accredited laboratory.

Where the material has been derived from a commercial company, certificates or other industry quality protocol compliance i.e. WRAP should be obtained. However, it will be necessary to ensure that this documentation specifically related to the material being imported, it is no more than two months old and complies with the screening and frequency requirements given above.

Suitable fill materials should be either placed immediately or sufficiently quarantined to prevent cross-contamination. If it is necessary, the quarantined material should be placed on appropriate sheeting and covered to prevent it becoming mixed with contaminated soils or dust, or penetrated by mobile contaminants.

12. Recommendations for Further Work

- This report should be forwarded to the relevant authorities as soon as practicable to ensure they have sufficient time to review and discuss any issues.
- Completion and reporting of water monitoring to submit as part of the Environmental Permit.
- Detailed design of the sub-structure.

Clearly Rogers Geotechnical Services Ltd would be happy to offer advice with respect to the above and assist where necessary.

13. References

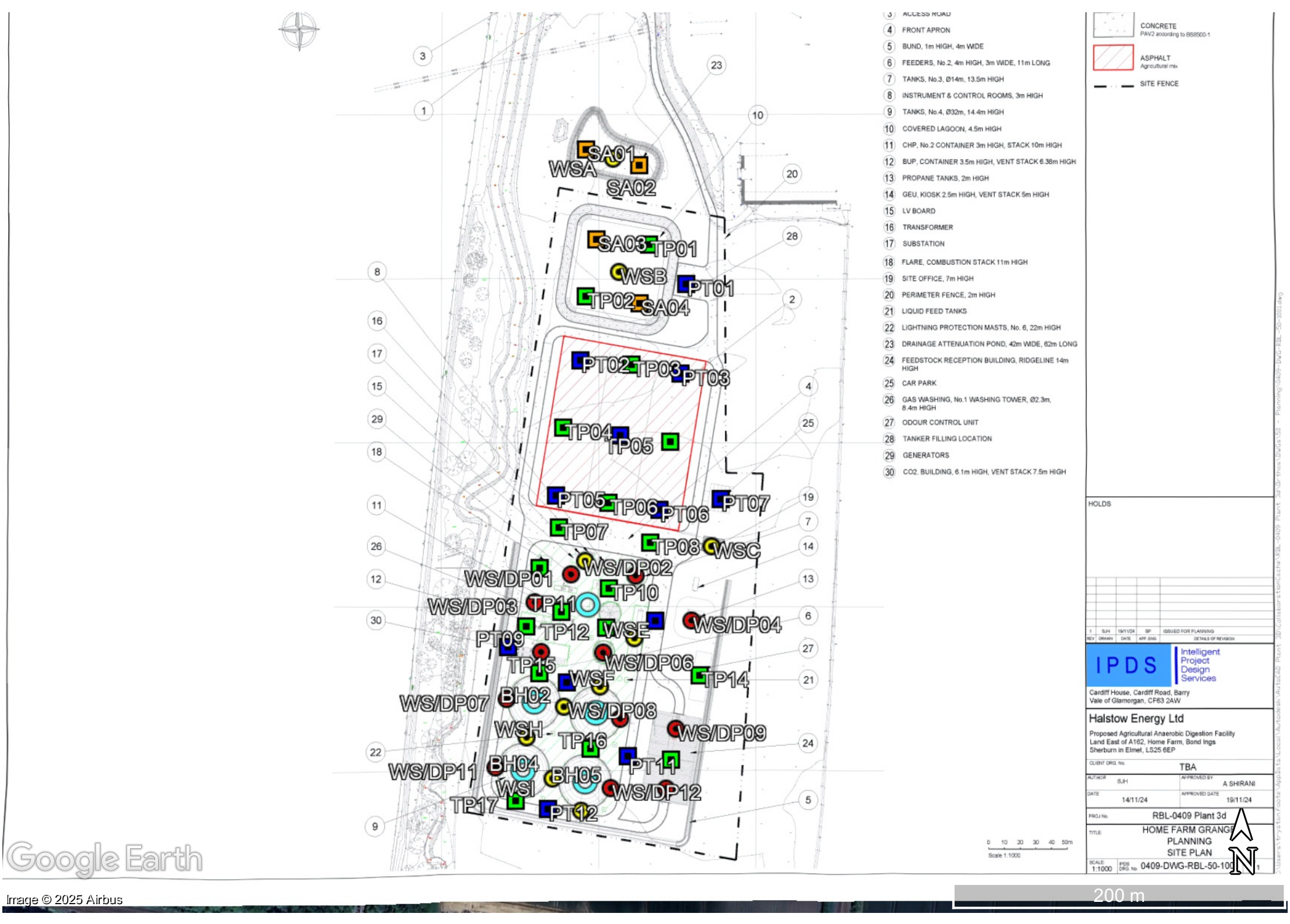
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Appendix 1

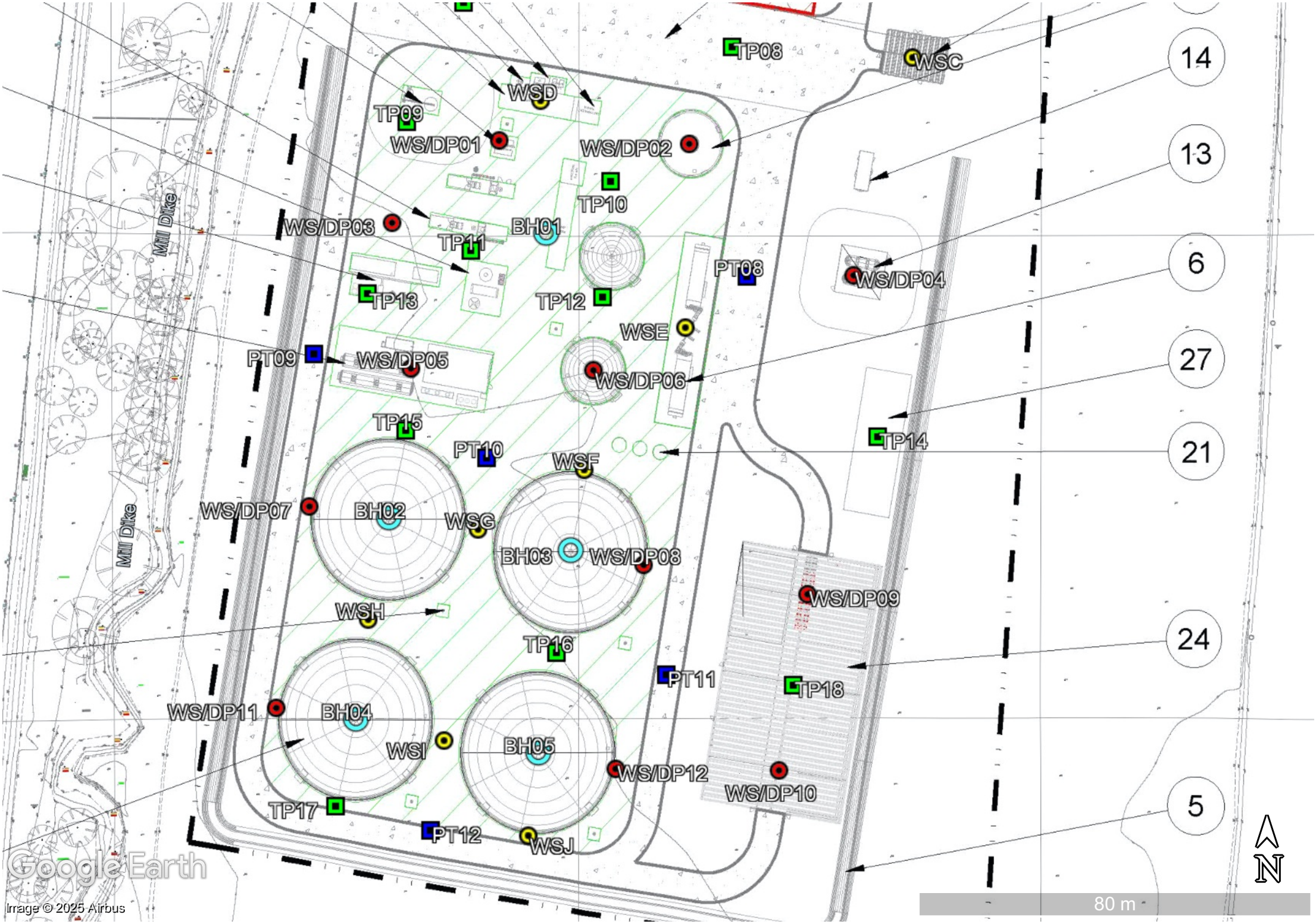
Site Plan


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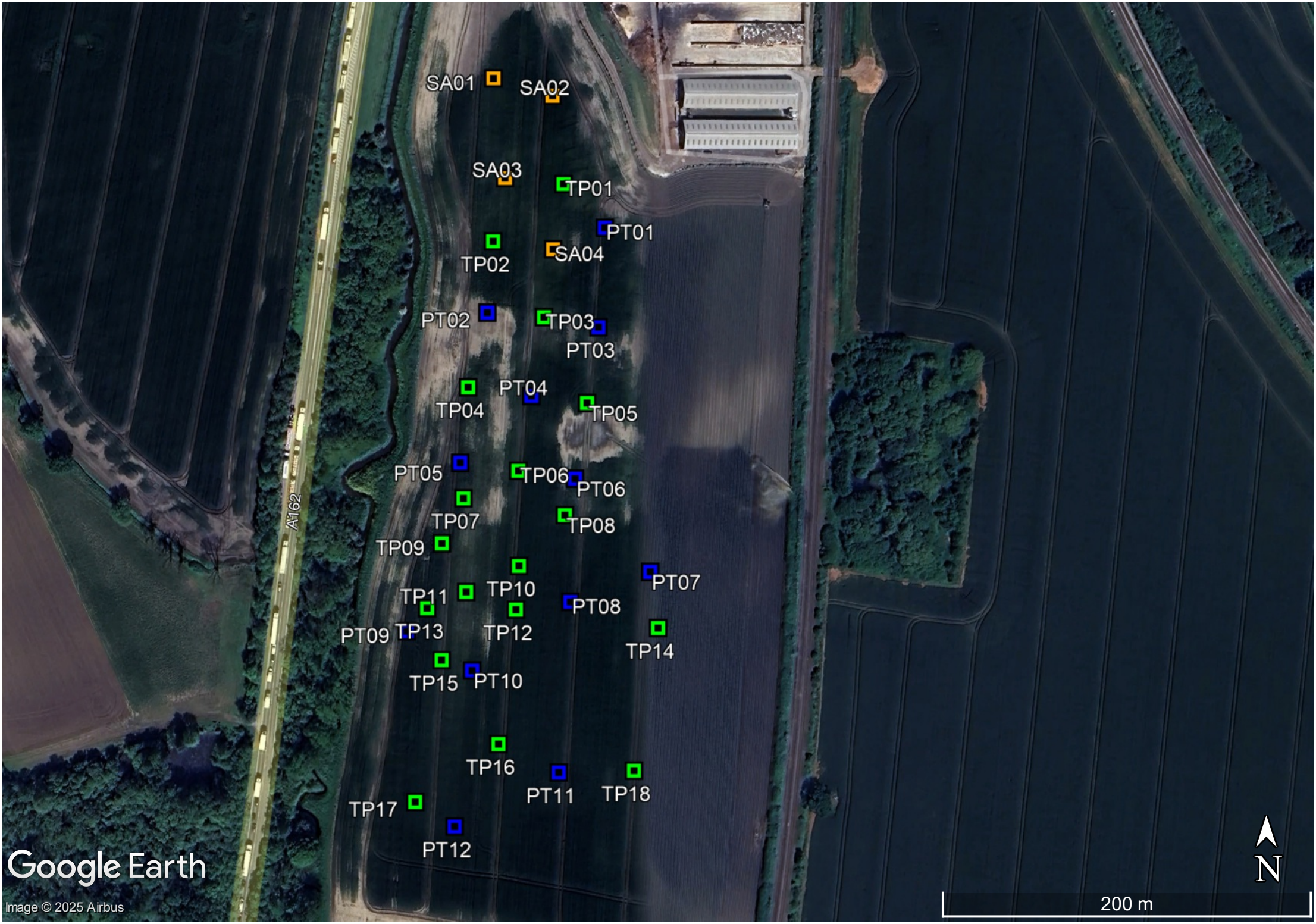

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3 ACCESS ROAD
4 FRONT APRON
5 BUND, 1m HIGH, 4m WIDE
6 FEEDERS, No.2, 4m HIGH, 3m WIDE, 11m LONG
7 TANKS, No.3, Ø14m, 13.5m HIGH
8 INSTRUMENT & CONTROL ROOMS, 3m HIGH
9 TANKS, No.4, Ø32m, 14.4m HIGH
10 COVERED LAGOON, 4.5m HIGH
11 CHP, No.2 CONTAINER 3m HIGH, STACK 10m HIGH
12 BUP, CONTAINER 3.5m HIGH, VENT STACK 6.38m HIGH
13 PROPANE TANKS, 2m HIGH
14 GEU, KIOSK 2.5m HIGH, VENT STACK 5m HIGH
15 LV BOARD
16 TRANSFORMER
17 SUBSTATION
18 FLARE, COMBUSTION STACK 11m HIGH
19 SITE OFFICE, 7m HIGH
20 PERIMETER FENCE, 2m HIGH
21 LIQUID FEED TANKS
22 LIGHTNING PROTECTION MASTS, No. 6, 22m HIGH
23 DRAINAGE ATTENUATION POND, 42m WIDE, 62m LONG
24 FEEDSTOCK RECEPTION BUILDING, RIDGELINE 14m HIGH
25 CAR PARK
26 GAS WASHING, No.1 WASHING TOWER, Ø2.3m, 8.4m HIGH
27 ODOUR CONTROL UNIT
28 TANKER FILLING LOCATION
29 GENERATORS
30 CO2. BUILDING, 6.1m HIGH, VENT STACK 7.5m HIGH
CONCRETE
PAV2 according to BS8500-1
ASPHALT
Agricultural mix
SITE FENCE
0 10 20 30 40 50m
Scale 1:1000
HOLDS
1 SJH 19/11/24 BP ISSUED FOR PLANNING
REV DRAWN DATE APP. ENG DETAILS OF REVISION
IPDS Intelligent Project Design Services
Cardiff House, Cardiff Road, Barry
Vale of Glamorgan, CF63 2AW
Halstow Energy Ltd
Proposed Agricultural Anaerobic Digestion Facility
Land East of A162, Home Farm, Bond Ings
Sherburn in Elmet, LS25 6EP
CLIENT ORG. No. TBA
AUTHOR SJH
APPROVED BY A SHIRANI
DATE 14/11/24
APPROVED DATE 19/11/24
PROJ No. RBL-0409 Plant 3d
TITLE HOME FARM GRANGE
PLANNING
SITE PLAN
SCALE 1:1000
IPDS DRG. No. 0409-DWG-RBL-50-100
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Google Earth
Image © 2025 Airbus
200 m


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Image © 2025 Airbus
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Mill Dike
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Google Earth
Image © 2025 Airbus



6 FEEDERS, No.2, 4m HIGH, 3m WIDE,
7 TANKS, No.3, Ø14m, 13.5m HIGH
8 INSTRUMENT & CONTROL ROOMS,
9 TANKS, No.4, Ø32m, 14.4m HIGH
10 COVERED LAGOON, 4.5m HIGH
11 CHP, No.2 CONTAINER 3m HIGH, ST
12 BUP, CONTAINER 3.5m HIGH, VENT
13 PROPANE TANKS, 2m HIGH
14 GEU, KIOSK 2.5m HIGH, VENT STAC
15 LV BOARD
16 TRANSFORMER
17 SUBSTATION
18 FLARE, COMBUSTION STACK 11m H
19 SITE OFFICE, 7m HIGH
20 PERIMETER FENCE, 2m HIGH
21 LIQUID FEED TANKS
22 LIGHTNING PROTECTION MASTS, N
23 DRAINAGE ATTENUATION POND, 42
24 FEEDSTOCK RECEPTION BUILDING HIGH
25 CAR PARK
26 GAS WASHING, No.1 WASHING TOV 8.4m HIGH
27 ODOUR CONTROL UNIT
28 TANKER FILLING LOCATION
29 GENERATORS
30 CO2. BUILDING, 6.1m HIGH, VENT S


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Image © 2025 Airbus
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Appendix 2
Cable Percussive and Rotary Follow-on Borehole Records

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH01**

Sheet 1 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: CP

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10			TOPSOIL (Sandy soil) (Drillers notes).
		0.20 - 1.20	B		0.20			Silty CLAY (Drillers notes).
								Greyish brown, thinly bedded, silty SAND (Drillers notes).
		1.20 - 1.65	B					
		1.20 - 1.65	D					
		1.20	SPT	N=9 (1,2/2,2,3,2)				
		2.00 - 2.45	U					
		2.50	D		2.40			Grey, silty CLAY (Drillers notes).
		3.00 - 3.45	B		2.90			Brown, silty CLAY (Drillers notes).
		3.00 - 3.45	D					
		3.00	SPT	N=8 (1,2/2,2,2,2)	3.40			Gravelly boulder CLAY (Drillers notes).
		4.00 - 4.45	U					
		4.50	D					
		5.00 - 5.45	B					
		5.00 - 5.45	D					
		5.90	D		5.90			Firm, brown, sandy, gravelly, boulder CLAY (Drillers notes).
		6.00 - 6.45	U					
		6.50	D		6.40			Reddish brown, silty, sandy, boulder CLAY (Drillers notes).
		7.00	D					
		7.50 - 7.95	B		7.30			Light brown, thinly laminated, silty, sandy CLAY (Drillers notes).
		7.50 - 7.95	D					
		7.50	SPT	N=26 (3,3/5,5,7,9)				
		8.60	D		8.60			Grey, weathered MUDSTONE (Drillers notes).
		9.00 - 9.45	U					
		9.50	D					
		9.90	D		9.90			

Continued on Next Sheet

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Water strikes recorded at 6.4m and 11.0m - Monitored for 20 mins each. 4. Chiselling - 1 hour. 5. Pulling casing - 25 mins. 6. No monitoring install due to artesian ground conditions, borehole sealed with bentonite - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH01**

Sheet 2 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	Hole Type CP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025	Logged By

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		9.90	SPT	60 (10,10/60 for 295mm)				Cream, weathered LIMESTONE (Drillers notes).
		10.50 - 10.95	B					
		10.50 - 10.95	D					
		11.00	SPT	50 (25 for 20mm/50 for 25mm)	11.10			
		11.10	D					End of Borehole at 11.100m

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Water strikes recorded at 6.4m and 11.0m - Monitored for 20 mins each. 4. Chiselling - 1 hour. 5. Pulling casing - 25 mins. 6. No monitoring install due to artesian ground conditions, borehole sealed with bentonite - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH02**

Sheet 1 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: CP

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10 - 0.40	B					TOPSOIL (Brown, sandy, gravelly SOIL) (Drillers notes).
		0.50 - 1.20	B		0.50			Soft to firm, yellowish brown, silty, sandy CLAY (Drillers notes).
		1.20 - 1.65	B					
		1.20 - 1.65	D					
		1.20	SPT	N=10 (1,2/2,2,3,3)				
		2.00 - 2.45	U					
		2.50	D					
		3.00 - 3.45	B					
		3.00 - 3.45	D					
		3.00	SPT	N=9 (1,2/2,2,2,3)				
		4.00 - 4.45	U					
		4.50	D					
		5.00 - 5.45	B					
		5.00 - 5.45	D					
		5.00	SPT	N=13 (1,1/2,2,2,7)	5.40			SAND & GRAVEL with clay bands (Drillers notes).
		6.00 - 6.45	B					
		6.00	SPT	N=18 (2,3/4,5,4,5)				
		7.00	D					
		7.50 - 7.95	B					
		7.50	SPT	N=15 (2,3/3,4,4,4)				
		8.00	D					
		9.00 - 9.45	B					
		9.00	SPT	N=23 (3,4/5,5,6,7)	9.20			Firm, reddish brown, gravelly CLAY (Drillers notes).
		10.00	D					

Continued on Next Sheet

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 30 mins. 3. Water strike recorded at 5.4m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Pulling casing and installing standpipe - 1 hour 30 mins.

AGS

Borehole Log

Borehole No. **BH02**

Sheet 2 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: CP

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50 - 10.95	B		10.50			Grey mottled yellow MUDSTONE and SILTSTONE (Drillers notes).
		10.50 - 10.95	D					
		10.50	SPT	50 (10,11/50 for 245mm)				
		11.50	D					
		12.00	D		12.00			End of Borehole at 12.000m
		12.00	SPT	50 (25 for 90mm/50 for 105mm)				

11 12 13 14 15 16 17 18 19 20

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 30 mins. 3. Water strike recorded at 5.4m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Pulling casing and installing standpipe - 1 hour 30 mins.

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 1 of 2

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords:	Hole Type CP+RC
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	Scale 1:50
Client: Engie Renewable Gases UK Limited		Dates: 31/03/2025 - 03/04/2025	Logged By

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	D		0.20			TOPSOIL (Drillers notes).
	▼	0.20	D					Brownish grey, silty CLAY (Drillers notes).
		0.20 - 1.00	B					
		0.35						
		0.50	D					
		1.20 - 1.65	B					
		1.20 - 1.65	D					
		1.20	SPT	N=6 (1,1/1,1,2,2)				
		2.00 - 2.45	U					
		2.50	D					
		3.00 - 3.45	B		3.00			Soft, grey CLAY with sand lenses (Drillers notes).
		3.00 - 3.45	D					
		3.00	SPT	N=8 (1,2/2,2,2,2)				
		3.50	D					
		4.00 - 4.45	U					
		4.50	D					
		5.00 - 5.45	B					
		5.00 - 5.45	D					
		5.00	SPT	N=14 (2,2/3,3,4,4)				
		5.50	D					
	▽	6.00 - 6.45	U		6.10			Firm, greyish brown, silty CLAY with sand and gravel bands (Drillers notes).
		6.10	D					
		6.10						
		7.00	D					
		7.50 - 7.95	B					
		7.50	SPT	N=16 (2,3/3,4,4,5)				
		7.70	D					
		8.50	D		8.50			Firm, light grey, silty CLAY (Drillers notes).
		9.00 - 9.45	B					
		9.00	SPT	N=11 (2,2/3,3,2,3)				
		10.00	D					

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Fetching water to assist drilling - 20 mins. 4. Water strike recorded at 6.1m - Monitored for 20 mins. 5. Chiselling - 1 hour. 6. Installing rotary casing and pulling casing - 45 mins. 7. Pulling rotary casing and backfilling borehole - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH03**

Sheet 2 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	Hole Type CP+RC
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 31/03/2025 - 03/04/2025	Logged By

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.50 - 10.95	B					Firm, light grey, silty CLAY (Drillers notes).
		10.50	SPT	N=13 (2,3/3,3,3,4)				
		11.00	D					
		11.50	D		11.50			Cream, weathered LIMESTONE recovered as a gravel (Drillers notes).
		11.80	D					
		12.00	D					
		12.00	SPT	50 (10,15/50 for 250mm)	12.00			LIMESTONE (Drillers notes).
					15.00			End of Borehole at 15.00m

Dia. (mm) | TCR (%) | SCR (%) | RQD (%) | FS (mm)

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Fetching water to assist drilling - 20 mins. 4. Water strike recorded at 6.1m - Monitored for 20 mins. 5. Chiselling - 1 hour. 6. Installing rotary casing and pulling casing - 45 mins. 7. Pulling rotary casing and backfilling borehole - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH04**

Sheet 1 of 2

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords:	Hole Type CP+RC
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	Scale 1:50
Client: Engie Renewable Gases UK Limited		Dates: 02/04/2025 - 03/04/2025	Logged By

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	D					TOPSOIL (Drillers notes).
	▼	0.30	D		0.30			Brown, gravelly CLAY (Drillers notes).
		0.30 - 1.00	B					
		0.40						
		0.50	D					
		1.00	D		1.00			Soft to firm, greyish brown, silty CLAY (Drillers notes).
		1.20 - 1.65	B					
		1.20 - 1.65	D					
		1.20	SPT	N=7 (1,1/1,2,2,2)				
		2.00 - 2.45	U					
		2.50	D					
		3.00 - 3.45	B					
		3.00 - 3.45	D					
		3.00	SPT	N=7 (1,2/1,2,2,2)				
		3.50	D					
		4.00 - 4.45	B					
		4.50	D					
		5.00 - 5.45	B					
		5.00 - 5.45	D					
		5.00	SPT	N=15 (2,2/3,4,4,4)				
		5.50	D					
	▽	6.00 - 6.45	B		6.00			SAND & GRAVEL with clay bands (Drillers notes).
		6.00	SPT	N=17 (2,3/4,4,4,5)				
		6.00						
		7.50 - 7.95	B					
		7.50	SPT	N=19 (2,3/4,3,6,6)				
		8.50	D					
		9.00 - 9.45	B					
		9.00	SPT	N=11 (2,3/3,2,3,3)				
		10.00	D					

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Water strike recorded at 6.0m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Installing rotary casing and pulling casing - 1 hour. 6. Pulling rotary casing and backfilling borehole - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH04**

Sheet 2 of 2

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords:	Hole Type CP+RC
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	Scale 1:50
Client: Engie Renewable Gases UK Limited		Dates: 02/04/2025 - 03/04/2025	Logged By

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.50 - 10.95 10.50 10.80	B SPT D	N=27 (4,5/5,6,8,8)	10.80			SAND & GRAVEL with clay bands (Drillers notes).
		11.80 - 12.00 11.80	D SPT	50 (25 for 125mm/50 for 25mm)				Cream, highly weathered LIMESTONE recovered as a gravelly clay (Drillers notes).
					12.00			LIMESTONE (Drillers notes).
					15.00			End of Borehole at 15.00m

Dia. (mm) | TCR (%) | SCR (%) | RQD (%) | FS (mm)

11 12 13 14 15 16 17 18 19 20

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 1 hour. 3. Water strike recorded at 6.0m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Installing rotary casing and pulling casing - 1 hour. 6. Pulling rotary casing and backfilling borehole - 1 hour.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **BH05**

Sheet 1 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: CP

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.10	D					TOPSOIL (Drillers notes).
		0.30	D		0.30			Brown, very sandy CLAY (Drillers notes).
		0.30 - 1.00	B					
		1.00	D		1.00			Soft to firm, brown, silty CLAY (Drillers notes).
		1.20 - 1.65	B					
		1.20 - 1.65	D					
		1.20	SPT	N=8 (1,1/2,2,2,2)				
		2.00 - 2.45	U		2.00			Firm, grey, silty CLAY (Drillers notes).
		2.50	D					
		3.00 - 3.45	B					
		3.00 - 3.45	D					
		3.00	SPT	N=8 (1,1/2,2,2,2)				
		3.50	D					
		4.00 - 4.45	U					
		4.50	D					
		5.00 - 5.45	B					
		5.00 - 5.45	D					
		5.00	SPT	N=16 (3,3/4,3,4,5)				
		6.00 - 6.45	U					
					6.45			SAND & GRAVEL with clay bands (Drillers notes).
		7.00	D					
		7.50 - 7.95	B					
		7.50	SPT	N=20 (4,4/5,4,5,6)				
		8.50	D					
		9.00 - 9.45	B					
		9.00	SPT	N=13 (2,3/2,2,4,5)				
		10.00	D					

Continued on Next Sheet

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 40 mins. 3. Water strike recorded at 6.45m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Pulling casing and installing standpipe - 1 hour 30 mins.

AGS

Borehole Log

Borehole No. **BH05**

Sheet 2 of 2

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: CP

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.50 - 10.95	B					
		10.50	SPT	N=22 (3,4/4,5,6,7)				
		10.80	D		10.80			Firm to stiff, reddish brown, silty CLAY (Drillers notes).
		11.40	D					
		11.80	D		11.80			Grey, weathered SILTSTONE (Drillers notes).
		12.00 - 12.45	B					
		12.00	SPT	50 (25 for 115mm/50 for 115mm)				
		12.50	D		12.50			End of Borehole at 12.500m
		12.50	SPT	50 (25 for 140mm/50 for 15mm)				

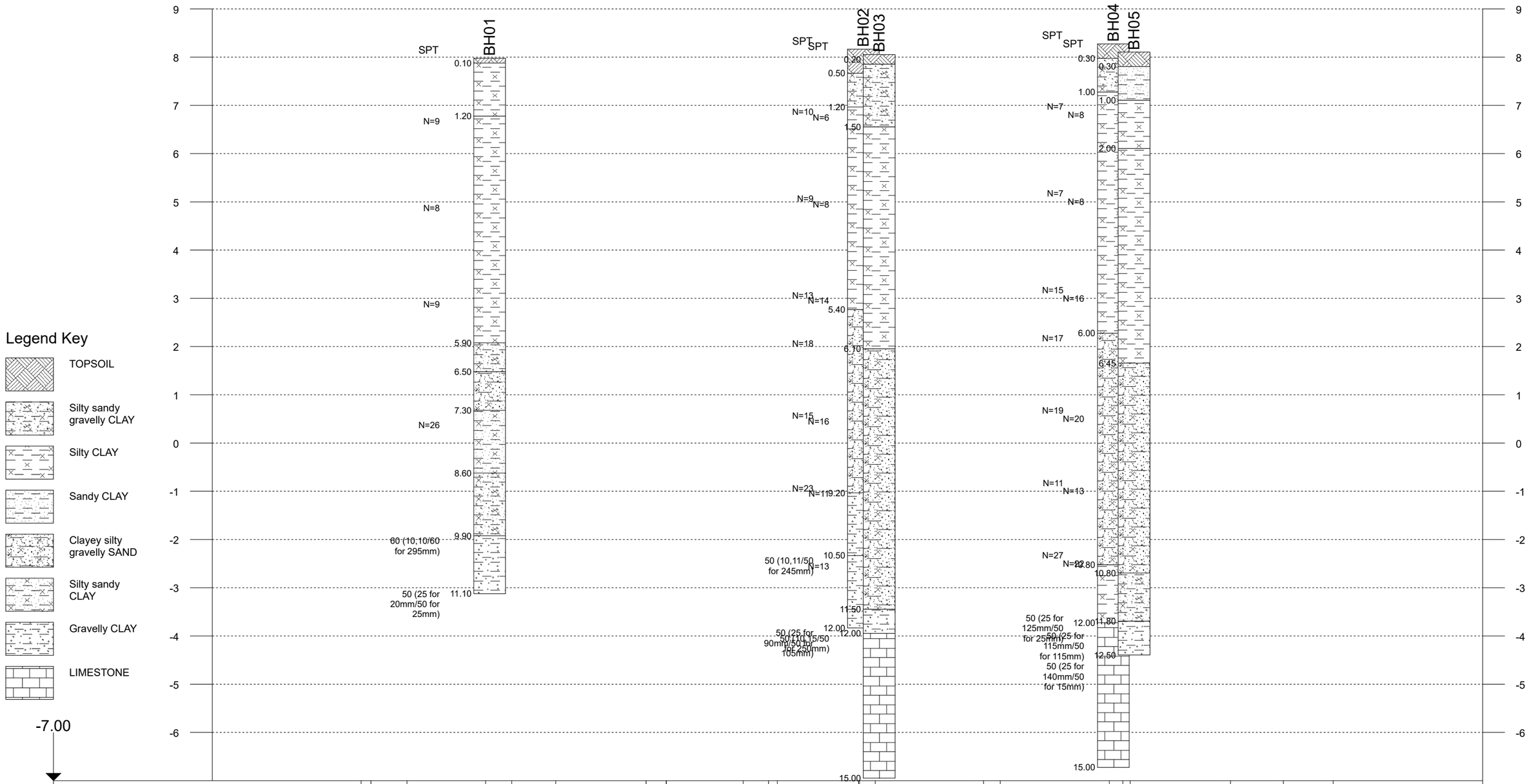
11 12 13 14 15 16 17 18 19 20

Remarks

1. Position scanned for services using CAT and Genny. 2. Inspection pit dug to 1.2m - 40 mins. 3. Water strike recorded at 6.45m - Monitored for 20 mins. 4. Chiselling - 1 hour. 5. Pulling casing and installing standpipe - 1 hour 30 mins.

Project No: C4826/24/E/7379	Title: Home Farm	Scale
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Vertical: 1:82
Client: Engie Renewable Gases UK Limited	Engineer: RP	Horizontal: 1:645

RGS Environmental Geotechnical Specialists



Legend Key

- TOPSOIL
- Silty sandy gravelly CLAY
- Silty CLAY
- Sandy CLAY
- Clayey silty gravelly SAND
- Silty sandy CLAY
- Gravelly CLAY
- LIMESTONE

-7.00

| | | |

Appendix 3

Windowless Sample Borehole Records

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS01**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450385.02E - 432128.70N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.90m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.60		TOPSOIL.
		1.00	SPT			N=8 (1,1/2,2,2,2)				CLAY (Driller's notes).
				77	90					
		2.00	SPT			N=7 (1,1/1,2,2,2)				
				67	90					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	4.90		End of Borehole at 3.00m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS02**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450423.86E - 432127.98N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	7.82m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	04/05/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.30	7.52		TOPSOIL.
				87	100					CLAY (Driller's notes).
		1.00	SPT			N=8 (1,2/2,2,2,2)				
				77	100					
	▼	2.00	SPT			N=7 (1,2/2,1,2,2)				
		2.00								
		2.00		67	100					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	4.82		End of Borehole at 3.00m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

Borehole Log

Borehole No. **WS03**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450363.12E - 432111.75N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.10m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.80		TOPSOIL.
		1.00	SPT			N=8 (2,1/2,2,2,2)				CLAY (Driller's notes).
				77	90					
		2.00	SPT			N=7 (1,1/2,1,2,2)				
				67	100					
		3.00	SPT			N=12 (2,2/3,3,3,3)	3.00	5.10		End of Borehole at 3.00m

Remarks

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS04**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450457.49E - 432101.66N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.95m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.65		TOPSOIL
		1.00	SPT			N=7 (1,1/1,2,2,2)				CLAY (Driller's notes).
				77	100					
		2.00	SPT			N=8 (1,2/2,2,2,2)				
				67	100					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	4.95		End of Borehole at 3.00m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS05**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450367.50E - 432081.88N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.70		TOPSOIL.
		1.00	SPT			N=8 (2,1/1,2,3,2)				CLAY (Driller's notes).
				77	100					
		2.00	SPT			N=8 (2,2/2,2,2,2)				
				67	100					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	5.00		End of Borehole at 3.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS06**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450404.80E - 432081.92N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.70		TOPSOIL.
		1.00	SPT			N=9 (1,2/2,2,2,3)				CLAY (Driller's notes).
				77	100					
		2.00	SPT			N=8 (2,2/2,2,2,2)				
				67	100					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	5.00		End of Borehole at 3.00m

1 2 3 4 5 6 7 8 9 10

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS07**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450347.09E - 432053.81N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.24m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.94		TOPSOIL.
		1.00	SPT			N=7 (1,1/1,2,2,2)				CLAY (Driller's notes).
				77	100					
		2.00	SPT			N=8 (2,2/2,2,2,2)				
				67	100					
		3.00	SPT			N=9 (2,2/2,2,2,3)	3.00	5.24		End of Borehole at 3.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS08**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450415.35E - 432042.41N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.30	7.70		TOPSOIL.
				87	100					CLAY (Driller's notes).
		1.00	SPT			N=9 (2,2/2,2,2,3)				
				77	90					
		2.00	SPT			N=8 (1,2/2,2,2,2)				
				67	90					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	5.00		End of Borehole at 3.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS09**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450448.81E - 432036.84N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.90m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	90		0.30	7.60		TOPSOIL.
		1.00	SPT			N=6 (1,2/1,2,1,2)				CLAY (Driller's notes).
				77	80					
		2.00	SPT			N=8 (2,2/2,2,2,2)				
				67	80					
		3.00	SPT			N=8 (2,2/2,2,2,2)	3.00	4.90		End of Borehole at 3.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS10**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450443.36E - 432001.03N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	7.89m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	01/04/2025	Logged By SH

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.10	7.79		TOPSOIL (Soft, brown, sandy, silty CLAY. Sand is fine to medium).
				77	85					Soft to firm, greyish brown, thinly laminated, slightly sandy, silty CLAY. Sand is fine to medium. Rare gravel.
				67	90					
							3.45	4.44		End of Borehole at 3.45m

Remarks

1. Position scanned for services using CAT and Genny. 2. Target depth achieved.

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WS11**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450340.88E - 432012.60N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	8.32m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	01/04/2025	Logged By SH

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	90		0.10	8.22		TOPSOIL (Soft, brown, sandy, silty CLAY. Sand is fine to medium).
				77	95		1.00	7.32		Soft to firm, greyish brown, thinly laminated, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies.
				67	95					Soft to firm, greyish brown, thinly laminated, slightly sandy silty CLAY. Sand is fine to medium. Silt and sand partings.
							3.45	4.87		End of Borehole at 3.45m

Remarks

1. Position scanned for services using CAT and Genny. 2. Target depth achieved.

AGS

Borehole Log

Borehole No. **WS12**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450410.15E - 432000.95N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	8.02m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	01/04/2025	Logged By SH

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	90		0.10	7.92		TOPSOIL (Soft, brown, sandy, silty CLAY. Sand is fine to medium).
							0.80	7.22		Soft to firm, greyish brown, thinly laminated, slightly gravelly, silty CLAY. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies.
				77	95		1.42	6.60		Loose, brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular and fine to medium of various lithologies.
				67	95					Soft to firm, greyish brown, thinly laminated, silty CLAY. Sand is fine to medium. Rare gravel.
							3.45	4.57		End of Borehole at 3.45m

Remarks

1. Position scanned for services using CAT and Genny. 2. Target depth achieved.

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSA**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450407.45E - 432378.11N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.53m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 17/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.30	7.23		TOPSOIL
				128	100					Firm brownish grey streaked orangish brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub-angular fine limestone.
				101	100		1.20	6.33		Soft to firm hinly laminated greyish brown silty CLAY with silt and fine sand partings.
				87	100					
				87	100					
				77	100					
	▼	5.80		67	0		5.00	2.53		No core recovery; sample fell from sampling tube. Inferred SAND.
				57	100		6.00	1.53		Brown silty fine SAND.
							6.60	0.93		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings.
							7.00	0.53		End of Borehole at 7.00m

Remarks

AGS

Borehole Log

Borehole No. **WSA2**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450410.00E - 432000.00N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	8.00m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	14/05/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.30	7.70		TOPSOIL.
										Firm brownish grey streaked orangish brown slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub-angular fine limestone.
				87	100		1.00	7.00		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings.
				77	100					*2m: 200m fine SAND lens.*
				67	100					
							4.00	4.00		End of Borehole at 4.00m

1 2 3 4 5 6 7 8 9 10

Remarks

Installed 1m south of WSA. Shorter standpipe installed.

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSB**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450412.07E - 432309.94N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	7.72m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	17/04/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				128	100		0.30	7.42		TOPSOIL.
										Soft to firm brownish grey slightly sandy slightly gravelly silty CLAY. Sand is fine. Gravel is sub-angular fine limestone.
				101	100		1.00	6.72		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings.
				87	100					
				87	100					
				77	100					
				67	100		5.50	2.22		Brown very silty fine SAND.
	▼	6.00		57	0		6.00	1.72		No recovery and borehole collapsed back to 7; inferred to be waterlogged granular strata.
							7.00	0.72		End of Borehole at 7.00m

Remarks

AGS

RGS Environmental Geotechnical Specialists

Borehole Log

Borehole No. **WSC**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450468.99E - 432146.26N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	7.52m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	04/04/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.15	7.37		TOPSOIL (Firm dark brown organic slightly sandy CLAY).
				87	100					Firm dark greyish brown streaked orangish brown slightly sandy silty CLAY. Sand is fine. Rare limestone gravel.
							0.80	6.72		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings.
		1.00	SPT			N=7 (1,1/1,2,2,2)				
		1.30	D							
		1.50 - 2.00	C	87	100					
	▼	2.00	SPT			N=8 (1,1/2,2,2,2)				
		2.00								
		2.30	D							
				77	85					
	▽	3.00	SPT			N=8 (2,2/2,2,2,2)				*3m: 0.1m lens of clayey sandy sub-rounded fine and medium GRAVEL of various lithologies.*
		3.00								
		3.30	D							
				67	60					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	100					
		5.00	SPT			N=8 (2,2/2,2,2,2)				
							5.45	2.07		End of Borehole at 5.45m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSD**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450393.54E - 432136.89N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.83m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 04/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.30	7.53		TOPSOIL
				87	100					Soft grey and greyish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub-angular and rounded of flint and ironstone.
		1.00	SPT			N=7 (1,1/1,2,2,2)	1.05	6.78		Soft to firm locally firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
				87	100					
		2.00	SPT			N=6 (1,1/1,1,2,2)				
				77	100					
		3.00	SPT			N=9 (2,2/2,2,2,3)				
				67	100					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	100					
		5.00	SPT			N=21 (2,3/4,4,6,7)				
							5.45	2.38		End of Borehole at 5.45m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSE**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450423.53E - 432090.99N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.91m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025

Hole Type: WLS

Scale: 1:50

Logged By:

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.25	7.66		TOPSOIL
				87	100					Soft grey and greyish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub-angular and rounded of flint and ironstone.
		1.00	SPT			N=9 (2,1/2,2,2,3)				
				87	90		1.20	6.71		Soft to firm locally firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00	SPT			N=7 (2,1/2,1,2,2)				
				77	90					
		3.00	SPT			N=8 (2,2/2,2,2,2)				
				67	80					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	80					*4.4m: 100mm dark grey SILT lens.*
		5.00	SPT			N=12 (2,2/2,3,4,3)				
							5.45	2.46		End of Borehole at 5.45m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSF**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450403.14E - 432060.58N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.06m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
				87	100		0.15	7.91		TOPSOIL (Soft to firm organic dark brown sandy CLAY).
										Firm dark greyish brown streaked orangish brown slightly sandy silty CLAY. Sand is fine.
		1.00	SPT			N=8 (1,1/2,2,2,2)	0.90	7.16		
		1.30	D				1.05	7.01		Greyish brown and orangish brown clayey silty very gravelly fine to coarse SAND. Gravel is sub-rounded to angular fine to coarse of limestone flint and various lithologies.
		1.50 - 2.00	C	87	100					
		2.00	SPT			N=8 (2,2/2,2,2,2)				Soft to firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
				77	90		2.50	5.56		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
		3.00	SPT			N=7 (2,2/2,1,2,2)				
				67	80					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	0					
		5.00	SPT			N=12 (2,2/3,3,3,3)				
							5.45	2.61		End of Borehole at 5.45m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSG**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450381.50E - 432049.18N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.08m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.25	7.83		TOPSOIL
				87	100					Soft grey and greyish brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is sub-angular and rounded of flint and ironstone.
		1.00	SPT			N=9 (1,2/2,2,2,3)	1.10	6.98		
				87	100					Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00	SPT			N=8 (1,2/2,2,2,2)	2.00	6.08		
				77	70		2.50	5.58		Loose to medium dense clayey silty gravelly fine and medium SAND. Gravel is sub-angular fine chalk and flint. Moist.
		3.00	SPT			N=9 (1,2/2,2,2,3)				Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
				67	100					
		4.00	SPT			N=9 (2,2/3,2,2,2)	4.00	4.08		No sample recovery in sampling tube. Firm grey silty CLAY inferred from SPT samples.
				57	0					
		5.00	SPT			N=9 (2,2/2,2,2,3)				
							5.45	2.63		End of Borehole at 5.45m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSH**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords:	450359.44E - 432030.66N	Hole Type WLS
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	8.16m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates:	31/03/2025	Logged By RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.20	7.96		TOPSOIL (Firm dark brown organic slightly sandy CLAY).
				87	100					Greyish brown fine and medium silty SAND.
		0.70	D				0.70	7.46		Greyish brown and orangish brown clayey silty very gravelly fine to coarse SAND. Gravel is sub-rounded to angular fine to coarse of limestone flint and various lithologies.
		1.00	SPT			N=7 (1,1/1,2,2,2)	1.00	7.16		
		1.30	D							
		1.50 - 2.00	C	87	100					Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00	SPT			N=7 (2,1/2,1,2,2)				
		2.30	D							
		2.50 - 3.00	C	77	90					
	▼	3.00	SPT			N=8 (2,1/2,2,2,2)				*3m: 0.1m lens of clayey sandy sub-rounded fine and medium GRAVEL of various lithologies.*
		3.00								
				67	100					
		4.00	SPT			N=8 (2,1/2,2,2,2)				
				57	65					
		5.00	SPT			N=8 (2,2/2,2,2,2)	5.00	3.16		End of Borehole at 5.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSI**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450375.42E - 432006.45N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.21m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 31/03/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
		0.40	ES	87	100		0.30	7.91		TOPSOIL
							0.55	7.66		Loose brown silty SAND.
		1.00	SPT			N=5 (1,1/1,1,1,2)	0.95	7.26		Soft to firm brown slightly gravelly silty CLAY. Gravel is sub-angular fine and medium of flint and chalk.
				87	90		1.20	7.01		Loose grey very clayey very sandy sub-rounded and rounded GRAVEL of chalk and flint.
	▼	2.00	SPT			N=8 (1,1/2,2,2,2)	2.00	6.21		Soft thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00		77	90					Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00								
		3.00	SPT			N=8 (2,1/2,2,2,2)				
				67	85					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	100					
		5.00	SPT			N=8 (2,2/2,2,2,2)	5.00	3.21		End of Borehole at 5.00m

Remarks

AGS

Borehole Log

Environmental Geotechnical Specialists

Borehole No. **WSJ**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450392.39E - 431987.34N
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.14m aOD
Client:	Engie Renewable Gases UK Limited		Dates: 31/03/2025

Hole Type: WLS

Scale: 1:50

Logged By: RP

Well	Water Strikes	Samples and In Situ Testing: Depth (m)	Type	Dia. (mm)	TCR (%)	Results	Depth (m)	Level (m)	Legend	Stratum Description
							0.15	7.99		TOPSOIL (Soft to firm organic dark brown sandy CLAY).
				87	100		0.60	7.54		Firm dark greyish brown streaked orangish brown slightly sandy silty CLAY. Sand is fine.
							0.75	7.39		Greyish brown and orangish brown silty very sandy sub-rounded to angular fine to coarse GRAVEL of flint limestone and various lithologies. Sand is fine to coarse.
		1.00	SPT			N=5 (1,1/1,1,1,2)	1.00	7.14		Greyish brown fine and medium silty SAND.
				87	100					Soft thinly laminated greyish brown silty CLAY with silt and fine sand partings
		2.00	SPT			N=7 (1,1/2,1,2,2)	2.00	6.14		Firm thinly laminated greyish brown silty CLAY with silt and fine sand partings
				77	80					
		3.00	SPT			N=8 (2,2/2,2,2,2)				
				67	80					
		4.00	SPT			N=8 (2,2/2,2,2,2)				
				57	0					
		5.00	SPT			N=8 (2,2/2,2,2,2)				
							5.45	2.69		End of Borehole at 5.45m

Remarks

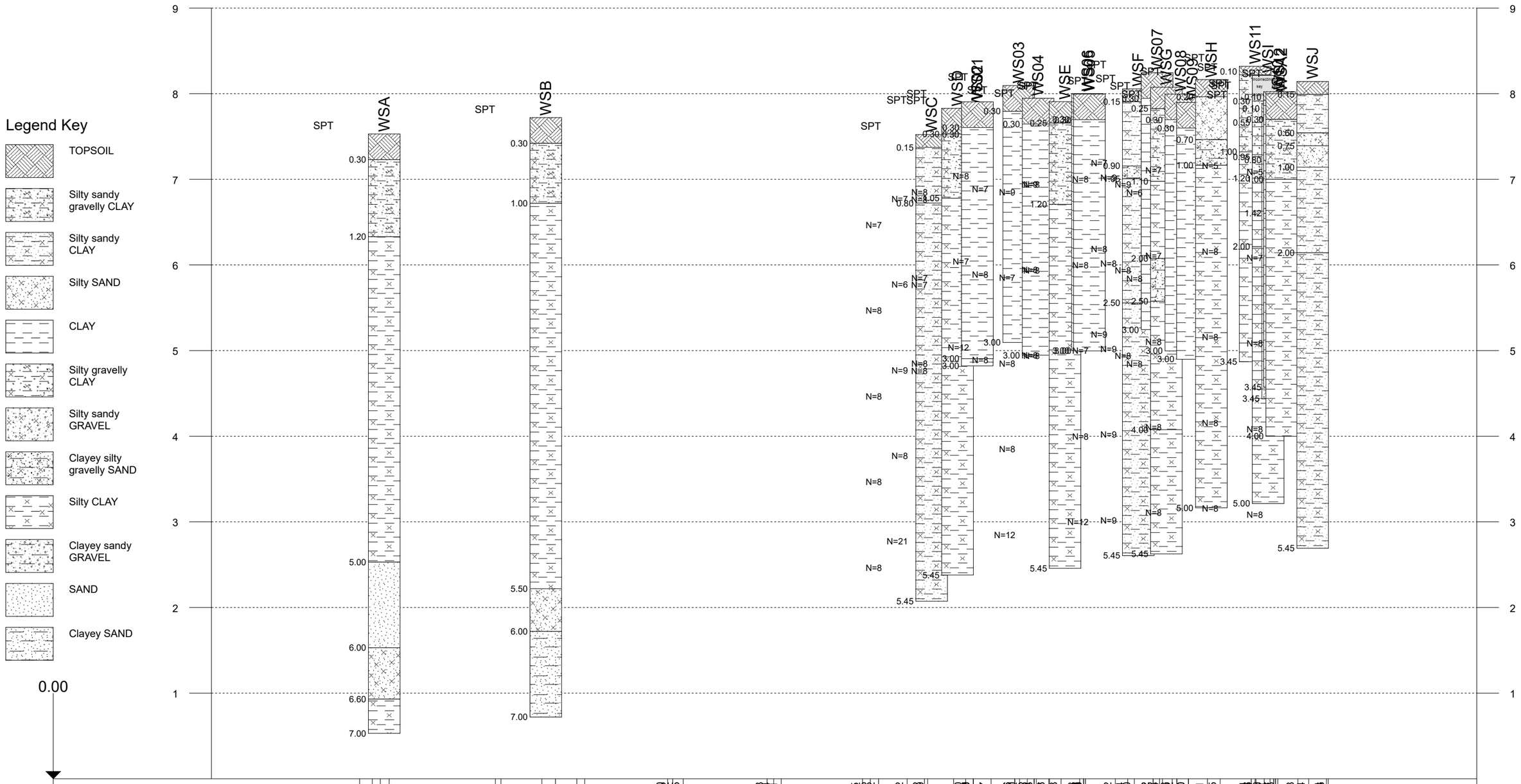
AGS

Project No: C4826/24/E/7379 | Title: Home Farm | Scale

Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW | Vertical: 1:46

Client: Engie Renewable Gases UK Limited | Engineer: RP | Horizontal: 1:1659

RGS Environmental Geotechnical Specialists



| | | |

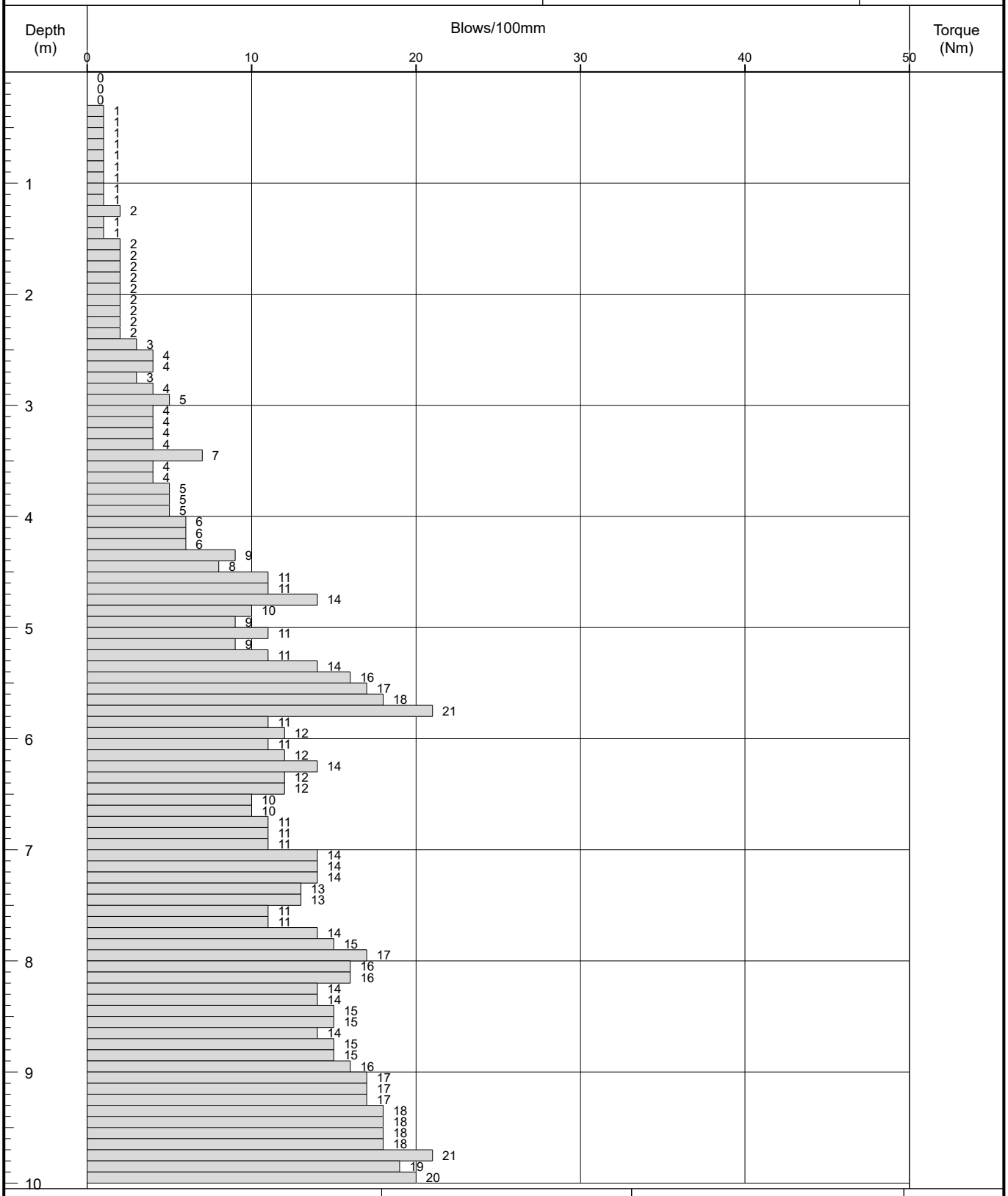
Appendix 4

Dynamic Probe Records

Probe Log

Probe No.
DP01
Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450385.02E - 432128.70N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.91m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

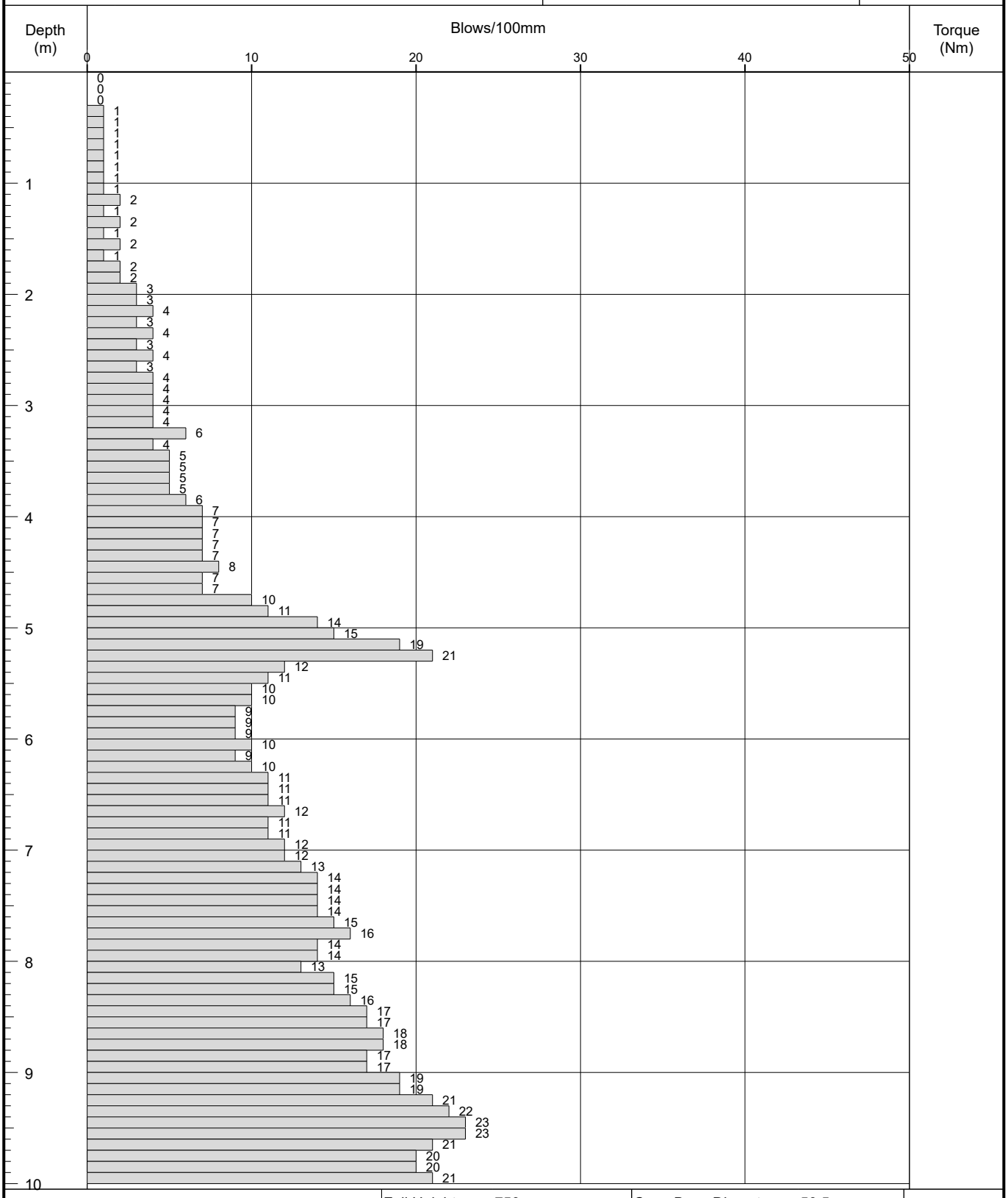
Probe Log

Environmental Geotechnical Specialists

Probe No. **DP02**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450423.86E - 432127.98N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.82m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 04/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

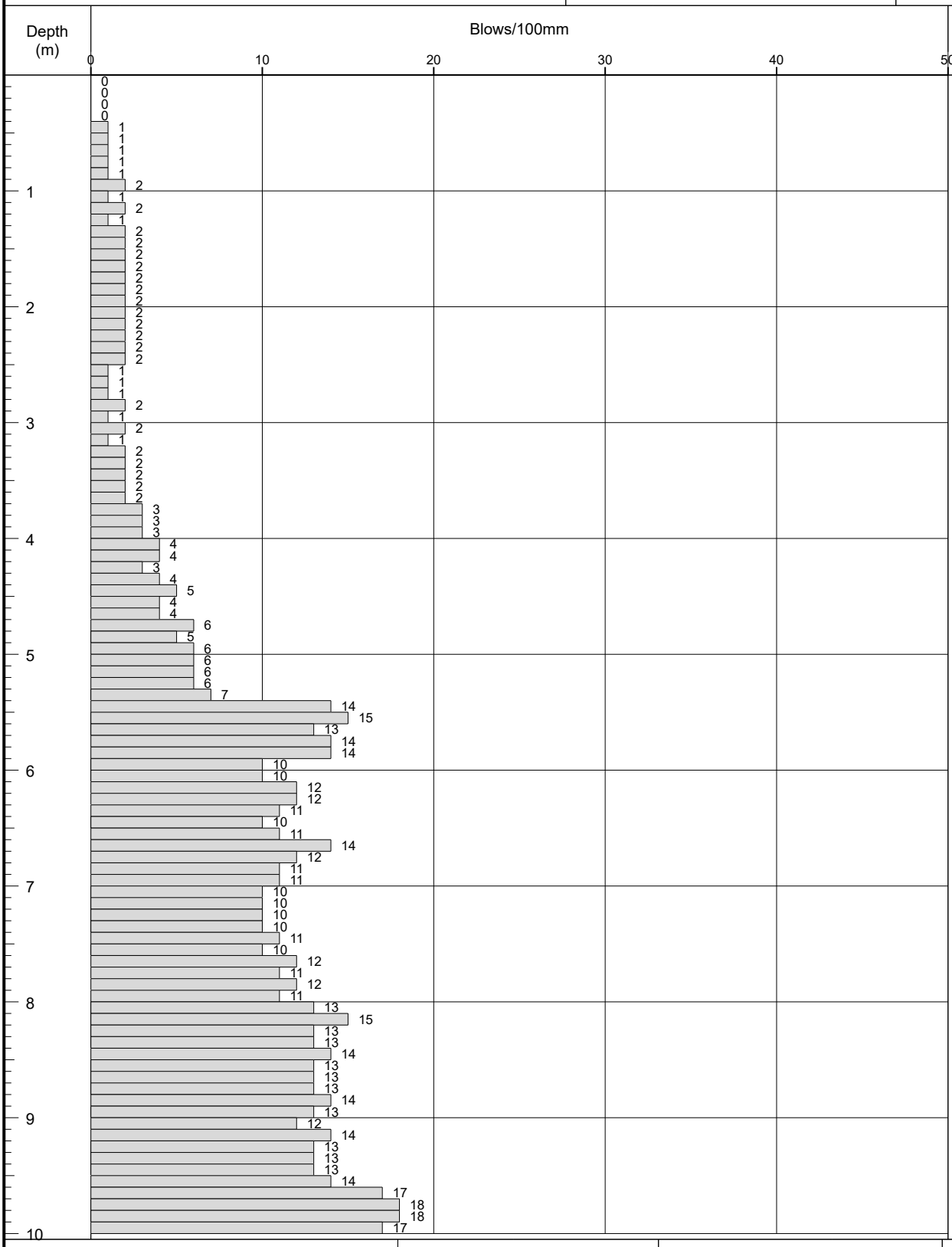
AGS

Probe Log

Probe No. **DP03**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450363.12E - 432111.75N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.10m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 03/04/2025	Logged By AB & GH



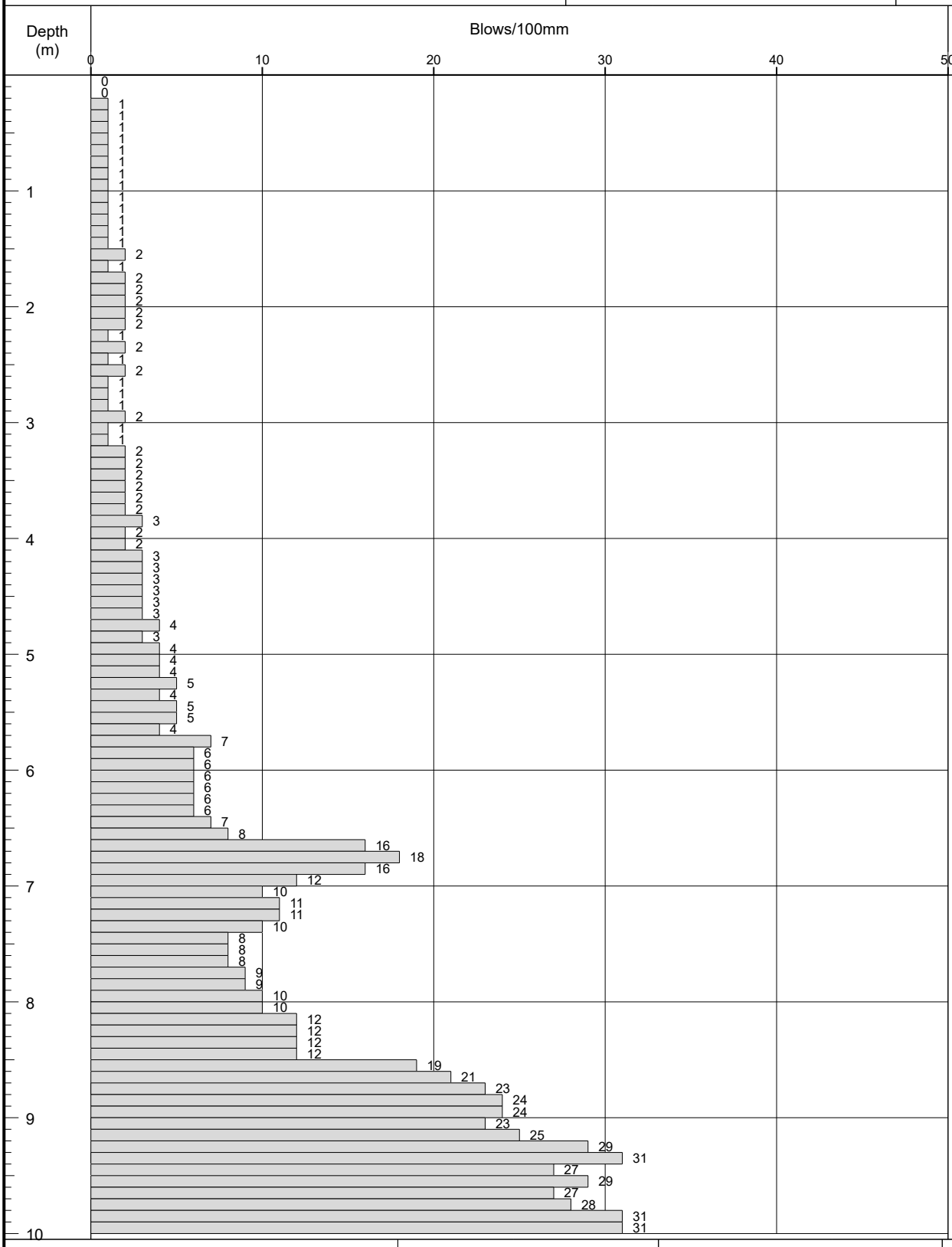
Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

Probe Log

Probe No. **DP04** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords:	450457.49E - 432101.66N	Hole Type DP
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level:	7.95m aOD	Scale 1:50
Client: Engie Renewable Gases UK Limited		Dates:	04/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

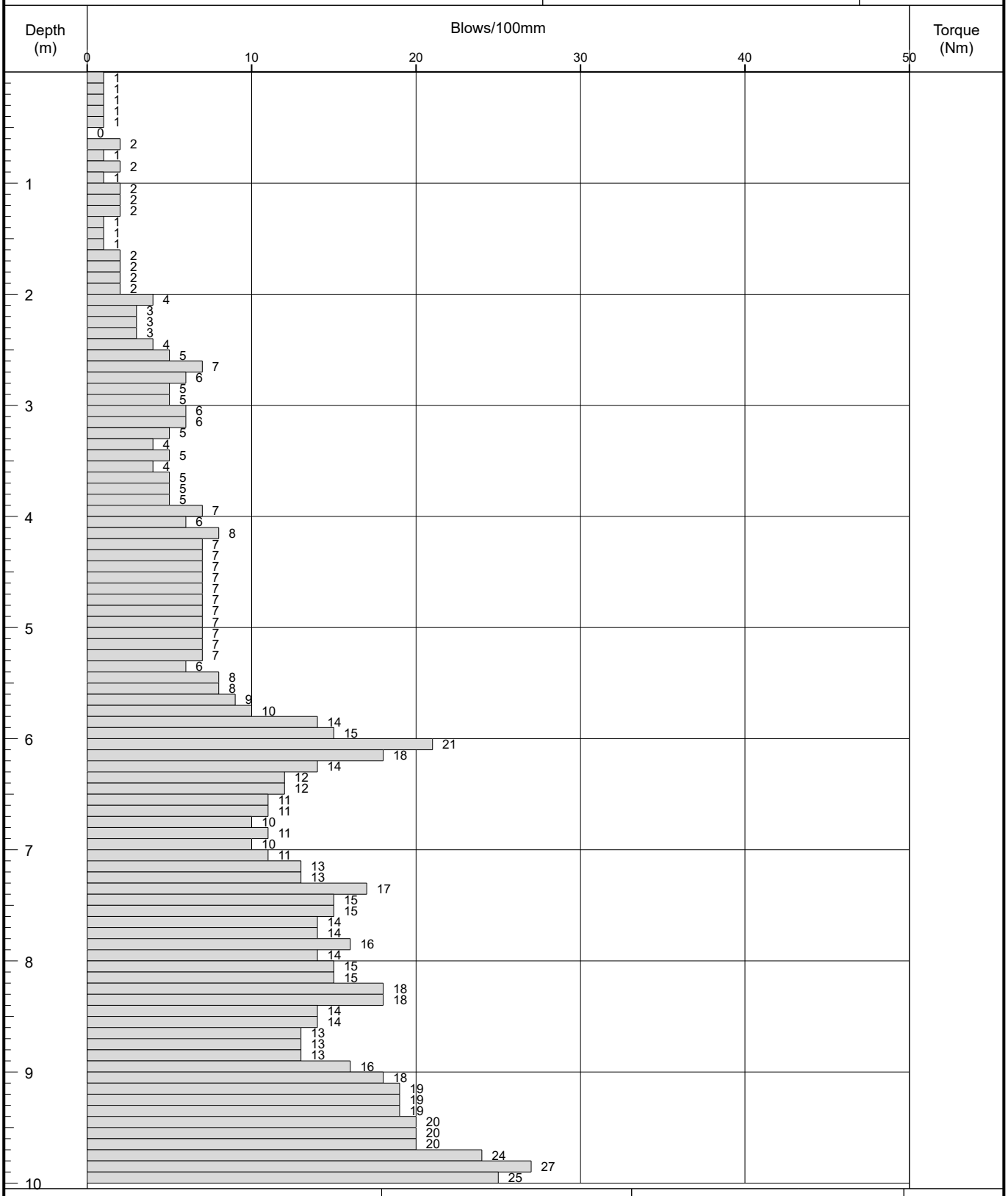
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

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Probe Log

Probe No.
DP05
Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450367.50E - 432081.88N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

AGS

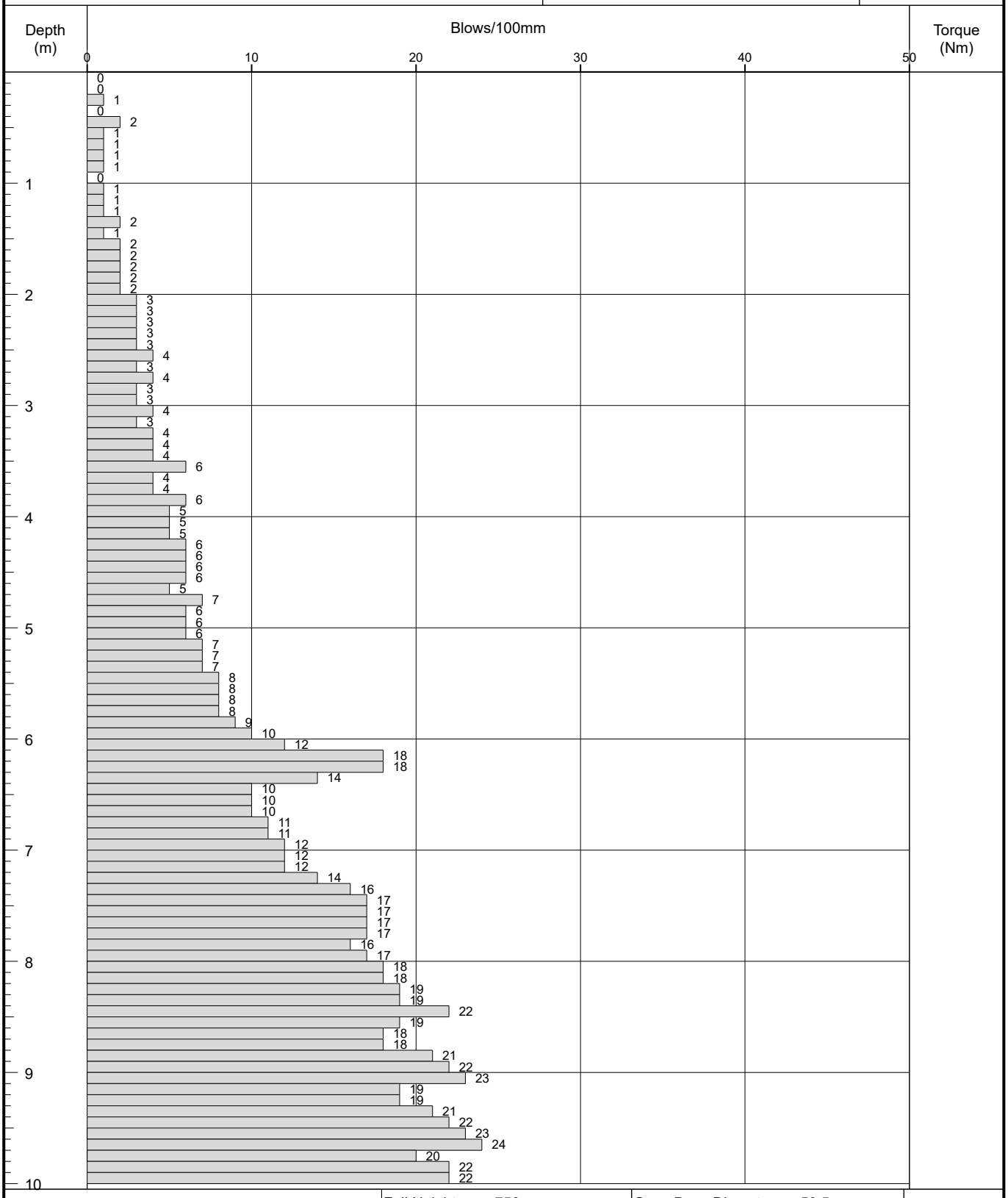
Probe Log

Environmental Geotechnical Specialists

Probe No. **DP06**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450404.80E - 432081.92N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

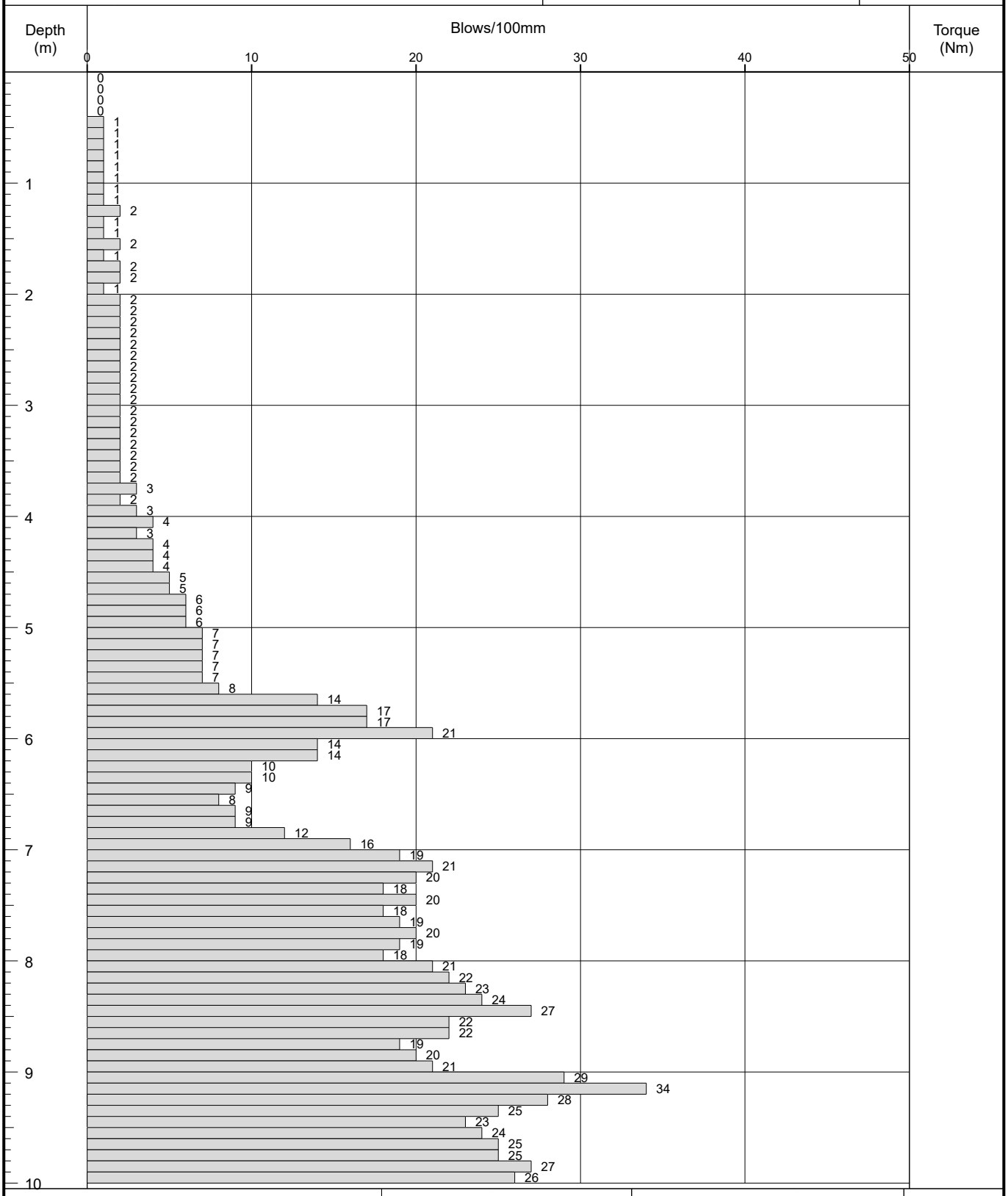
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

AGS

Probe Log

Probe No. **DP07** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450347.09E - 432053.81N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.25m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 02/04/2025	Logged By AB & GH



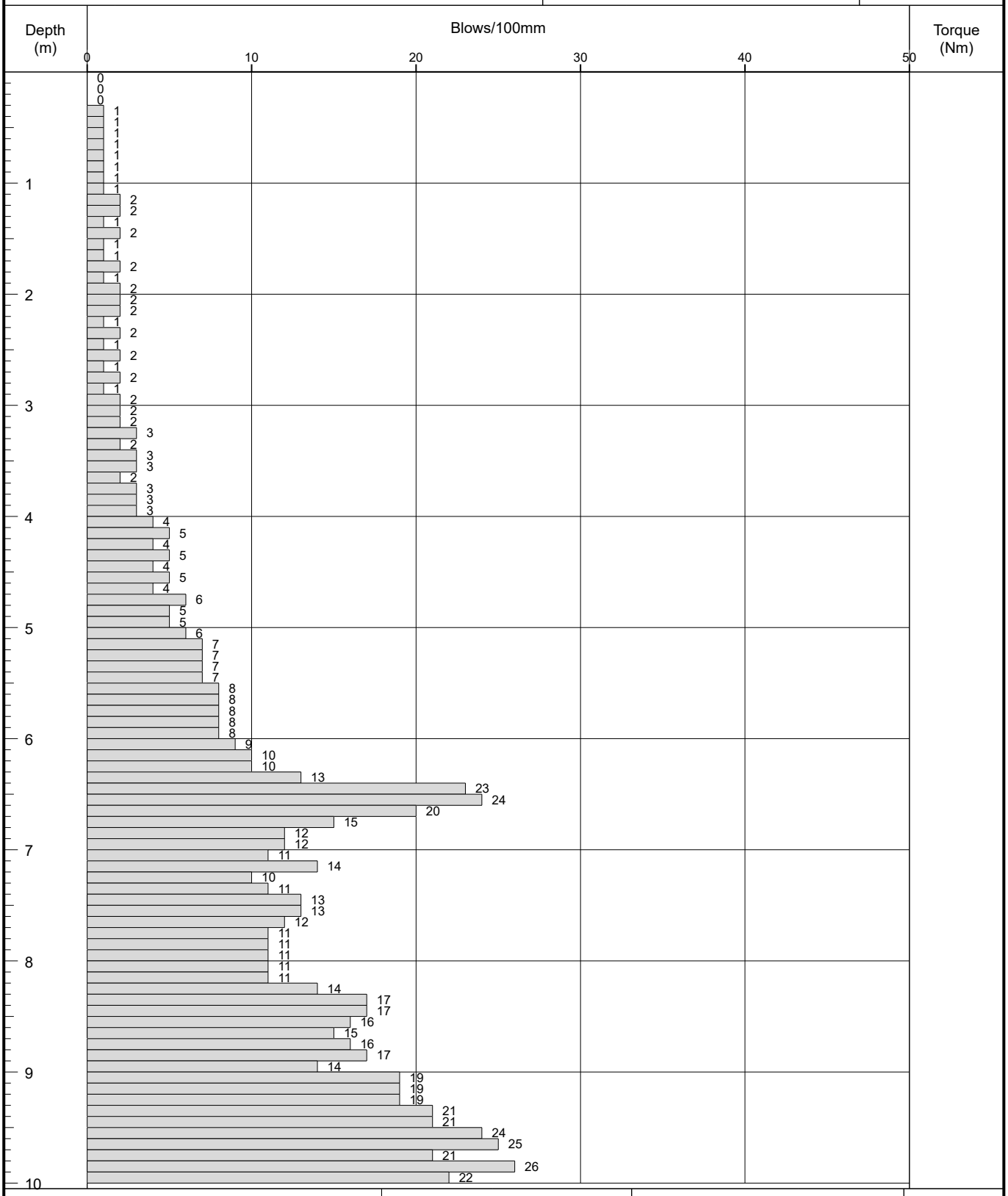
Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

Probe Log

Probe No.
DP08
Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450415.35E - 432042.41N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.00m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

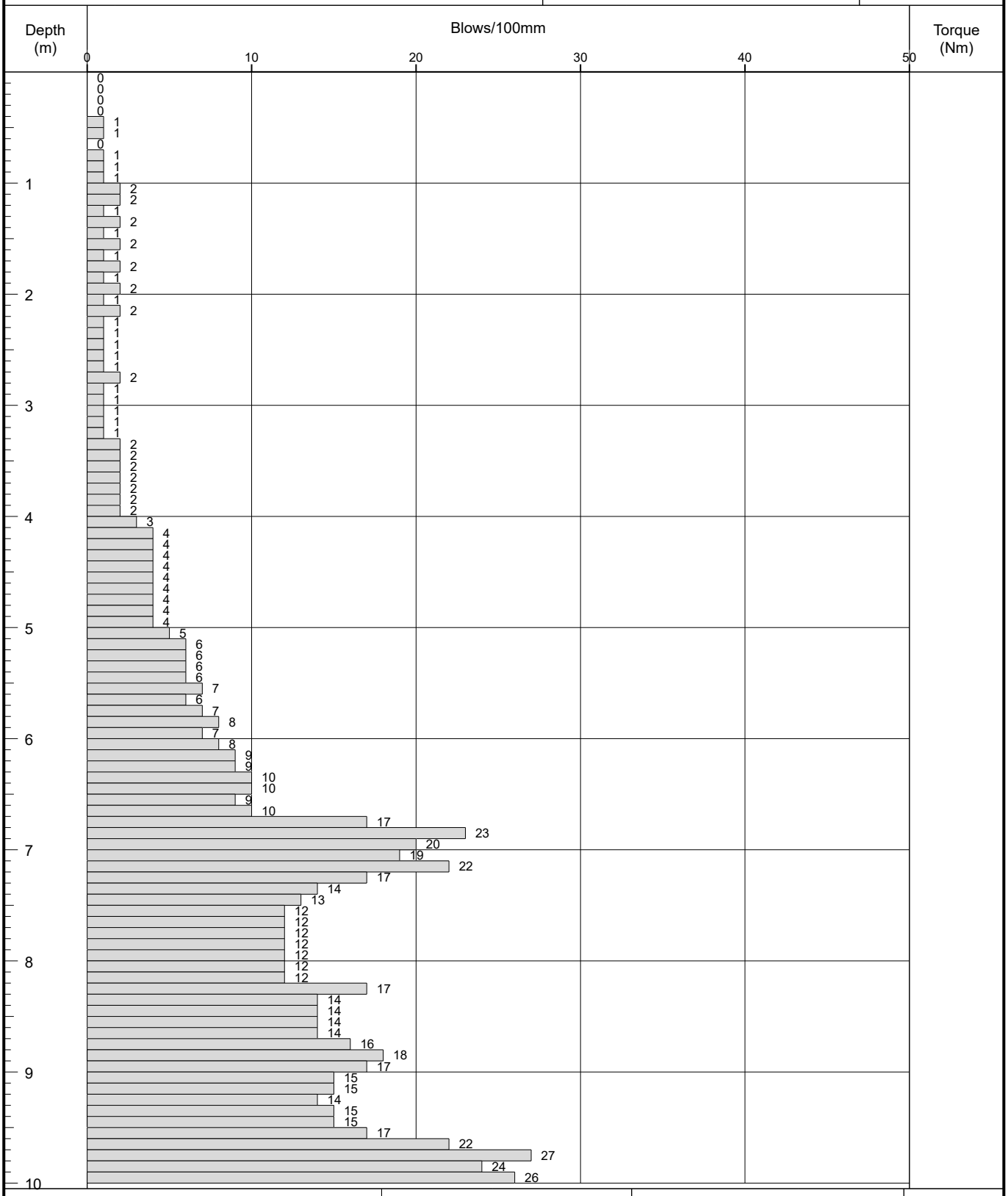
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

Probe Log

Environmental Geotechnical Specialists

Probe No. **DP09** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450448.81E - 432036.84N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.90m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

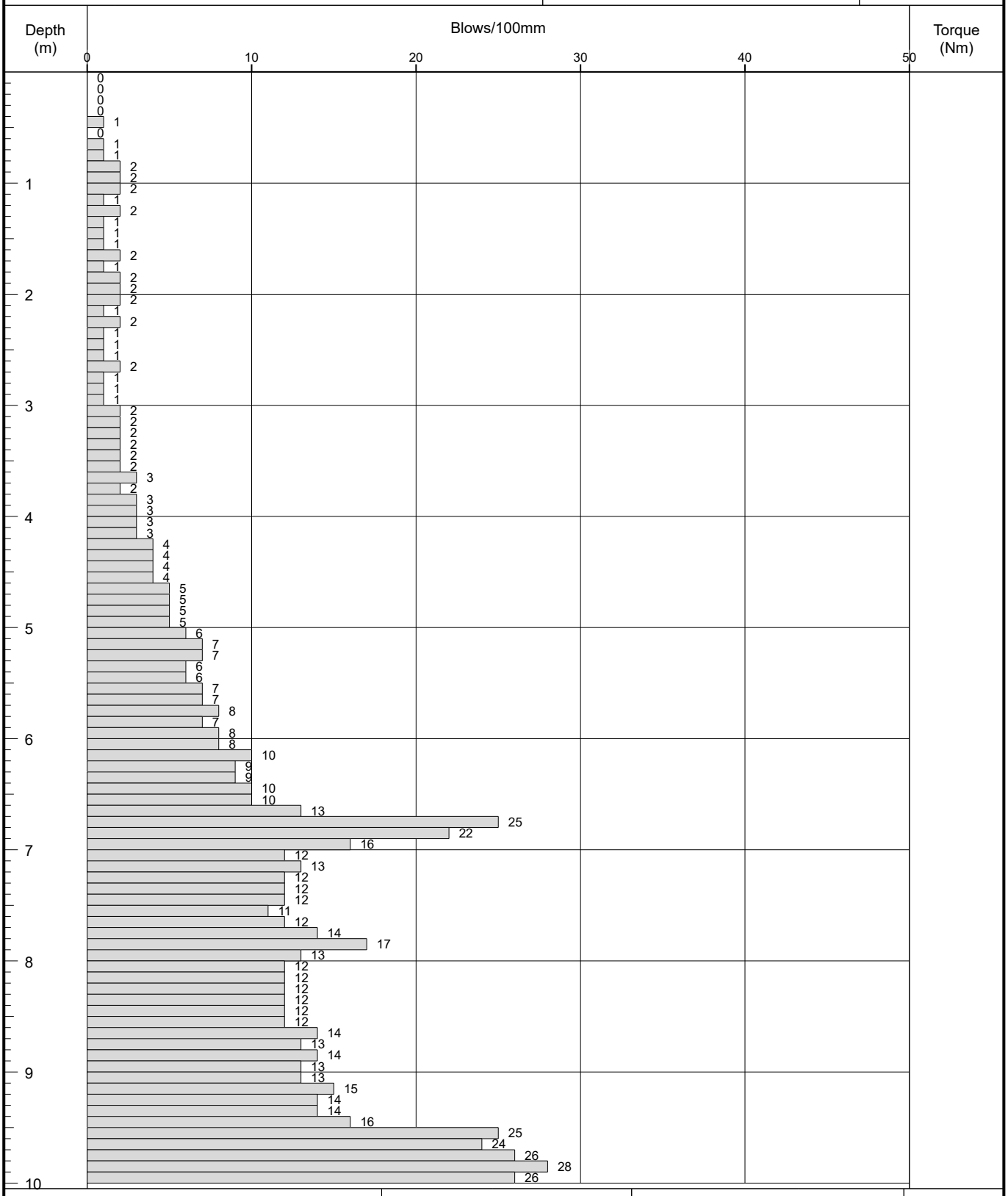
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

AGS

Probe Log

Probe No. **DP10** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450443.36E - 432001.03N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 7.89m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

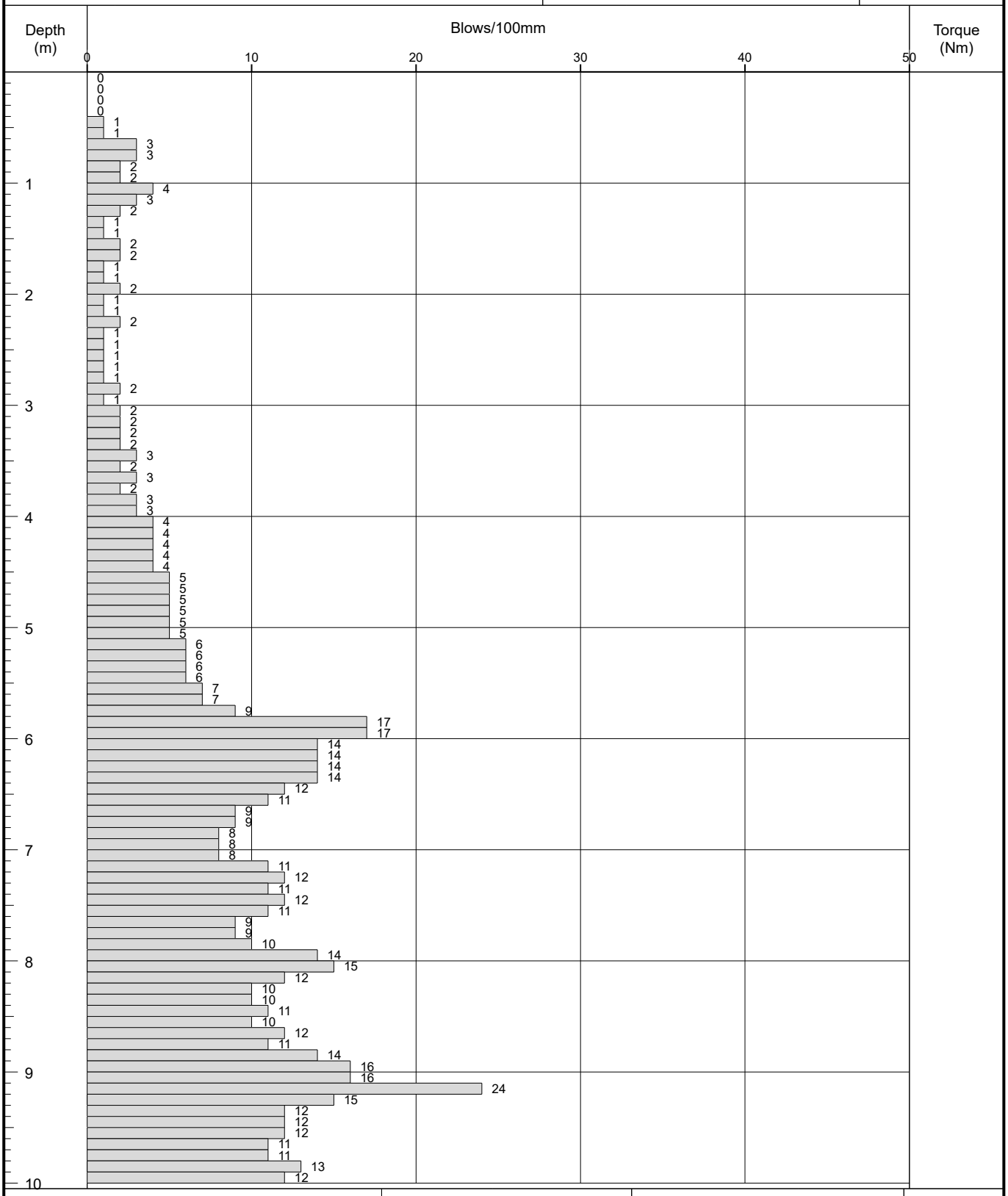
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

Probe Log

Environmental Geotechnical Specialists

Probe No. **DP11** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450340.88E - 432012.60N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.32m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

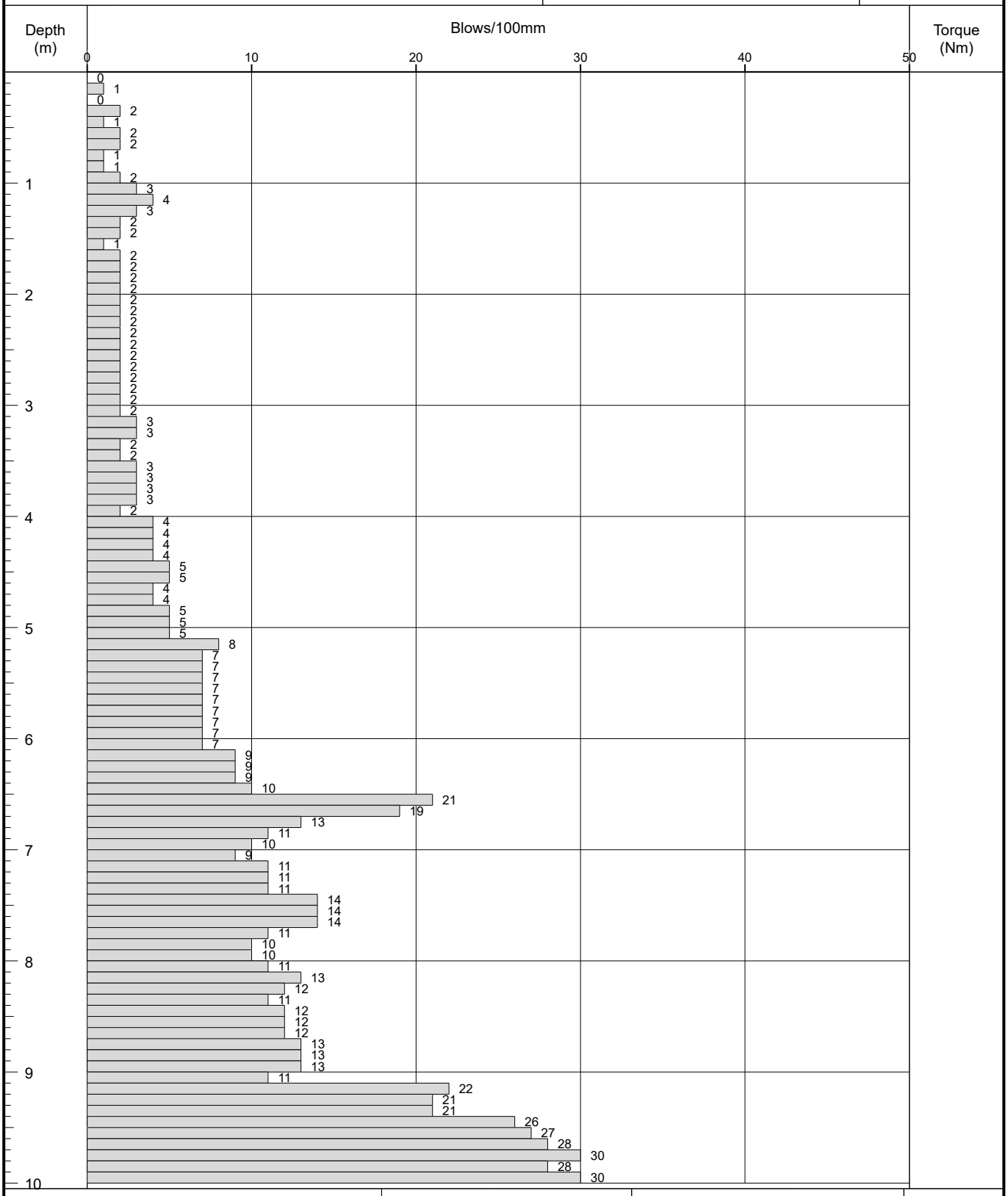
Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

AGS

Probe Log

Probe No. **DP12** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450410.15E - 432000.95N	Hole Type DP
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Level: 8.02m aOD	Scale 1:50
Client:	Engie Renewable Gases UK Limited		Dates: 01/04/2025	Logged By AB & GH



Remarks:
1. Drilled adjacent to equivalent WS

Fall Height	750mm	Cone Base Diameter	50.5mm
Hammer Wt	63.5kg	Final Depth	10m
Probe Type	DPSH-B		

Appendix 5

Trial Pit Records

Trial Pit Log

Trialpit No **TP01** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.8 × 0.6, Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	1.00	B					Firm, brown mottled grey, slightly sandy, silty CLAY. Sand is fine to medium.
				1.40			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
	2.00	B					
				2.50			Firm, brown, sandy, silty CLAY. Sand is fine to medium.
	3.00	B		3.00			End of pit at 3.00 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP02**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited		3 × 0.6	Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	1.00	B		1.20			Firm, brown mottled grey, slightly sandy, silty CLAY. Sand is fine to medium.
	2.00	B		2.40			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
	3.00	B		3.00			Firm, brown, sandy, silty CLAY. Sand is fine to medium.
							End of pit at 3.00 m

1 2 3 4 5

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP03**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.4 × 0.6, Depth 1.50	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	0.50	B					Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
				1.50			End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP04**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 1.50 — 2.5 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.25			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	0.50	B					Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
				1.50			End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP05**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.2 × 0.6, Depth 1.50	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	0.50	B					Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
				1.50			End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP06**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.1 × 0.6 Depth 1.50	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.50	B		0.20			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
							Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
				1.50			End of pit at 1.50 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP07**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 2.00 (2.5 × 0.6)	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	1.00	B		1.10			Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
	2.00	B		2.00			Firm, brown streaked greyish brown, sandy, clayey SILT. Sand is fine to medium.
							End of pit at 2.00 m

1 2 3 4 5

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP08**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 14/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 2.00 — 2.6 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	1.00	B		1.15			Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
	2.00	B		2.00			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
							End of pit at 2.00 m

1 2 3 4 5

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP09**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.8 × 0.6, Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
			HVP=105 HVP=75 HVP=73				Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B					
				1.30			Firm, brown streaked greyish brown, thinly laminated, slightly sandy, clayey SILT. Sand is fine to medium.
	2.00	B					
				2.50			Firm, greyish brown, thinly laminated, sandy, silty CLAY. Sand is fine to medium.
	3.00	B		3.00			End of pit at 3.00 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP10** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 3.1 × 0.6, Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
				0.30			Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
			HVP=86 HVP=84 HVP=110				
	1.00	B					
				1.40			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
			HVP=79 HVP=114				
	2.00	B	HVP=94				
			HVP=58 HVP=56	3.00			End of pit at 3.00 m
	3.00	B	HVP=75				

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP11** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.7 × 0.6, Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
			HVP=97 HVP=125 HVP=157				Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B		1.10			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
			HVP=76 HVP=77				
	2.00	B	HVP=76	2.30			Firm, greyish brown, ,thinly laminated, sandy, silty CLAY. Sand is fine to medium.
			HVP=60 HVP=87	3.00			End of pit at 3.00 m
	3.00	B	HVP=65				

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP12** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00 — 2.9 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
				0.45			Light brown, silty, fine to coarse SAND.
			HVP=70 HVP=83 HVP=91				Firm, grey streaked brown, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B					
				1.90			
			HVP=91 HVP=124				Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
	2.00	B	HVP=101				
				2.50			Firm, grey streaked brown, thinly laminated, slightly sandy, silty CLAY. Sand is fine to medium.
			HVP=84 HVP=104	3.00			End of pit at 3.00 m
	3.00	B	HVP=86				

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP13**

Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00 — 2.8 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.20			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
			HVP=90 HVP=91 HVP=80				Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B		1.00			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
			HVP=96 HVP=82				
	2.00	B	HVP=112				
				2.40			Firm, greyish brown, thinly laminated, sandy, silty CLAY. Sand is fine to medium.
			HVP=70 HVP=70	3.00			End of pit at 3.00 m
	3.00	B	HVP=91				

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP14** Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 17/04/2025
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW	Dimensions (m): Depth 3.00	2.6 / 0.6	Scale 1:25
Client:	Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
			HVP=84 HVP=83 HVP=97				Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B		1.10			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
	2.00	B	HVP=125 HVP=141 HVP=115				
	3.00	B	HVP=51 HVP=41 HVP=46	3.00			End of pit at 3.00 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP15** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 15/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00 (2.8 × 0.6)	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
			HVP=82 HVP=80 HVP=79	0.20			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies). Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B		1.10			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
	2.00	B	HVP=112 HVP=98 HVP=93	2.45			Firm, greyish brown, thinly laminated, sandy, silty CLAY. Sand is fine to medium.
	3.00	B	HVP=59 HVP=65 HVP=60	3.00			End of pit at 3.00 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP16** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 17/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00 — 2.9 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
							TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
				0.30			Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
			HVP=105 HVP=97 HVP=103				
	1.00	B					
			HVP=87 HVP=86				
	2.00	B	HVP=104				
				2.30			Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
			HVP=48 HVP=56	3.00			End of pit at 3.00 m
	3.00	B	HVP=42				

1 2 3 4 5

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP17** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 17/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): 2.9 × 0.6, Depth 3.00	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
	1.00	B					Orangish brown, clayey, silty, slightly gravelly, fine to coarse SAND. Gravel is sub-angular to sub-rounded and fine to medium of various lithologies.
				1.50			Firm, brown streaked grey, thinly laminated, slightly sandy, silty CLAY. Sand is fine to medium.
	2.00	B	HVP=112 HVP=112 HVP=112				
				2.30			Firm, brown streaked greyish brown, thinly laminated sandy, clayey SILT. Sand is fine to medium.
	3.00	B	HVP=67 HVP=73 HVP=96	3.00			End of pit at 3.00 m

Remarks:

Stability: Stable

Trial Pit Log

Trialpit No **TP18** Sheet 1 of 1

Project Name: Home Farm	Project No. C4826/24/E/7379	Co-ords: - Level:	Date 17/04/2025
Location: Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW		Dimensions (m): Depth 3.00 — 2.8 × 0.6	Scale 1:25
Client: Engie Renewable Gases UK Limited			Logged SH

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30			TOPSOIL (Soft, dark brown, slightly sandy, slightly gravelly, clayey SILT. Sand is fine to medium. Gravel is sub-angular and fine to coarse of various lithologies).
			HVP=93 HVP=105 HVP=90				Firm, brown streaked grey, slightly sandy, silty CLAY. Sand is fine to medium.
	1.00	B					
			HVP=107 HVP=127	2.10			
	2.00	B	HVP=142				Firm, brown streaked greyish brown, thinly laminated, sandy, clayey SILT. Sand is fine to medium.
			HVP=66 HVP=49	3.00			End of pit at 3.00 m
	3.00	B	HVP=63				

Remarks:

Stability: Stable

Appendix 6

Trial Pit Soakaway Records

Trial Pit Log

Trialpit No **SA01**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450393.46 - 432381.75 Level: 7.40
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW	Dimensions (m): Depth 3.10	1.8 × 0.45
Client:	Engie Renewable Gases UK Limited		

Date 22/04/2025

Scale 1:50

Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	7.10		TOPSOIL
							Grey slightly sandy slightly gravelly silty CLAY.
				1.00	6.40		Brown thinly laminated sandy silty CLAY.
				3.10	4.30		End of pit at 3.10 m

1 2 3 4 5 6 7 8 9 10

Remarks:

Stability:

Trial Pit Log

Trialpit No **SA02**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450423.27 - 432374.05 Level: 7.68
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW	Dimensions (m): Depth 3.05	1.7 × 0.45
Client:	Engie Renewable Gases UK Limited		

Date 22/04/2025

Scale 1:50

Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	7.38		TOPSOIL.
				1.20	6.48		Grey slightly sandy slightly gravelly silty CLAY.
				3.05	4.63		Brown thinly laminated sandy silty CLAY. End of pit at 3.05 m

Remarks:

Stability:

Trial Pit Log

Trialpit No **SA03**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450397.95 - 432329.80 Level: 7.61
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW	Dimensions (m): Depth 3.50	1.8 × 0.45
Client:	Engie Renewable Gases UK Limited		Date 22/04/2025 Scale 1:50 Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	7.31		TOPSOIL.
				1.00	6.61		Grey slightly sandy slightly gravelly silty CLAY.
				3.50	4.11		Brown thinly laminated sandy silty CLAY. End of pit at 3.50 m

Remarks:

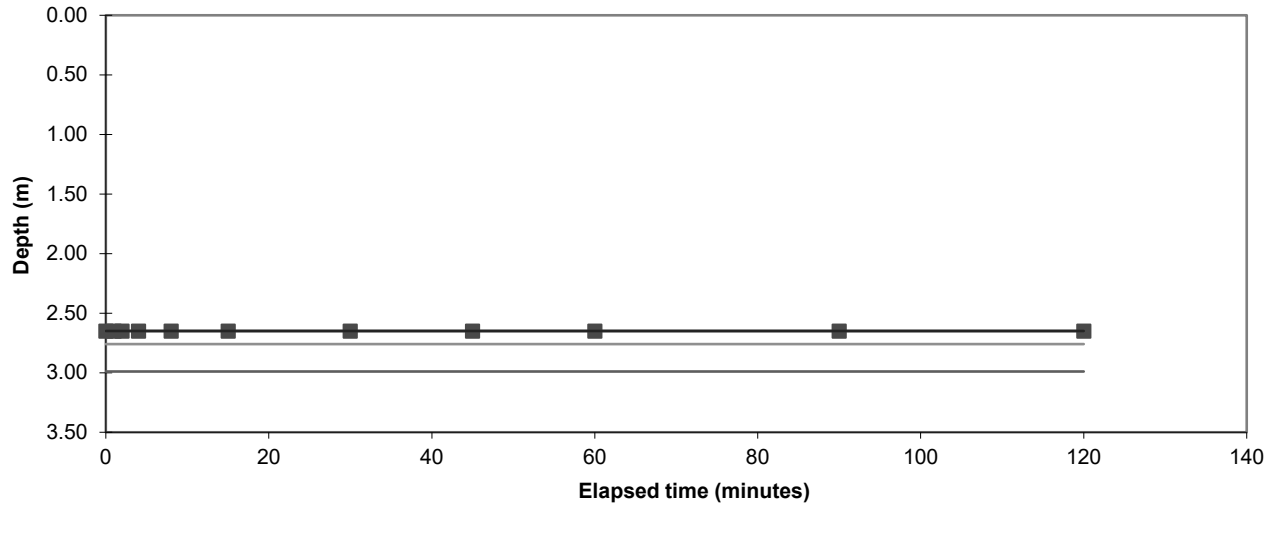
Stability:

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Soakaway Test

Trial Pit No:	SA01	Test No:	1	Date:	22/04/2025
Length (m):	1.800		Datum Height:	0.00	m agl
Width (m):	0.45		Granular infill:	None	
Depth (m):	3.10		Porosity of infill:	1	(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	2.650		
1	2.650		
2	2.650		
4	2.650		
8	2.650		
15	2.650		
30	2.650		
45	2.650		
60	2.650		
90	2.650		
120	2.650		



Start water depth for analysis (mbgl):	2.65		
75% effective depth (mbgl):	2.76	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	2.88		
25% effective depth (mbgl):	2.99	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	3.10		
Volume outflow between 75% and 25% effective depth (m^3):			
Mean surface area of outflow (m^2):			1.80
(side area at 50% effective depth + base area)			
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	**Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.**

Remarks Results processed following BRE 365 (2007).

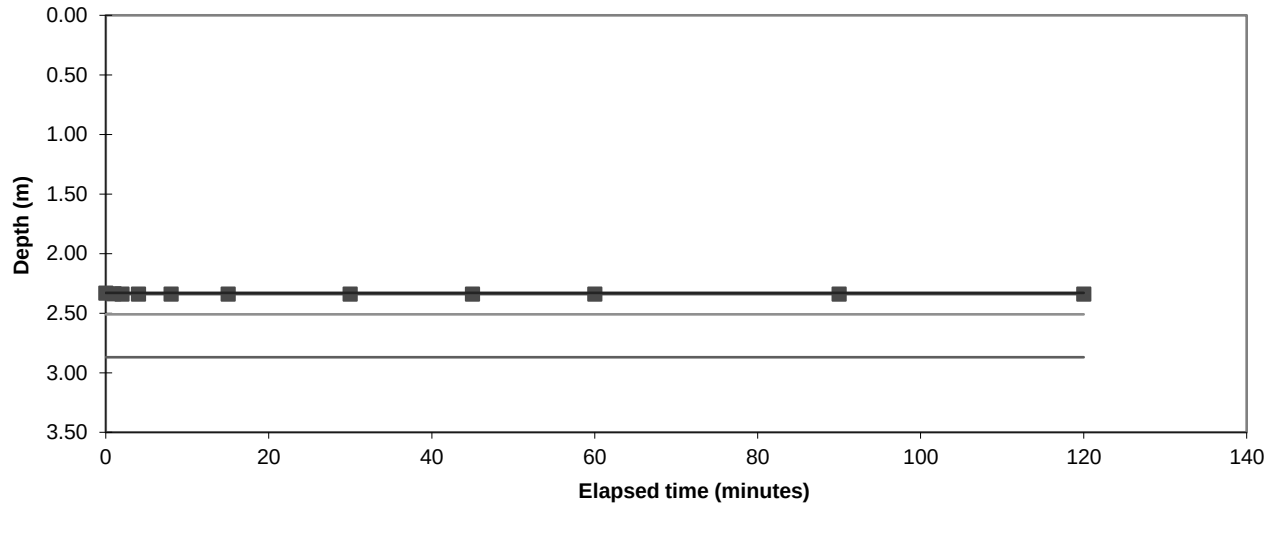
Client:	Engie	**Job No:**
Site:	Home Farm	C4826/24/E

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Soakaway Test

Trial Pit No:	SA02	Test No:	1	Date:	22/04/2025
Length (m):	1.700		Datum Height:	0.00	m agl
Width (m):	0.45		Granular infill:	None	
Depth (m):	3.05		Porosity of infill:	1	(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	2.330		
1	2.335		
2	2.340		
4	2.340		
8	2.340		
15	2.340		
30	2.340		
45	2.340		
60	2.340		
90	2.340		
120	2.340		



Start water depth for analysis (mbgl):	2.33		
75% effective depth (mbgl):	2.51	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	2.69		
25% effective depth (mbgl):	2.87	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	3.05		
Volume outflow between 75% and 25% effective depth (m^3):			
Mean surface area of outflow (m^2): (side area at 50% effective depth + base area)			2.31
Time for outflow between 75% and 25% effective depth (mins):			

Soil infiltration rate (m/s):	**Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.**

Remarks Results processed following BRE 365 (2007).

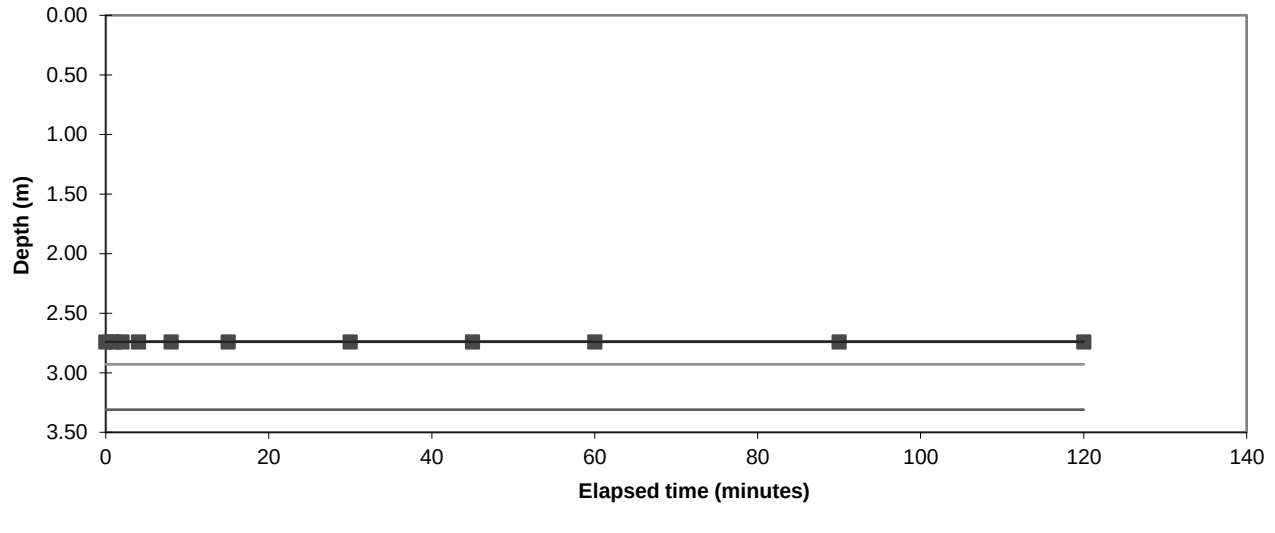
Client:	Engie	**Job No:**	
Site:	Home Farm	C4826/24/E	

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Soakaway Test

Trial Pit No:	SA03	Test No:	1	Date:	22/04/2025
Length (m):	1.800		Datum Height:	0.00	m agl
Width (m):	0.45		Granular infill:	None	
Depth (m):	3.50		Porosity of infill:	1	(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	2.740		
1	2.740		
2	2.740		
4	2.740		
8	2.740		
15	2.740		
30	2.740		
45	2.740		
60	2.740		
90	2.740		
120	2.740		



Start water depth for analysis (mbgl):	2.74		
75% effective depth (mbgl):	2.93	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	3.12		
25% effective depth (mbgl):	3.31	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	3.50		

Volume outflow between 75% and 25% effective depth (m^3):

Mean surface area of outflow (m^2): 2.52
(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	**Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.**

Remarks Results processed following BRE 365 (2007).

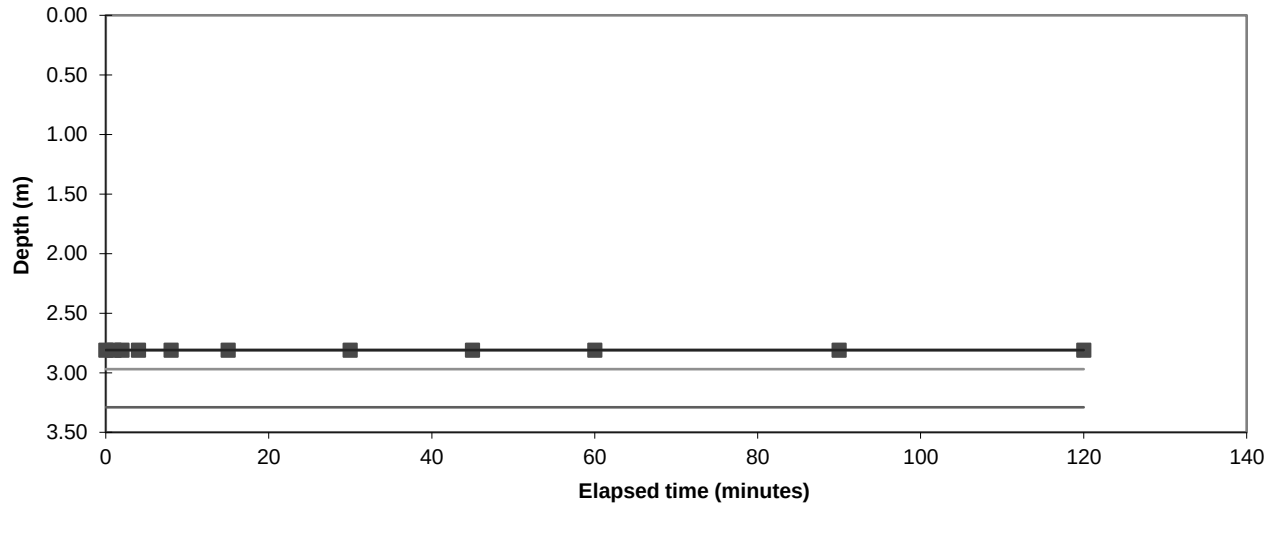
Client:	Engie	**Job No:**
Site:	Home Farm	C4826/24/E

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Soakaway Test

Trial Pit No:	SA04	Test No:	1	Date:	22/04/2025
Length (m):	1.800		Datum Height:	0.00	m agl
Width (m):	0.45		Granular infill:	None	
Depth (m):	3.45		Porosity of infill:	1	(assumed)

Elapsed time (minutes)	Water Depth (m below datum)	Elapsed time (minutes)	Water Depth (m below datum)
0	2.810		
1	2.810		
2	2.810		
4	2.810		
8	2.810		
15	2.810		
30	2.810		
45	2.810		
60	2.810		
90	2.810		
120	2.810		



Start water depth for analysis (mbgl):	2.81		
75% effective depth (mbgl):	2.97	Elapsed time (mins):	#N/A
50% effective depth (mbgl):	3.13		
25% effective depth (mbgl):	3.29	Elapsed time (mins):	#N/A
Base of soakage zone (mbgl):	3.45		

Volume outflow between 75% and 25% effective depth (m^3):

Mean surface area of outflow (m^2): 2.25
(side area at 50% effective depth + base area)

Time for outflow between 75% and 25% effective depth (mins):

Soil infiltration rate (m/s):	**Test incomplete as 25% effective depth not achieved. Unable to reliably determine soil infiltration rate.**

Remarks Results processed following BRE 365 (2007).

Client:	Engie	**Job No:**
Site:	Home Farm	C4826/24/E

Trial Pit Log

Trialpit No **SA04**

Sheet 1 of 1

Project Name:	Home Farm	Project No. C4826/24/E/7379	Co-ords: 450424.80 - 432291.61 Level: 7.60
Location:	Bond Ings Rise, Sherburn in Elmet, Leeds, North Yorkshire, LS25 6FW	Dimensions (m): Depth 3.40	1.8 × 0.45
Client:	Engie Renewable Gases UK Limited		

Date 22/04/2025

Scale 1:50

Logged RP

Water Strike	Samples and In Situ Testing: Depth	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
				0.30	7.30		TOPSOIL.
							Grey slightly sandy slightly gravelly silty CLAY.
				1.00	6.60		Brown thinly laminated sandy silty CLAY.
				3.40	4.20		End of pit at 3.40 m

Remarks:

Stability:

Appendix 7

Plate Load Test Results

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	01
Client	Engie - Matthew Sargeant	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	22.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	

Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT01		
GPS Coord's	W 1° 14' 8.9", N 53° 47' 4.7"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

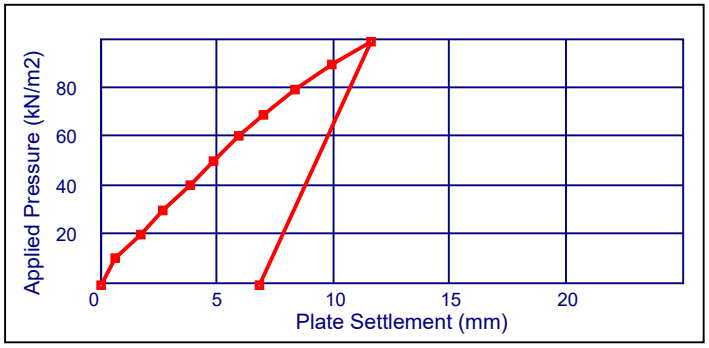




Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.60	11.1
1.70	20.8
2.64	30.7
3.83	41.0
4.82	50.9
5.91	61.2
6.97	69.8
8.33	80.2
9.90	90.5
11.59	99.8
6.80	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**101**
Maximum deformation (mm):	**11.59**
Modulus of subgrade reaction K (MN/m3):	**13.4**
K762 (MN/m3):	**8.4**
Estimated CBR (%):	**0.4**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	02
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT02		
GPS Coord's	W 1° 14' 11.9", N 53° 47' 3.2"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

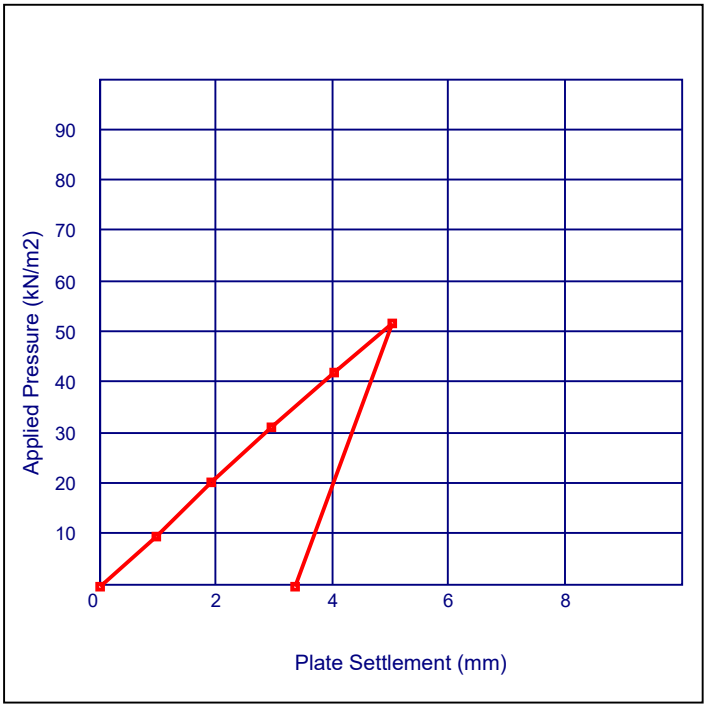


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.96	9.9
1.91	20.6
2.94	31.6
4.02	42.4
5.02	52.1
3.35	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**53**
Maximum deformation (mm):	**5.02**
Modulus of subgrade reaction K (MN/m3):	**10.5**
K762 (MN/m3):	**6.6**
Estimated CBR (%):	**0.3**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm, Bond Ings Rise, Leeds	**Test No:**	03
Client	Engie - Matthew Sargeant	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	22.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	

Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT03		
GPS Coord's	N/A, N/A	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

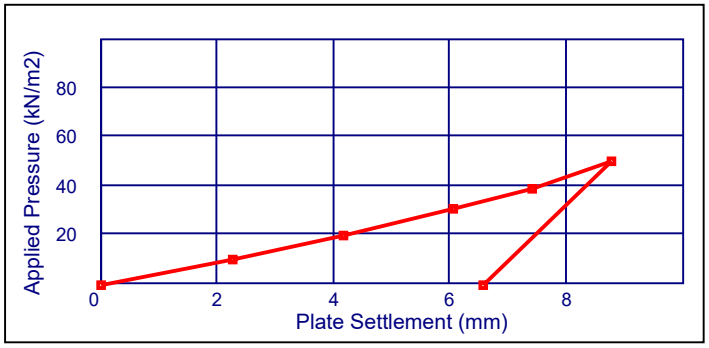
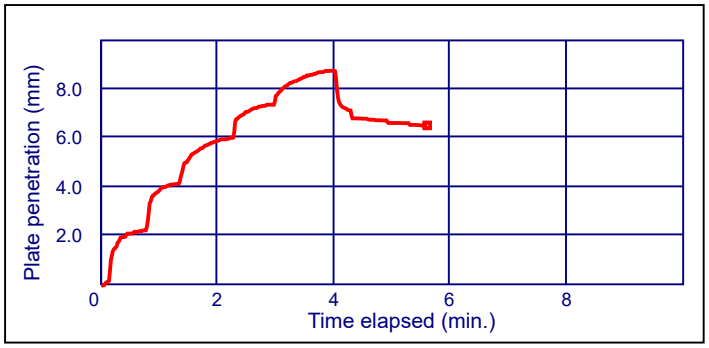


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
2.26	10.5
4.16	20.4
6.05	31.3
7.41	39.5
8.77	50.8
6.56	0.0



	Cycle 1
Maximum Applied Pressure (kPa):	**52**
Maximum deformation (mm):	**8.77**
Modulus of subgrade reaction K (MN/m3):	**4.7**
K762 (MN/m3):	**2.9**
Estimated CBR (%):	**0.1**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	04
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician		**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT04		
GPS Coord's	W 1° 14' 10.9", N 53° 47' 1.9"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

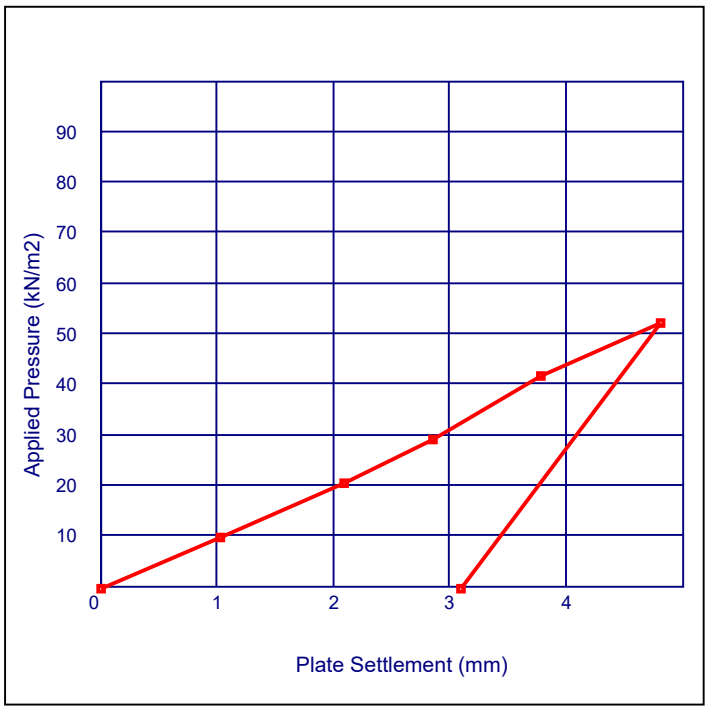


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
1.02	10.1
2.09	20.9
2.85	29.5
3.78	42.1
4.81	52.6
3.09	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**53**
Maximum deformation (mm):	**4.81**
Modulus of subgrade reaction K (MN/m3):	**9.9**
K762 (MN/m3):	**6.2**
Estimated CBR (%):	**0.2**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	05
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT05		
GPS Coord's	W 1° 14' 13.0", N 53° 47' 0.5"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

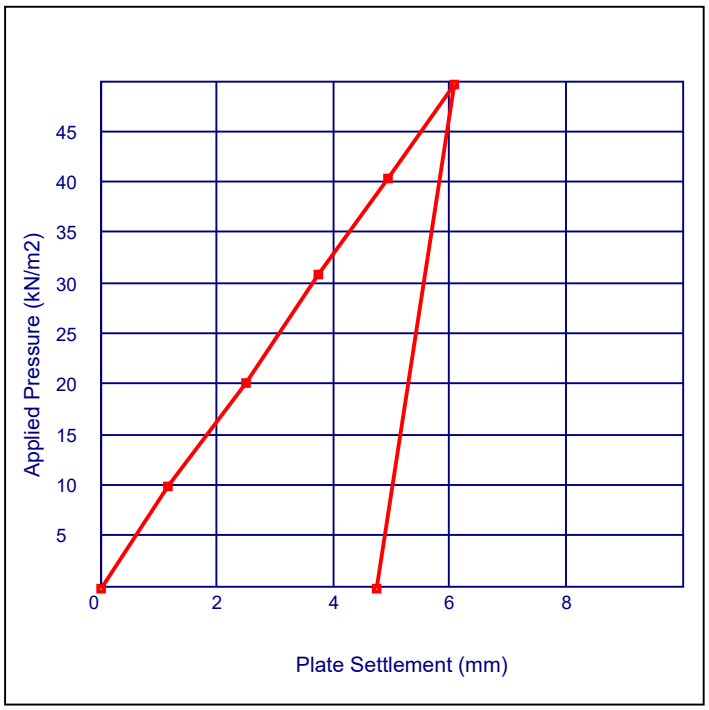


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
1.15	10.1
2.49	20.4
3.73	31.1
4.93	40.6
6.07	49.9
4.73	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**51**
Maximum deformation (mm):	**6.07**
Modulus of subgrade reaction K (MN/m3):	**8.7**
K762 (MN/m3):	**5.4**
Estimated CBR (%):	**0.2**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	06
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT06		
GPS Coord's	W 1° 14' 9.4", N 53° 47' 0.3"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

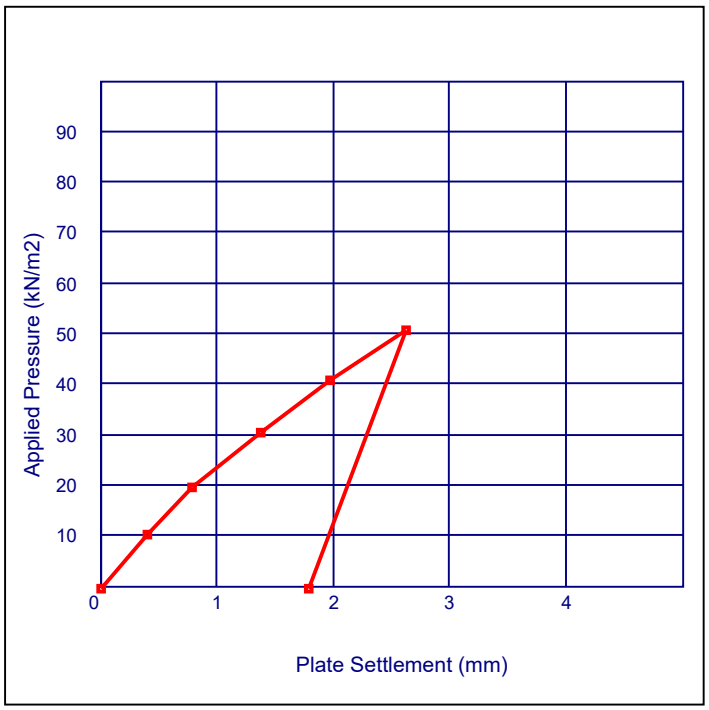


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.40	10.7
0.78	20.1
1.37	30.9
1.97	41.2
2.62	51.2
1.78	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**52**
Maximum deformation (mm):	**2.62**
Modulus of subgrade reaction K (MN/m3):	**22.9**
K762 (MN/m3):	**14.3**
Estimated CBR (%):	**1.0**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	07
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT07		
GPS Coord's	W 1° 14' 7.5", N 53° 46' 58.9"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

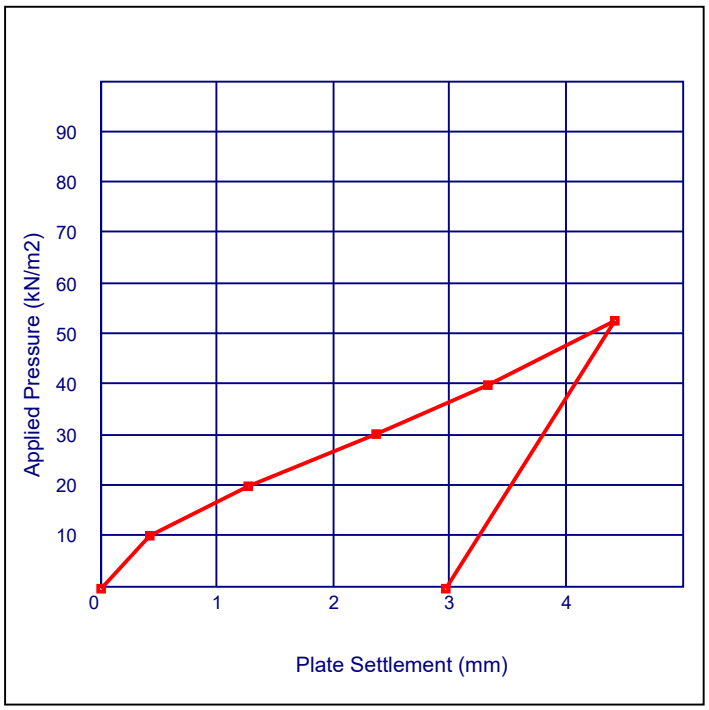


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.42	10.5
1.26	20.3
2.36	30.6
3.32	40.3
4.41	53.0
2.96	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**54**
Maximum deformation (mm):	**4.41**
Modulus of subgrade reaction K (MN/m3):	**16.1**
K762 (MN/m3):	**10.0**
Estimated CBR (%):	**0.5**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	08
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT08		
GPS Coord's	W 1° 14' 9.6", N 53° 46' 58.2"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

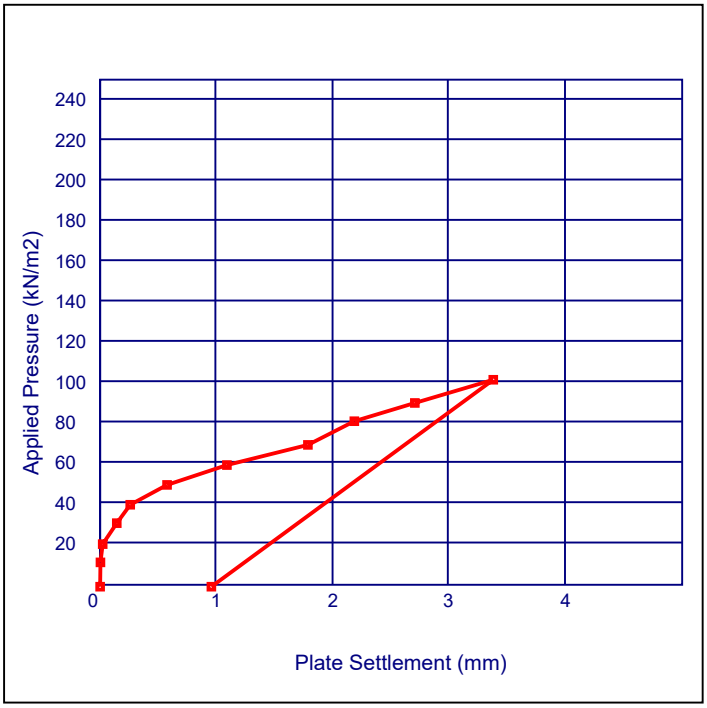


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.00	12.0
0.02	21.1
0.14	31.4
0.26	40.6
0.57	50.4
1.09	60.2
1.78	70.2
2.18	81.9
2.70	91.0
3.38	102.4
0.96	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**103**
Maximum deformation (mm):	**3.38**
Modulus of subgrade reaction K (MN/m3):	**50.0**
K762 (MN/m3):	**31.1**
Estimated CBR (%):	**3.7**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	9
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT09		
GPS Coord's	W 1° 14' 14.6", N 53° 46' 57.7"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

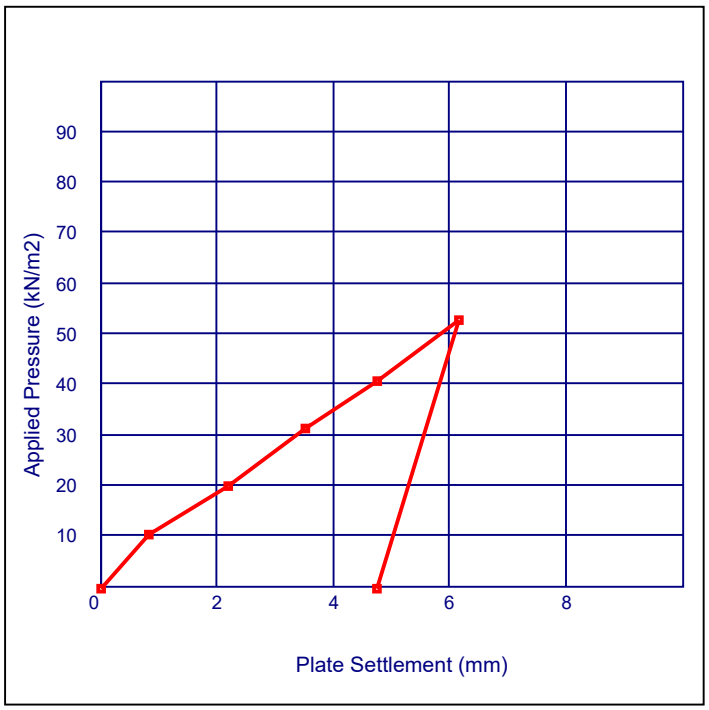


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.82	10.7
2.18	20.3
3.51	31.7
4.74	41.1
6.14	53.2
4.74	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**54**
Maximum deformation (mm):	**6.14**
Modulus of subgrade reaction K (MN/m3):	**11.0**
K762 (MN/m3):	**6.9**
Estimated CBR (%):	**0.3**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	10
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT10		
GPS Coord's	W 1° 14' 12.6", N 53° 46' 57.0"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

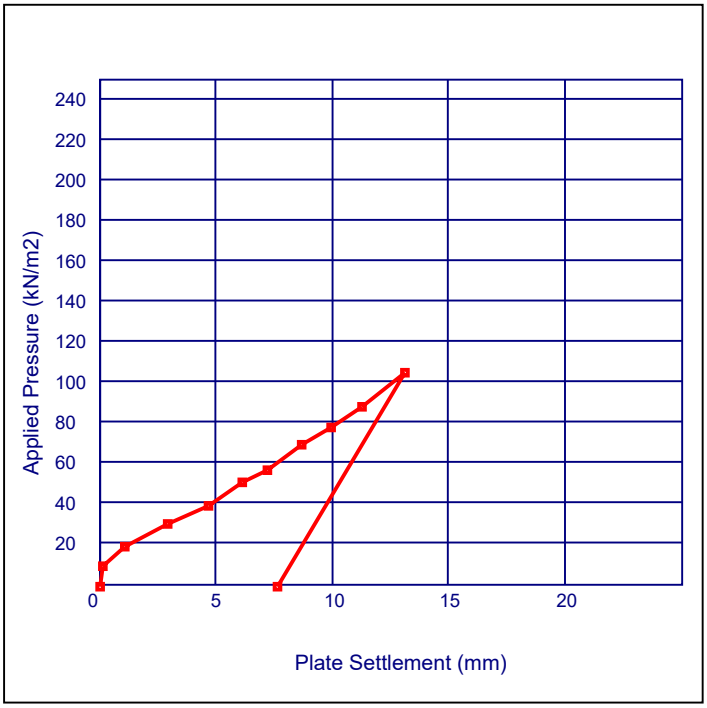


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.11	10.1
1.06	19.8
2.90	31.0
4.65	40.0
6.10	51.7
7.18	57.7
8.65	70.2
9.92	78.8
11.25	89.0
13.09	105.9
7.61	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**107**
Maximum deformation (mm):	**13.09**
Modulus of subgrade reaction K (MN/m3):	**16.8**
K762 (MN/m3):	**10.5**
Estimated CBR (%):	**0.6**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	11
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT11		
GPS Coord's	W 1° 14' 9.9", N 53° 46' 55.2"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

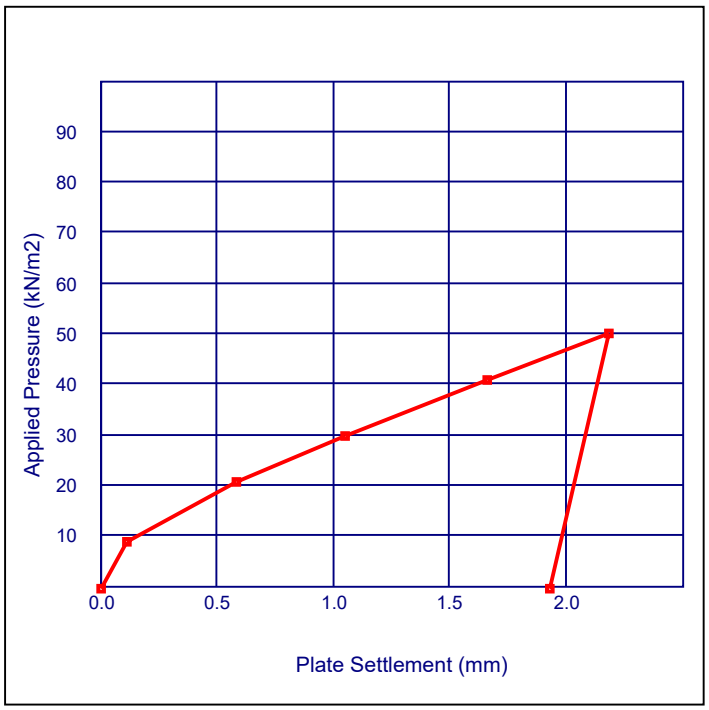


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
0.11	9.3
0.58	21.1
1.05	30.2
1.66	41.3
2.18	50.5
1.93	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**51**
Maximum deformation (mm):	**2.18**
Modulus of subgrade reaction K (MN/m3):	**27.1**
K762 (MN/m3):	**16.9**
Estimated CBR (%):	**1.3**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Rogers Geotechnical Services
Unit 4 Barncliffe Business Park , Shelley
Huddersfiled, HD88LU
Tel. 01484607977

TEST REPORT
PLATE LOADING TEST

Project	Home Farm	**Test No:**	12
Client	Engie	**Lab Ref No:**	C4826/24/E/7379
		Date Reported	28.04.25
		Weather Conditions	Wet
Technician	SH	**Air Temperature °C**	
Date Tested	15/04/2025	**Plate Dia (mm)**	450
Location	PLT12		
GPS Coord's	W 1° 14' 13.1", N 53° 46' 54.1"	**Depth (m)**	0
Material Type	Existing ground	**Reaction Type**	13T Excavator
No Cycles	1	**App Weight (kg)**	13

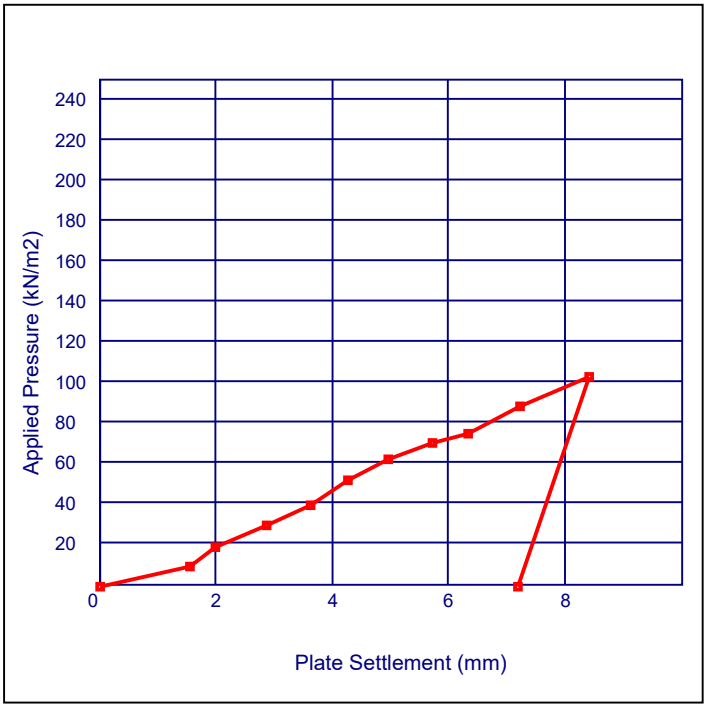


Plate Settlement (mm)	Applied Pressure (kN/m2)
0.00	0.0
1.54	10.0
1.98	19.5
2.86	30.4
3.62	40.3
4.26	52.7
4.95	63.1
5.71	71.1
6.32	75.8
7.21	89.3
8.40	103.9
7.18	0.0

	Cycle 1
Maximum Applied Pressure (kPa):	**105**
Maximum deformation (mm):	**8.40**
Modulus of subgrade reaction K (MN/m3):	**6.5**
K762 (MN/m3):	**4.0**
Estimated CBR (%):	**0.1**

Comments:

Approved Signature
Rogers Geotechnical Services
Mr H J Letch
Technical Laboratory Manager

Plate Load - Tested in accordance with BS 1377 : Part 9 C
Moisture Content - Tested in accordance with BS 1377 : P
Opinions and interpolations expressed herein are outside the scope of UKAS acceditation

Appendix 8

Laboratory Testing

UKAS TESTING
8948

Environmental
Geotechnical
Specialists

RGS

LABORATORY REPORT

job number	C4826/24/E/7379
date	20/06/2025
site address	Home Farm Bond Ings Rise, Sherburn in Elmet, LS25 6FW
date scheduled	16/05/2025
date issued	20/06/2025
issued by	H J Letch

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Schedule of UKAS Accredited Laboratory Tests

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1. CLASSIFICATION OF SOIL	BS 1377-2:2022	BS EN ISO 17892	Accredited (A)	Unaccredited (U)
1.1 Moisture / Water content determination				
i. Oven drying	Pt 2	BS EN ISO 17892-1:2014+A1:2022	A	
ii. Saturation m/c of chalk	Pt 2 :			U
1.2 Index Properties				
i. Liquid limit – cone penetrometer	Pt 2	**BS EN ISO 17892-12 2018+A2:2022**	A	
ii. Plastic limit	Pt 2	**BS EN ISO 17892-12 2018+A2:2022**	A	
iii. Shrinkage limit	:			U
iv. Linear shrinkage	Pt 2		A	
1.3 Particle Density				
i. Gas jar	Pt 2 :		A	
ii. Large pyknometer	Pt 2			U
iii. Small pyknometer		BS EN SIO 17892-3:2015	A	
1.4 Density Tests				
i. Linear measurement	Pt 2	BS EN ISO 17892-2:2014	A	
ii. Immersion in water	Pt 2	Pt 2 : 2014 : 5.2		U
iii. Fluid / Water displacement	Pt 2	Pt 2 : 2014 : 5.3		U
iv. Sand replacement	Pt 9			U
v. Core cutter	Pt 9			U
1.5 Particle Size Distribution				
i. Dry Sieve	Pt 2	BS EN ISO 17892-4:2016	A	
ii. Wet Sieve	Pt 2	BS EN ISO 17892-4:2016	A	
iii. Sedimentation by pipette	Pt 2	BS EN ISO 17892-4:2016	A	
iv. Sedimentation by hydrometer	Pt 2			U
2. CHEMICAL TESTS	**BS 1377-3:2018**			
ii. Mass loss on ignition	Pt 3 : 4			U
3. COMPACTION RELATED TESTS	**BS 1377-2:2022**			
3.1 Dry density/moisture relationship				
i. 2.5kg rammer – 1 litre mould	Pt 2		A	
- CBR mould	Pt 2		A	
ii. 4.5kg rammer – 1 litre mould	Pt 2		A	
- CBR mould	Pt 2		A	
3.2 Moisture Condition Value				
i. Single point test	Pt 2			U
ii. MCV/moisture content relationship	Pt 2			U
3.3 California Bearing Ratio				
i. Undisturbed sample	Pt 2		A	
ii. Recompacted sample	Pt 2		A	
iii. Soaked, inc measurement of swell	Pt 2		A	
4. COMPRESSIBILITY OF SOIL	**BS 1377-2:2022**			
i. One dimensional consolidation	Pt 2	BS EN ISO 17892-5:2017	A	
ii. Swelling pressure test	Pt 2			U
5. SHEAR STRENGTH OF SOIL	**BS 1377-2:2022**			
i. Hand shear vane	Makers instructions			U
ii. Shear box (100mm square sample)	BS 1377 : Pt 7 : 4			U
iii. Triaxial – quick undrained	BS 1377 : Pt 2	BS EN ISO 17892-8:2018	A	
6. PERMEABILITY				
i. Falling head	K. H. Head Vol 2			U
ii. Constant head	BS 1377 : Pt 6 : 6			U
iii Triaxial cell	BS 1377 : Pt 6 : 6			U
7. ROCK TESTS				
7.1 Classification Tests				
i. Natural moisture content	-			U
ii. Saturated moisture content	-			U
iii. Natural density	-			U
iv. Porosity	-			U
7.2 Strength Tests				
i. Point load index	ISRM '85			U
ii. Uniaxial compression test	ISRM '81			U

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GEOTECHNICAL TESTING RESULTS

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RGS Environmental Geotechnical Specialists

Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
01484 604354 Company No. 5130864

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Summary of Classification Test Results

Project No.	Project Name
C4826/24/E/7379	Home Farm

Hole No.	Sample				Soil Description	Density bulk Mg/m³	Density dry Mg/m³	w %	Passing 425µm %	LL %	PL %	PI %	Particle density Mg/m³	1pt/4pt	Date	Increase/Decrease
	Ref	Top	Base	Type												
WSC	1	1.30		D	Greyish brown silty CLAY.			29	100	55	28	27		4pt	15-May	Increase
WSC	2	2.30		D	Greyish brown silty CLAY.			30	100	53	22	31		4pt	15-May	Increase
WSC	3	3.30		D	Greyish brown silty CLAY.			32	100	55	29	26		4pt	15-May	Increase
WSD	1	0.60		D	Greyish brown silty CLAY.			37	100	83	36	47		4pt	15-May	Increase
WSD	2	1.60		D	Greyish brown silty CLAY.			31	100	53	26	27		4pt	15-May	Increase
WSE	1	1.30		D	Greyish brown silty CLAY.			31	100	58	29	29		4pt	15-May	Increase
WSE	2	2.30		D	Greyish brown silty CLAY.			35	100	49	24	25		4pt	15-May	Increase
WSE	3	3.30		D	Greyish brown silty CLAY.			33	100	53	25	28		4pt	15-May	Increase
WSF	1	1.30		D	Greyish brown silty CLAY.			32	99	56	29	27		4pt	15-May	Increase
WSH	1	1.30		D	Greyish brown silty CLAY.			30	100	54	26	28		4pt	15-May	Increase
WSH	2	2.30		D	Greyish brown silty CLAY.			33	100	50	24	26		4pt	15-May	Increase
WSJ	1	1.30		D	Greyish brown silty CLAY.			29	100	48	24	24		4pt	15-May	Increase
WSJ	2	2.30		D	Greyish brown silty CLAY.			29	100	38	22	16		4pt	15-May	Increase

All Water Content Tests perfromed to BS EN ISO 17892-1:2014+A1:2022 Unless specified Otherwise
All Index Property testing preformed to BS EN ISO 17892-12 2018+A2:2022 Unless Specified Otherwise
All Liquid Limit Tests performed on a 80g/30 Degree Cone unless specified otherwise

Key

Density test
Linear measurement unless :
wd - water displacement
wi - immersion in water

Liquid Limit
4pt cone unless :
cas - Casagrande method
1pt - single point test

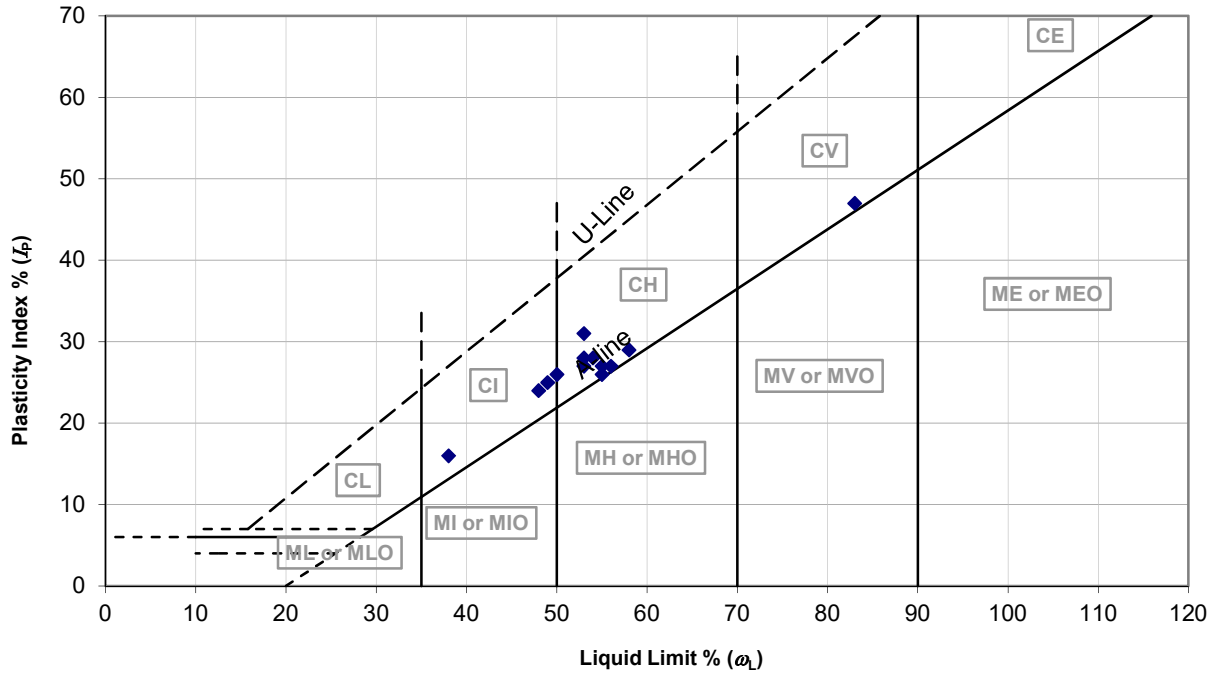
Particle density
sp - small pyknometer
gj - gas jar

Date Printed	Approved By	Table
04/06/2025	Harry	1
		sheet 1

Rogers Geotechnical Services Ltd. Offices 1&2, Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU	**Classification of Index Properties**	**C4826/24/E/7379**
Project Name: Home Farm	**BS EN ISO 17892-12 2018+A2:2022**	Fig. 2 Sheet. 1
Location:		Input By: Harry
Client: Engie Renewable Gases UK Limited		Check By: EC

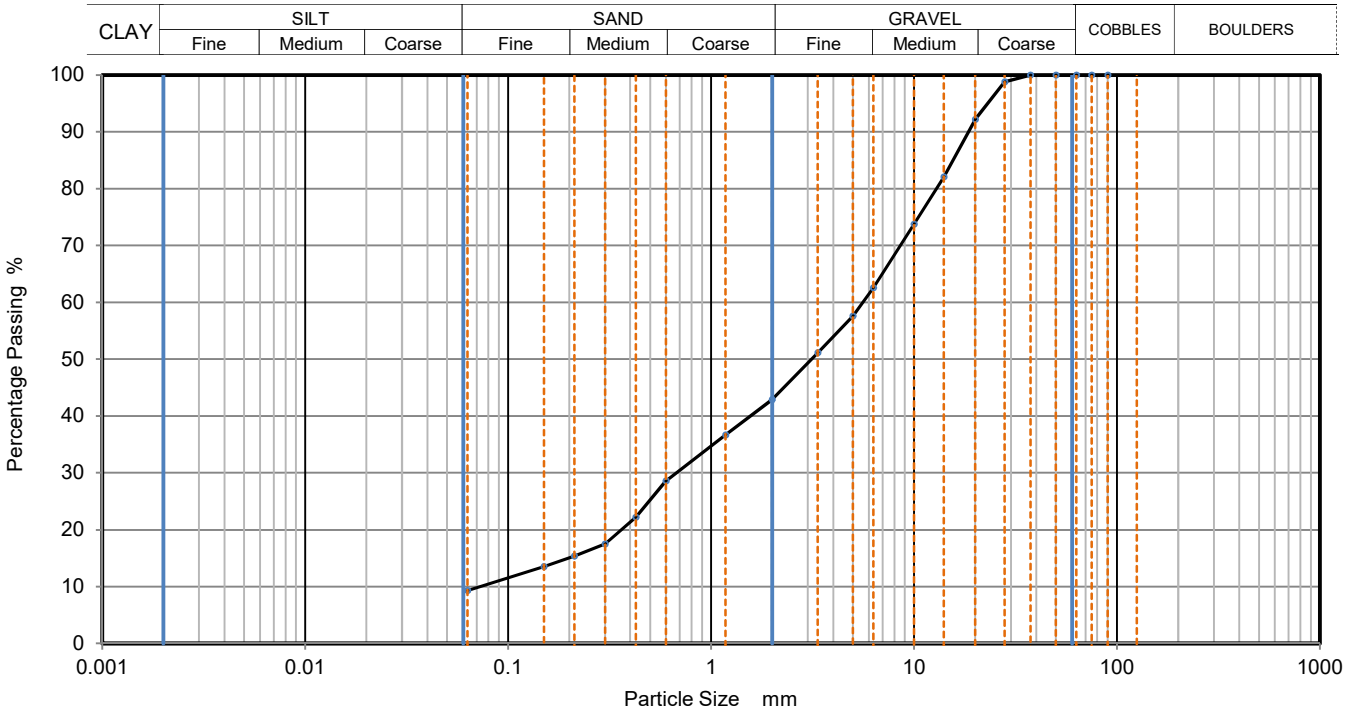
Location	Depth	Water Content (ω)	Liquid Limit (ω_L)	Plastic Limit (ω_P)	Plasticity Index (I_P)	Retained by 0.425mm	Modified (ω) (ω')	Modified (I_P) (I_P')	Liquidity/ Consistency (I_L)	Liquidity/ Consistency (I_C)	Casagrande Class	N.H.B.C Class
	(m)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)		(%)
WSC	1.30	29	55	28	27	0	29	27	0.0	1.0	C H	MEDIUM
WSC	2.30	30	53	22	31	0	30	31	0.3	0.7	C H	MEDIUM
WSC	3.30	32	55	29	26	0	32	26	0.1	0.9	C H	MEDIUM
WSD	0.60	37	83	36	47	0	37	47	0.0	1.0	C V	HIGH
WSD	1.60	31	53	26	27	0	31	27	0.2	0.8	C H	MEDIUM
WSE	1.30	31	58	29	29	0	31	29	0.1	0.9	C H	MEDIUM
WSE	2.30	35	49	24	25	0	35	25	0.4	0.6	C I	MEDIUM
WSE	3.30	33	53	25	28	0	33	28	0.3	0.7	C H	MEDIUM
WSF	1.30	32	56	29	27	1	32	27	0.1	0.9	C H	MEDIUM
WSH	1.30	30	54	26	28	0	30	28	0.1	0.9	C H	MEDIUM
WSH	2.30	33	50	24	26	0	33	26	0.3	0.7	C H	MEDIUM
WSJ	1.30	29	48	24	24	0	29	24	0.2	0.8	C I	MEDIUM
WSJ	2.30	29	38	22	16	0	29	16	0.4	0.6	C I	LOW

Interpretation graph based on BS EN ISO 14688-2:2018 any interpretations are expressed outside of our UKAS Accreditation.



PARTICLE SIZE DISTRIBUTION

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	BH03
Site Name	Home Farm			Sample No.	18
Soil Description	Brown clayey silty very gravelly SAND.			Depth, m	6.10
Specimen Reference	18	Specimen Depth	6.1 m	Sample Type	D
Test Method	ISO 17892 -4, by sieving on pre-dried or dry sample			KeyLAB ID	18



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	92		
14	82		
10	74		
6.3	63		
5	58		
3.35	51		
2	43		
1.18	37		
0.6	29		
0.425	22		
0.3	18		
0.212	15		
0.15	14		
0.063	9		

Dry Mass of sample, g	3252

Sample Proportions	% dry mass
Very coarse	0
Gravel	57
Sand	34
Fines <0.063mm	9

Grading Analysis		
D100	mm	37.5
D60	mm	5.58
D30	mm	0.672
D10	mm	0.0726

Remarks

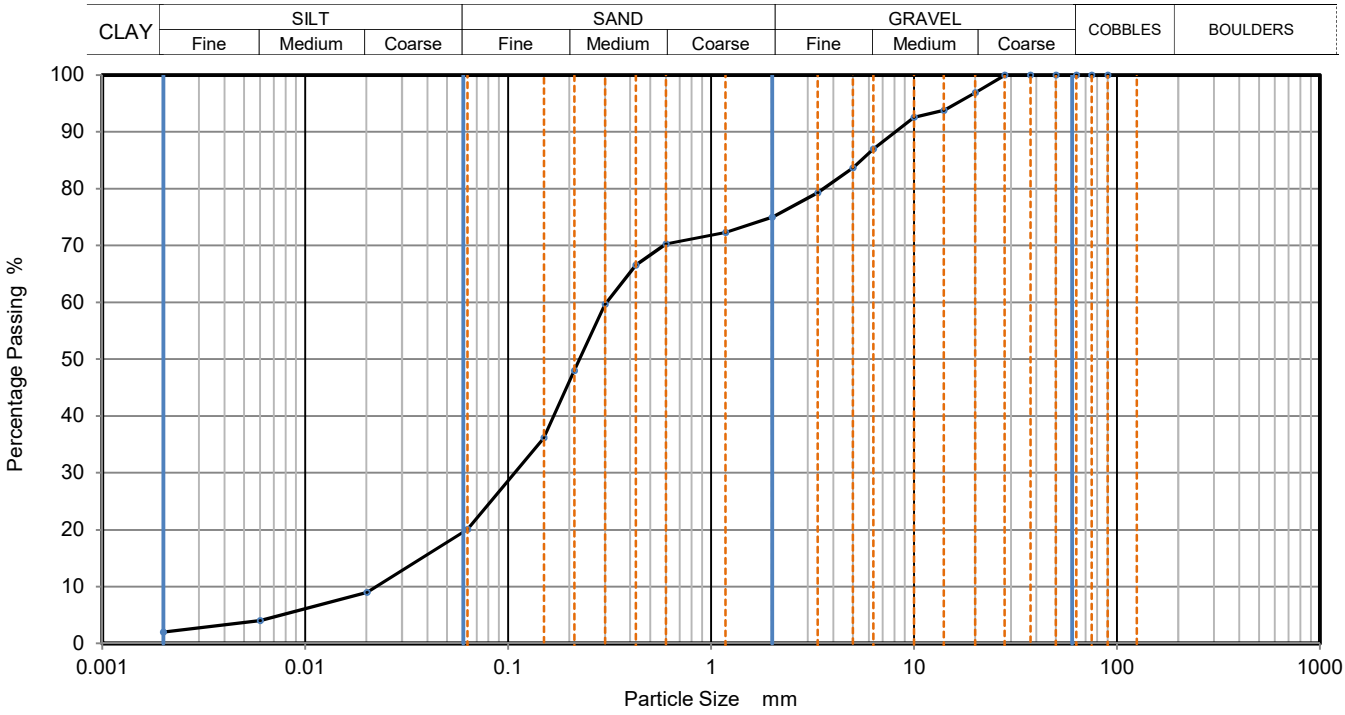
Preparation and testing in accordance with BS EN ISO 17892 - 4, unless noted below

Test performance date: 23/5/2025

Operator	Checked	Approved	Sheet printed	Fig 3
Mark Tuck	EC	Harry	04/06/2025	Sheet 1

PARTICLE SIZE DISTRIBUTION

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	WSH
Site Name	Home Farm			Sample No.	5
Soil Description	Greyish brown/orangish brown clayey silty very gravelly SAND.			Depth, m	0.70
Specimen Reference	5	Specimen Depth	0.7 m	Sample Type	D
Test Method	ISO 17892 -4, by sieving and pipette sedimentation			KeyLAB ID	RGS_2025051911



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0201	9
90	100	0.0060	4
75	100	0.0020	2
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	94		
10	93		
6.3	87		
5	84		
3.35	79		
2	75		
1.18	72		
0.6	70	Particle density (assumed)	
0.425	67	2.65	Mg/m3
0.3	60		
0.212	48		
0.15	36		
0.063	20		

Dry Mass of sample, g	1841

Sample Proportions	% dry mass
Very coarse	0
Gravel	25
Sand	55
Silt	18
Clay	2

Grading Analysis		
D100	mm	28
D60	mm	0.304
D30	mm	0.107
D10	mm	0.0219

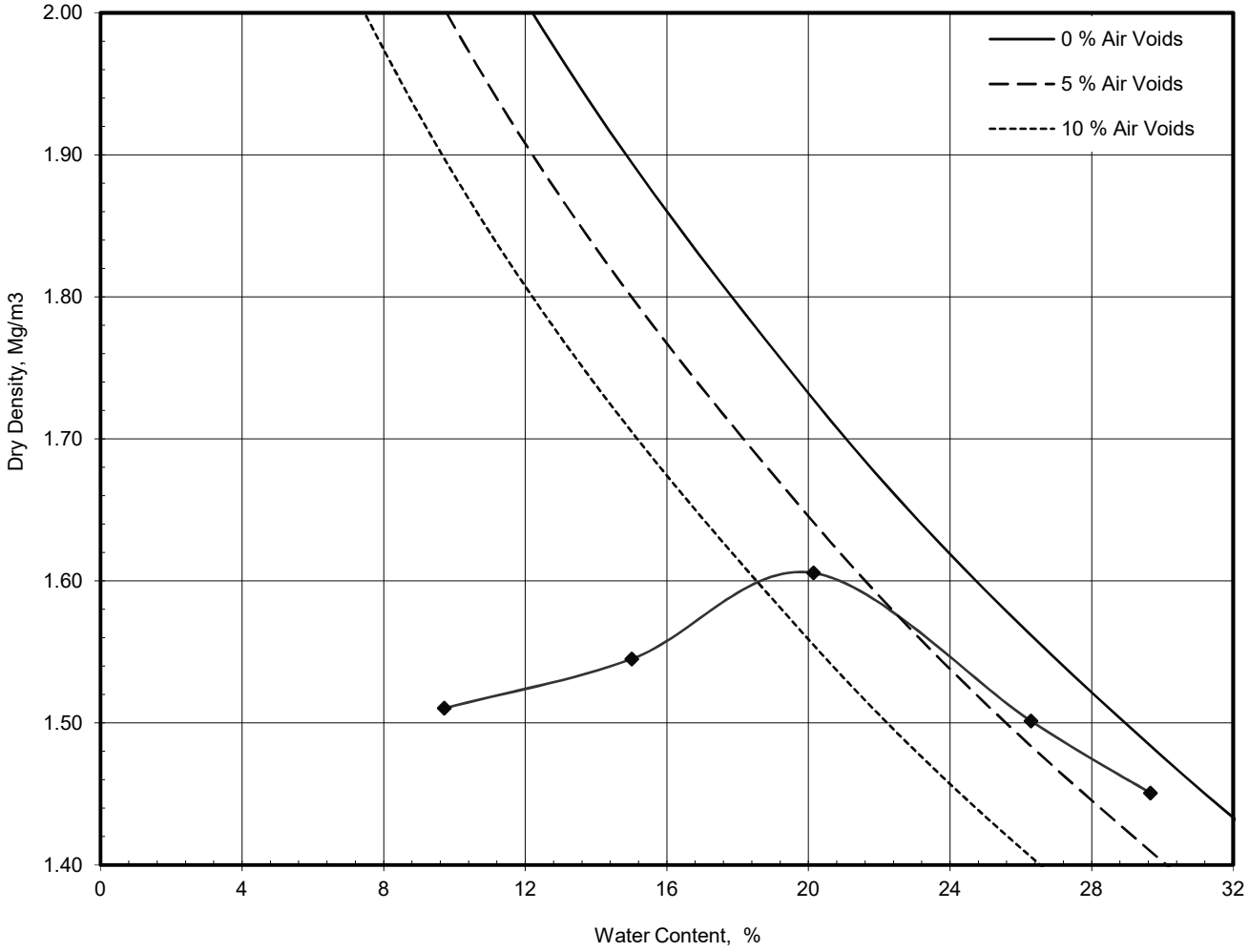
Remarks

Preparation and testing in accordance with BS EN ISO 17892 - 4, unless noted below

Test performance date: 23/5/2025

Operator	Checked	Approved	Sheet printed	Fig 3
EC	EC	Harry	04/06/2025	Sheet 2

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP01
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm brown mottled grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051925
					Compaction Test Reference/No.	1

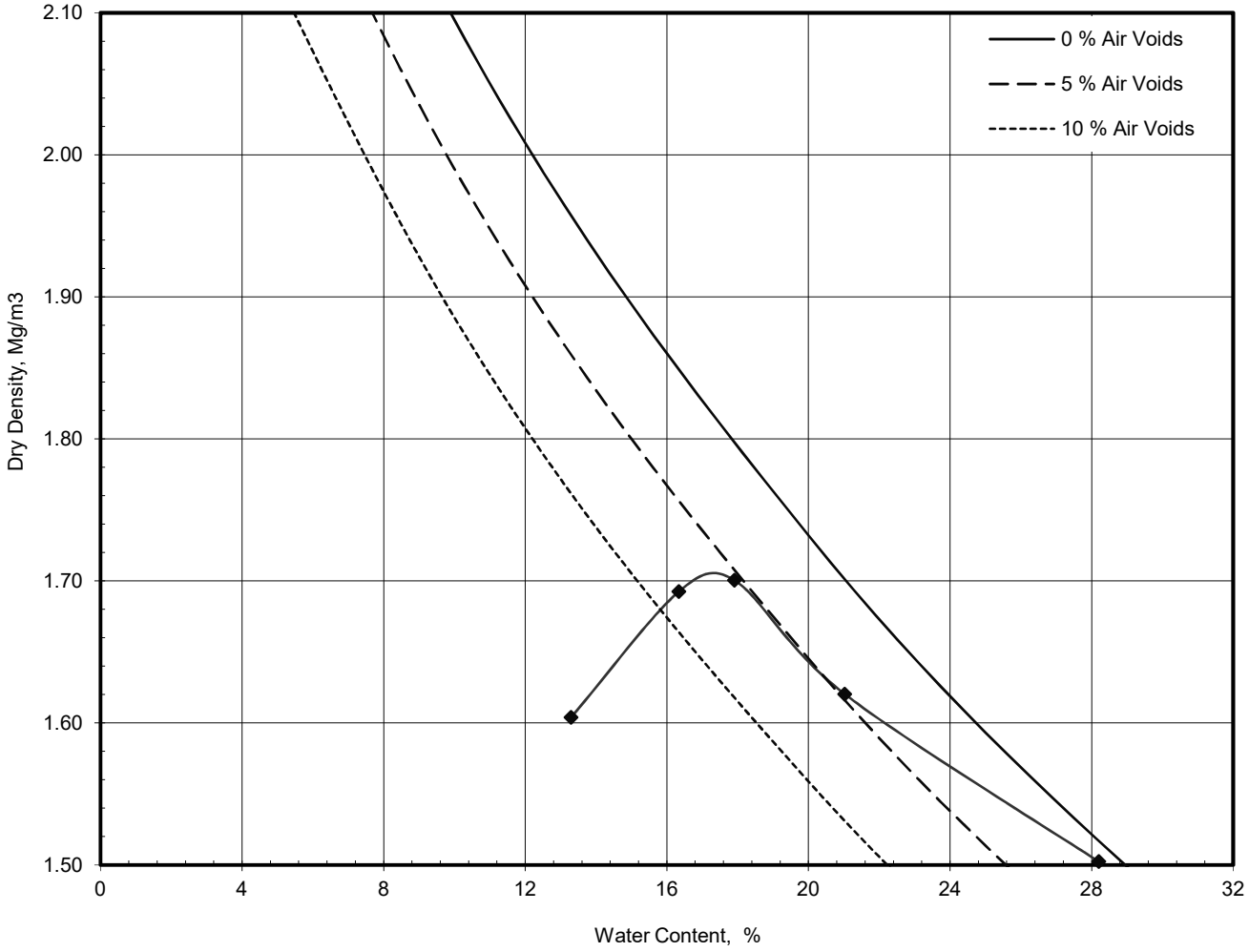


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.61**

Optimum Water Content	%	**20**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP03
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm greyish brown slightly sandy silty CLAY.				Depth	0.50 m
Specimen Ref.	1	Specimen Depth	0.5	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051926
					Compaction Test Reference/No.	2

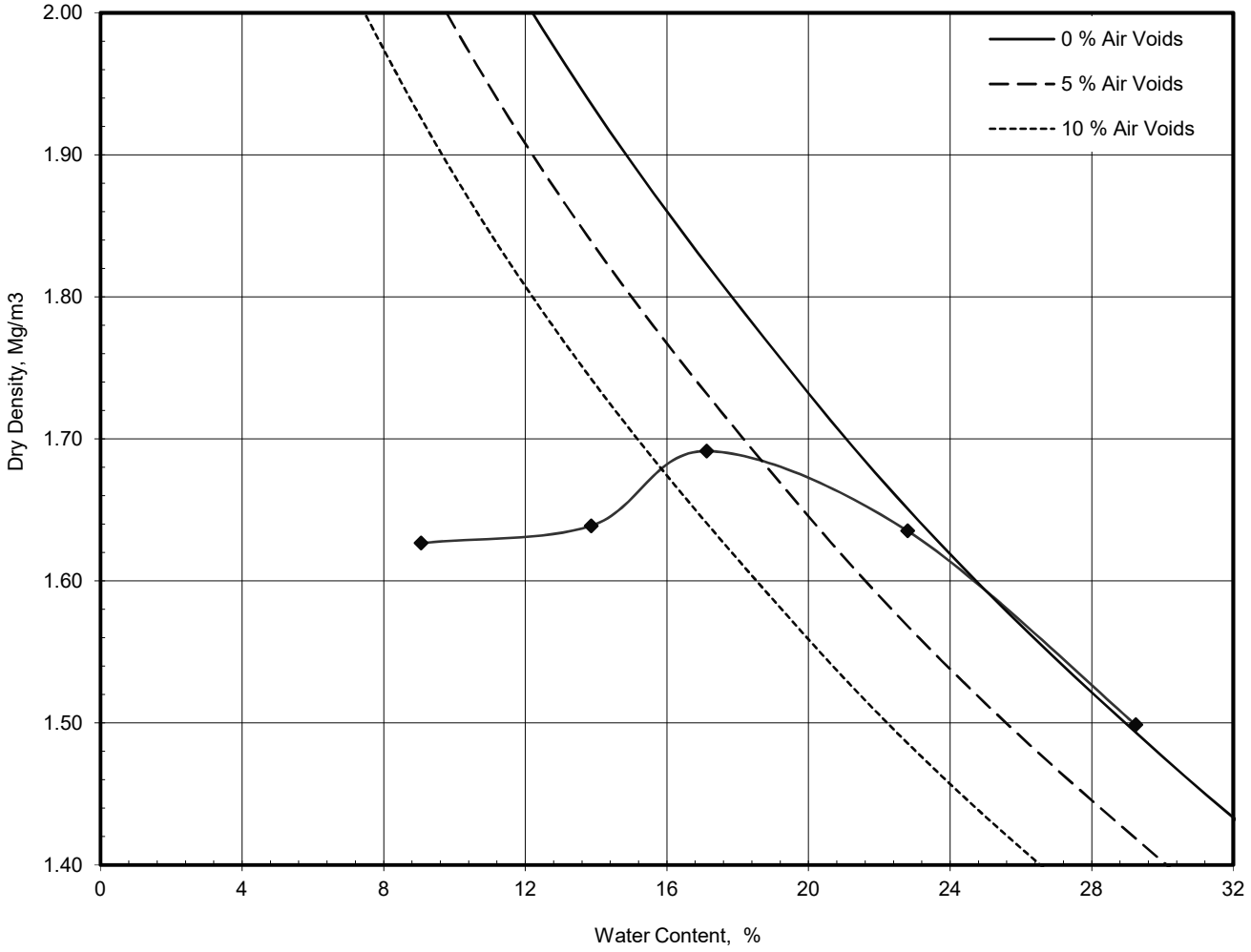


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.71**

Optimum Water Content	%	**17**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP04
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	0.50 m
Specimen Ref.	1	Specimen Depth	0.5	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051927
					Compaction Test Reference/No.	3

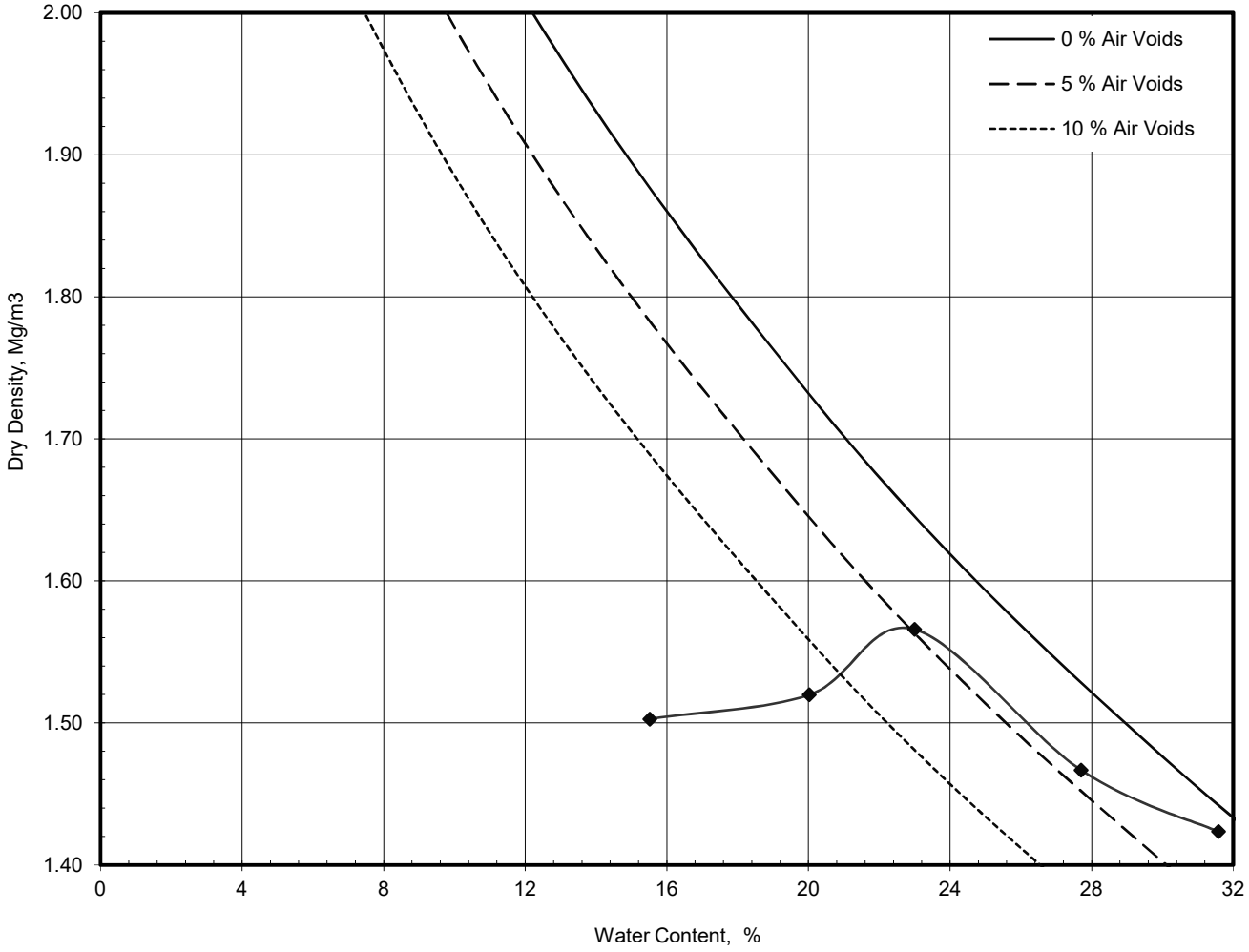


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Separate specimens tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.69**

Optimum Water Content	%	**17**

Operator	Checked	Approved	Remarks	**Fig 4**
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP05
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	0.50 m
Specimen Ref.	1	Specimen Depth	0.5	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051928
					Compaction Test Reference/No.	4

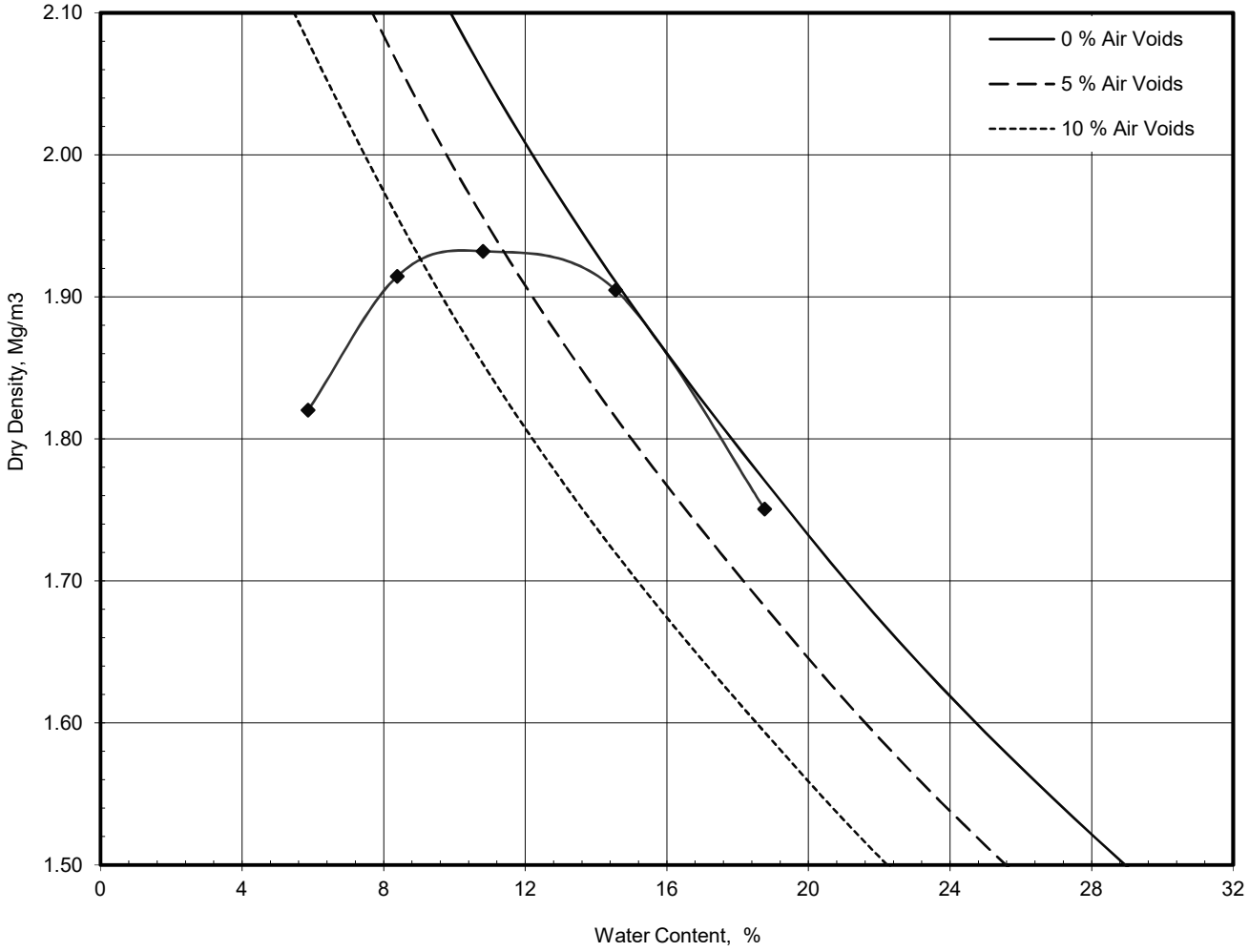


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.57**

Optimum Water Content	%	**23**

Operator	Checked	Approved	Remarks	**Fig 4**
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP06
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	0.50 m
Specimen Ref.	1	Specimen Depth	0.5	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051929
					Compaction Test Reference/No.	5

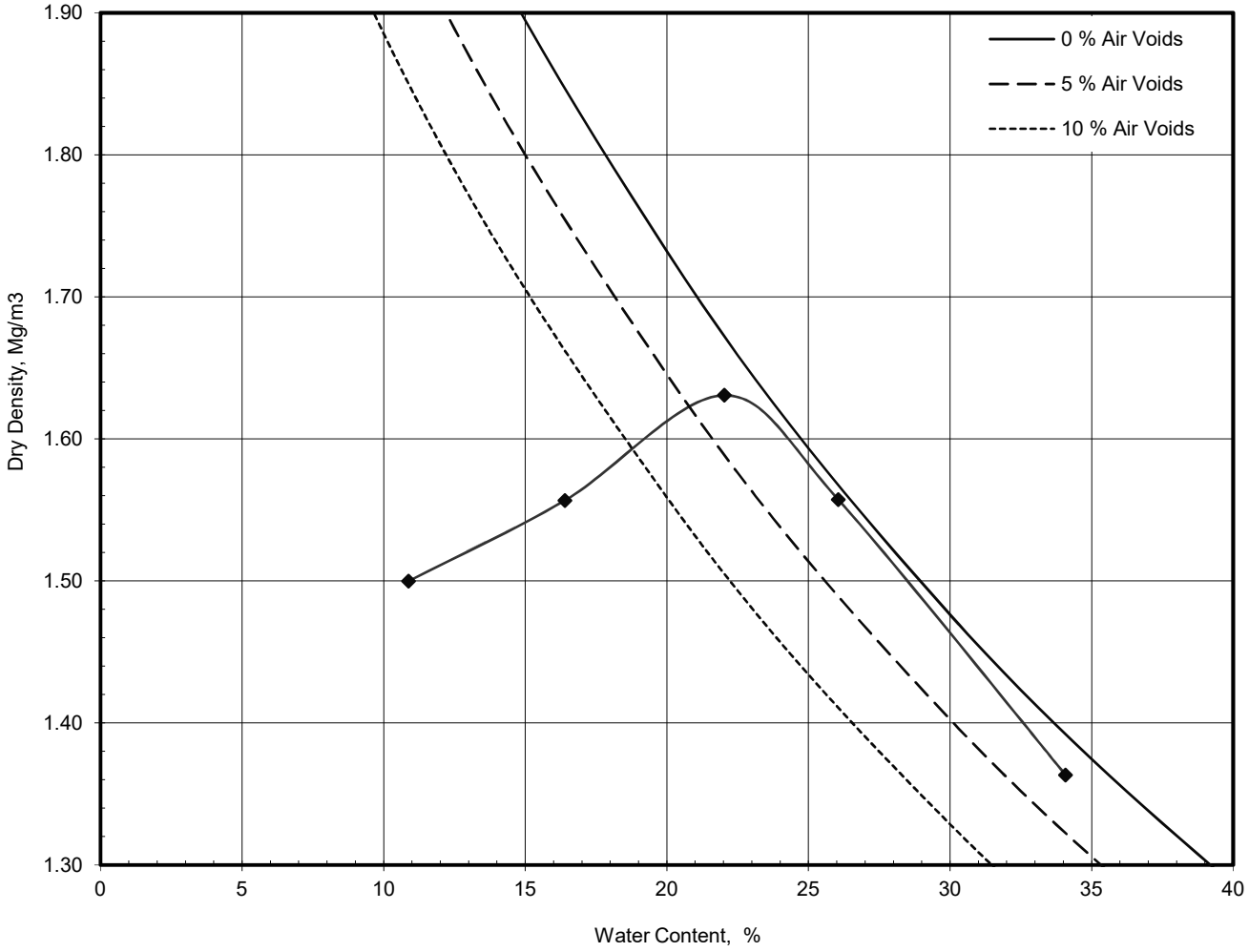


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	2
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		2
Maximum Dry Density	Mg/m³	**1.93**

Optimum Water Content	%	**11**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP07
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.4, 2.5kg rammer				Keylab ID	RGS_2025051930
					Compaction Test Reference/No.	6

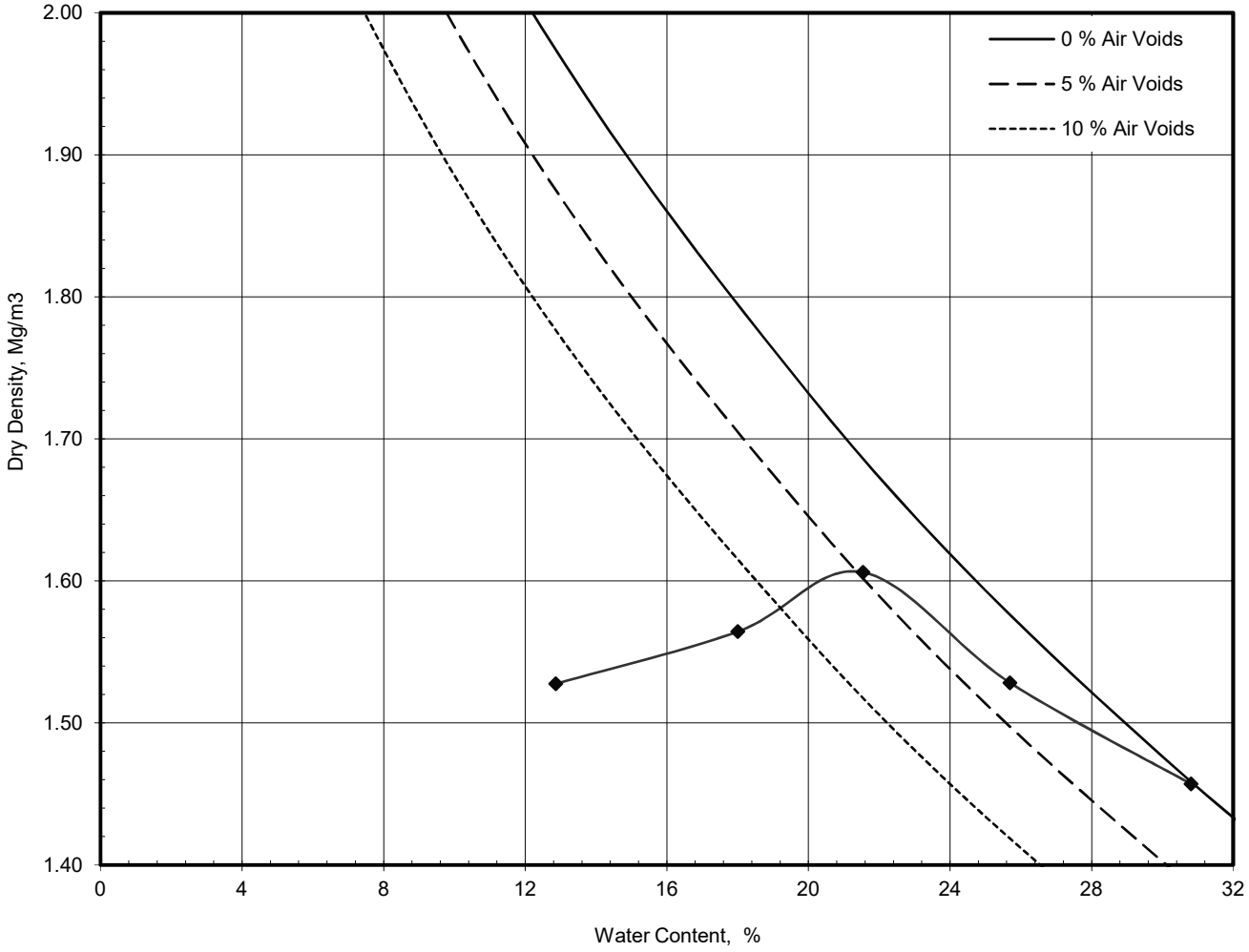


Preparation		Material used was natural
Mould Type		CBR
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.63**

Optimum Water Content	%	**22**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP08
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	14	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051931
					Compaction Test Reference/No.	7

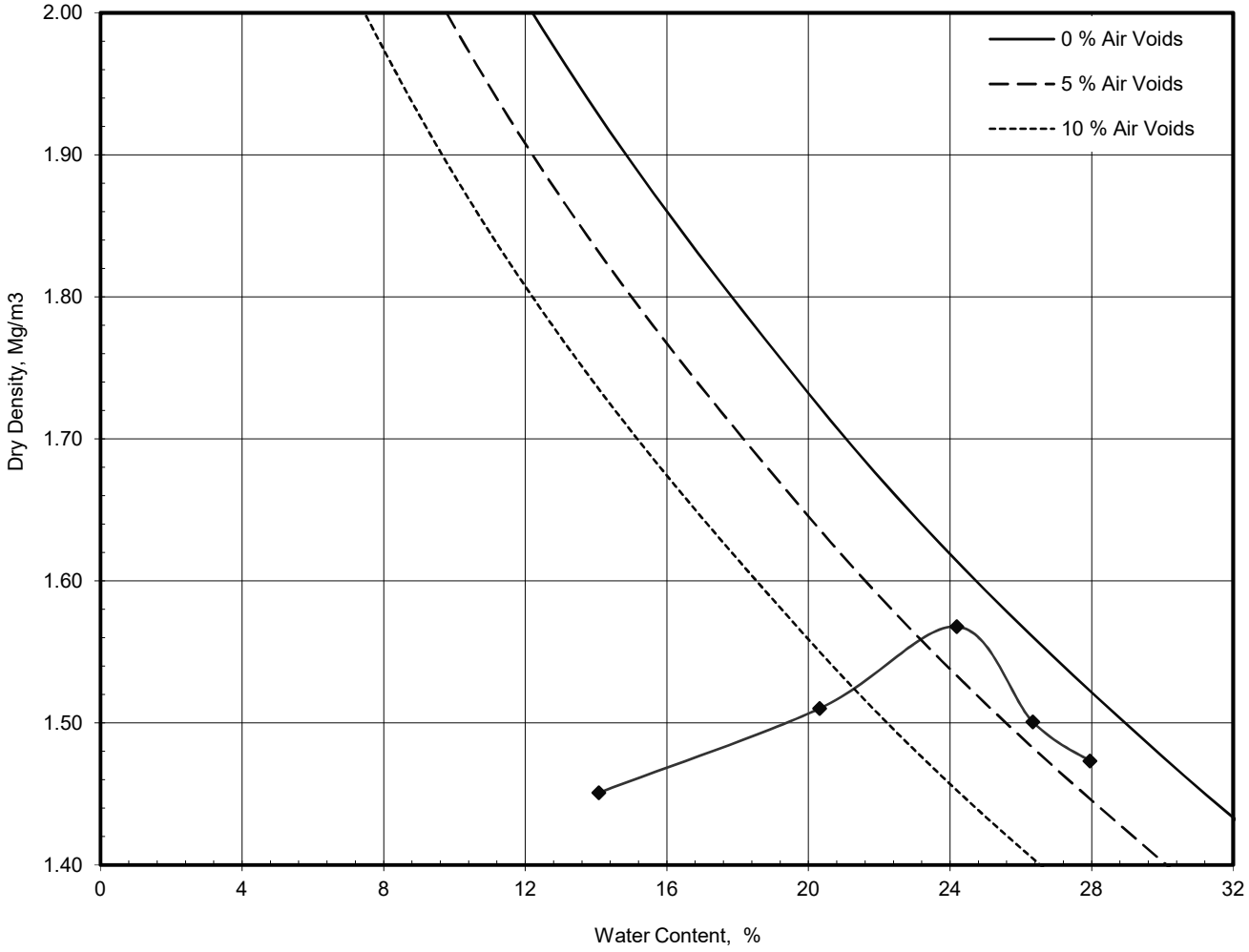


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.61**

Optimum Water Content	%	**21**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP14
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051932
					Compaction Test Reference/No.	8

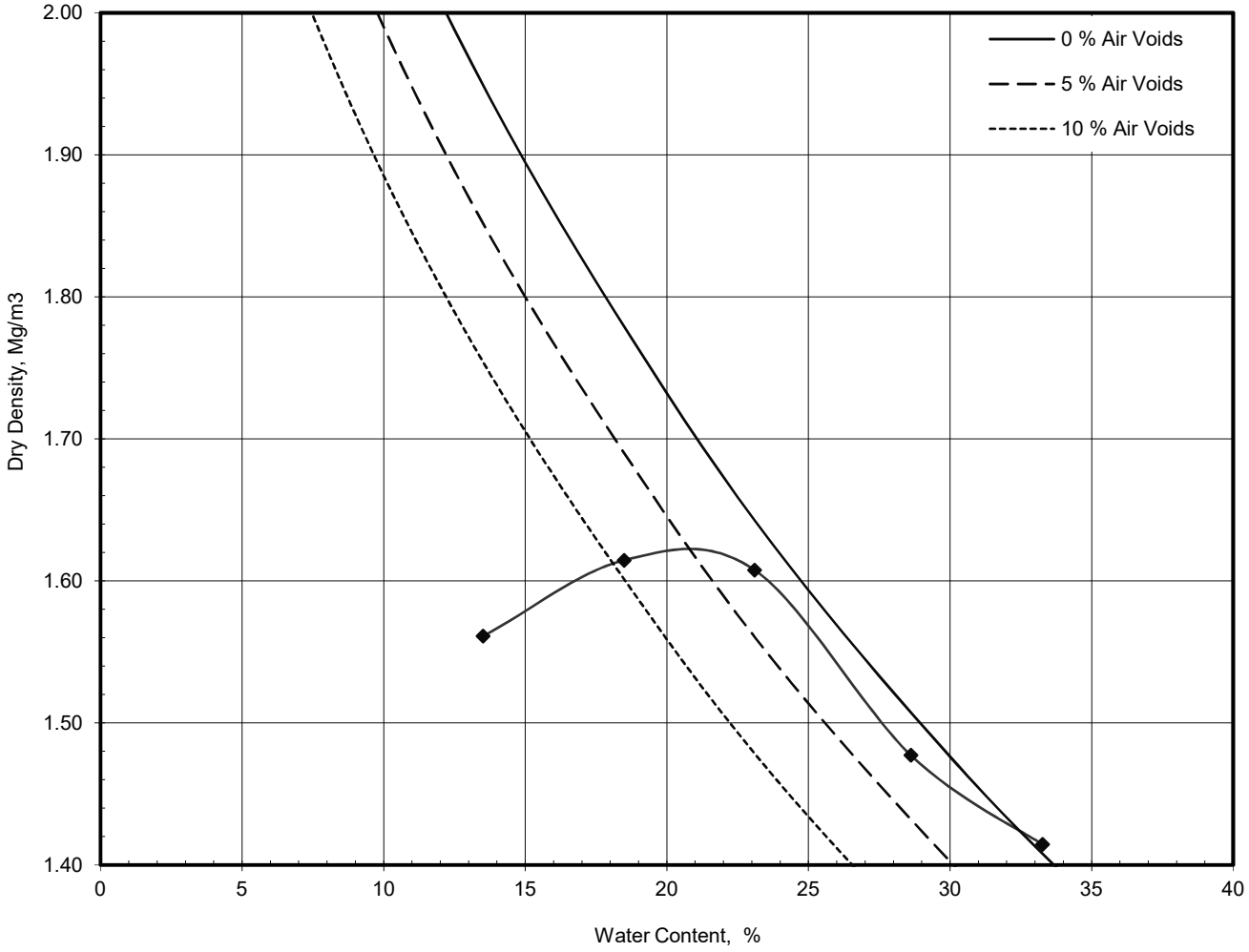


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.57**

Optimum Water Content	%	**24**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP15
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051933
					Compaction Test Reference/No.	9

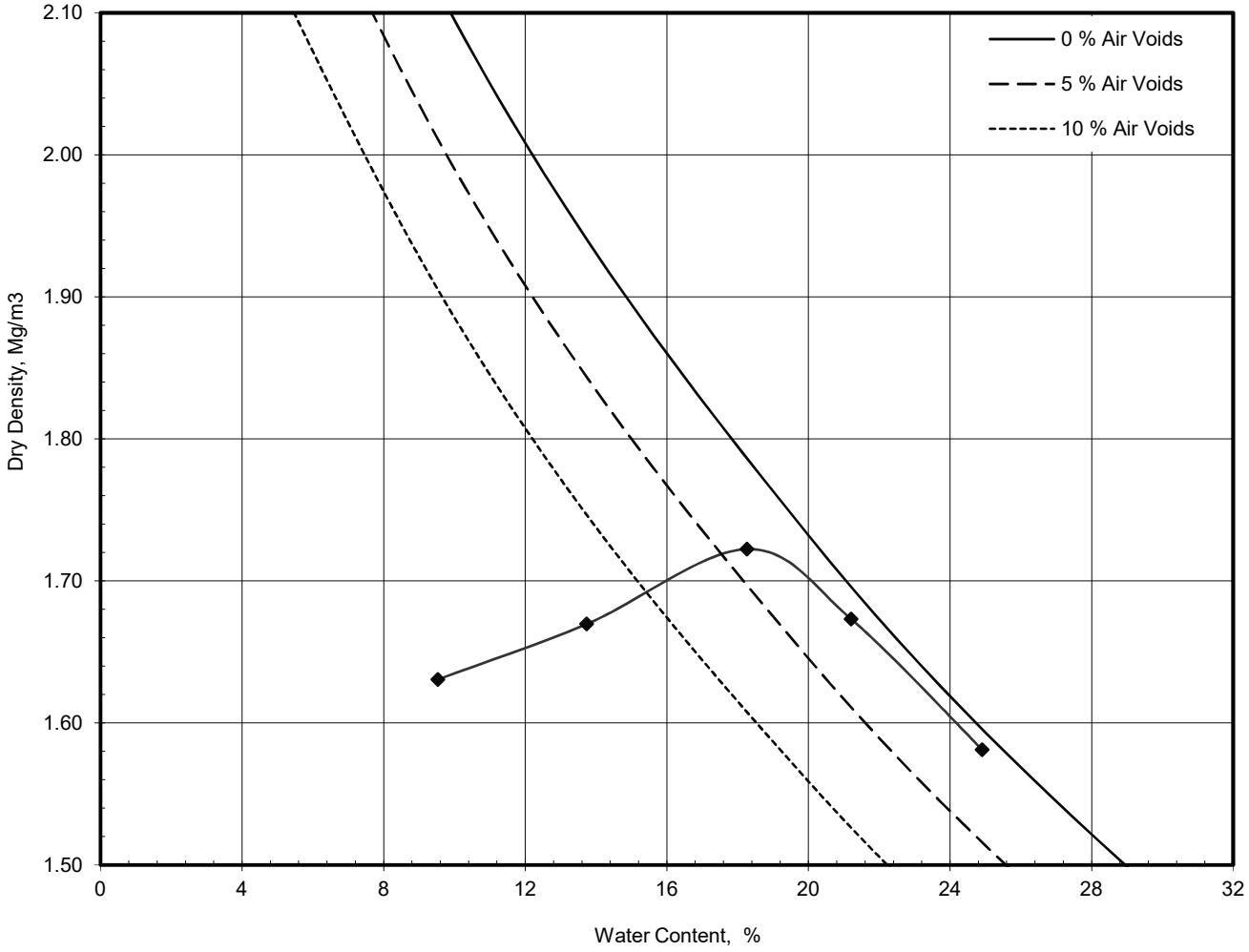


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Measured	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.62**

Optimum Water Content	%	**21**

Operator	Checked	Approved	Remarks	**Fig 4**
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP16
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051934
					Compaction Test Reference/No.	10

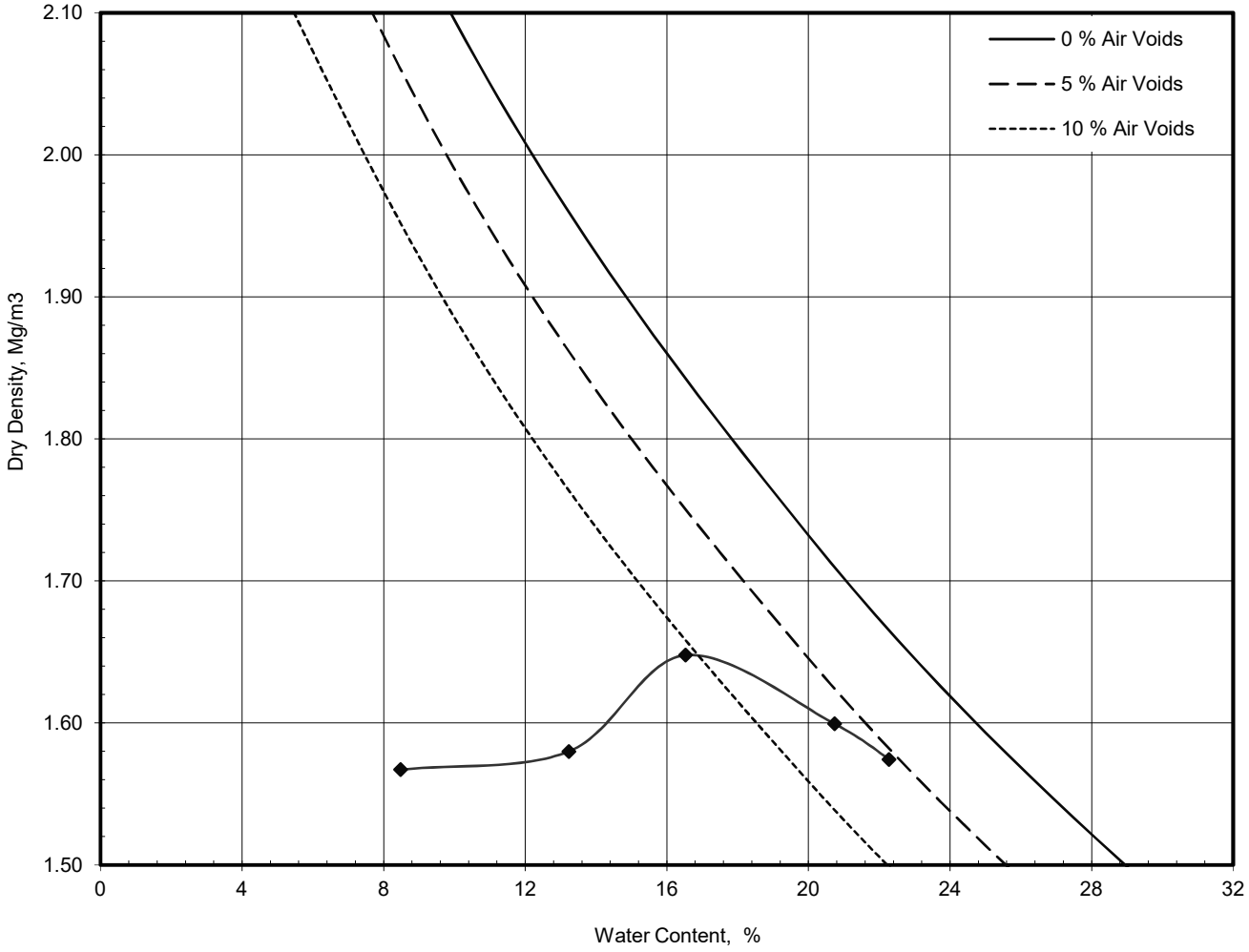


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.72**

Optimum Water Content	%	**18**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP17
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051935
					Compaction Test Reference/No.	11

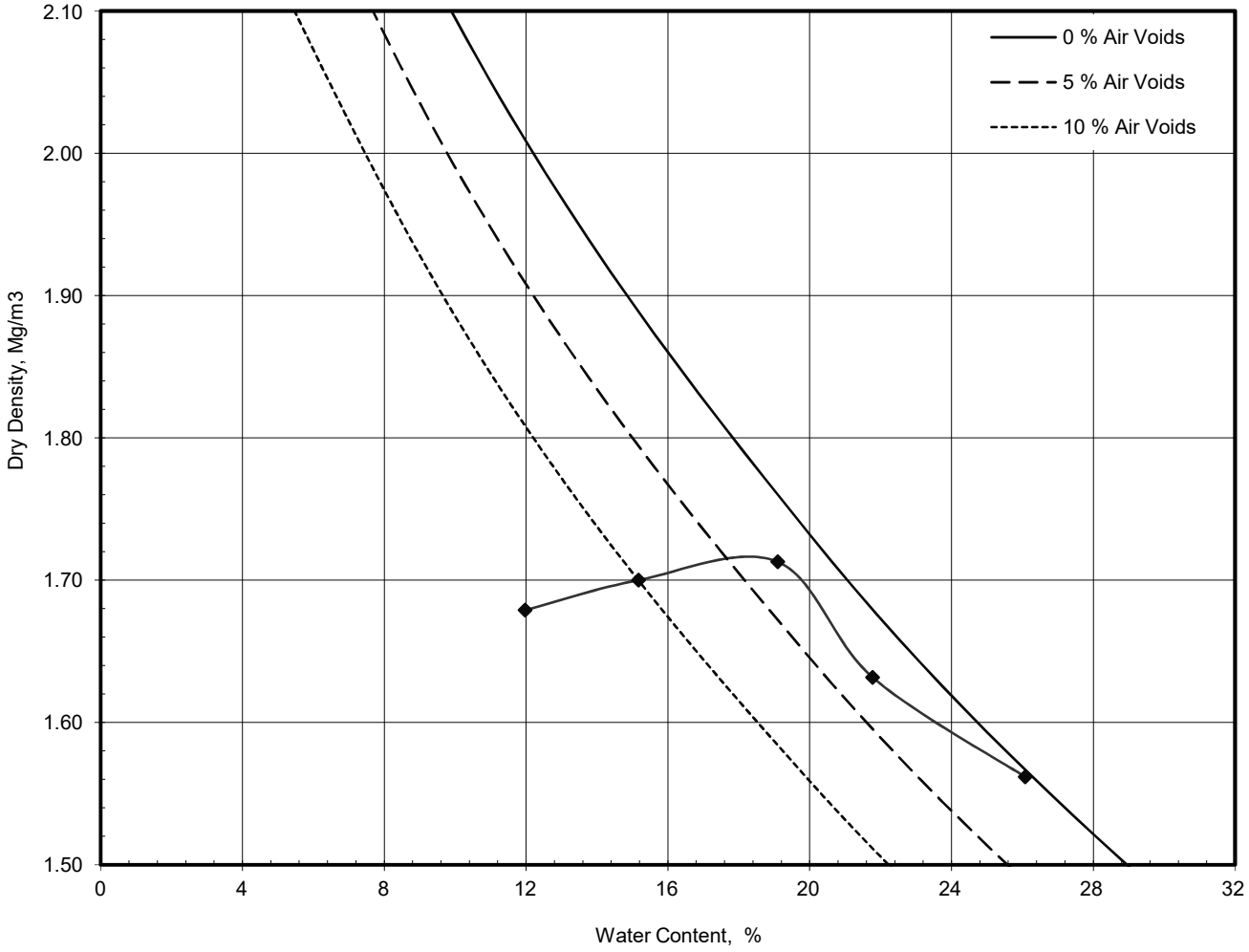


Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.65**

Optimum Water Content	%	**17**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

	Dry Density / Water Content Relationship Light Compaction				Job Ref	C4826/24/E/7379
					Borehole / Pit No	TP18
Site Name	**Home Farm**				Sample No	1
Soil Description	Firm grey slightly sandy silty CLAY.				Depth	1.00 m
Specimen Ref.	1	Specimen Depth	1	m	Sample Type	B
Test Method	BS1377-2:2022, clause 11.3, 2.5kg rammer				Keylab ID	RGS_2025051936
					Compaction Test Reference/No.	12



Preparation		Material used was natural
Mould Type		One Litre
Samples Used		Single sample tested
Material Retained on 37.5 mm Sieve	%	0
Material Retained on 20.0 mm Sieve	%	0
Particle Density - Assumed	Mg/m³	2.65
Grading Zone		1
Maximum Dry Density	Mg/m³	**1.72**

Optimum Water Content	%	**18**

Operator	Checked	Approved	Remarks	Fig 4
EC	EC	Harry		Sheet 1 of 1

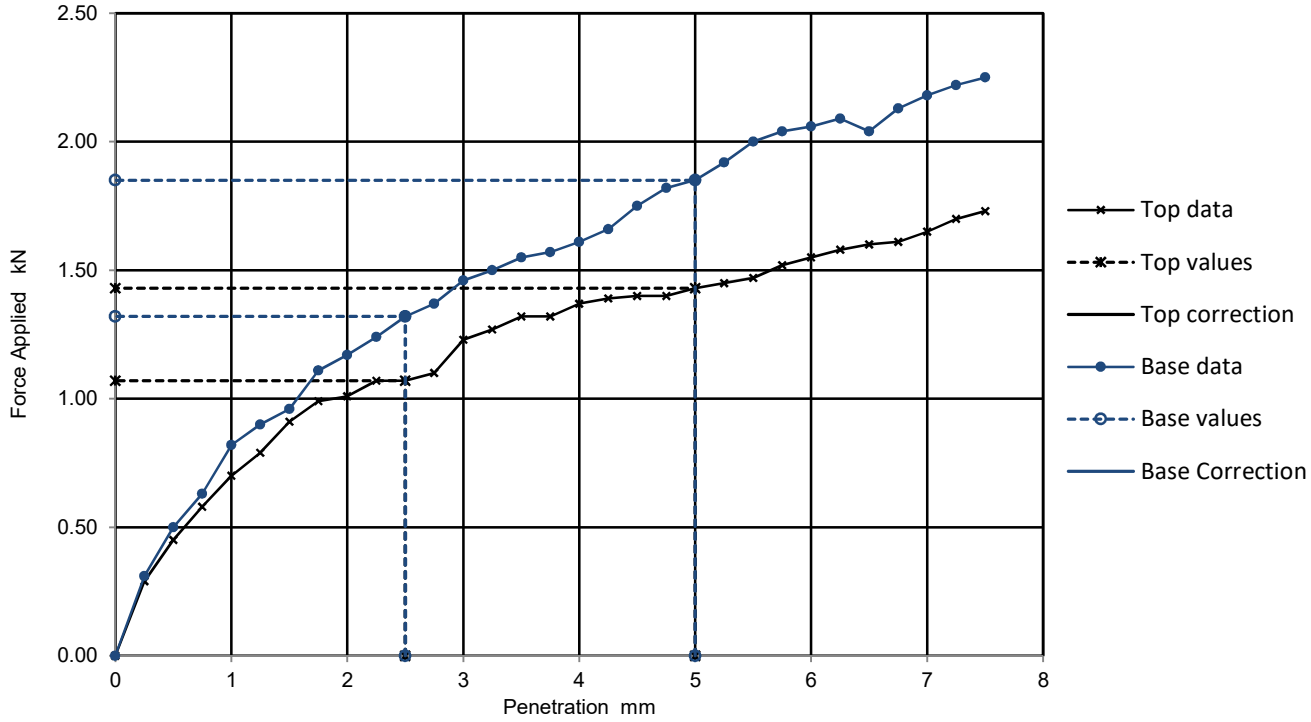
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP01
Site Name	Home Farm			Sample No.	1
Soil Description	Firm brown mottled grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm brown mottled grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051925
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.93	Mg/m3	Surcharge applied	2	kg
	Dry density	1.58	Mg/m3		1	kPa
	Moisture content	22.3	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		8.1	7.2	8.1		22.5
BASE		10.0	9.3	10.0		23.3

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	1

Lab Sheet Reference :

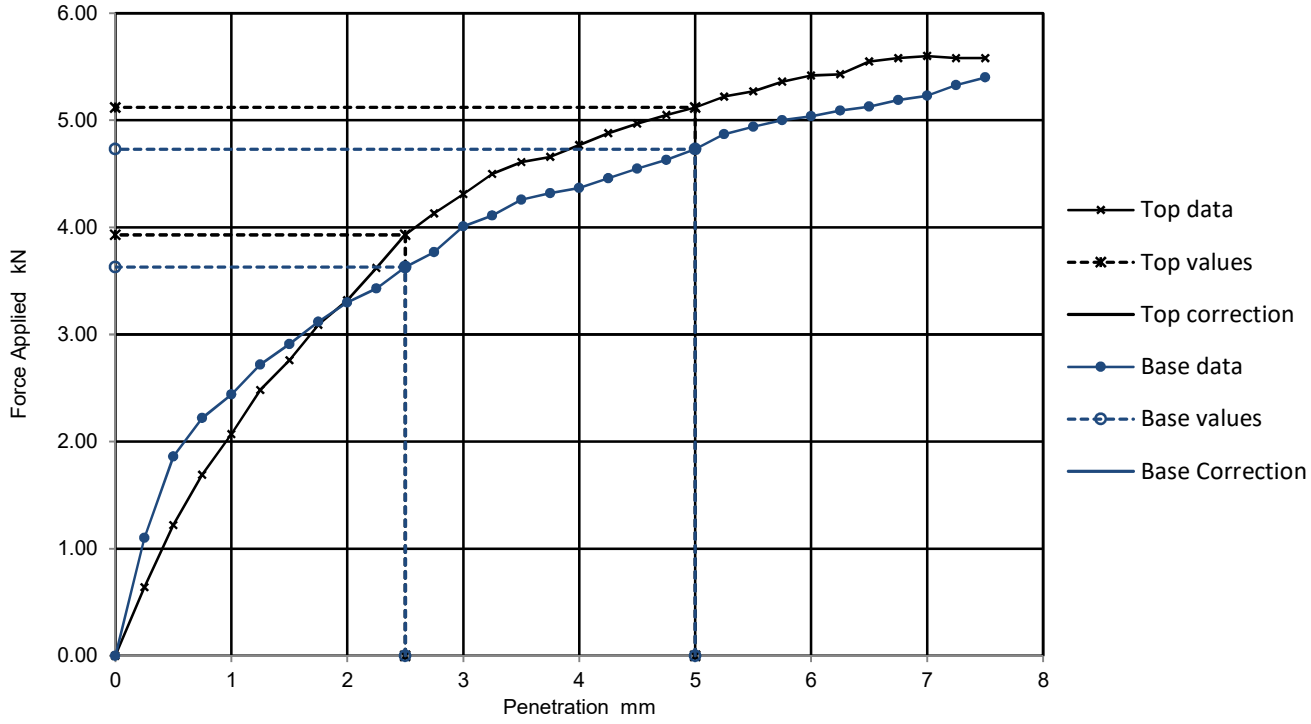
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP03
Site Name	Home Farm			Sample No.	1
Soil Description	Firm greyish brown slightly sandy silty CLAY.			Depth m	0.50
Specimen Reference	2	Specimen Depth	0.50 m	Sample Type	B
Specimen Description	Firm greyish brown slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051926
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked
Details	Recompacted to specified density using 2.5kg rammer			Period of soaking	days
				Time to surface	days
				Amount of swell recorded	mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking	Mg/m3
Initial Specimen details	Bulk density	2.00	Mg/m3	Surcharge applied	2 kg
	Dry density	1.71	Mg/m3		1 kPa
	Moisture content	17.0	%		

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	30.0	26.0	30.0	29.0	17.0
BASE	No	28.0	24.0	28.0		17.0

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	2

Lab Sheet Reference :

California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP04
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	0.50
Specimen Reference	1	Specimen Depth	0.50 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051927
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition: REMOULDED

Details: Recompacted with specified standard effort using 2.5kg rammer

Material retained on 20mm sieve removed: 0 %

Initial Specimen details: Bulk density 1.98 Mg/m3; Dry density 1.65 Mg/m3; Moisture content 19.7 %

Soaking details: Not soaked

Period of soaking: days

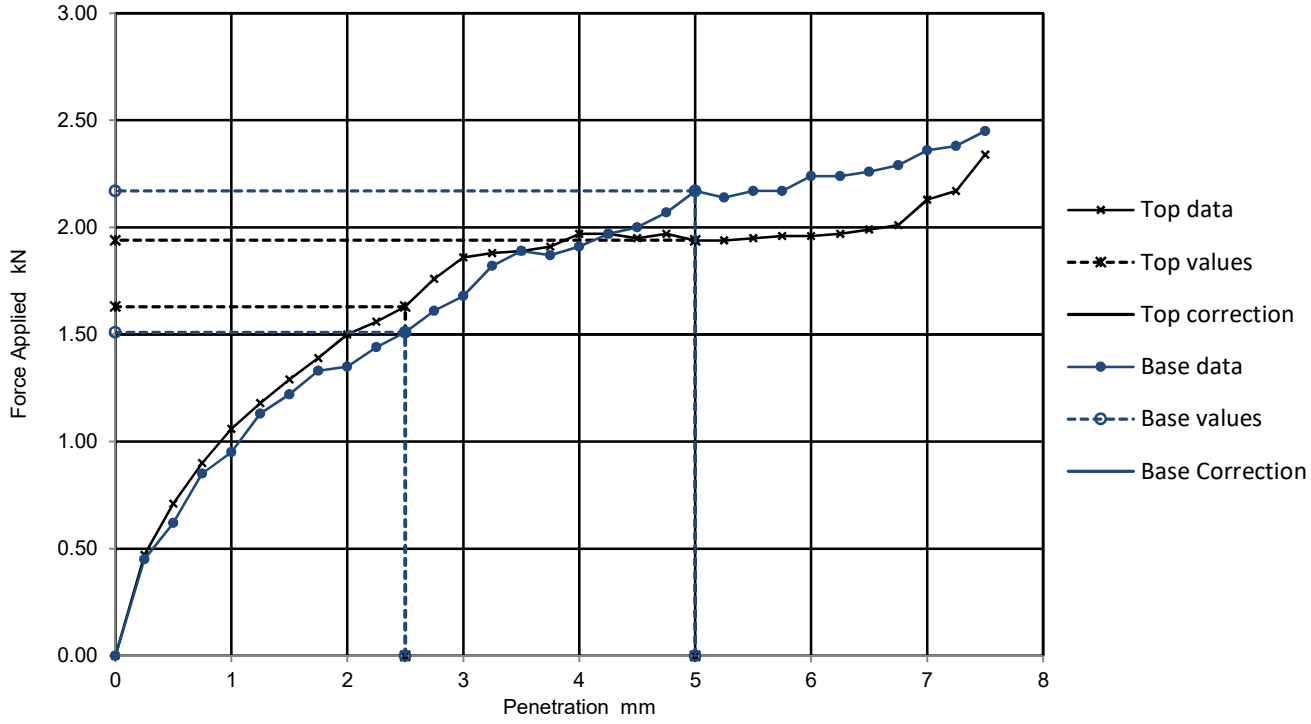
Time to surface: days

Amount of swell recorded: mm

Dry density after soaking: Mg/m3

Surcharge applied: 2 kg; 1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		12.0	9.7	12.0	12.0	18.1
BASE		11.0	11.0	11.0		19.6

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No. 5

Sheet No 3

Lab Sheet Reference :

California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP05
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	0.50
Specimen Reference	2	Specimen Depth	0.50 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051928
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition: REMOULDED
Details: Recompacted to specified density using 2.5kg rammer

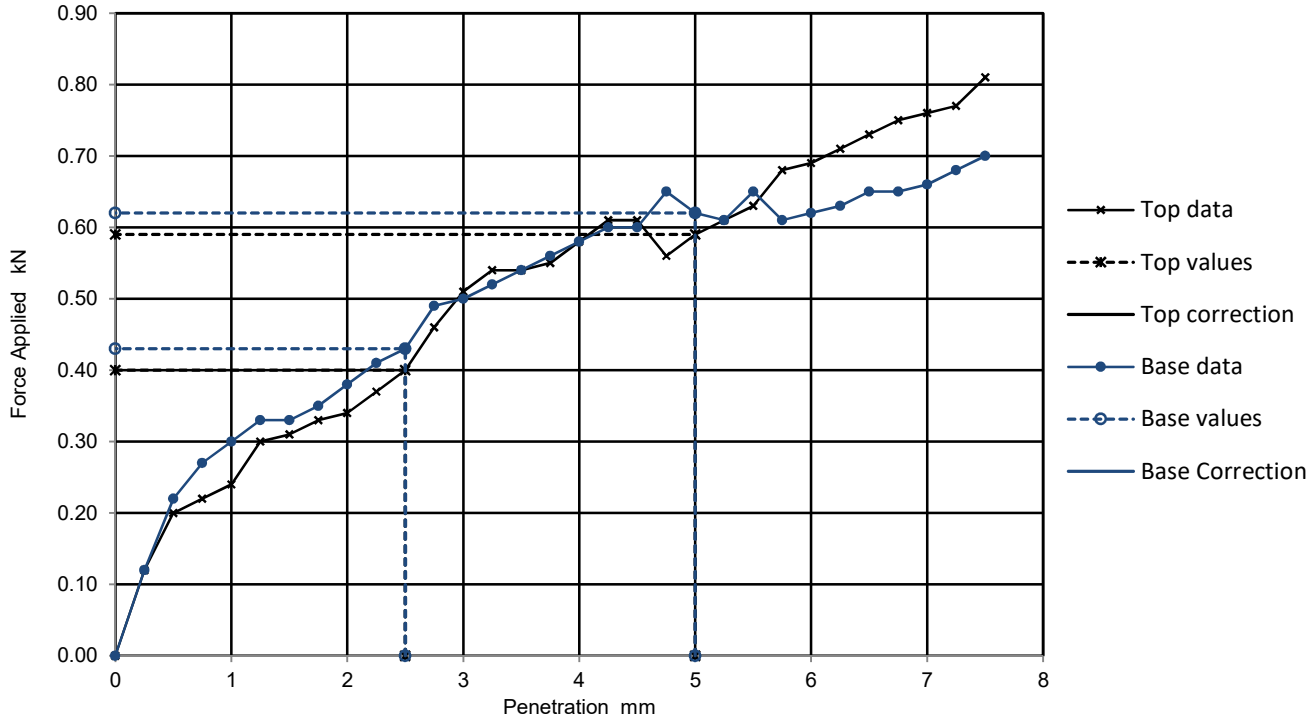
Material retained on 20mm sieve removed: 0 %

Initial Specimen details: Bulk density 1.93 Mg/m3; Dry density 1.56 Mg/m3; Moisture content 23.5 %

Soaking details: Not soaked
Period of soaking: days
Time to surface: days
Amount of swell recorded: mm
Dry density after soaking: Mg/m3

Surcharge applied: 2 kg; 1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP	No	3.0	3.0	3.0	3.1	24.4
BASE	No	3.3	3.1	3.3		25.2

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No. 5

Sheet No 4

Lab Sheet Reference :

California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP06
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	0.50
Specimen Reference	1	Specimen Depth	0.50 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051929
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition: REMOULDED

Details: Recompacted with specified standard effort using 2.5kg rammer

Material retained on 20mm sieve removed: 0 %

Soaking details: Not soaked

Period of soaking: days

Time to surface: days

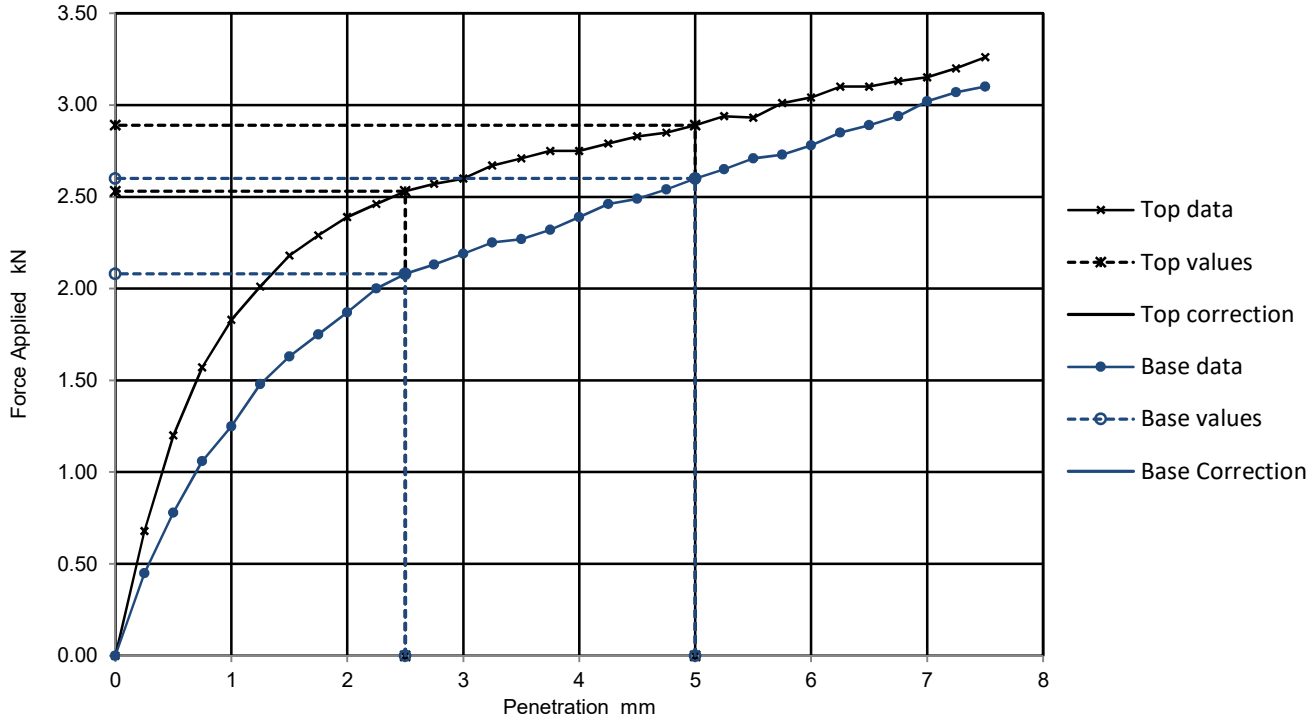
Amount of swell recorded: mm

Dry density after soaking: Mg/m3

Initial Specimen details			
	Bulk density	1.93	Mg/m3
	Dry density	1.62	Mg/m3
	Moisture content	18.9	%

Surcharge applied: 2 kg; 1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		19.0	14.0	19.0	17.0	18.7
BASE		16.0	13.0	16.0		18.2

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No. 5

Sheet No 5

Lab Sheet Reference :

California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP07
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051930
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition: REMOULDED

Details: Recompacted with specified standard effort using 2.5kg rammer

Material retained on 20mm sieve removed: 0 %

Initial Specimen details: Bulk density 1.99 Mg/m3; Dry density 1.62 Mg/m3; Moisture content 22.5 %

Soaking details: Not soaked

Period of soaking: days

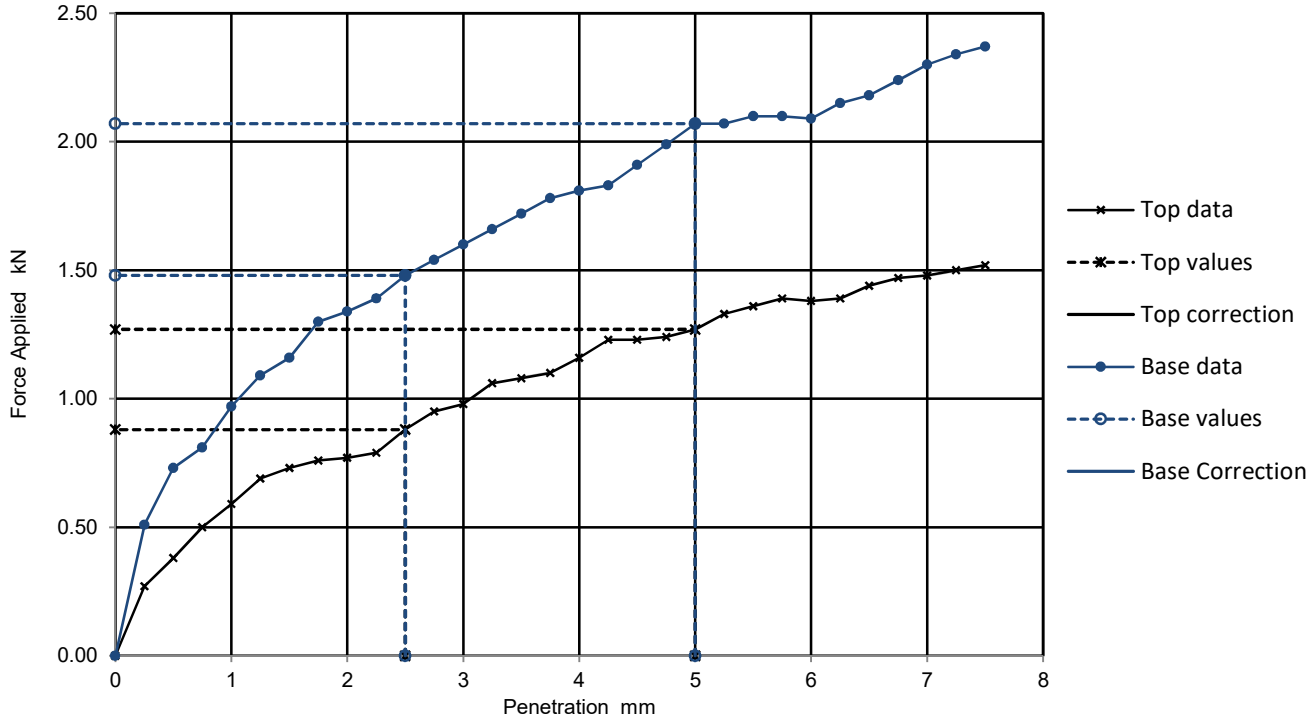
Time to surface: days

Amount of swell recorded: mm

Dry density after soaking: Mg/m3

Surcharge applied: 2 kg; 1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		6.7	6.4	6.7		22.1
BASE		11.0	10.0	11.0		21.3

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No. 5

Sheet No 6

Lab Sheet Reference :

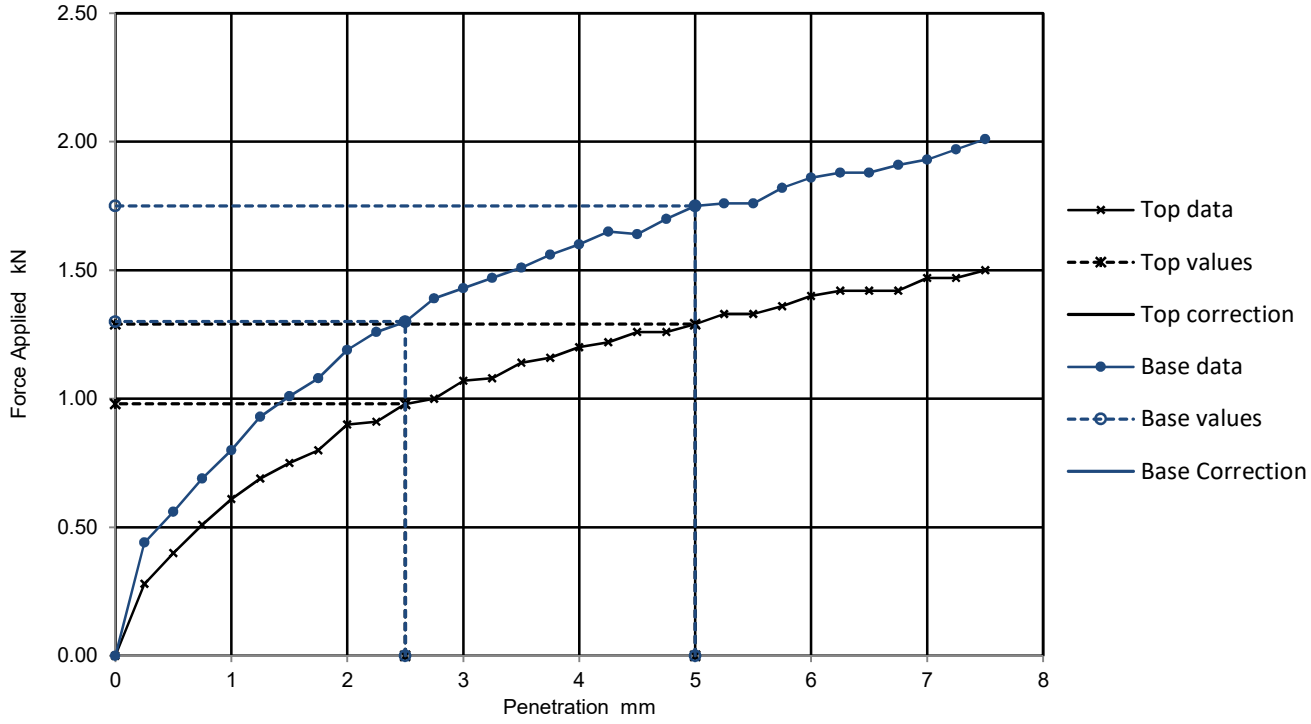
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP08
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051931
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.94	Mg/m3	Surcharge applied	2	kg
	Dry density	1.57	Mg/m3		1	kPa
	Moisture content	23.8	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		7.4	6.5	7.4		24.6
BASE		9.8	8.8	9.8		24.1

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	7

Lab Sheet Reference :

California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP14
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	2	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051932
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition: REMOULDED

Details: Recompacted to specified density using 2.5kg rammer

Material retained on 20mm sieve removed: 0 %

Initial Specimen details: Bulk density 1.94 Mg/m3; Dry density 1.56 Mg/m3; Moisture content 24.5 %

Soaking details: Not soaked

Period of soaking: days

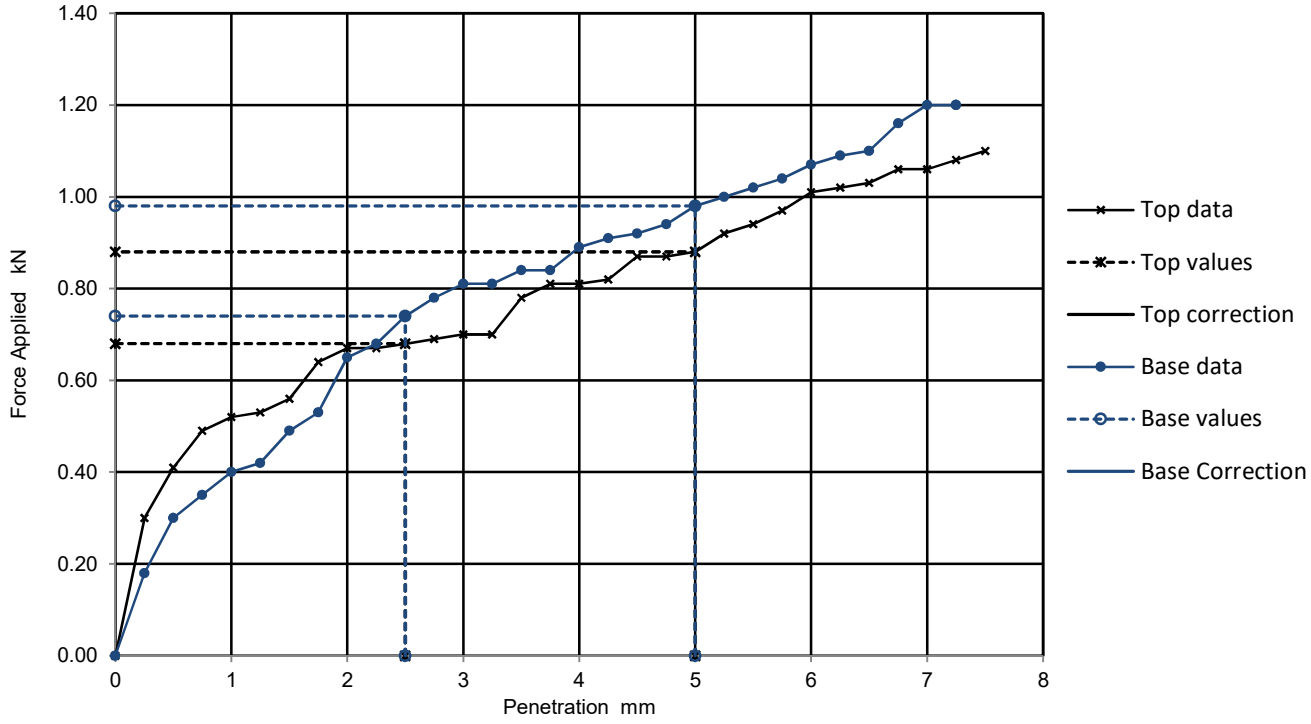
Time to surface: days

Amount of swell recorded: mm

Dry density after soaking: Mg/m3

Surcharge applied: 2 kg; 1 kPa

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		5.2	4.4	5.2	5.4	23.5
BASE		5.6	4.9	5.6		24.6

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No. 5

Sheet No 8

Lab Sheet Reference :

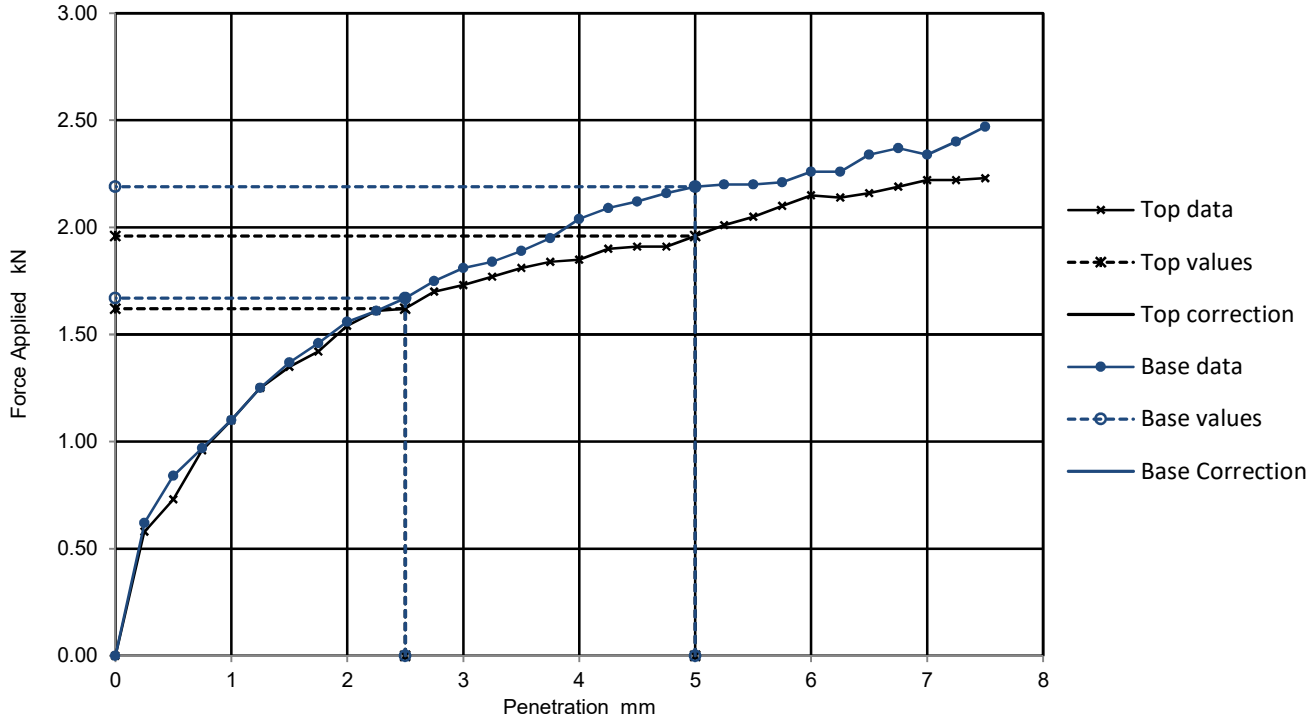
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP15
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051933
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	1.95	Mg/m3	Surcharge applied	2	kg
	Dry density	1.59	Mg/m3		1	kPa
	Moisture content	22.5	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		12.0	9.8	12.0	12.0	21.0
BASE		13.0	11.0	13.0		22.8

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	9

Lab Sheet Reference :

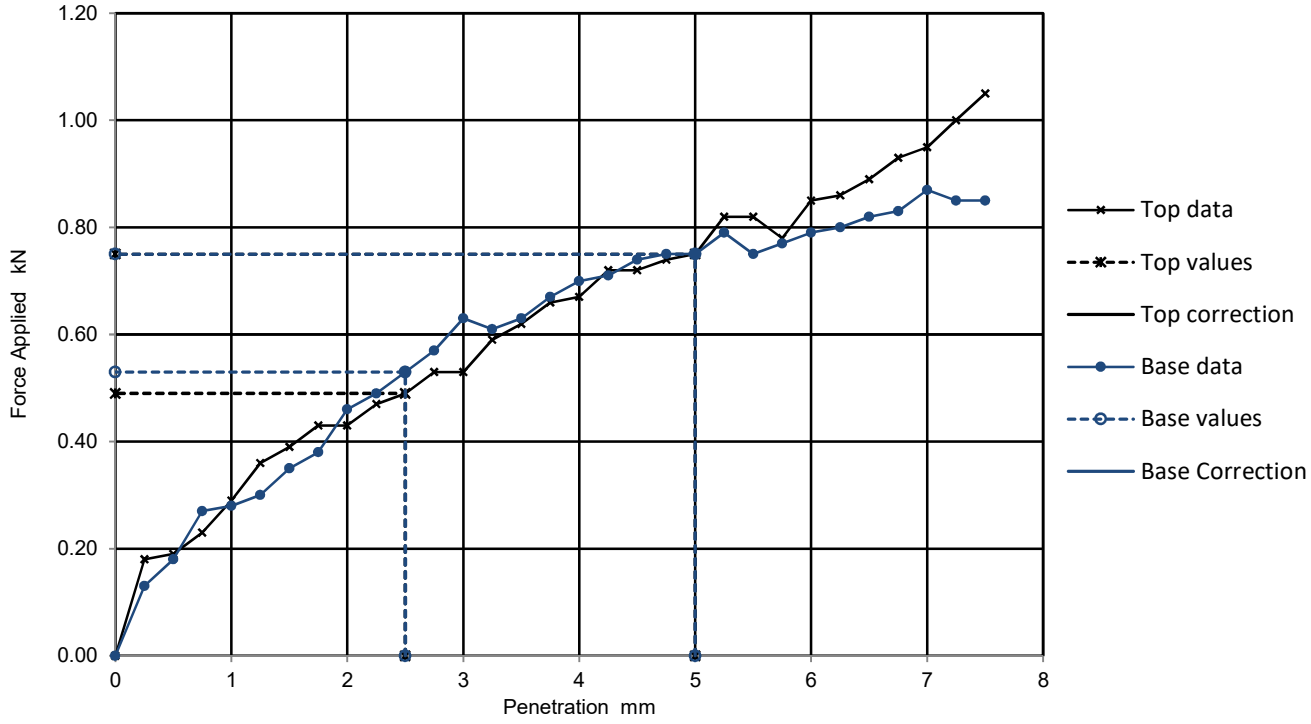
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP16
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051934
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.04	Mg/m3	Surcharge applied	2	kg
	Dry density	1.70	Mg/m3		1	kPa
	Moisture content	20.3	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		3.7	3.8	3.8	3.9	20.6
BASE		4.0	3.8	4.0		19.9

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	10

Lab Sheet Reference :

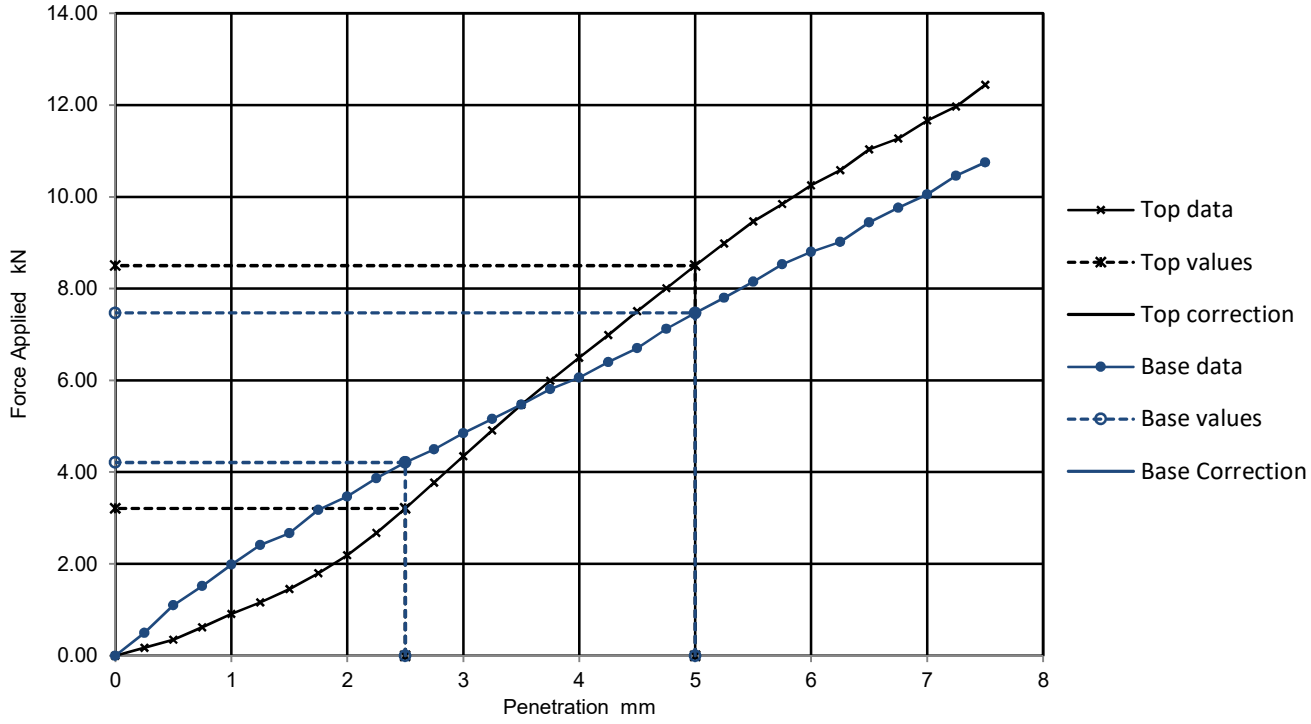
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP17
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051935
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.17	Mg/m3	Surcharge applied	2	kg
	Dry density	1.97	Mg/m3		1	kPa
	Moisture content	10.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		24.0	43.0	43.0	40.0	10.5
BASE		32.0	37.0	37.0		10.7

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	11

Lab Sheet Reference :

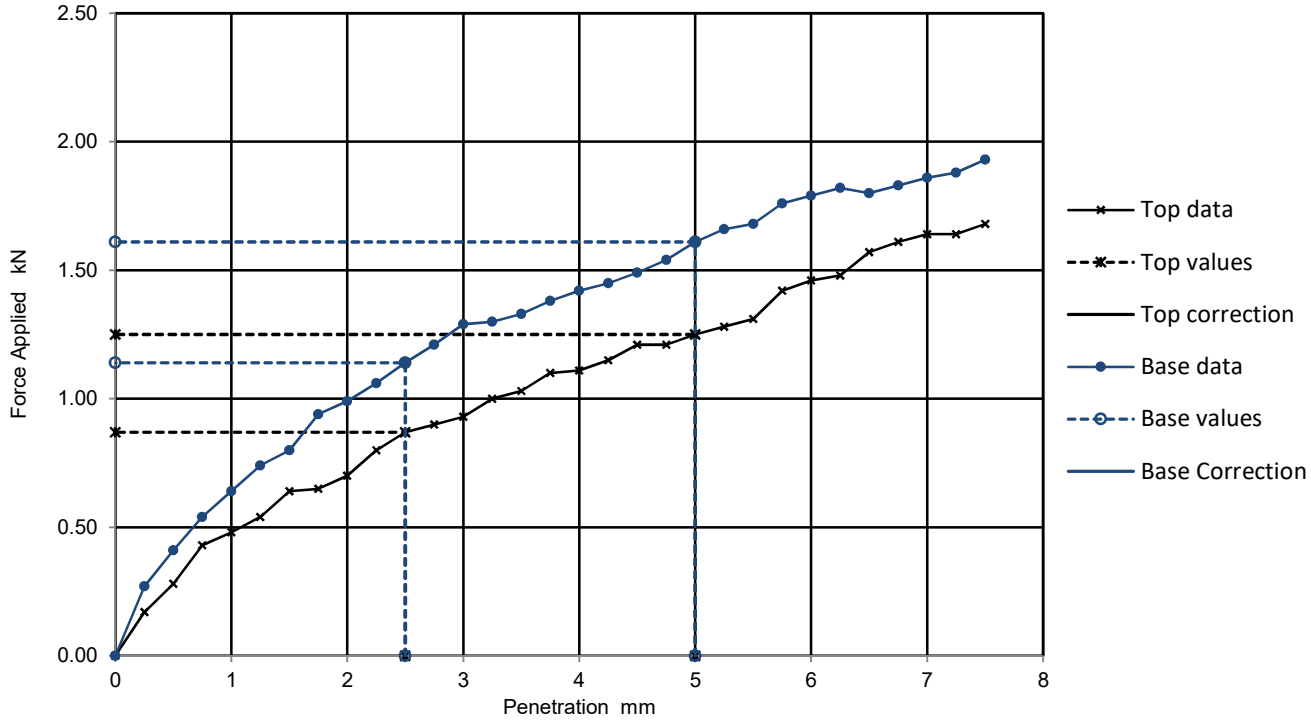
California Bearing Ratio (CBR)

				Job Ref	C4826/24/E/7379
				Borehole/Pit No.	TP18
Site Name	Home Farm			Sample No.	1
Soil Description	Firm grey slightly sandy silty CLAY.			Depth m	1.00
Specimen Reference	1	Specimen Depth	1.00 m	Sample Type	B
Specimen Description	Firm grey slightly sandy silty CLAY.			KeyLAB ID	RGS_2025051936
Test Method	BS 1377-2:2022			CBR Test Number	1

Specimen Preparation

Condition	REMOULDED			Soaking details	Not soaked	
Details	Recompacted with specified standard effort using 2.5kg rammer			Period of soaking		days
				Time to surface		days
				Amount of swell recorded		mm
Material retained on 20mm sieve removed		0	%	Dry density after soaking		Mg/m3
Initial Specimen details	Bulk density	2.02	Mg/m3	Surcharge applied	2	kg
	Dry density	1.68	Mg/m3		1	kPa
	Moisture content	20.4	%			

Force v Penetration Plots



Results

	Curve correction applied	CBR Values, % 2.5mm	5mm	Highest	Average	Moisture Content %
TOP		6.6	6.3	6.6		21.4
BASE		8.6	8.1	8.6		20.2

General remarks	Test specific remarks	Approved
	Results reported under 1kN are below the loadcells lower limit and are outside of the calibrated range.	Harry

Fig No.	5
Sheet No	12

Lab Sheet Reference :

Laboratory Report

UKAS TESTING 2788

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES A PHENNA GROUP COMPANY

Contract Number: 78342

Client Ref: **C4826/24/E/7379**
Client PO:

Date Received: **22-04-2025**
Date Completed: **01-05-2025**
Report Date: **01-05-2025**

Client: **Rogers Geotechnical Services LTD**

Contract Title: **Home Farm**
For the attention of: **Harry Letch**

This report has been checked and approved by:



Richard John
Quality/Technical Manager

Description	Qty
Determination of water content BS EN ISO 17892-1:2014 - @ Non Accredited Test	12
4 Point Liquid & Plastic Limit.. BS EN ISO 17892-12 - * UKAS	12
One-dimensional Consolidation 75mm or 50mm diameter specimens (up to 5 stages/days) BS 1377:1990 - Part 5 : 3 - * UKAS	18
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	12

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

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 test report/certificate shall not be reproduced except in full, without the approval of GEO Site & Testing Services Ltd. Any opinions or interpretations stated - within this report/certificate are excluded from the laboratories UKAS accreditation.

Approved Signatories:
Brendan Evans (Senior Office Administrator) - Darren Bourne (Quality Senior Technician) - Paul Evans (Director)
Richard John (Quality/Technical Manager) - Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager)
Wayne Honey (HR & HSE Manager)

GEO Site & Testing Services Ltd
Unit 3-4 Heol Aur, Dafen Ind Est, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784 040 Fax: 01554 784 040 info@gstl.co.uk https://gstl.co.uk

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX** **BS EN ISO 17892-12:2018+A2:2022 4 Point Liquid Limit** **BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content**	
Contract Number	78342	
Project Name	Home Farm	
Date Tested	30/04/2025	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Descriptions
BH01		U	2.00	-	2.45	Grey Silty CLAY
BH01		U	4.00	-	4.45	Grey Silty CLAY
BH01		U	6.00	-	6.45	Grey Silty CLAY
BH01		U	7.50	-	7.95	Brown silty CLAY
BH02		U	2.00	-	2.45	Brown silty CLAY
BH02		U	4.00	-	4.45	Grey Silty CLAY
BH03		U	2.00	-	2.40	Grey Silty CLAY
BH03		U	4.00	-	4.45	Grey Silty CLAY
BH04		U	2.00	-	2.45	Brown silty CLAY
BH05		U	2.00	-	2.45	Grey Silty CLAY
BH05		U	4.00	-	4.45	Grey Silty CLAY
BH05		U	6.00	-	6.45	Brown silty CLAY
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

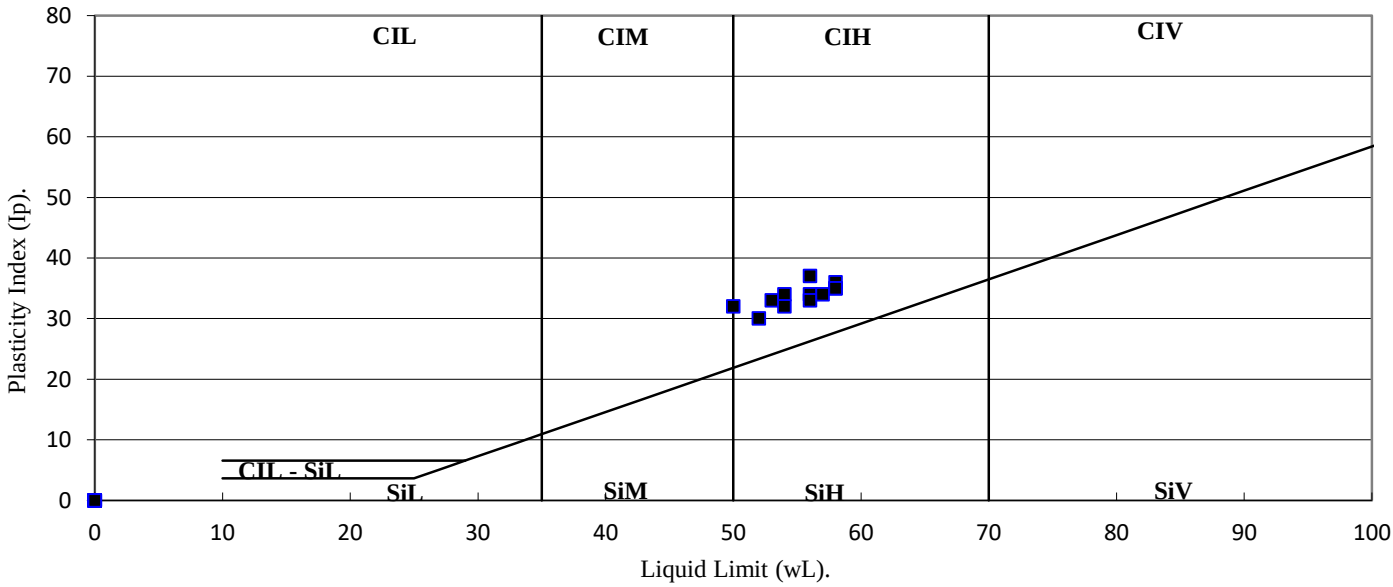
Operator
Aaron H

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	WATER CONTENT, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX BS EN ISO 17892-12:2018+A2:2022 4 Point Liquid Limit BS EN ISO 17892-1:2014+A1:2022 Determination of Water Content	
Contract Number	78342	
Project Name	Home Farm	
Date Tested	30/04/2025	
Test Comments	80g/30° Fall cone used with increasing water content	

Sample/Hole Reference	Sample Number	Sample Type	Depth (m)			Water Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH01		U	2.00	-	2.45	28.1	53	20	33	100	CH High Plasticity
BH01		U	4.00	-	4.45	32.8	56	19	37	100	CH High Plasticity
BH01		U	6.00	-	6.45	23.6	50	18	32	100	CI/H Inter/High Plasticity
BH01		U	7.50	-	7.95	32.2	54	20	34	100	CH High Plasticity
BH02		U	2.00	-	2.45	34.1	58	22	36	100	CH High Plasticity
BH02		U	4.00	-	4.45	31.8	58	23	35	100	CH High Plasticity
BH03		U	2.00	-	2.40	28.3	56	22	34	100	CH High Plasticity
BH03		U	4.00	-	4.45	32.0	56	23	33	100	CH High Plasticity
BH04		U	2.00	-	2.45	28.0	54	22	32	100	CH High Plasticity
BH05		U	2.00	-	2.45	30.3	57	23	34	100	CH High Plasticity
BH05		U	4.00	-	4.45	32.2	58	23	35	100	CH High Plasticity
BH05		U	6.00	-	6.45	31.4	52	22	30	100	CH High Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

SYMBOLS : NP = Non Plastic **NB: All liquid limits are 4 point and wet sieved**

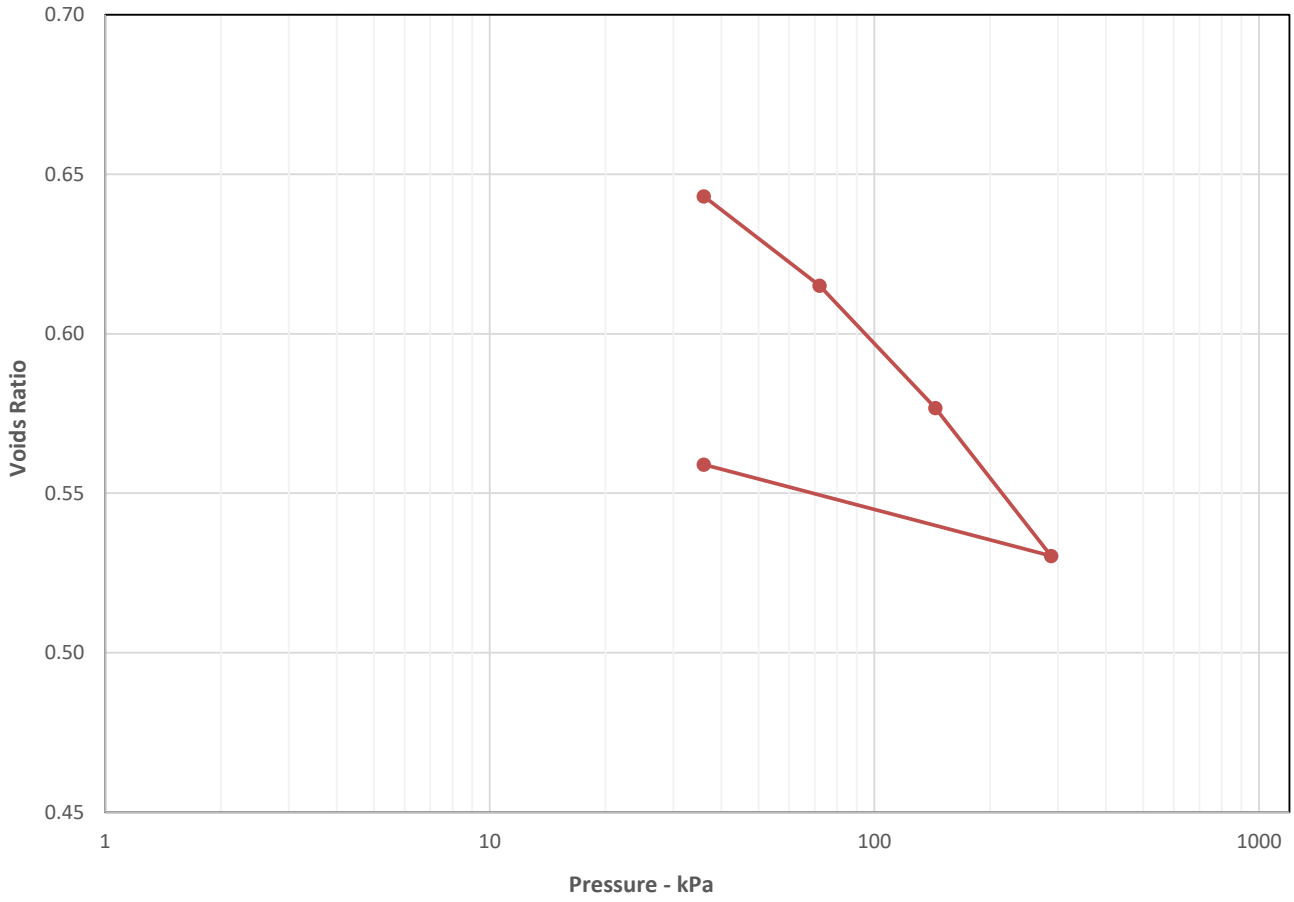
PLASTICITY CHART
BS EN ISO 14688-2:2018 Clause 4.4



***For sample descriptions please see sample descriptions sheet**

Operator
Aaron H

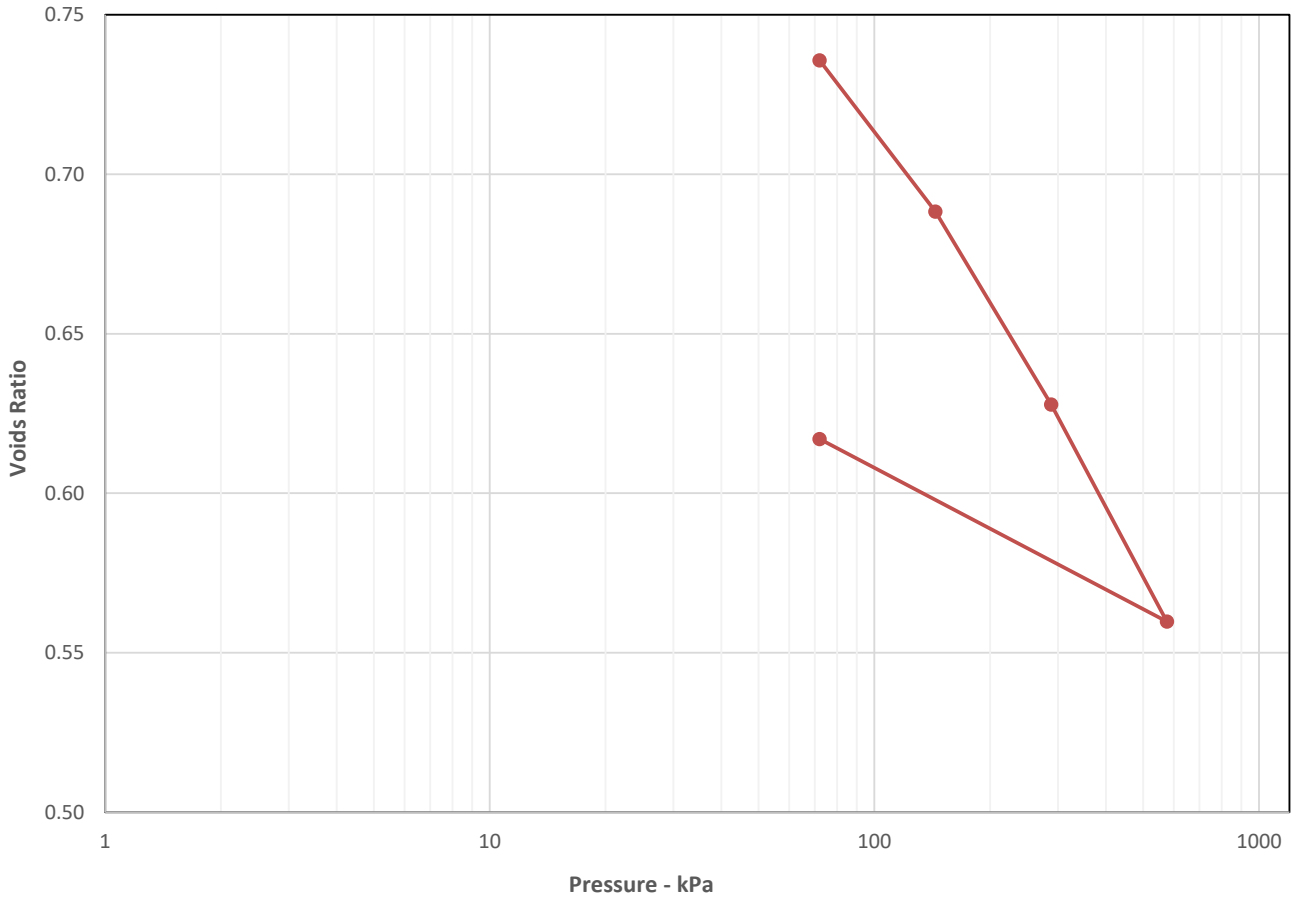
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown Silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	-	36	1.1	1.0		-			
Bulk Density (Mg/m3)	2.03	36	-	72	0.47	1.7		-			
Dry Density (Mg/m3)	1.55	72	-	144	0.33	2.1		-			
Voids Ratio	0.7114	144	-	288	0.20	2.4		-			
Degree of saturation	115.0	288	-	36	0.074	2.4		-			
Height (mm)	19.96		-					-			
Diameter (mm)	74.97		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

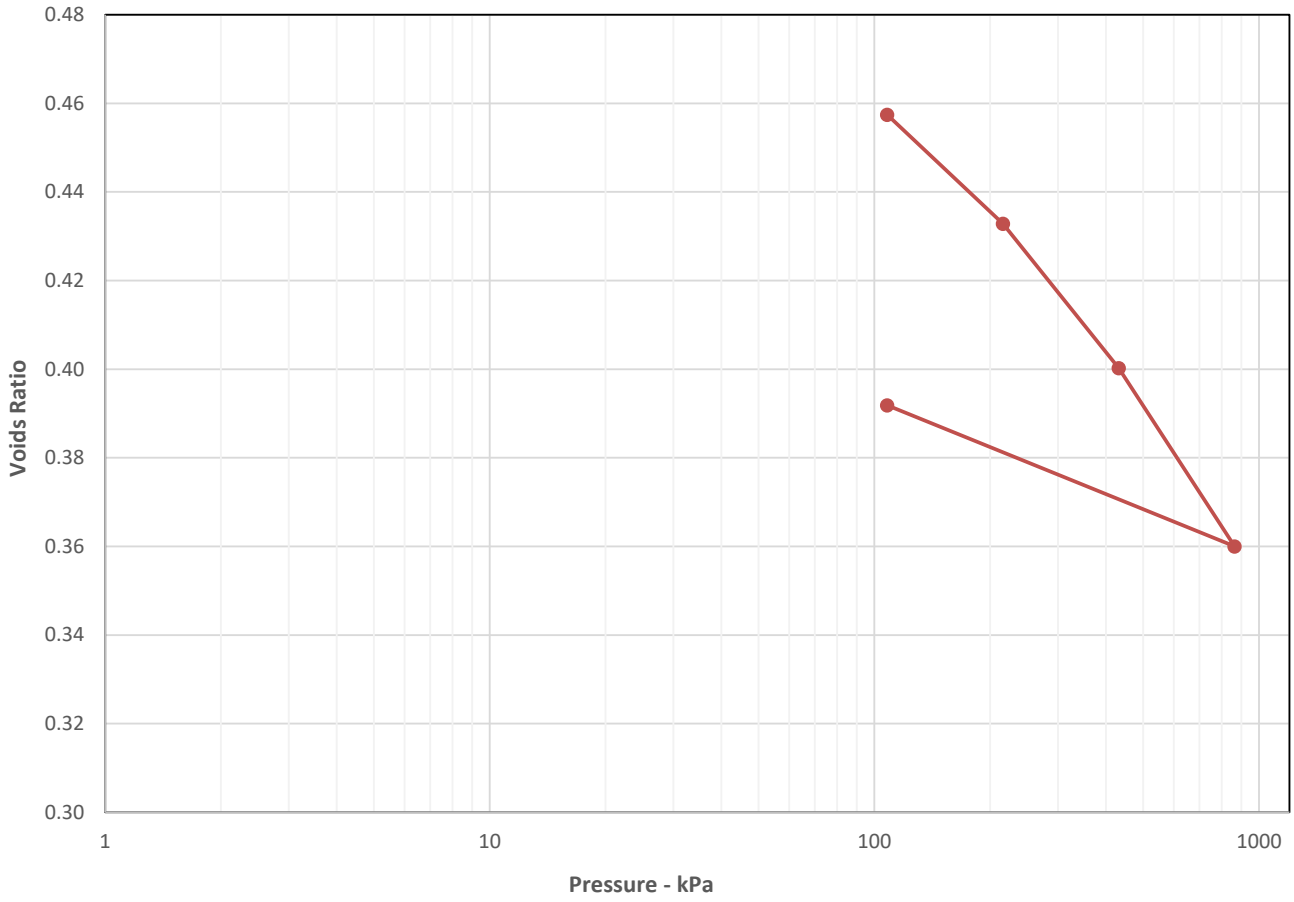
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown Silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	35	0	-	72	0.63	0.67		-			
Bulk Density (Mg/m3)	1.97	72	-	144	0.38	0.88		-			
Dry Density (Mg/m3)	1.46	144	-	288	0.25	0.98		-			
Voids Ratio	0.8188	288	-	576	0.15	1.0		-			
Degree of saturation	113.5	576	-	72	0.073	0.98		-			
Height (mm)	19.95		-					-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

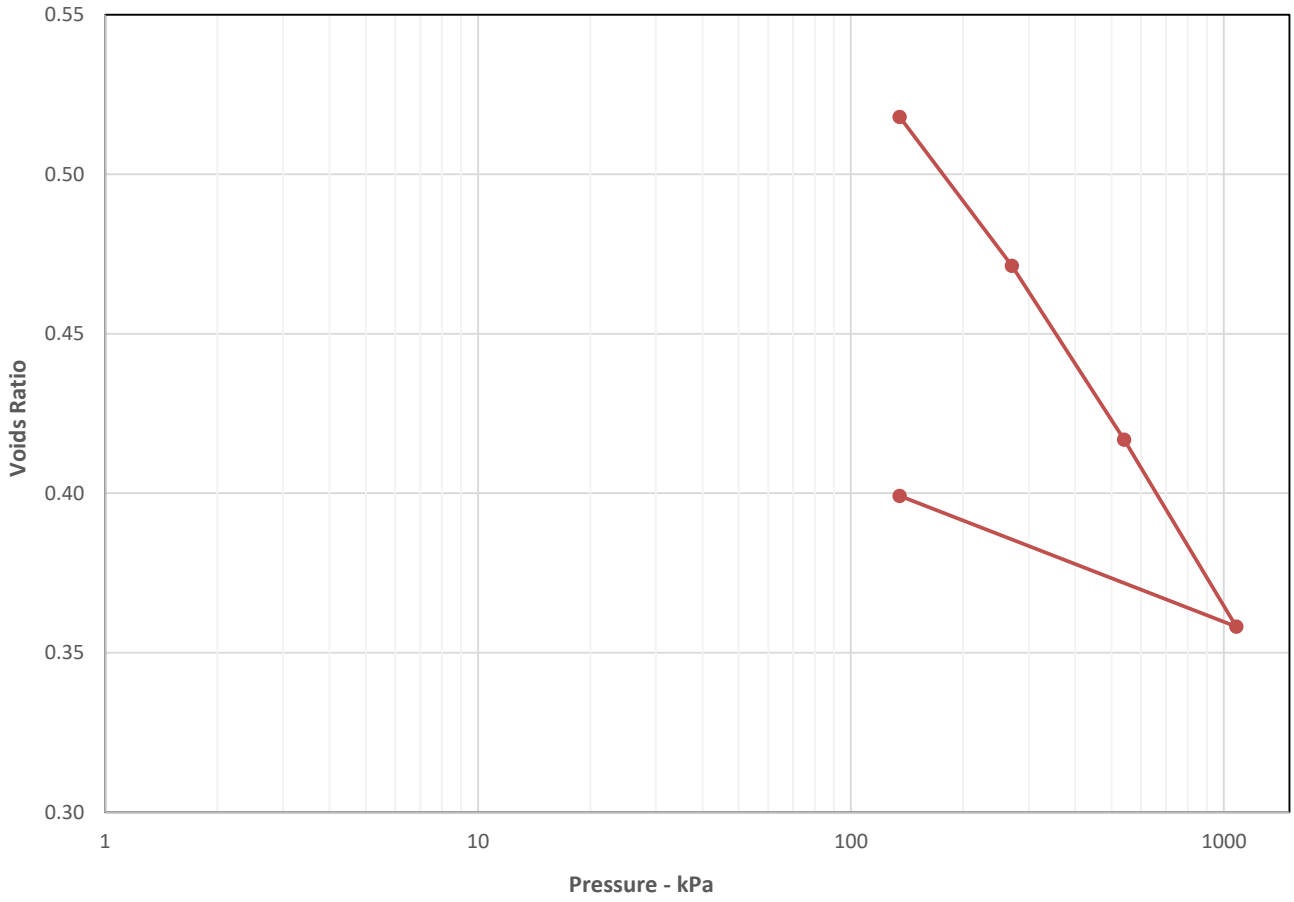
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown/Grey Slightly Gravelly Silty CLAY	Depth Top (m)	6.00
		Depth Base (m)	6.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	24	0	-	108	0.43	1.1		-			
Bulk Density (Mg/m3)	2.16	108	-	216	0.16	1.4		-			
Dry Density (Mg/m3)	1.73	216	-	432	0.11	1.7		-			
Voids Ratio	0.5287	432	-	864	0.066	1.8		-			
Degree of saturation	122.1	864	-	108	0.031	2.0		-			
Height (mm)	19.73		-					-			
Diameter (mm)	75		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

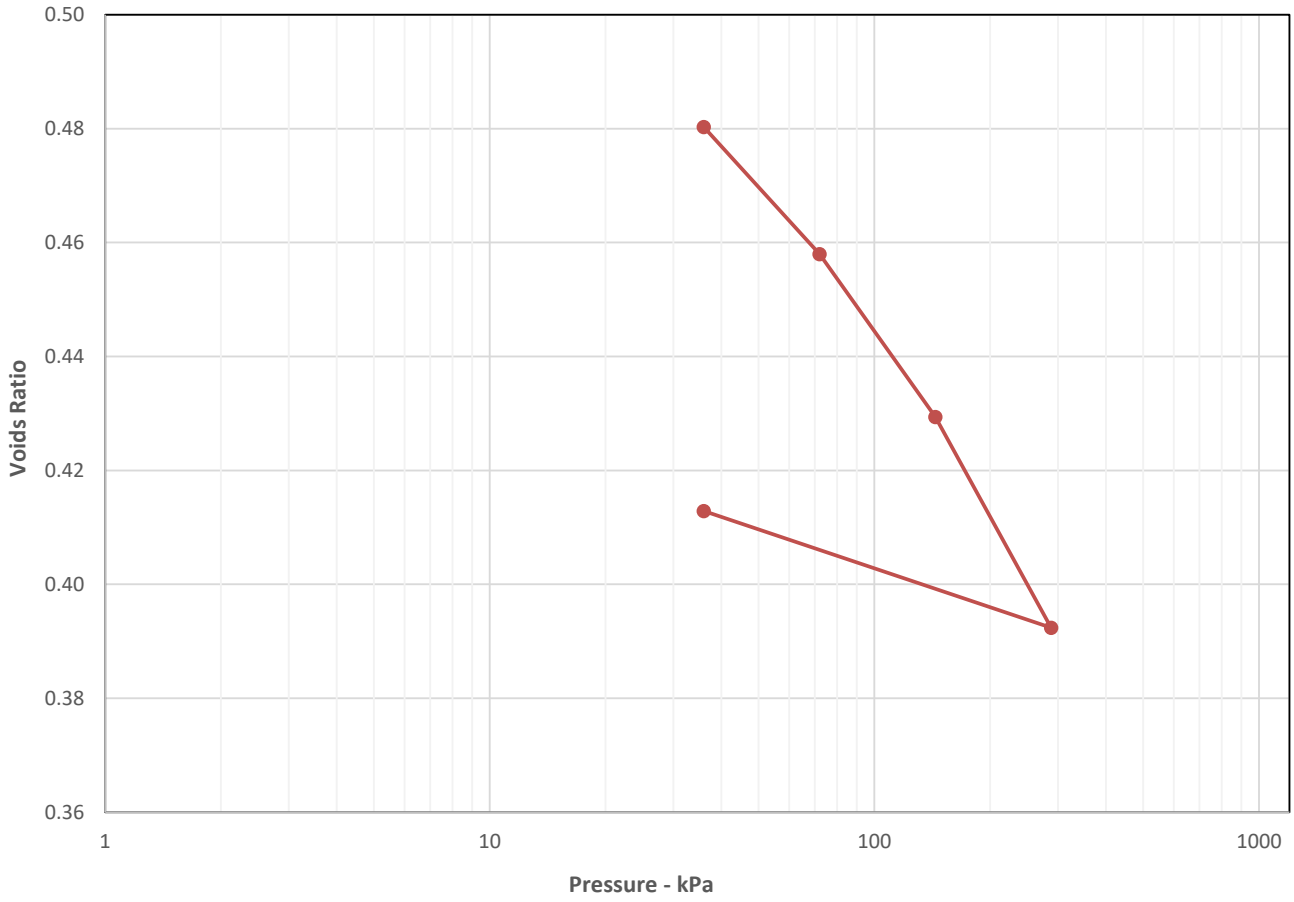
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown Silty CLAY	Depth Top (m)	7.50
		Depth Base (m)	7.95
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	30	0	-	135	0.73	1.2		-			
Bulk Density (Mg/m3)	2.05	135	-	270	0.23	1.9		-			
Dry Density (Mg/m3)	1.57	270	-	540	0.14	1.9		-			
Voids Ratio	0.6847	540	-	1080	0.077	2.1		-			
Degree of saturation	116.3	1080	-	135	0.032	3.3		-			
Height (mm)	19.91		-					-			
Diameter (mm)	74.99		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

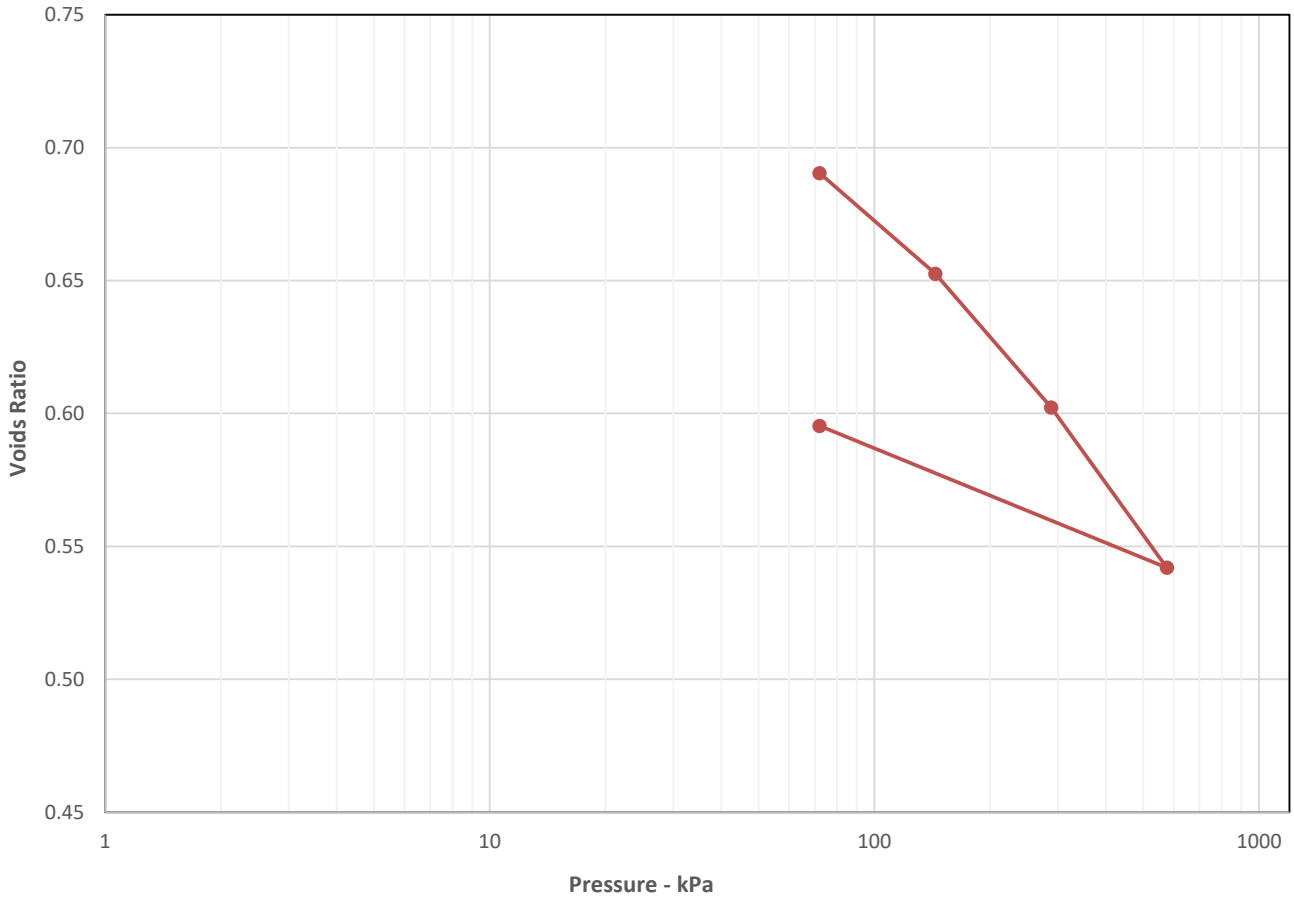
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH02
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	26	0	-	36	1.3	1.2		-			
Bulk Density (Mg/m3)	2.15	36	-	72	0.42	2.5		-			
Dry Density (Mg/m3)	1.71	72	-	144	0.27	3.7		-			
Voids Ratio	0.5533	144	-	288	0.18	5.5		-			
Degree of saturation	125.3	288	-	36	0.058	8.7		-			
Height (mm)	19.65		-					-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

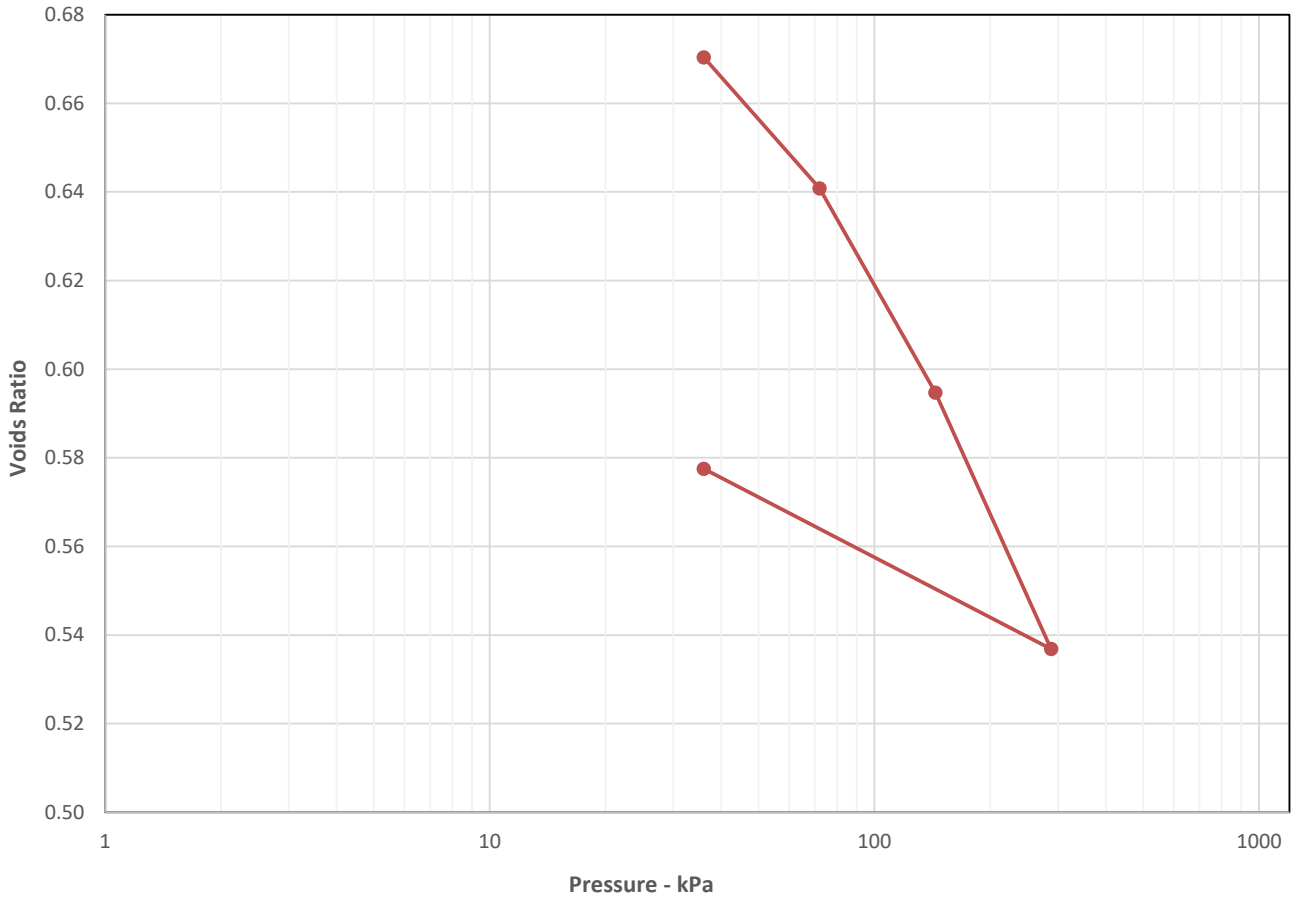
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH02
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	72	0.73	0.92		-			
Bulk Density (Mg/m3)	1.98	72	-	144	0.31	1.2		-			
Dry Density (Mg/m3)	1.49	144	-	288	0.21	1.7		-			
Voids Ratio	0.7837	288	-	576	0.13	1.8		-			
Degree of saturation	112.6	576	-	72	0.069	1.1		-			
Height (mm)	19.97		-					-			
Diameter (mm)	74.95		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

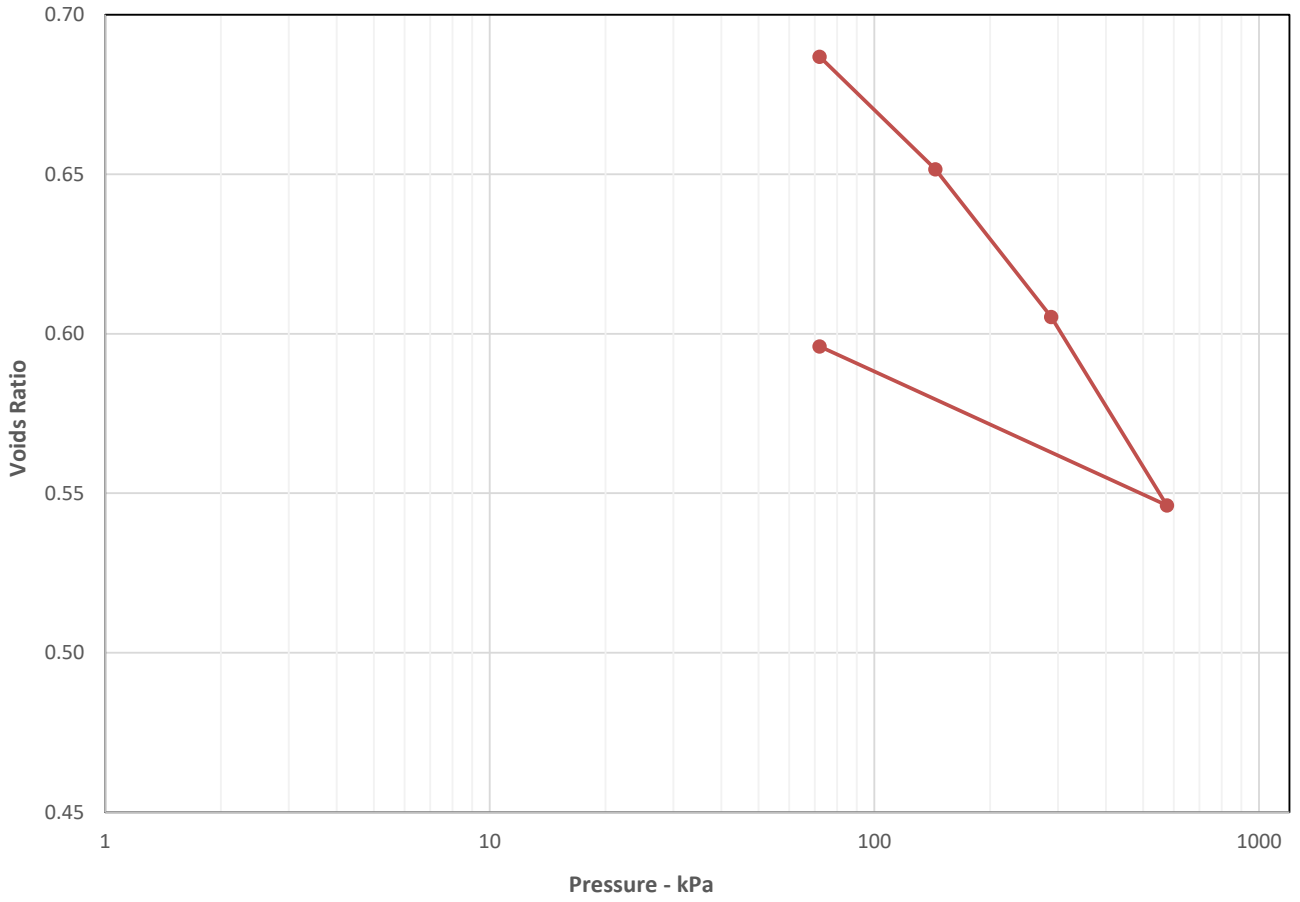
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH03
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	36	1.2	4.0		-			
Bulk Density (Mg/m3)	2.01	36	-	72	0.49	6.6		-			
Dry Density (Mg/m3)	1.52	72	-	144	0.39	8.2		-			
Voids Ratio	0.7449	144	-	288	0.25	8.1		-			
Degree of saturation	115.8	288	-	36	0.11	11		-			
Height (mm)	19.99		-					-			
Diameter (mm)	75.02		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

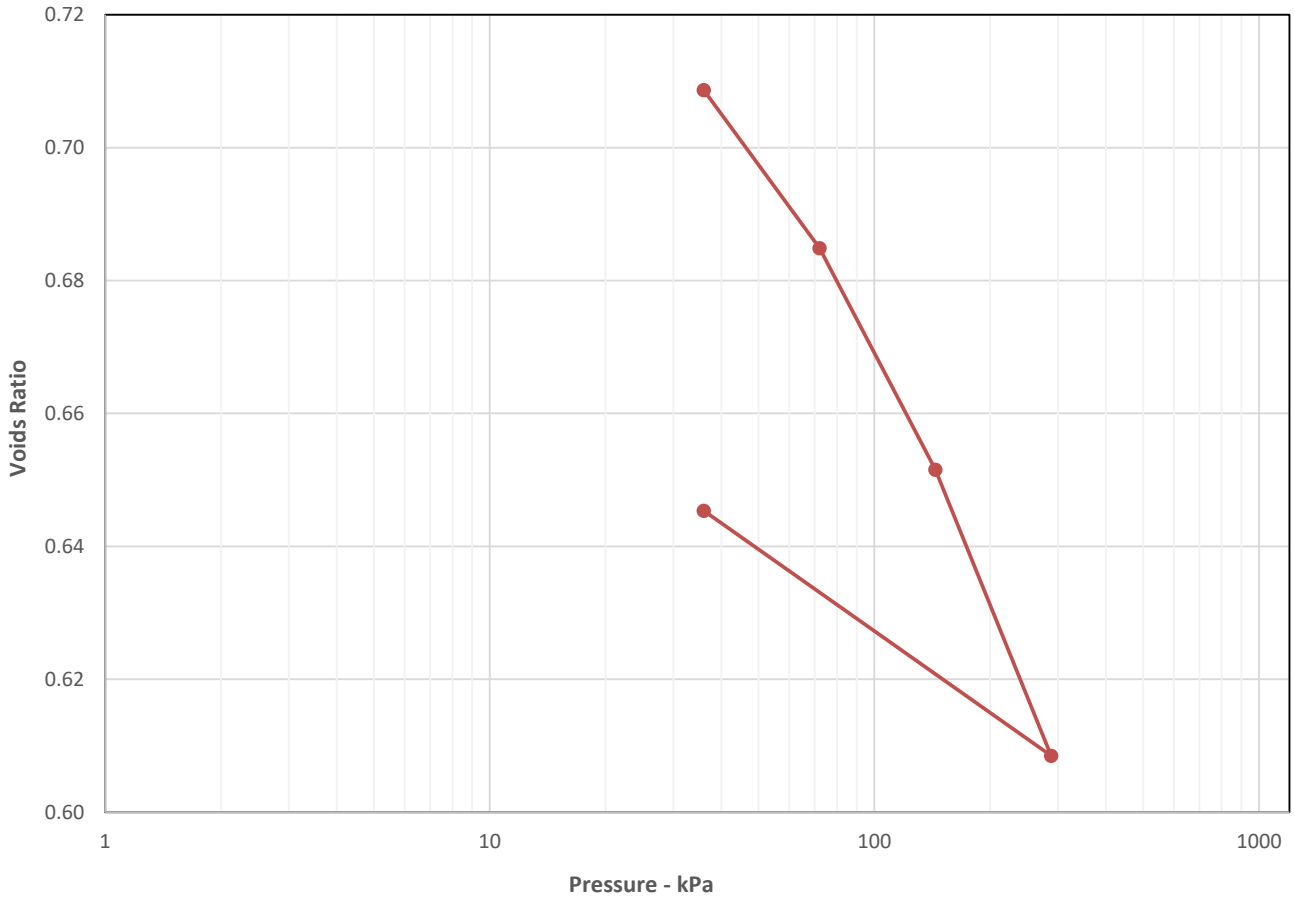
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH03
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	72	0.70	3.2		-			
Bulk Density (Mg/m3)	1.98	72	-	144	0.29	3.7		-			
Dry Density (Mg/m3)	1.49	144	-	288	0.19	3.7		-			
Voids Ratio	0.7768	288	-	576	0.13	4.9		-			
Degree of saturation	112.5	576	-	72	0.064	3.6		-			
Height (mm)	19.97		-					-			
Diameter (mm)	75.02		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

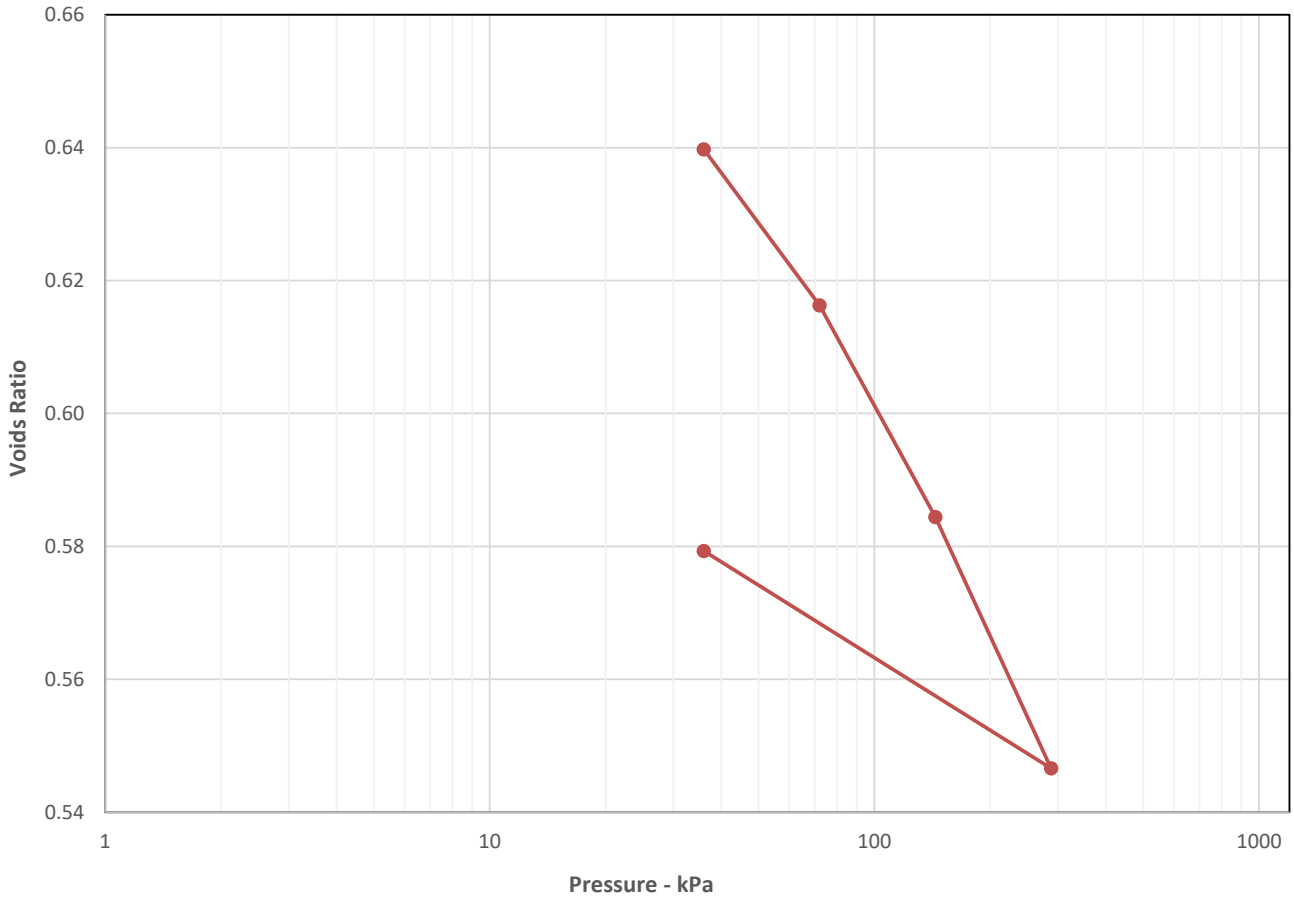
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH04
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	30	0	-	36	0.54	0.44		-			
Bulk Density (Mg/m3)	1.98	36	-	72	0.39	0.78		-			
Dry Density (Mg/m3)	1.52	72	-	144	0.27	0.97		-			
Voids Ratio	0.7424	144	-	288	0.18	1.2		-			
Degree of saturation	108.1	288	-	36	0.091	1.2		-			
Height (mm)	19.99		-					-			
Diameter (mm)	74.94		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

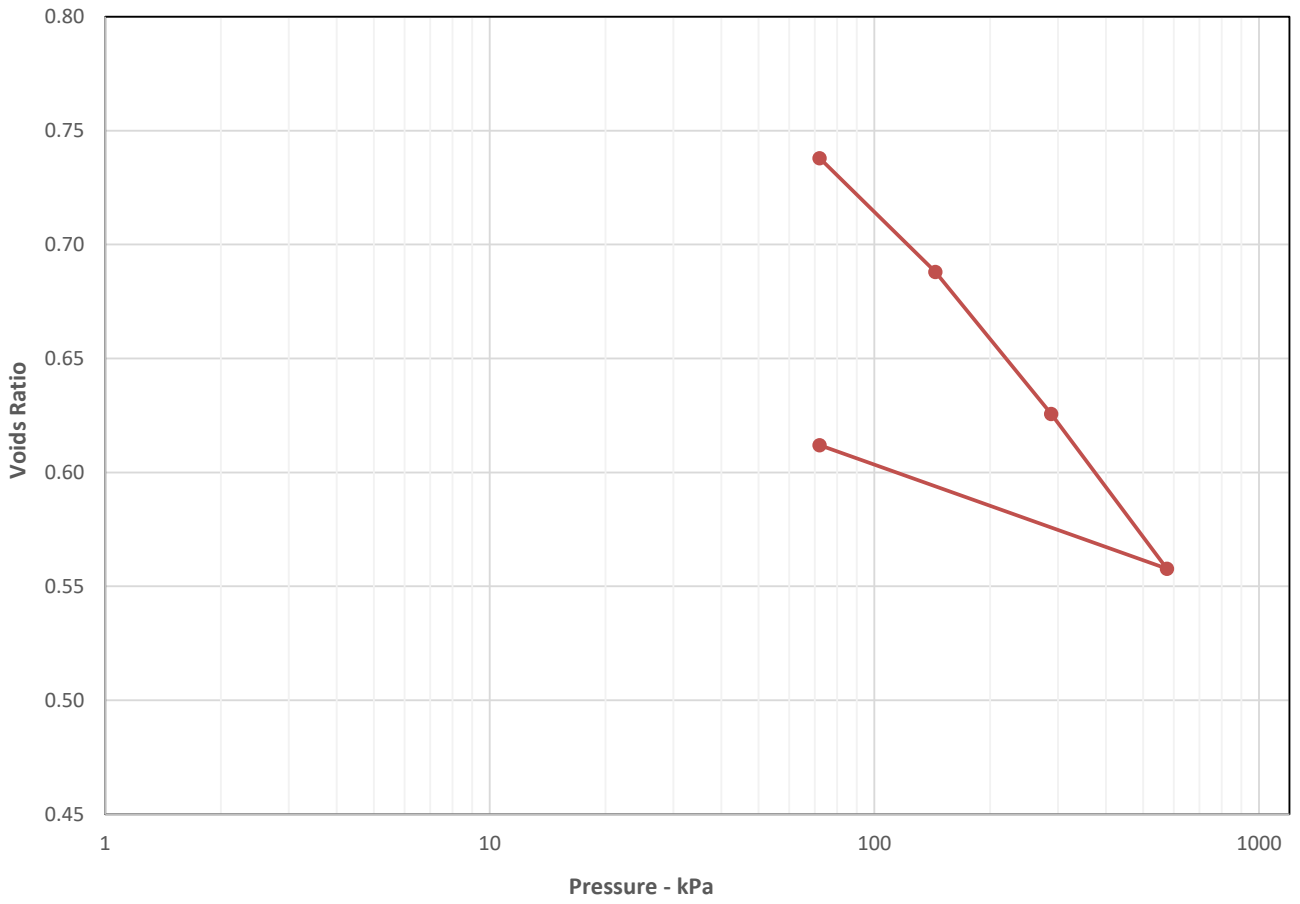
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	29	0	-	36	0.88	0.68		-			
Bulk Density (Mg/m3)	2.03	36	-	72	0.40	1.3		-			
Dry Density (Mg/m3)	1.56	72	-	144	0.27	1.6		-			
Voids Ratio	0.6937	144	-	288	0.17	1.6		-			
Degree of saturation	112.4	288	-	36	0.084	2.0		-			
Height (mm)	19.98		-					-			
Diameter (mm)	75.03		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

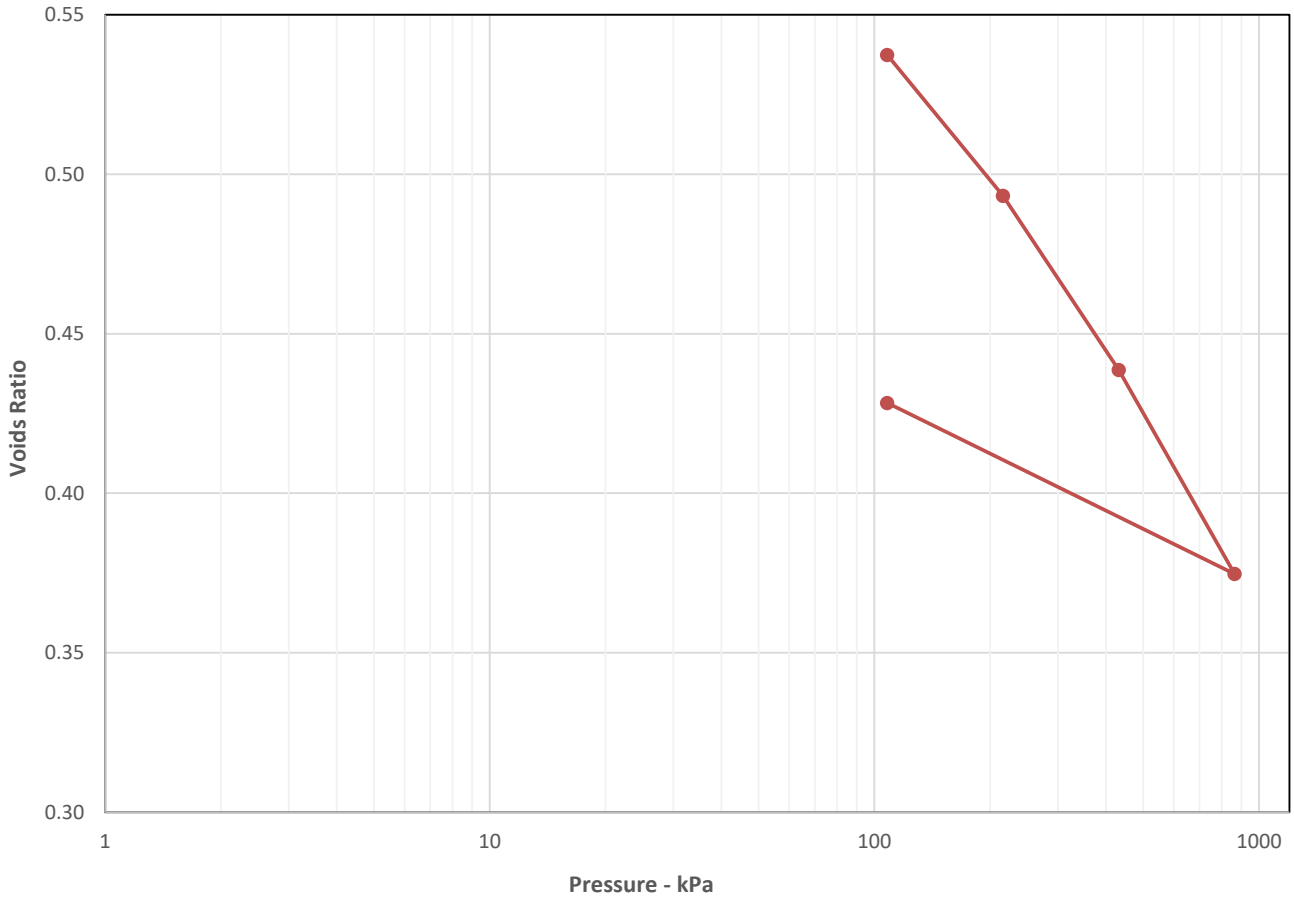
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	35	0	-	72	0.66	0.61		-			
Bulk Density (Mg/m3)	1.96	72	-	144	0.40	0.66		-			
Dry Density (Mg/m3)	1.45	144	-	288	0.26	0.93		-			
Voids Ratio	0.8250	288	-	576	0.15	0.90		-			
Degree of saturation	112.4	576	-	72	0.069	1.0		-			
Height (mm)	19.94		-					-			
Diameter (mm)	74.92		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

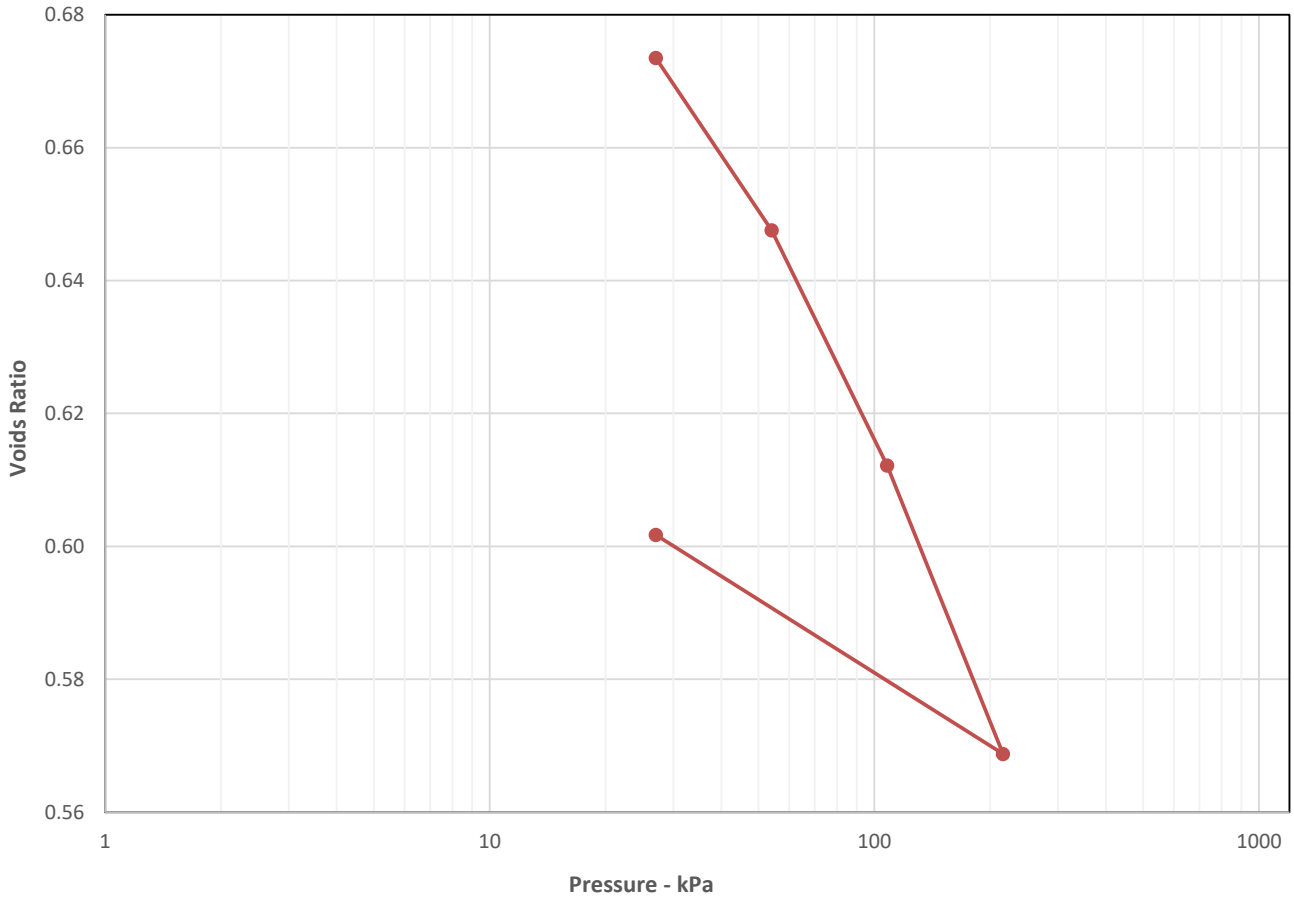
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Gey Silty CLAY	Depth Top (m)	6.00
		Depth Base (m)	6.45
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	U
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	30	0	-	108	0.68	0.86		-			
Bulk Density (Mg/m3)	2.07	108	-	216	0.27	0.92		-			
Dry Density (Mg/m3)	1.60	216	-	432	0.17	1.2		-			
Voids Ratio	0.6600	432	-	864	0.10	1.4		-			
Degree of saturation	119.4	864	-	108	0.052	1.2		-			
Height (mm)	20.03		-					-			
Diameter (mm)	74.79		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

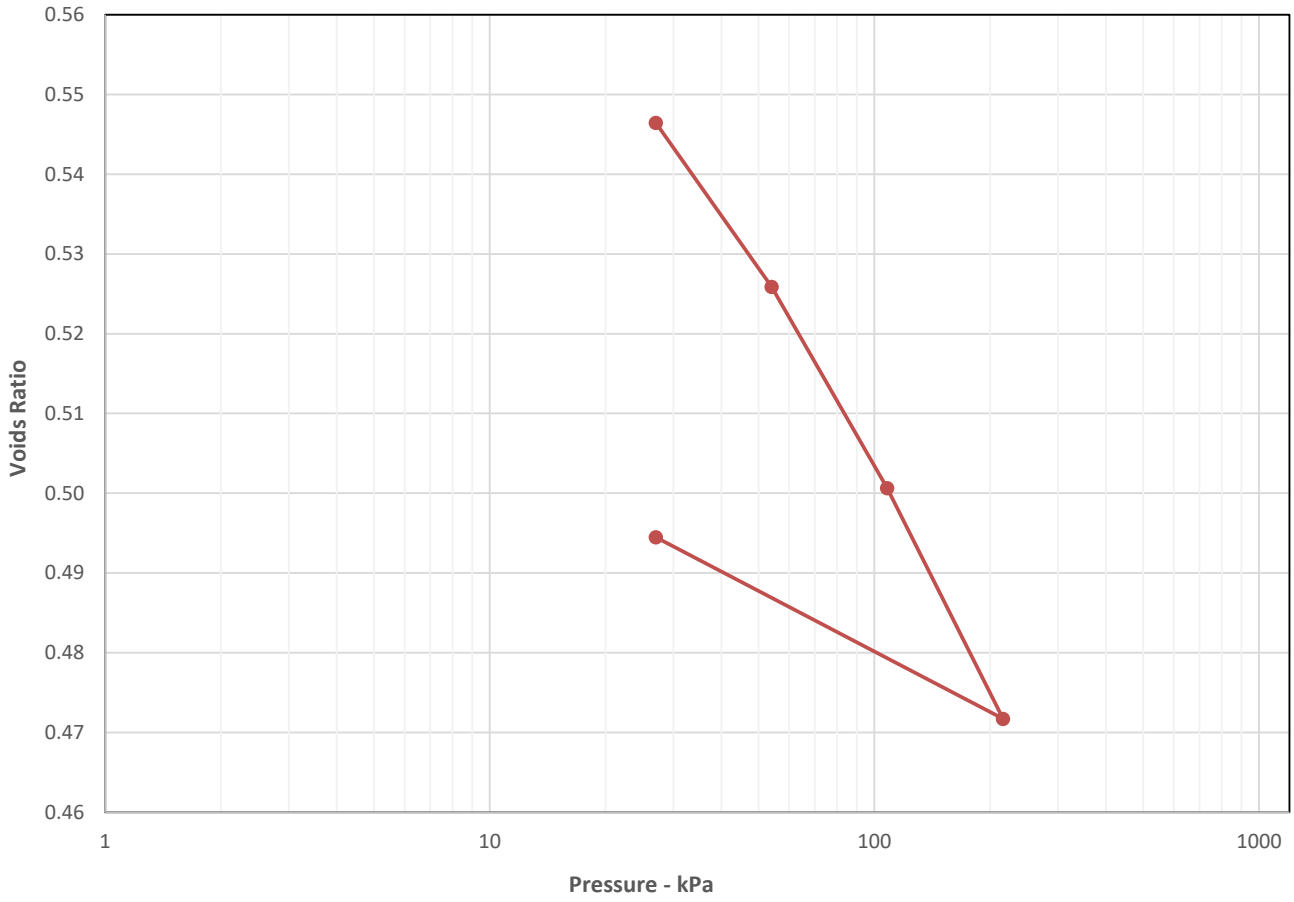
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSC
Project Name	Home Farm	Sample No.	
Soil Description	Mortled Brown Slightly Sandy Silty CLAY	Depth Top (m)	1.50
		Depth Base (m)	2.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	33	0	-	27	1.2	6.3		-			
Bulk Density (Mg/m3)	2.03	27	-	54	0.57	6.5		-			
Dry Density (Mg/m3)	1.53	54	-	108	0.40	6.8		-			
Voids Ratio	0.7316	108	-	216	0.25	6.7		-			
Degree of saturation	118.4	216	-	27	0.11	7.3		-			
Height (mm)	20.02		-					-			
Diameter (mm)	74.92		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

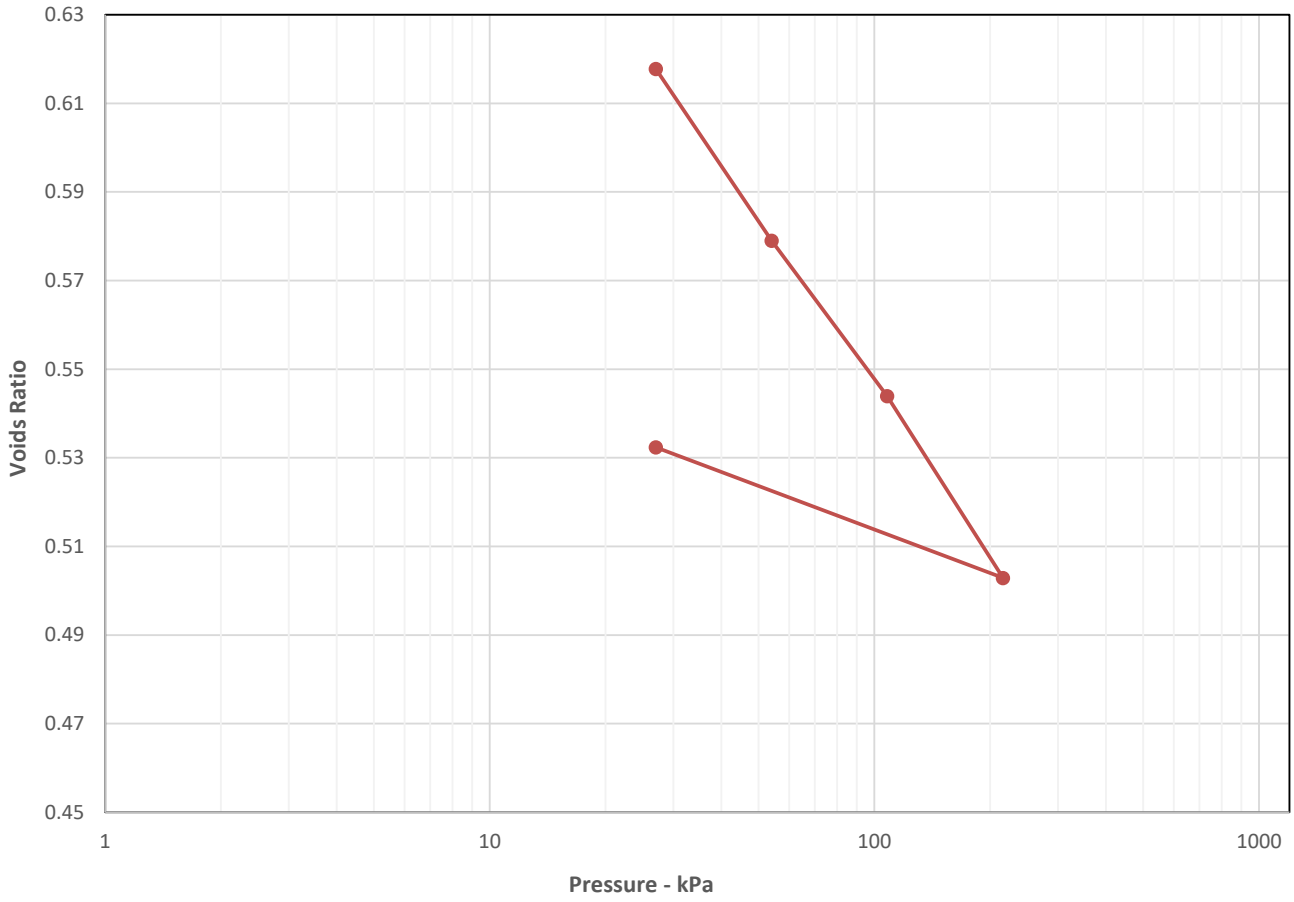
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSF
Project Name	Home Farm	Sample No.	
Soil Description	Mottled Brown Slightly Sandy Silty CLAY	Depth Top (m)	1.50
		Depth Base (m)	2.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	26	0	-	27	1.3	5.6		-			
Bulk Density (Mg/m3)	2.09	27	-	54	0.49	3.3		-			
Dry Density (Mg/m3)	1.65	54	-	108	0.31	6.9		-			
Voids Ratio	0.6026	108	-	216	0.18	6.0		-			
Degree of saturation	115.3	216	-	27	0.082	7.7		-			
Height (mm)	20.07		-					-			
Diameter (mm)	74.95		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

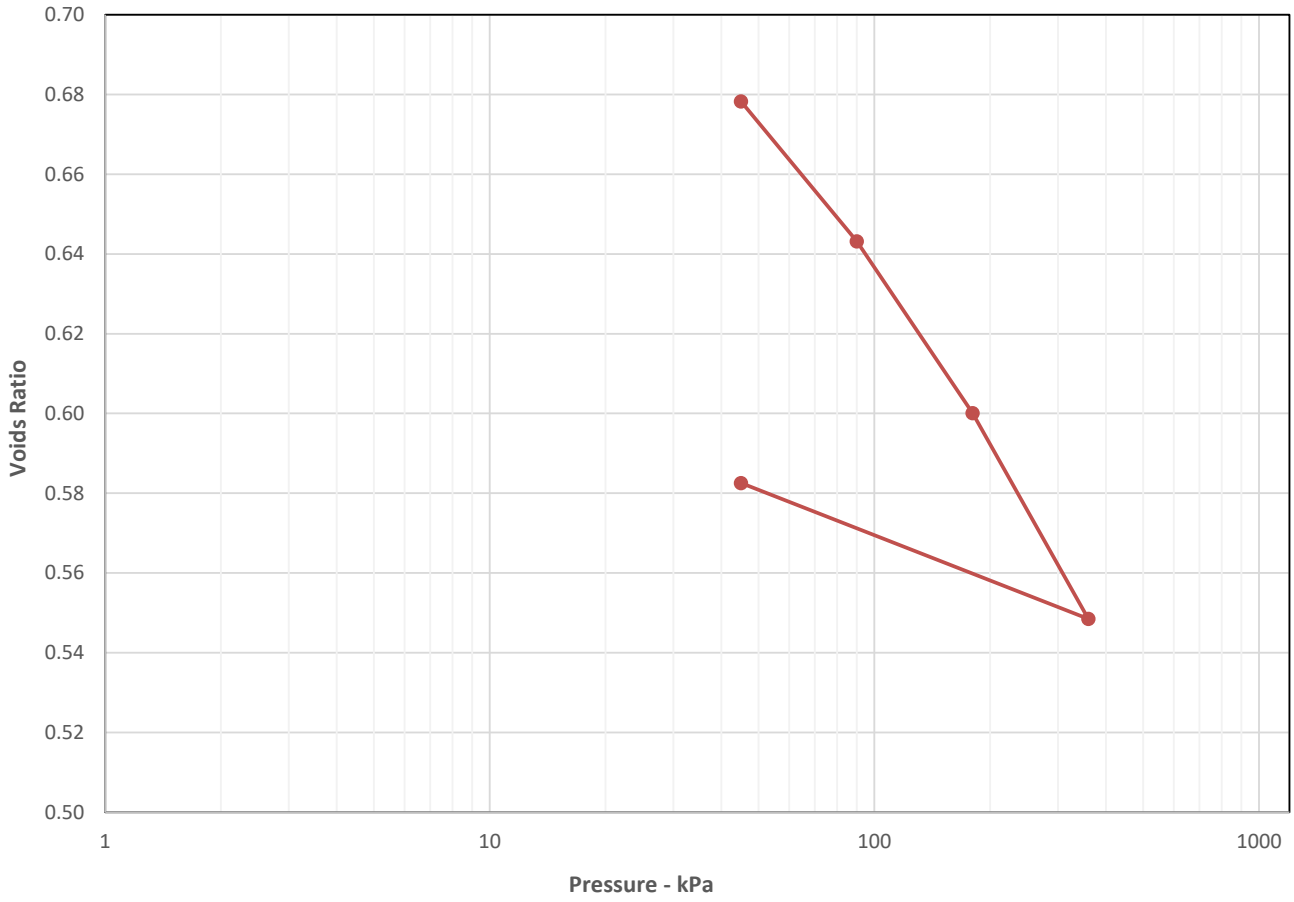
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSH
Project Name	Home Farm	Sample No.	
Soil Description	Brown Slightly Sandy Silty CLAY	Depth Top (m)	1.50
		Depth Base (m)	2.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	-	27	1.4	7.9		-			
Bulk Density (Mg/m3)	2.07	27	-	54	0.89	12		-			
Dry Density (Mg/m3)	1.57	54	-	108	0.41	4.2		-			
Voids Ratio	0.6829	108	-	216	0.25	5.1		-			
Degree of saturation	121.0	216	-	27	0.10	6.5		-			
Height (mm)	20.05		-					-			
Diameter (mm)	74.99		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

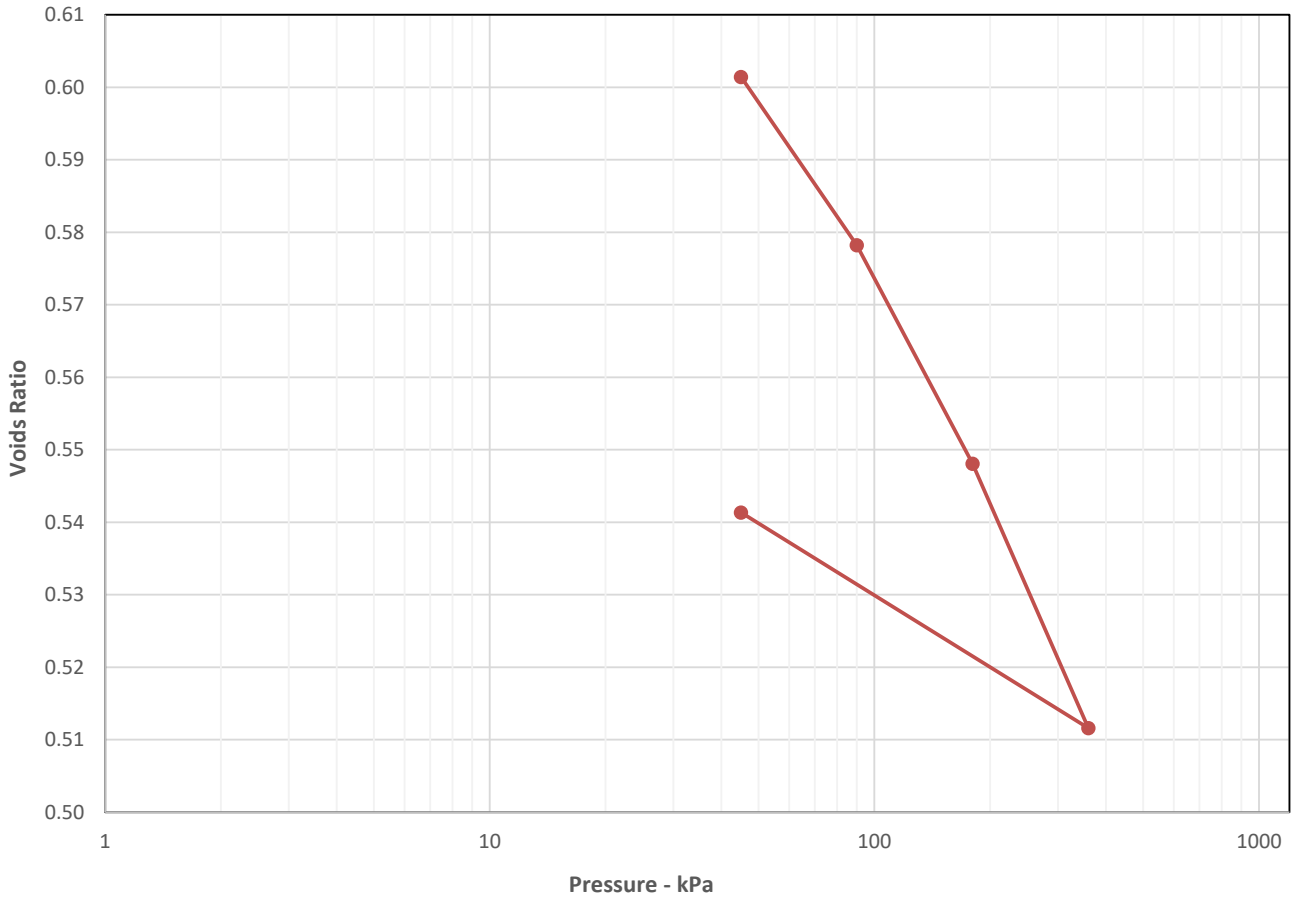
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSH
Project Name	Home Farm	Sample No.	
Soil Description	Brown Slightly Sandy Silty CLAY	Depth Top (m)	2.50
		Depth Base (m)	3.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	32	0	-	45	1.2	4.1		-			
Bulk Density (Mg/m3)	1.98	45	-	90	0.46	4.7		-			
Dry Density (Mg/m3)	1.50	90	-	180	0.29	5.4		-			
Voids Ratio	0.7702	180	-	360	0.18	6.2		-			
Degree of saturation	110.6	360	-	45	0.070	5.3		-			
Height (mm)	19.89		-					-			
Diameter (mm)	74.97		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

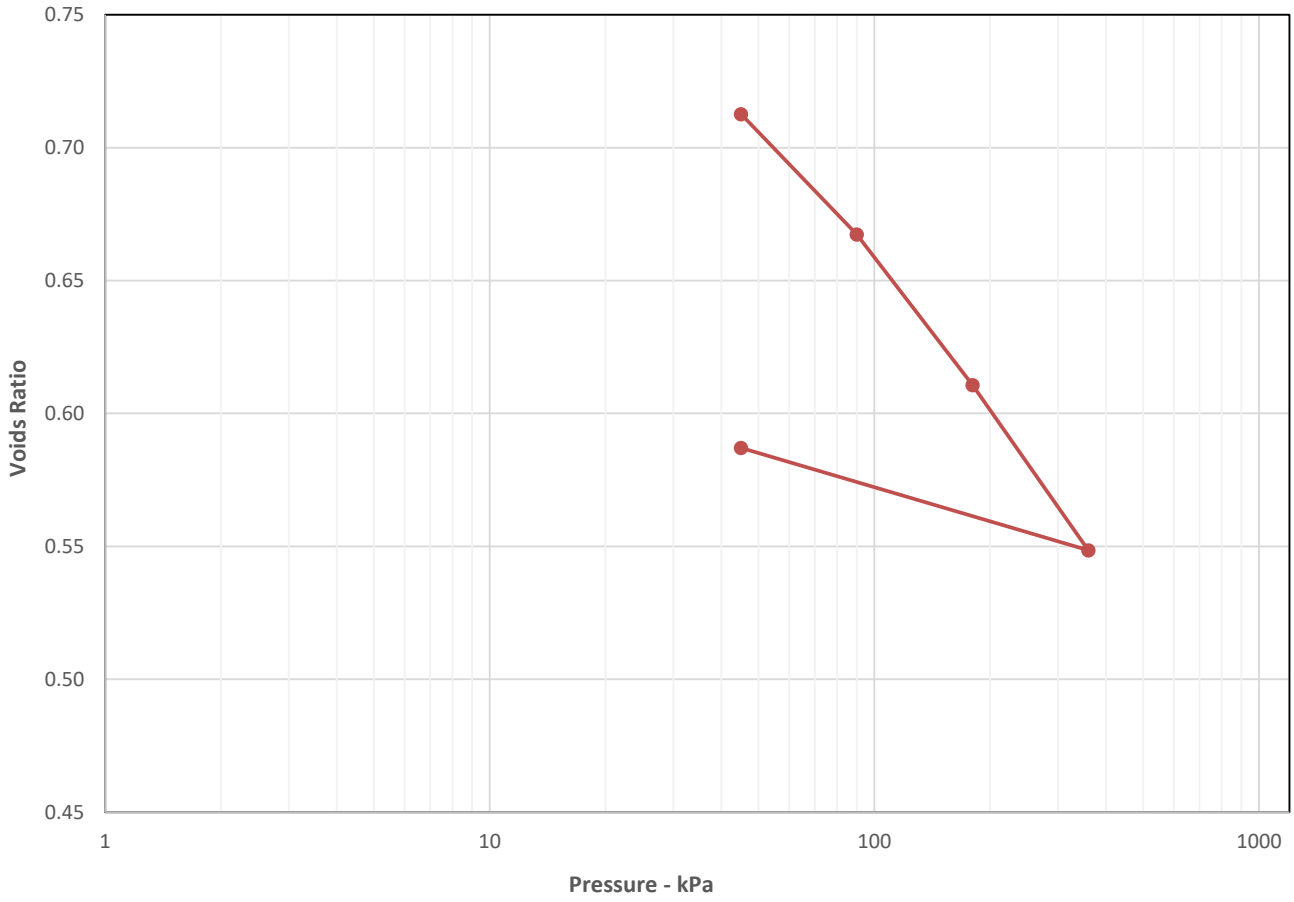
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSJ
Project Name	Home Farm	Sample No.	
Soil Description	Brown Slightly Sandy Silty CLAY	Depth Top (m)	1.50
		Depth Base (m)	2.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	31	0	-	45	1.0	2.8		-			
Bulk Density (Mg/m3)	2.07	45	-	90	0.32	2.3		-			
Dry Density (Mg/m3)	1.58	90	-	180	0.21	2.3		-			
Voids Ratio	0.6796	180	-	360	0.13	2.6		-			
Degree of saturation	122.4	360	-	45	0.062	2.8		-			
Height (mm)	19.99		-					-			
Diameter (mm)	74.86		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operator
Wayne W

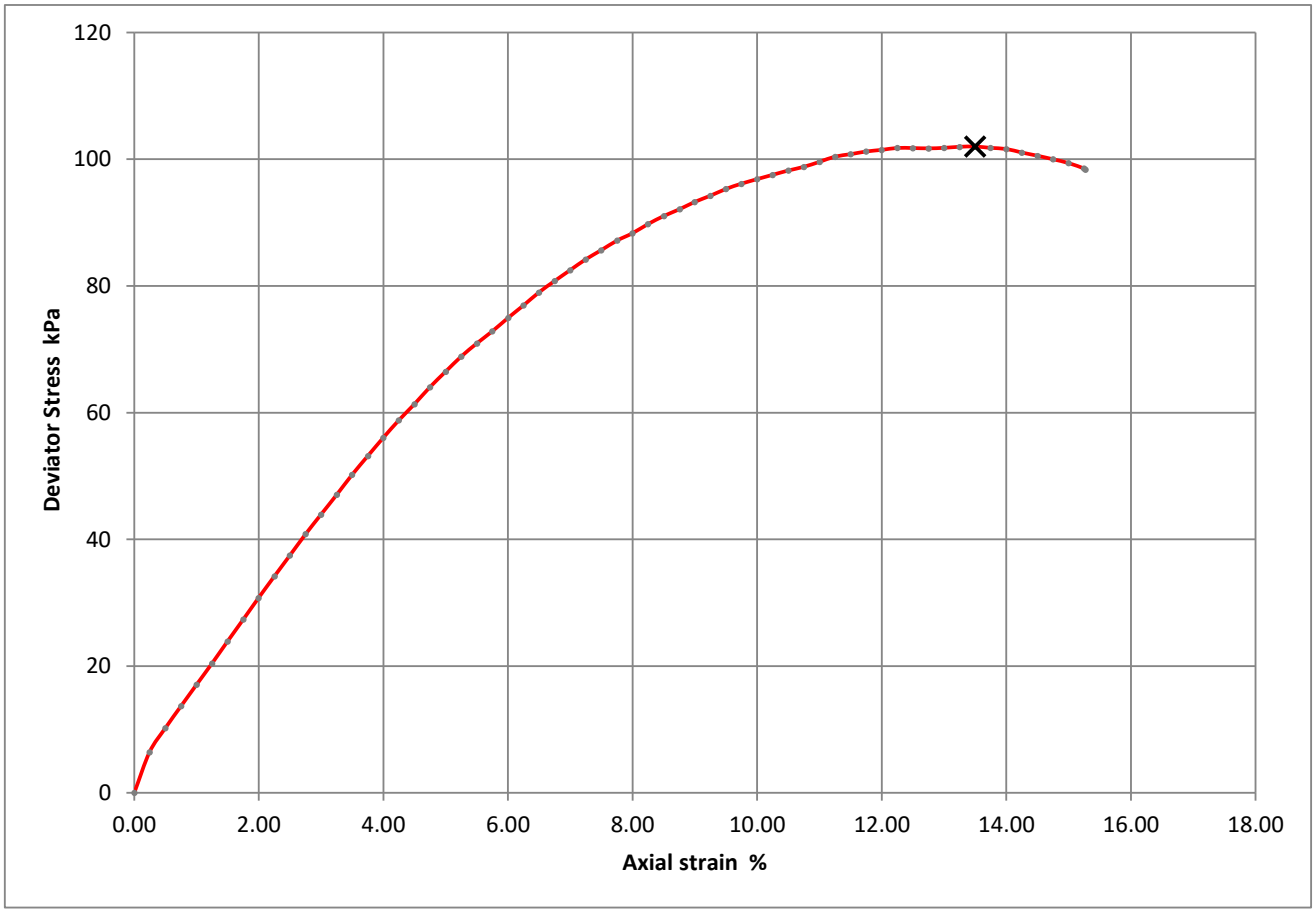
GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3	Contract Number	78342
		Borehole/Trialpit No.	WSJ
Project Name	Home Farm	Sample No.	
Soil Description	Brown Slightly Sandy Silty CLAY	Depth Top (m)	2.50
		Depth Base (m)	3.00
Lab Temperature	20°c	Sample Location	Top
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	C
Date Tested	23/04/2025		



Initial Sample Conditions		Pressure Range			Mv m2/MN	Cv m2/yr	Pressure Range			Mv m2/MN	Cv m2/yr
Moisture Content (%)	35	0	-	45	1.4	1.7		-			
Bulk Density (Mg/m3)	1.95	45	-	90	0.59	1.9		-			
Dry Density (Mg/m3)	1.45	90	-	180	0.38	2.3		-			
Voids Ratio	0.8309	180	-	360	0.21	2.4		-			
Degree of saturation	111.8	360	-	45	0.079	2.6		-			
Height (mm)	19.96		-					-			
Diameter (mm)	74.92		-					-			
Particle Density (Mg/m3)	2.65		-					-			

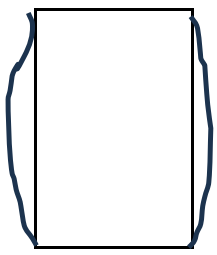
Operator
Wayne W

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



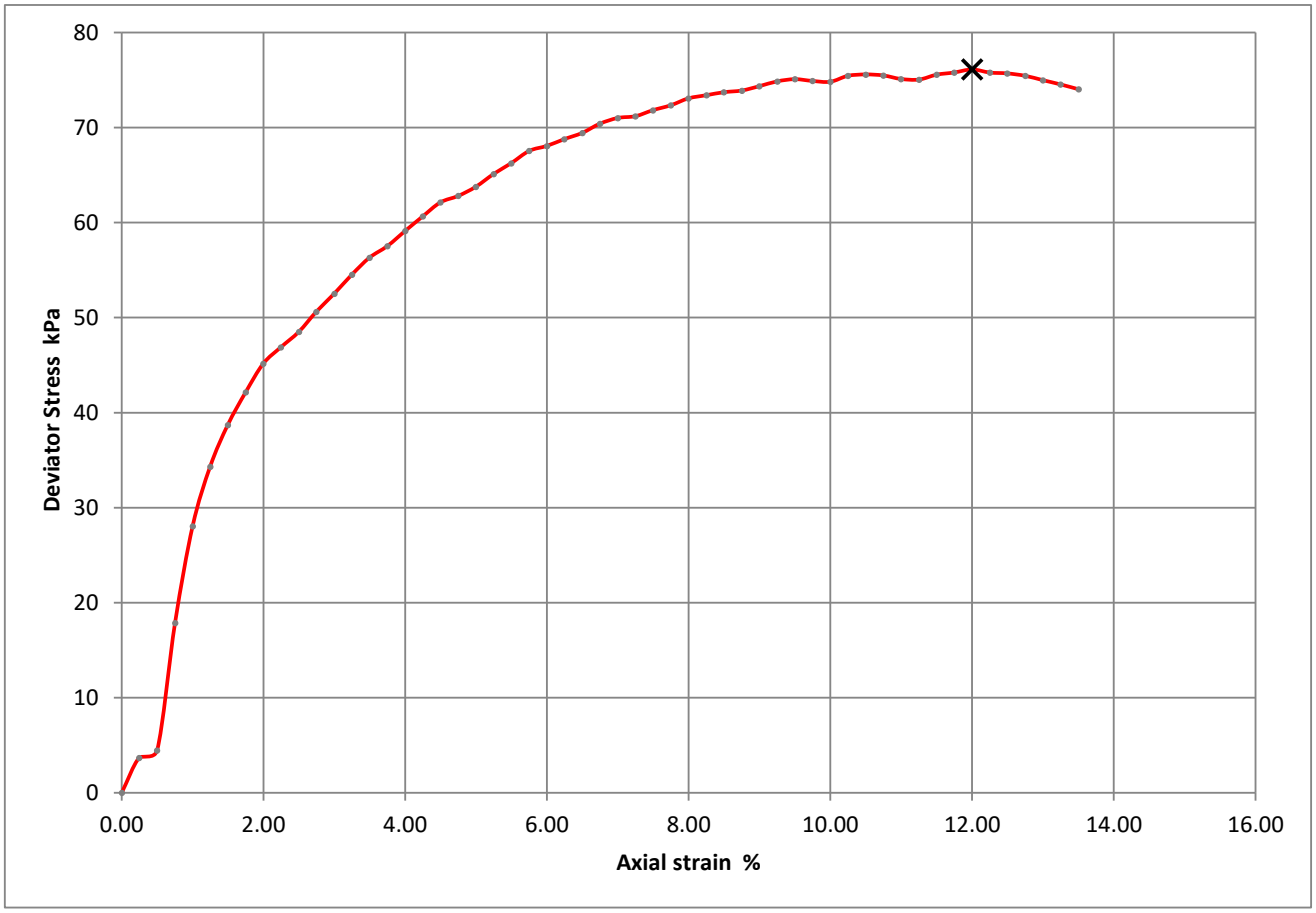
Moisture Content (%)	30
Bulk Density (Mg/m^3)	1.94
Dry Density (Mg/m^3)	1.49
Specimen Length (mm)	208.4
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	36
Deviator Stress (kPa)	102
Undrained Shear Strength (kPa)	51
Failure Strain (%)	13
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



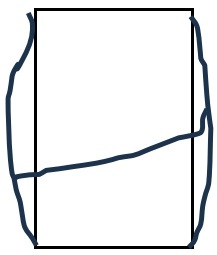
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



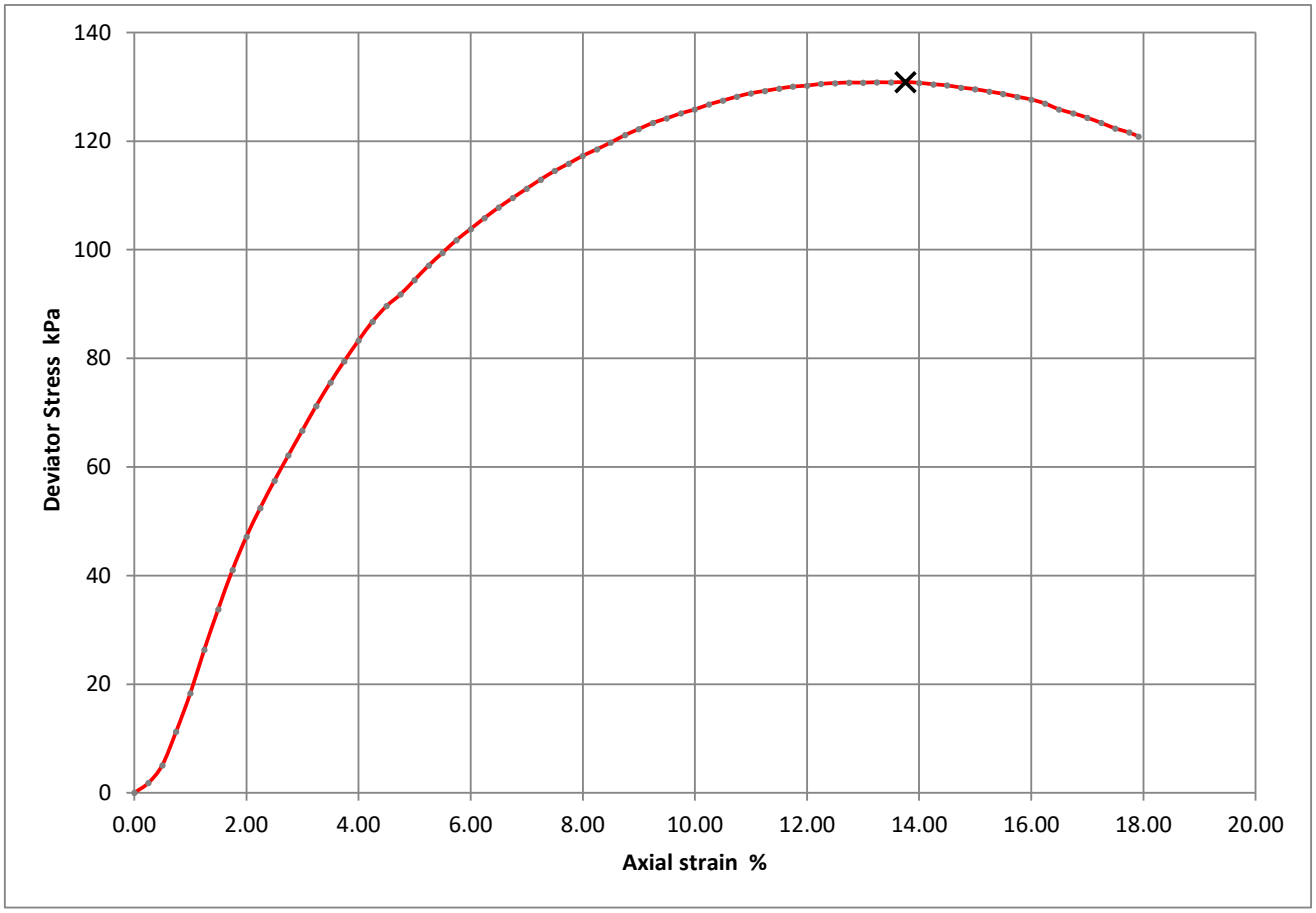
Moisture Content (%)	34
Bulk Density (Mg/m^3)	1.87
Dry Density (Mg/m^3)	1.40
Specimen Length (mm)	208.4
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	76
Deviator Stress (kPa)	76
Undrained Shear Strength (kPa)	38
Failure Strain (%)	12
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



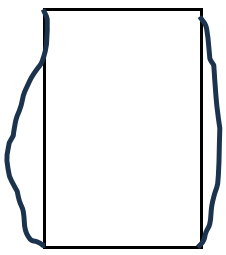
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown gravelly silty sandy CLAY	Depth Top (m)	6.00
		Depth Base (m)	6.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



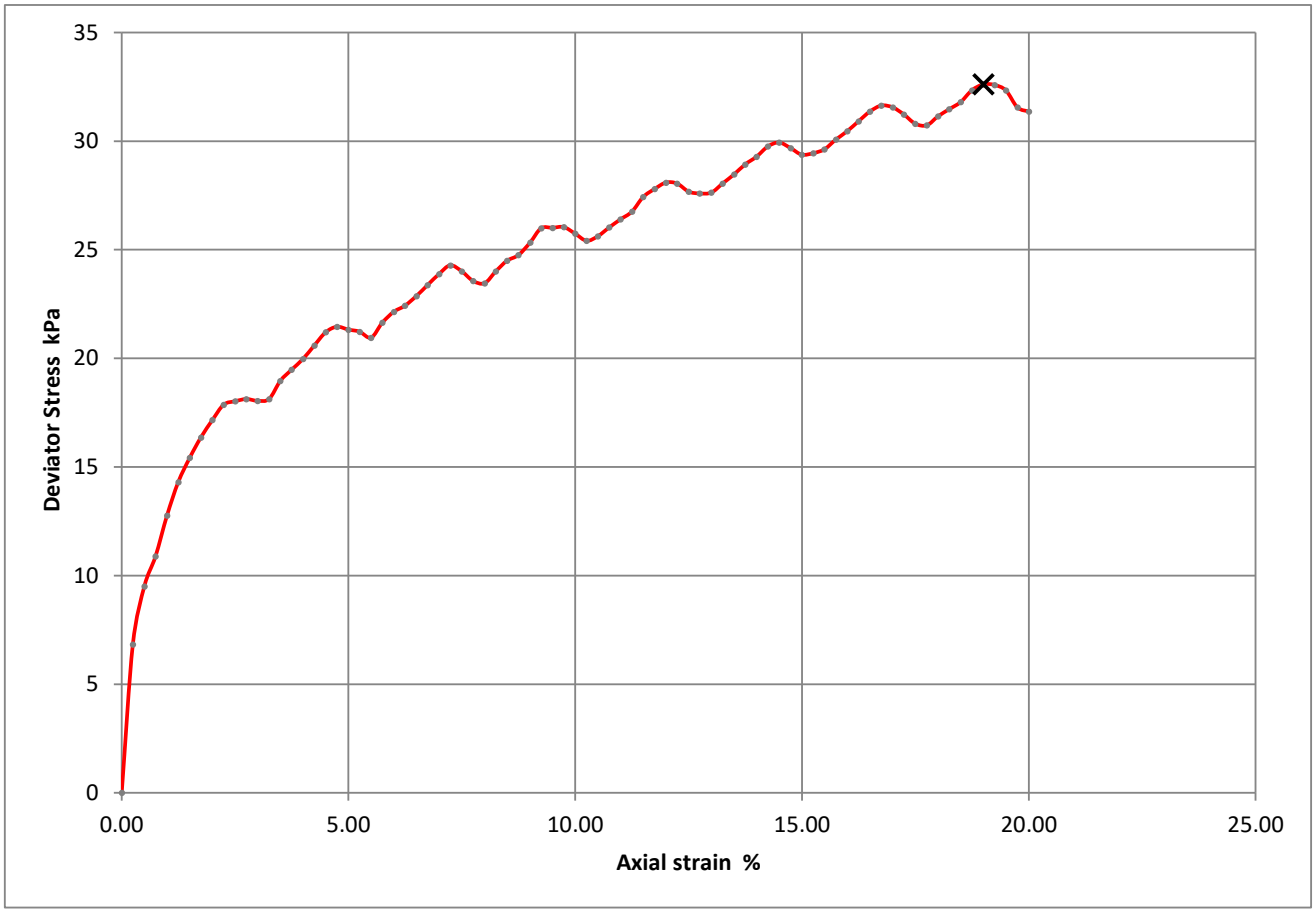
Moisture Content (%)	24
Bulk Density (Mg/m^3)	1.91
Dry Density (Mg/m^3)	1.55
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	108
Deviator Stress (kPa)	131
Undrained Shear Strength (kPa)	65
Failure Strain (%)	14
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



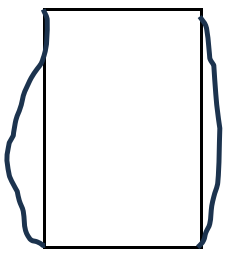
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH01
Project Name	Home Farm	Sample No.	
Soil Description	Brown gravelly silty sandy CLAY	Depth Top (m)	9.50
		Depth Base (m)	9.95
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



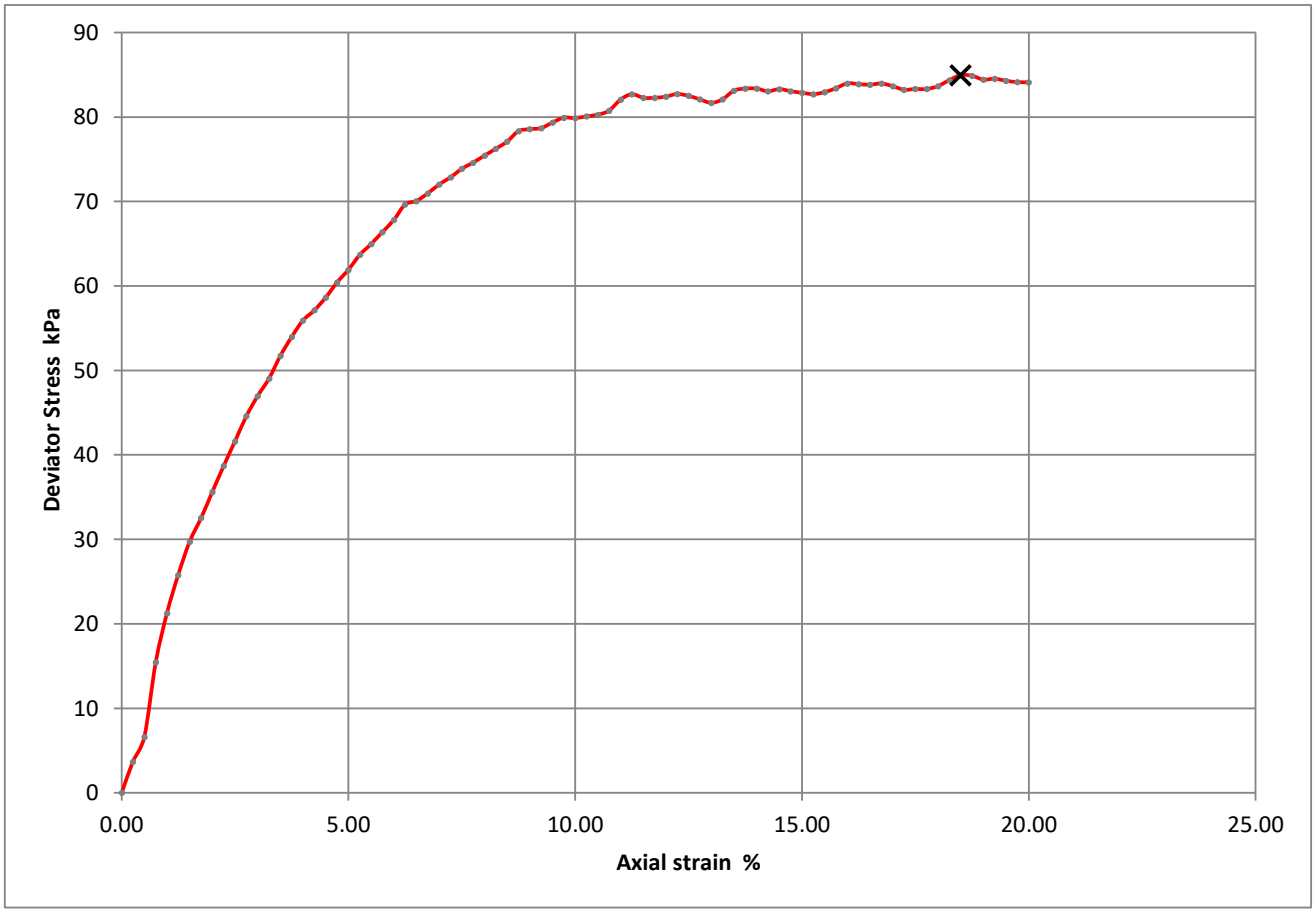
Moisture Content (%)	29
Bulk Density (Mg/m^3)	2.02
Dry Density (Mg/m^3)	1.56
Specimen Length (mm)	208.2
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	135
Deviator Stress (kPa)	33
Undrained Shear Strength (kPa)	16
Failure Strain (%)	19
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



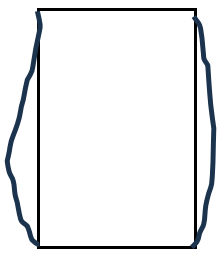
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH02
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



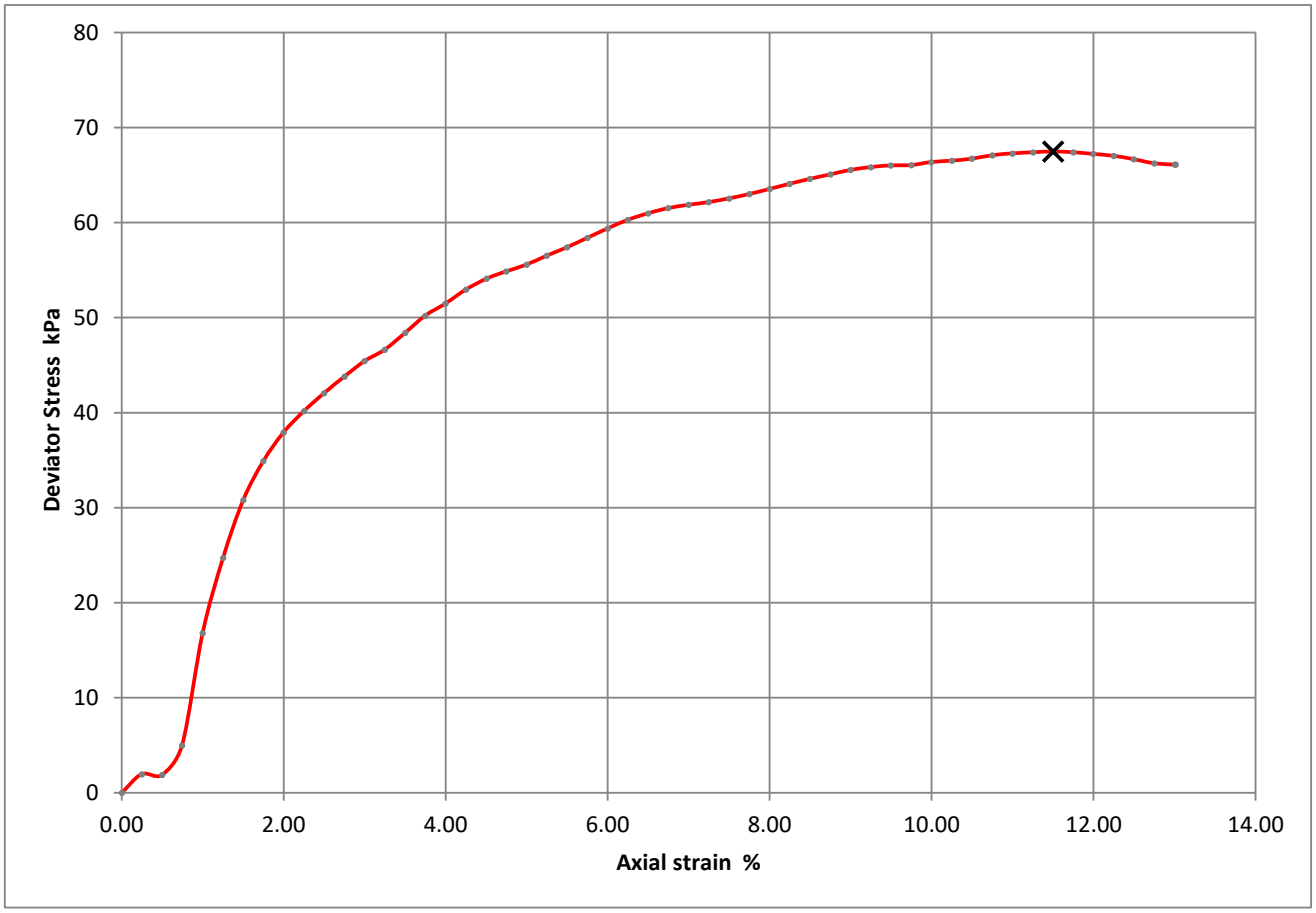
Moisture Content (%)	26
Bulk Density (Mg/m^3)	1.90
Dry Density (Mg/m^3)	1.51
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	36
Deviator Stress (kPa)	85
Undrained Shear Strength (kPa)	42
Failure Strain (%)	18
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



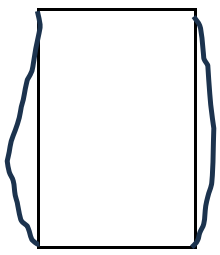
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH02
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



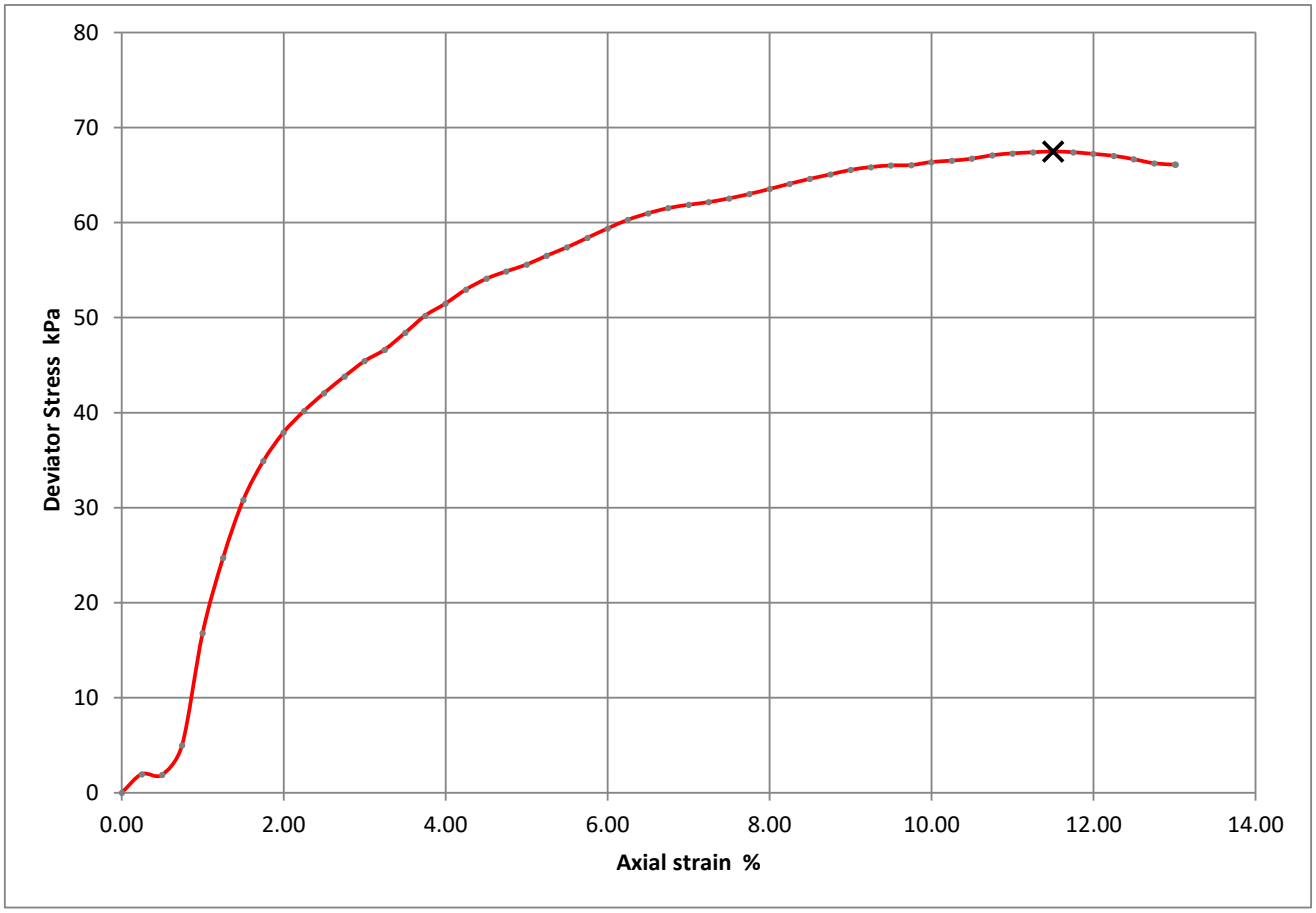
Moisture Content (%)	37
Bulk Density (Mg/m^3)	1.88
Dry Density (Mg/m^3)	1.37
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	72
Deviator Stress (kPa)	67
Undrained Shear Strength (kPa)	34
Failure Strain (%)	11
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



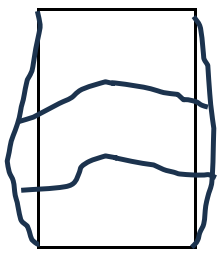
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH03
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



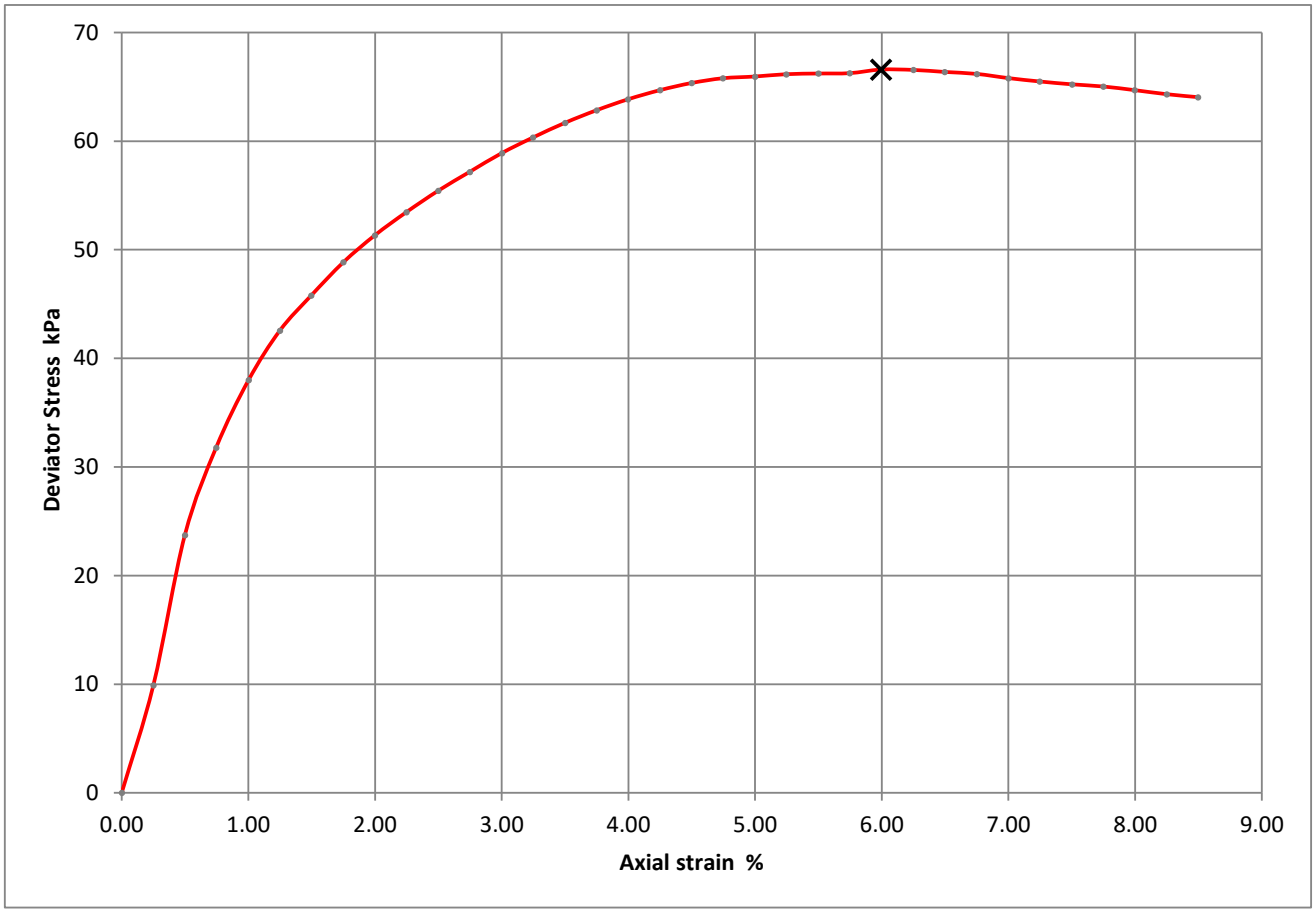
Moisture Content (%)	29
Bulk Density (Mg/m^3)	1.77
Dry Density (Mg/m^3)	1.37
Specimen Length (mm)	208.2
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	72
Deviator Stress (kPa)	67
Undrained Shear Strength (kPa)	34
Failure Strain (%)	11
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



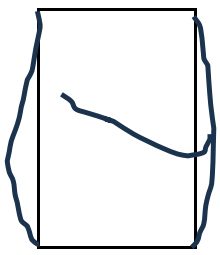
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH03
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



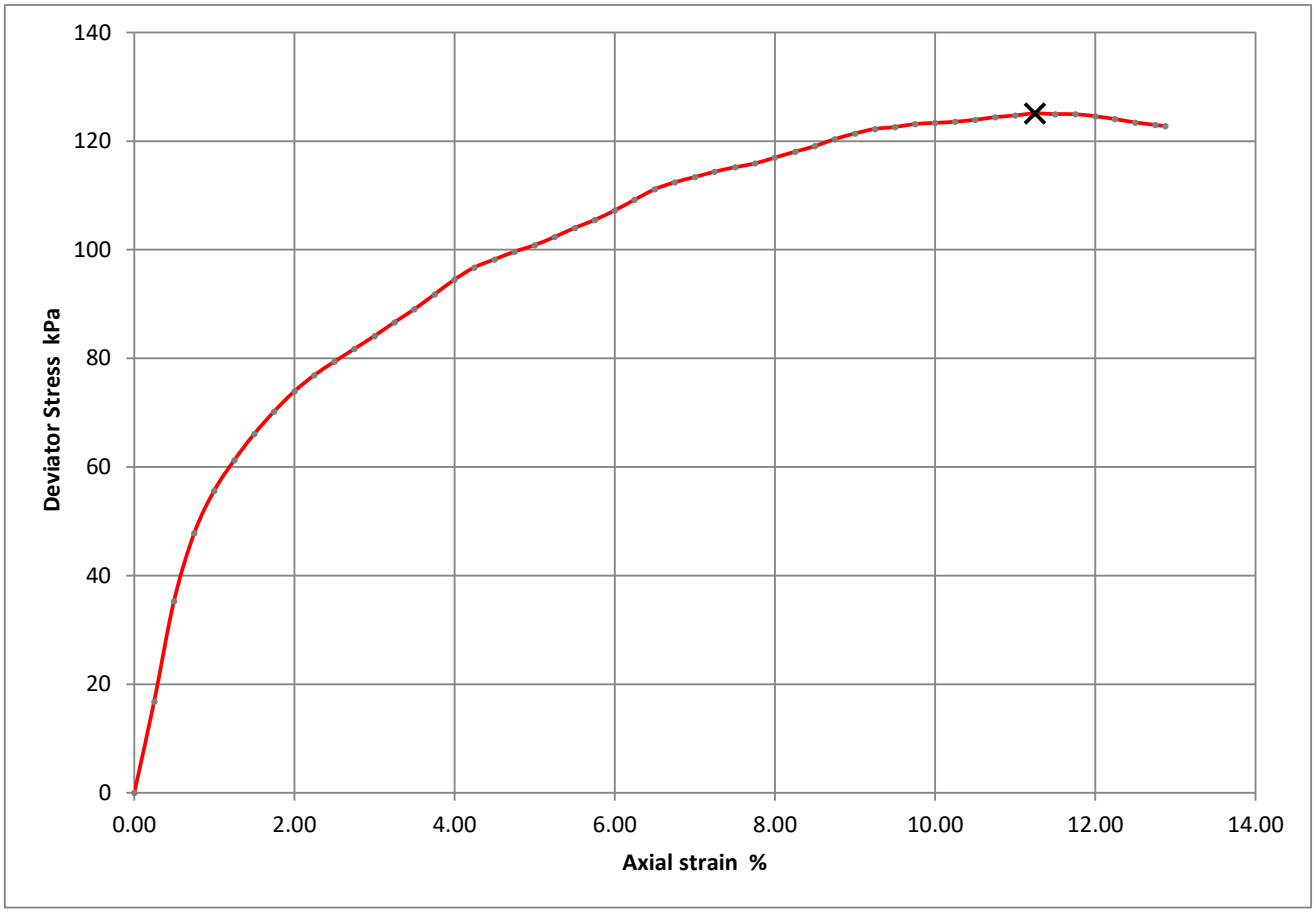
Moisture Content (%)	33
Bulk Density (Mg/m^3)	1.89
Dry Density (Mg/m^3)	1.42
Specimen Length (mm)	208.2
Specimen Diameter (mm)	104.2
Cell Pressure (kPa)	76
Deviator Stress (kPa)	67
Undrained Shear Strength (kPa)	33
Failure Strain (%)	6
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



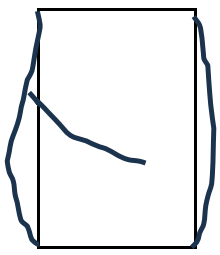
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH04
Project Name	Home Farm	Sample No.	
Soil Description	Brown gravelly silty sandy CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



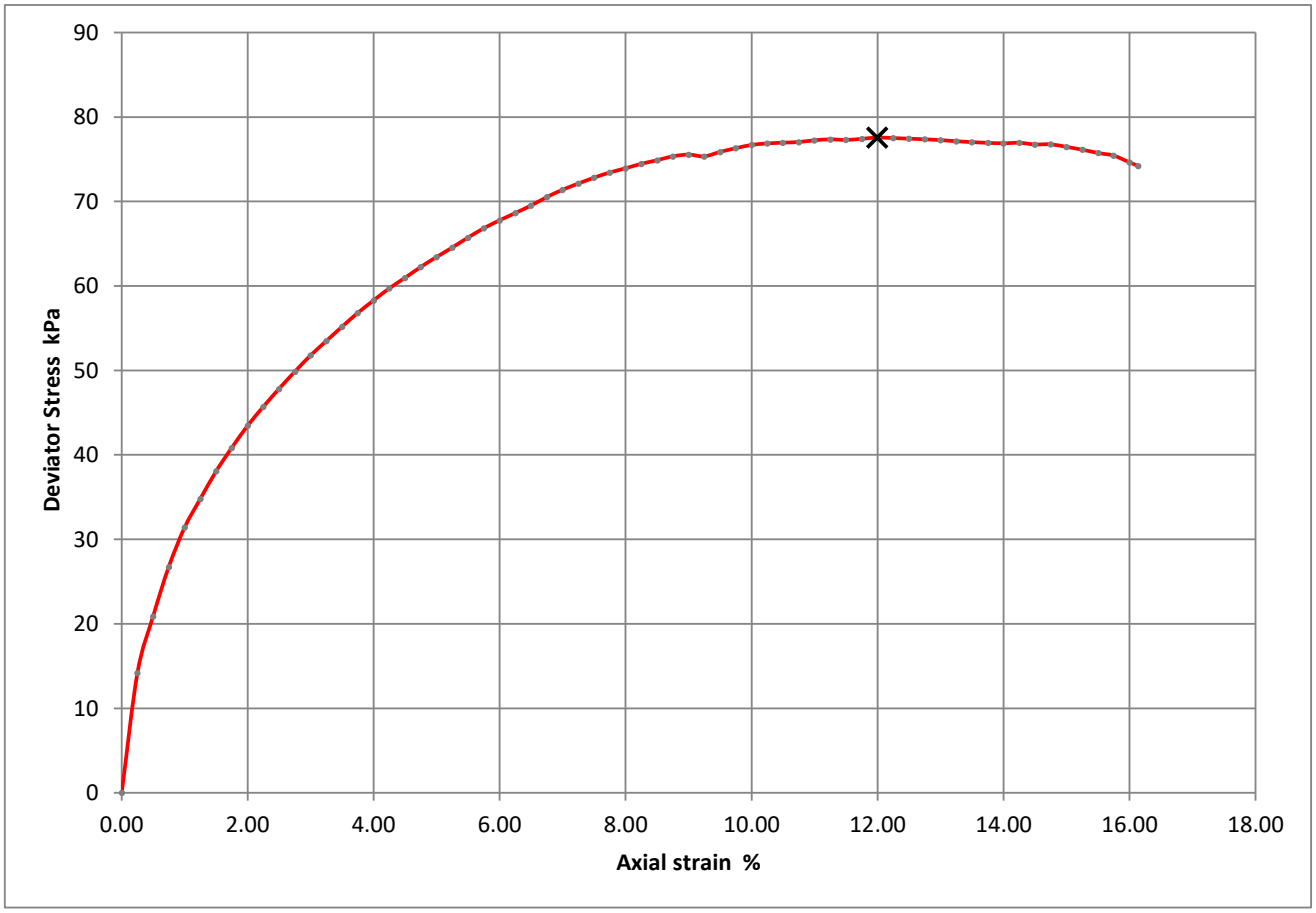
Moisture Content (%)	28
Bulk Density (Mg/m^3)	1.94
Dry Density (Mg/m^3)	1.51
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.3
Cell Pressure (kPa)	36
Deviator Stress (kPa)	125
Undrained Shear Strength (kPa)	63
Failure Strain (%)	11
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



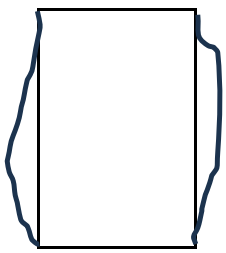
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	2.00
		Depth Base (m)	2.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



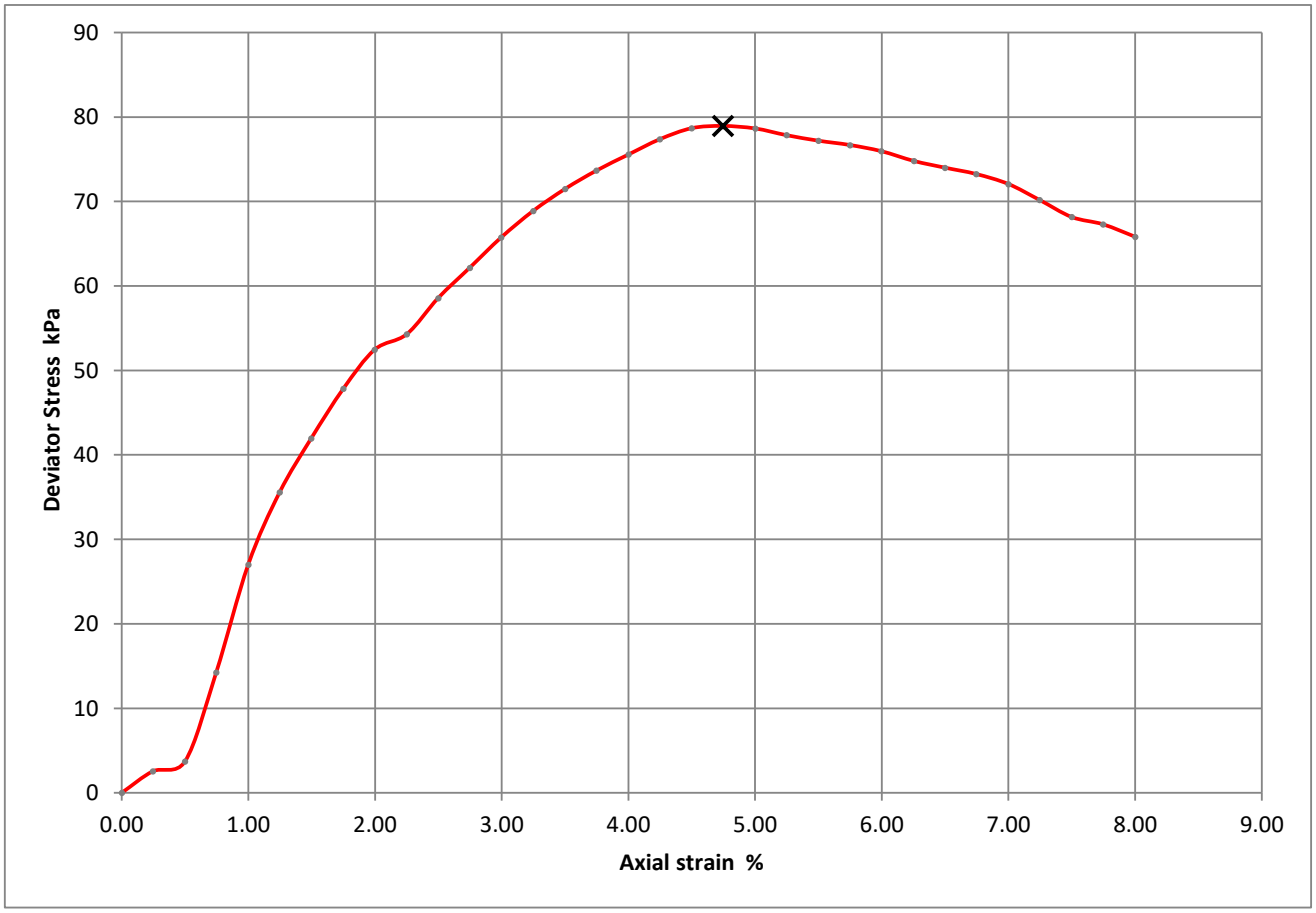
Moisture Content (%)	30
Bulk Density (Mg/m^3)	1.92
Dry Density (Mg/m^3)	1.48
Specimen Length (mm)	208.4
Specimen Diameter (mm)	104.1
Cell Pressure (kPa)	36
Deviator Stress (kPa)	78
Undrained Shear Strength (kPa)	39
Failure Strain (%)	12
Mode Of Failure	Plastic
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



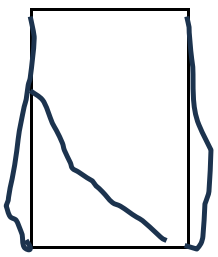
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty CLAY	Depth Top (m)	4.00
		Depth Base (m)	4.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



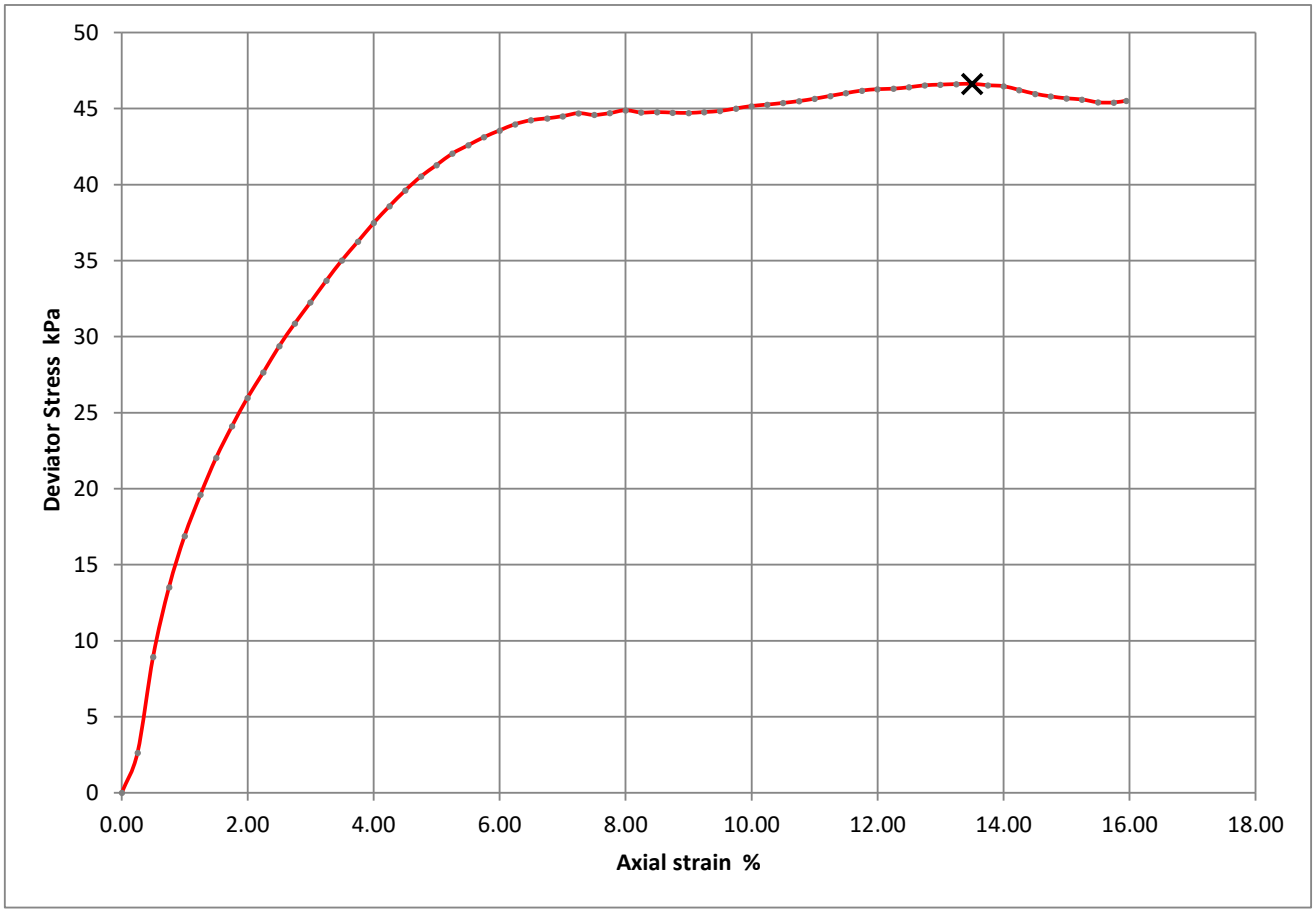
Moisture Content (%)	34
Bulk Density (Mg/m^3)	1.85
Dry Density (Mg/m^3)	1.38
Specimen Length (mm)	208.3
Specimen Diameter (mm)	104.2
Cell Pressure (kPa)	36
Deviator Stress (kPa)	79
Undrained Shear Strength (kPa)	39
Failure Strain (%)	5
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



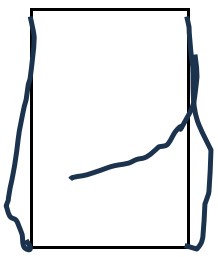
Failure Sketch.

GSTL GEOTECHNICAL SITE & TESTING LABORATORIES	**Single Stage Unconsolidated-Undrained Triaxial Test BS 1377 : 1990 Part 7 : 8**	Contract Number	78342
		Borehole/Pit No.	BH05
Project Name	Home Farm	Sample No.	
Soil Description	Brown silty sandy CLAY	Depth Top (m)	6.00
		Depth Base (m)	6.45
Date Tested	26/04/2025	Sample Type	U
		Operator	David E



Moisture Content (%)	32
Bulk Density (Mg/m^3)	1.80
Dry Density (Mg/m^3)	1.37
Specimen Length (mm)	208.4
Specimen Diameter (mm)	104.2
Cell Pressure (kPa)	36
Deviator Stress (kPa)	47
Undrained Shear Strength (kPa)	23
Failure Strain (%)	14
Mode Of Failure	Compound
Membrane Used/Thickness	Rubber/0.4mm
Rate of Strain (%/min)	1.32

Notes.



Failure Sketch.

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RGS Environmental Geotechnical Specialists

Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
01484 604354 Company No. 5130864

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WD18 8YS

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

Analytical Report Number : 25-025766

Project / Site name:	Home Farm	**Samples received on:**	16/05/2025
Your job number:	C4826/24/7379	**Samples instructed on/ Analysis started on:**	19/05/2025
Your order number:		**Analysis completed by:**	26/05/2025
Report Issue Number:	1	**Report issued on:**	26/05/2025
Samples Analysed:	5 soil samples		

Signed:

Anna Goc
PL Head of Reporting Team
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
air	- once the analysis is complete

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Retention period for records and reports is minimum 6 years from the date of issue of the final report.
Some records may be kept for longer according to other legal/best practice requirements.

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.

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The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number: 25-025766
Project / Site name: Home Farm

Lab Sample Number				550579	550580	550581	550582	550583
Sample Reference				WSD	WSI	WSE	WSG	WS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.4	0.3	0.8	1.1	1
Date Sampled				14/05/2025	14/05/2025	03/05/2025	03/05/2025	04/05/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	24	18	23	18	21
Total mass of sample received	kg	0.1	NONE	1.6	1.6	0.6	0.6	0.5
Asbestos								
Asbestos in Soil Detected/Not Detected	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	-
Asbestos Analyst ID	N/A	N/A	N/A	MJN	MJN	-	-	-
Analysis completed	N/A	N/A	N/A	24/05/2025	24/05/2025	-	-	-
General Inorganics								
pH (L099)	pH Units	N/A	MCERTS	7.9	8	8.1	8.2	8
Free Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Total Sulphate as SO_4	mg/kg	50	MCERTS	-	-	450	330	1000
Total Sulphate as SO_4	%	0.005	MCERTS	0.032	0.045	-	-	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	110	79	130	85	670
Water Soluble SO_4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	52.5	39.5	-	-	-
Water Soluble SO_4 16hr extraction (2:1)	mg/l	1.25	MCERTS	-	-	63.7	42.7	335
Organic Matter (automated)	%	0.1	MCERTS	2.9	1.6	-	-	-
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(b)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	-	-	-
Benzo(k)fluoranthene	mg/kg	0.05	ISO 17025	< 0.05	< 0.05	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	-	-	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	ISO 17025	< 0.80	< 0.80	-	-	-

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 25-025766
Project / Site name: Home Farm

Lab Sample Number				550579	550580	550581	550582	550583
Sample Reference				WSD	WSI	WSE	WSG	WS02
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Water Matrix				N/A	N/A	N/A	N/A	N/A
Depth (m)				0.4	0.3	0.8	1.1	1
Date Sampled				14/05/2025	14/05/2025	03/05/2025	03/05/2025	04/05/2025
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Test Limit of detection**	**Test Accreditation Status**					
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	8.2	-	-	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.6	0.6	-	-	-
Chromium (hexavalent)	mg/kg	1.8	MCERTS	< 1.8	< 1.8	-	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	21	-	-	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	37	20	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28	16	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-	-	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	52	29	-	-	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	43	29	-	-	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	96	58	-	-	-
Petroleum Hydrocarbons								
TPHCWG - Aliphatic >EC5 - EC6 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC6 - EC8 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC8 - EC10 $_{HS_1D_AL}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aliphatic >EC10 - EC12 $_{EH_CU_1D_AL}$	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPHCWG - Aliphatic >EC12 - EC16 $_{EH_CU_1D_AL}$	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPHCWG - Aliphatic >EC16 - EC21 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
TPHCWG - Aliphatic >EC21 - EC35 $_{EH_CU_1D_AL}$	mg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
TPHCWG - Aliphatic >EC5 - EC35 $_{EH_CU+HS_1D_AL}$	mg/kg	10	NONE	< 10	< 10	-	-	-
TPHCWG - Aromatic >EC5 - EC7 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aromatic >EC7 - EC8 $_{HS_1D_AR}$	mg/kg	0.01	MCERTS	< 0.010	< 0.010	-	-	-
TPHCWG - Aromatic >EC8 - EC10 $_{HS_1D_AR}$	mg/kg	0.02	MCERTS	< 0.020	< 0.020	-	-	-
TPHCWG - Aromatic >EC10 - EC12 $_{EH_CU_1D_AR}$	mg/kg	1	MCERTS	< 1.0	< 1.0	-	-	-
TPHCWG - Aromatic >EC12 - EC16 $_{EH_CU_1D_AR}$	mg/kg	2	MCERTS	< 2.0	< 2.0	-	-	-
TPHCWG - Aromatic >EC16 - EC21 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPHCWG - Aromatic >EC21 - EC35 $_{EH_CU_1D_AR}$	mg/kg	10	MCERTS	< 10	< 10	-	-	-
TPHCWG - Aromatic >EC5 - EC35 $_{EH_CU+HS_1D_AR}$	mg/kg	10	NONE	< 10	< 10	-	-	-
VOCs								
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
Benzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
Toluene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
Ethylbenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-
p & m-Xylene	µg/kg	8	MCERTS	< 8.0	< 8.0	-	-	-
o-Xylene	µg/kg	5	MCERTS	< 5.0	< 5.0	-	-	-

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number : 25-025766
Project / Site name: Home Farm

* 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 *
550579	WSD	None Supplied	0.4	Grey clay
550580	WSI	None Supplied	0.3	Brown clay and sand with gravel
550581	WSE	None Supplied	0.8	Grey clay
550582	WSG	None Supplied	1.1	Brown clay and sand
550583	WS02	None Supplied	1	Brown clay and sand

Analytical Report Number : 25-025766
Project / Site name: Home Farm

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in Soil	Asbestos Identification with the use of polarised light microscopy in conjunction with dispersion staining techniques	In-house method based on HSG 248, 2021	A001B	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 (Walkley Black Method)	In-house method	L009B	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically (up to 30°C)	In-house method	L019B	W	NONE
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.	L019B	D	NONE
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	L038B	D	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES	In-house method	L038B	D	MCERTS
Sulphate, water soluble, in soil (16hr extraction)	Sulphate, water soluble, in soil (16hr extraction)	In-house method	L038B	D	MCERTS
Speciated PAHs and/or Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds (including PAH) in soil by extraction in dichloromethane and hexane followed by GC-MS	In-house method based on USEPA 8270	L064B	D	MCERTS
BTEX and/or Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS	In-house method based on USEPA 8260	L073B	W	MCERTS
Total petroleum hydrocarbons with carbon banding by GC-FID/GC-MS HS in soil	Determination of total petroleum hydrocarbons in soil by GC-FID/GC-MS HS with carbon banding aliphatic and aromatic	In-house method	L076B/L088-PL	D/W	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
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	MCERTS
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	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

Analytical Report Number : 25-025766
Project / Site name: Home Farm

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Soil Descriptions	Textural classification	In-house method	L019B	W	NONE

For method numbers ending in 'UK' or 'A' analysis have been carried out in our laboratory in the United Kingdom (Watford).
For method numbers ending in 'F' analysis have been carried out in our laboratory in the United Kingdom (East Kilbride).
For method numbers ending in 'PL' or 'B' 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.

Quality control parameter failure associated with individual result applies to calculated sum of individuals.
The result for sum should be interpreted with caution

Sample Deviation Report

Analytical Report Number : 25-025766
Project / Site name: Home Farm

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.

Key: a - No sampling date b - Incorrect container/Insufficient material provided c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
WS02	N/A	S	550583	c	pH in soil (automated)	L099-PL	c
WSE	N/A	S	550581	c	pH in soil (automated)	L099-PL	c
WSG	N/A	S	550582	c	pH in soil (automated)	L099-PL	c

End of Report

ENVIRONMENTAL GEOTECHNICAL

Constructionline
A UK GOVERNMENT CERTIFICATION SERVICE
QMS ISO 9001 : 2015 REGISTERED Cert No. 14123657
QMS ISO 14001 : 2015 REGISTERED Cert No. 14127804
QMS ISO 45001 : 2018 REGISTERED Cert No. 14130281
CIVATION APPROVED Registered Member
UKAS United Kingdom Accreditation Service

RGS Environmental Geotechnical Specialists
Rogers Geotechnical Services Ltd
Offices 1 & 2 Barncliffe Business Park, Near Bank, Shelley, Huddersfield, HD8 8LU
01484 604354 Company No. 5130864

Appendix 9

Soil Screening Sheet

Rogers Geotechnical Services: Soil Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet

Job Number	C4826/24/E
Job Name	Home Farm
Date	14.07.25
Client	Engie

A = WS Atkins PLC, Atrisk Soil Screening Values.
A+ = Values updated June 2017.
A* = Atrisk's SSV is lower than i2's detectable limit for this compound.
B = health criterion values, which are available from toxicological reviews published in the C4SL project methodology report.
C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter.
D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.

KEY
- Exceeds SSV
- Exceeds 2017, Below 2015
- Below limit of detection (LOD)

Sample Location	WSD	WSI	WSE	WSG	WS02					
Depth Top	0.4	0.3	0.8	1.1	1					
Depth Base										

Determinand	Units	Ref	LOD	Commercial 1%										
				Atrisk 2015 (No Free Product	Atrisk 2017									
Cadmium	mg/kg	C	0.2		410	0.6	0.6							
Chromium (Hexavalent)	mg/kg	B/C	1.8	49.1	19.7	< 1.8	< 1.8							
Copper	mg/kg	A+	1.0		106000	37.00	20.00							
Mercury	mg/kg	A/D	0.3		350	< 0.3	< 0.3							
Nickel	mg/kg	A+	1.0		1770	52.00	29.00							
Lead	mg/kg	C	1.0		2310	28.00	16.00							
Zinc	mg/kg	A+	1.0		1100000	96.00	58.00							
Vanadium	mg/kg	A+	1.0		7490	43.00	29.00							
Arsenic	mg/kg	C	1.0		635	11.00	8.20							
Selenium	mg/kg	A	1.0		13000	< 1.0	< 1.0							
Cyanide (Free)	mg/kg	A	1.0		373	< 1.0	< 1.0							
Total Phenols	mg/kg	A	1.0		685	< 1.0	< 1.0							
Naphthalene	mg/kg	A+	0.05	90.1	75	< 0.05	< 0.05							
Acenaphthylene	mg/kg		0.05			< 0.05	< 0.05							
Acenaphthene	mg/kg	A+	0.05	83600	156.8	< 0.05	< 0.05							
Fluorene	mg/kg	A+	0.05		66500	< 0.05	< 0.05							
Phenanthrene	mg/kg		0.05			< 0.05	< 0.05							
Anthracene	mg/kg	A+	0.05		535000	< 0.05	< 0.05							
Fluoranthene	mg/kg	A+	0.05		72200	< 0.05	< 0.05							
Pyrene	mg/kg	A+	0.05		54100	< 0.05	< 0.05							
Benzo[a]anthracene	mg/kg	A	0.05	131	1.71	< 0.05	< 0.05							
Chrysene	mg/kg	A	0.05	14000	0.44	< 0.05	< 0.05							
Benzo[b]fluoranthene	mg/kg	A	0.05	142	1.22	< 0.05	< 0.05							
Benzo[k]fluoranthene	mg/kg	A	0.05	1430	0.686	< 0.05	< 0.05							
Benzo[a]pyrene	mg/kg	B/C	0.05	76.3	26.1	< 0.05	< 0.05							
Indeno(1,2,3-c,d)Pyrene	mg/kg	A*	0.05	142	0.0614	< 0.05	< 0.05							
Dibenz(a,h)Anthracene	mg/kg	A	0.05	14.3	0.00393	< 0.05	< 0.05							
Benzo[g,h,i]perylene	mg/kg	A	0.05	1440	0.0187	< 0.05	< 0.05							
Total Of 16 PAH's	mg/kg		0.8											
Aliphatic TPH >C5-C6	mg/kg	A+	0.01	4490	327	< 0.010	< 0.010							
Aliphatic TPH >C6-C8	mg/kg	A+	0.01	10400	157	< 0.010	< 0.010							
Aliphatic TPH >C8-C10	mg/kg	A+	0.01	1370	82.4	< 0.010	< 0.010							
Aliphatic TPH >C10-C12	mg/kg	A+	1.0	7900	49.9	< 1.0	< 1.0							
Aliphatic TPH >C12-C16	mg/kg	A+	2.0	34000	20.9	< 2.0	< 2.0							
Aliphatic TPH >C16-C21	mg/kg	A+	8.0		3620000	< 8.0	< 8.0							
Aliphatic TPH >C21-C35	mg/kg	A+	8.0		3620000	< 8.0	< 8.0							
Aliphatic TPH >C35-C44	mg/kg		10.0											
Total Aliphatic Hydrocarbons	mg/kg		10.0											

Rogers Geotechnical Services: Soil Screening Values Comparison Sheet

Rogers Geotechnical Services Ltd: Soil Screening Value (SSV) Comparison Sheet

Job Number	C4826/24/E
Job Name	Home Farm
Date	14.07.25
Client	Engie

A = WS Atkins PLC, Atrisk Soil Screening Values.
A+ = Values updated June 2017.
A* = Atrisk's SSV is lower than i2's detectable limit for this compound.
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C = Category 4 Screening Levels (C4SLs) based on 6% soil organic matter.
D = Value provided is based on Methyl Mercury. Should elemental mercury be observed or a source be known then a limit of 102 should be used.

KEY
- Exceeds SSV
- Exceeds 2017, Below 2015
- Below limit of detection (LOD)

Determinand	Units	Ref	LOD	Commercial 1%											
Sample Location						WSD	WSI	WSE	WSG	WS02					
Depth Top						0.4	0.3	0.8	1.1	1					
Depth Base															
Aromatic TPH >C5-C7	mg/kg	A+	0.01		12.5	< 0.010	< 0.010								
Aromatic TPH >C7-C8	mg/kg	A+	0.01	27900	834	< 0.010	< 0.010								
Aromatic TPH >C8-C10	mg/kg	A+	0.02	2210	613	< 0.020	< 0.020								
Aromatic TPH >C10-C12	mg/kg	A+	1.0	12300	369	< 1.0	< 1.0								
Aromatic TPH >C12-C16	mg/kg	A+	2.0	41300	155	< 2.0	< 2.0								
Aromatic TPH >C16-C21	mg/kg	A+	10.0		28400	< 10	< 10								
Aromatic TPH >C21-C35	mg/kg	A+	10.0		28400	< 10	< 10								
Aromatic TPH >C35-C44	mg/kg		10.0												
Total Aromatic Hydrocarbons	mg/kg		10.0												
Total Petroleum Hydrocarbons	mg/kg		10.0												
pH			N/A			7.9	8	8.1	8.2	8					
Sulphate (2:1 Water Soluble) as SO4	mg/l		1.25			52.500	**39.500**	63.700	42.700	**335.000**					
ACM Type			N/A												
Asbestos Identification	%					Not detected	Not detected								
ACM Detection Stage			N/A												
Moisture	%		0.01												
Soil Colour			N/A												
Other Material			N/A												
Sulphate (Total)	mg/kg							450.00	330.00	1000.00					
Sulphate (Total)	%		0.005			0.0320	0.0450								
Organic Matter	%		0.1			**2.90**	**1.60**								

APPENDIX D MATERIAL SAFETY DATA SHEETS

SAFETY DATA SHEET

Alpha SP 220

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier Alpha SP 220

SDS # 456556

Code 456556-AR08

Relevant identified uses of the substance or mixture and uses advised against

Product use Gear lubricant
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

Manufacturer BP Lubricants USA Inc.
1500 Valley Road
Wayne, NJ 07470
Telephone: +1-888-CASTROL

Supplier PAN AMERICAN ENERGY S.L., SUCURSAL
ARGENTINA AV. LEANDRO N. ALEM 1180
PISO 11 – C1001AAT
CIUDAD AUTÓNOMA DE BUENOS AIRES.

Consultas Técnicas 0800-888-8088

EMERGENCY HEALTH INFORMATION: TELÉFONO PARA EMERGENCIAS (24 HORAS) CIQUIME: 0800-222-2933
+1-800-424-9300 (CHEMTREC USA)
+1-703-527-3887 (CHEMTREC outside the US)

EMERGENCY TELEPHONE NUMBER

SECTION 2: Hazards identification

Classification of the substance or mixture Not classified.

GHS label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Other hazards which do not result in classification Defatting to the skin.

SECTION 3: Composition/information on ingredients

Substance/mixture Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

Other means of identification Not available.

Ingredient name	%	CAS number
Distillates (petroleum), solvent-dewaxed heavy paraffinic	≥25 - ≤50	64742-65-0
Residual oils (petroleum), solvent-dewaxed	≥25 - ≤50	64742-62-7
1-Propene, 2-methyl-, sulfurized	≤3	68511-50-2
Alcohols, C12-16, ethoxylated	<0.025	68551-12-2

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

Description of necessary first aid measures

Eye contact In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Skin contact Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician Treatment should in general be symptomatic and directed to relieving any effects.

Specific treatments No specific treatment.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media Do not use water jet.

Specific hazards arising from the chemical In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

SECTION 5: Firefighting measures

Special protective actions for fire-fighters
No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Special protective equipment for fire-fighters
Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.

For emergency responders
If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill
Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill
Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

SECTION 7: Handling and storage

Precautions for safe handling

Protective measures
Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene
Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. Contaminated work clothing should not be allowed out of the workplace. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities
Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Not suitable
Prolonged exposure to elevated temperature

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Distillates (petroleum), solvent-dewaxed heavy paraffinic	**Ministry of Labor, Employment and Social Security. Argentina (Resolution 295,11/2003) (Argentina). [Aceite mineral]** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2003 Form: mist STEL: 10 mg/m³ 15 minutes. Issued/ Revised: 11/2003 Form: mist
Residual oils (petroleum), solvent-dewaxed	**Ministry of Labor, Employment and Social Security. Argentina (Resolution 295,11/2003) (Argentina). [Aceite mineral]** TWA: 5 mg/m³ 8 hours. Issued/Revised: 11/2003 Form: mist STEL: 10 mg/m³ 15 minutes. Issued/ Revised: 11/2003 Form: mist

While specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Safety glasses with side shields.

Skin protection

SECTION 8: Exposure controls/personal protection

Hand protection

Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Body protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.
For protection against metal working fluids, respiratory protection that is classified as “resistant to oil” (class R) or oil proof (class P) should be selected where appropriate. Depending on the level of airborne contaminants, an air-purifying, half-mask respirator (with HEPA filter) including disposable (P- or R-series) (for oil mists less than 50mg/m3), or any powered, air-purifying respirator equipped with hood or helmet and HEPA filter (for oil mists less than 125 mg/m3).
Where organic vapours are a potential hazard during metalworking operations, a combination particulate and organic vapour filter may be necessary.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance

Physical state	Liquid.
Color	Amber.
Odor	Not available.
Odor threshold	Not available.
pH	Not applicable.
Melting point/freezing point	Not available.
Boiling point, initial boiling point, and boiling range	Not available.
Flash point	Open cup: >200°C (>392°F) [Cleveland ASTM D 92]
Pour point	-18 °C
Evaporation rate	Not available.
Flammability	Not available.
Lower and upper explosion limit/flammability limit	Not available.

SECTION 9: Physical and chemical properties

Vapor pressure

Ingredient name	Vapor Pressure at 20˚C			Vapor pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Distillates (petroleum), solvent-dewaxed heavy paraffinic	<0.07501	<0.01	ASTM D 5191			
Residual oils (petroleum), solvent-dewaxed	<0.07501	<0.01	ASTM D 5191			

Relative vapor density Not available.

Density <1000 kg/m³ (<1 g/cm³) at 15°C

Solubility(ies)

Media	Result
water	Not soluble

Partition coefficient: n-octanol/water Not applicable.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Kinematic: 220 mm^2/s (220 cSt) at 40°C
Kinematic: 18.7 mm^2/s (18.7 cSt) at 100°C (ASTM D 445)

Particle characteristics

Median particle size Not applicable.

SECTION 10: Stability and reactivity

Reactivity No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

Chemical stability The product is stable.

Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to avoid Avoid all possible sources of ignition (spark or flame).

Incompatible materials Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

Information on toxicological effects

Information on the likely routes of exposure Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Skin contact Defatting to the skin. May cause skin dryness and irritation.

Inhalation Vapor inhalation under ambient conditions is not normally a problem due to low vapor pressure.

SECTION 11: Toxicological information

Ingestion No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Inhalation No specific data.

Ingestion No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Long term exposure

Potential immediate effects Not available.

Potential delayed effects Not available.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route
Not available.

SECTION 12: Ecological information

Toxicity

Environmental effects No known significant effects or critical hazards.

Persistence and degradability

Expected to be biodegradable.

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

SECTION 12: Ecological information

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

Other adverse effects No known significant effects or critical hazards.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

SECTION 13: Disposal considerations

Disposal methods The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA/ICAO
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-
Transport hazard class(es)	-	-	-	-
Packing group	-	-	-	-
Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

Special precautions for user Not available.

Transport in bulk according to IMO instruments Not available.

SECTION 15: Regulatory information

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

SECTION 15: Regulatory information

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Other regulations

Australia inventory (AIIC)	All components are listed or exempted.
Canada inventory	All components are listed or exempted.
China inventory (IECSC)	All components are listed or exempted.
Japan inventory (CSCL)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	All components are listed or exempted.
United States inventory (TSCA 8b)	All components are active or exempted.
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.

SECTION 16: Other information

History

Date of issue/Date of revision	07/07/2025.
Date of previous issue	02/07/2025.
Prepared by	Product Stewardship
Key to abbreviations	ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations VOC = Volatile Organic Compound Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Indicates information that has changed from previously issued version.

Notice to reader

SECTION 16: Other information

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Havoline Xtended Life Antifreeze/Coolant - Concentrate

Product Use: Antifreeze/Coolant
Product Number(s): 236542
Company Identification
Chevron Products Company
a division of Chevron U.S.A. Inc.
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: 1 (800) 582-3835, LUBETEK@chevron.com

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Target organ toxicant (repeated exposure): Category 2. Reproductive toxicant (developmental): Category 2. Acute oral toxicant: Category 4.



Signal Word: Warning

Health Hazards: Suspected of damaging the unborn child. Harmful if swallowed.

Target Organs: May cause damage to organs (Kidney) through prolonged or repeated exposure.

PRECAUTIONARY STATEMENTS:

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapours/spray. Use personal protective equipment as required. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Response: IF SWALLOWED: Rinse mouth. Call a poison center or doctor/physician if you feel unwell. Get medical advice/attention if you feel unwell. IF exposed or concerned: Get medical advice/attention.

Storage: Store locked up.

Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Ethylene glycol	107-21-1	80 - 98 %weight
Potassium 2-ethylhexanoate	3164-85-0	3 - < 5 %weight

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.

Ingestion: May be harmful if swallowed.

Inhalation: Not expected to be harmful if inhaled. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may cause harm to the unborn child if swallowed based on animal data.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated inhalation at concentrations above the recommended exposure limit:Kidney Risk depends on duration and level of exposure. See Section 11 for additional information.

Indication of any immediate medical attention and special treatment needed Not Applicable

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames. Dry Chemical, CO2, AFFF Foam or alcohol resistant foam.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: This material will burn although it is not easily ignited. See Section 7 for proper handling and storage. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion. Combustion may form oxides of: Potassium.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at

(800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Do not taste or swallow antifreeze or solution. Keep out of the reach of children and animals.
Precautionary Measures: Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling. Keep out of the reach of children.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: Do not store in open or unlabeled containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits. Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Natural rubber, Neoprene, Nitrile Rubber, Polyvinyl Chloride (PVC or Vinyl).

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors, Dusts and Mists.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Agency	TWA	STEL	Ceiling	Notation
Ethylene glycol	ACGIH	--	--	100 mg/m3	--
Potassium 2-ethylhexanoate	Not Applicable	--	--	--	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Orange
Physical State: Liquid
Odor: Faint or Mild
Odor Threshold: No data available
pH: 8 - 8.60 (Approximate)
Vapor Pressure: No data available
Vapor Density (Air = 1): 1
Initial Boiling Point: 180°C (356°F) (Estimated)
Solubility: Soluble in water.
Freezing Point: -18°C (-0.4°F) (Typical)
Melting Point: Not Applicable
Specific Gravity: 1.12 @ 15.6°C (60.1°F)
Viscosity: No data available
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Pensky-Martens Closed Cup) 122 °C (252 °F) (Estimated)
Autoignition: 400 °C (752 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: No data available Upper: No data

available

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: Ketones (Elevated temperatures), Aldehydes (Elevated temperatures)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.
Acute Toxicity Estimate (oral): 1678 mg/kg

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material.

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains ethylene glycol (EG). The toxicity of EG via inhalation or skin contact is expected to

be slight at room temperature. The estimated oral lethal dose is about 100 cc (3.3 oz.) for an adult human. Ethylene glycol is oxidized to oxalic acid which results in the deposition of calcium oxalate crystals mainly in the brain and kidneys. Early signs and symptoms of EG poisoning may resemble those of alcohol intoxication. Later, the victim may experience nausea, vomiting, weakness, abdominal and muscle pain, difficulty in breathing and decreased urine output. When EG was heated above the boiling point of water, vapors formed which reportedly caused unconsciousness, increased lymphocyte count, and a rapid, jerky movement of the eyes in persons chronically exposed. When EG was administered orally to pregnant rats and mice, there was an increase in fetal deaths and birth defects. Some of these effects occurred at doses that had no toxic effects on the mothers. We are not aware of any reports that EG causes reproductive toxicity in human beings.

2-Ethylhexanoic acid (2-EXA) caused an increase in liver size and enzyme levels when repeatedly administered to rats via the diet. When administered to pregnant rats by gavage or in drinking water, 2-EXA caused teratogenicity (birth defects) and delayed postnatal development of the pups. Additionally, 2-EXA impaired female fertility in rats. Birth defects were seen in the offspring of mice who were administered sodium 2-ethylhexanoate via intraperitoneal injection during pregnancy.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
This material is not expected to be harmful to aquatic organisms.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY
No data available.

PERSISTENCE AND DEGRADABILITY
This material is expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.
The product has not been tested. The statement has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: PROPRIETARY ANTIFREEZE PREPARATION IN NON-BULK PACKAGING; NOT REGULATED FOR TRANSPORT UNDER 49 CFR
Additional Information: Bulk shipments containing a reportable quantity (RQ, 5000 pounds or more) of ethylene glycol in a single packaging are transported as hazardous material. The shipping description is: UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ETHYLENE GLYCOL CONTAINS BITTERANT), 9, III, RQ (ETHYLENE GLYCOL)

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: Anti-freeze Preparations, Proprietary; NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORT UNDER ICAO

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:

1.	Immediate (Acute) Health Effects:	YES
2.	Delayed (Chronic) Health Effects:	YES
3.	Fire Hazard:	NO
4.	Sudden Release of Pressure Hazard:	NO
5.	Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Ethylene glycol	04, 05, 07

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), IECSC (China), PICCS (Philippines), TSCA (United States).

One or more components does not comply with the following chemical inventory requirements: ENCS (Japan), KECI (Korea).

NEW JERSEY RTK CLASSIFICATION:

Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows: Refer to components listed in Section 3.

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 2 Flammability: 1 Reactivity: 0

HMIS RATINGS: Health: 2* Flammability: 1 Reactivity: 0
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 15, 16

Revision Date: June 08, 2016

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

Visit SCL http://shop.sclubricants.com/havoline-xtended-life-antifreeze-concentrate

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

BTL TYPE BCM

Version 2.0 Print Date 07.12.2015

Revision date / valid from 05.08.2014

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name : **BTL TYPE BCM**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : At this time we do not yet have information on identified uses. They will be included in this safety data sheet when available.

Uses advised against : At this moment we have not identified any uses advised Against

1.3. Details of the supplier of the safety data sheet

Company : Agratech S.r.l.
Via L. Da Vinci 12
Bolzano
Telephone : ND
Telefax : ND
E-mail address : info@agratech.it
Responsible/issuing person : Environmental Consulting

1.4. Emergency telephone number

For dangerous goods incident spill, leak, fire, exposure or accident call Chemtrec day or night
Within Italy (support in Italian): +1 703-527-3887
Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Respiratory sensitisation	Category 1	---	H334
Skin sensitisation	Category 1	---	H317
Germ cell mutagenicity	Category 2	---	H341
Carcinogenicity (Inhalation)	Category 1A	---	H350i

Reproductive toxicity	Category 1B	---	H360FD
Specific target organ toxicity - repeated exposure	Category 2	---	H373
Acute aquatic toxicity	Category 1	---	H400
Chronic aquatic toxicity	Category 1	---	H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC

Hazard symbol / Category of danger	Risk phrases
Toxic (T)Toxic to Reproduction Category 2 (Repr.Cat.2)	R60
Harmful (Xn)Harmful (Xn)	R48/20
Harmful (Xn)Mutagenic Category 3 (Mut.Cat.3)	R68
Harmful (Xn)Sensitising	R42/43
Dangerous for the environment (N)Dangerous for the environment (N)	R50/53
Toxic (T)Carcinogenic Category 1 (Carc.Cat.1)	R49

For the full text of the R-phrases mentioned in this Section, see Section 16.

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word : Danger

Hazard statements : H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

		H341	Suspected of causing genetic defects.
		H350i	May cause cancer by inhalation.
		H360FD	May damage fertility. May damage the unborn child.
		H373	May cause damage to organs through prolonged or repeated exposure.
		H410	Very toxic to aquatic life with long lasting effects.
Precautionary statements			
Prevention	:	P201	Obtain special instructions before use.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		P281	Use personal protective equipment as required.
Response	:	P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P308 + P313	IF exposed or concerned: Get medical advice/ attention.
		P310	Immediately call a POISON CENTER or doctor/ physician.

Additional Labelling:

Restricted to professional users.

Hazardous components which must be listed on the label:

- cobalt dichloride hexahydrate
- nickel dichloride hexahydrate
- cobalt sulphate heptahydrate

2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical nature : Aqueous solution

BTL TYPE BCM

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008)		Classification (67/548/EEC)
		Hazard class / Hazard category	Hazard statements	
cobalt dichloride hexahydrate				
Index-No. : 027-004-00-5 CAS-No. : 7791-13-1 EC-No. : 231-589-4	>= 5 - < 7	Carc.1B Muta.2 Repr.1B Acute Tox.4 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360F H302 H334 H317 H400 H410	Carc.Cat.2; R49 Dangerous for the environment; N; R50-R53 R42/43 Harmful; Xn; R22 Repr.Cat.2; R60 Mut.Cat.3; R68 R68
Iron trichloride				
CAS-No. : 7705-08-0 EC-No. : 231-729-4 Registration : 01-2119497998-05-xxxx	>= 1 - < 3	Acute Tox.4 Skin Irrit.2 Eye Dam.1 Met. Corr.1	H302 H315 H318 H290	Harmful; Xn; R22 Irritant; Xi; R38 Irritant; Xi; R41
nickel dichloride hexahydrate				
Index-No. : 028-011-00-6 CAS-No. : 7791-20-0 EC-No. : 231-743-0 Registration : 01-2119486973-20-xxxx	>= 0,3 - < 0,5	Carc.1A Muta.2 Repr.1B Acute Tox.3 Acute Tox.3 STOT RE1 Skin Irrit.2 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360D H331 H301 H372 H315 H334 H317 H400 H410	Carc.Cat.1; R49 Mut.Cat.3; R68 Repr.Cat.2; R61 Toxic; T; R23/25-R48/23 Irritant; Xi; R38 R42/43 Dangerous for the environment; N; R50-R53
cobalt sulphate heptahydrate				
Index-No. : 027-005-00-0 CAS-No. : 10026-24-1 EC-No. : 233-334-2	>= 0,3 - < 0,5	Carc.1B Muta.2 Repr.1B Acute Tox.4 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360F H302 H334 H317 H400 H410	Dangerous for the environment; N; R50-R53 R42/43 Harmful; Xn; R22 Repr.Cat.2; R60 Mut.Cat.3; R68 Carc.Cat.2; R49
zinc chloride				
Index-No. : 030-003-00-2 CAS-No. : 7646-85-7 EC-No. : 231-592-0 Registration : 01-2119472431-44-xxxx	>= 0,1 - < 0,25	Acute Tox.4 Skin Corr.1B STOT SE3 Aquatic Acute1 Aquatic Chronic1	H302 H314 H335 H400 H410	Harmful; Xn; R22 Corrosive; C; R34 Dangerous for the environment; N; R50-R53

Remarks : This product contains a substance included on the candidate list according to article 59 (1, 10) of regulation EC No. 1907/2006 ('REACH') in a concentration >= 0.1% w/w.

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	: First aider needs to protect himself. Remove from exposure, lie down. Take off all contaminated clothing immediately.
If inhaled	: Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Oxygen, if needed. No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus. Call a physician immediately.
In case of skin contact	: Wash off immediately with soap and plenty of water. Call a physician immediately.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Keep patient warm and at rest. Call a physician immediately. If a person vomits when lying on his back, place him in the recovery position.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	: See Section 11 for more detailed information on health effects and symptoms.
Effects	: See Section 11 for more detailed information on health effects and symptoms.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment	: Treat symptomatically. No further information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: High volume water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Toxic gases, Under fire conditions: Carbon monoxide, Carbon dioxide (CO2)

5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Keep people away from and upwind of spill/leak. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Wear respiratory protection. For personal protection see section 8.

6.2. Environmental precautions

Environmental precautions	:	Should not be released into the environment. If material reaches soil inform authorities responsible for such cases. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal.
Further information	:	Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	:	Keep container tightly closed. Use personal protective equipment. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity. Plan first aid action before beginning work with this product.
Hygiene measures	:	Keep away from food, drink and animal feedingstuffs. Smoking,

eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately. Keep working clothes separately. Avoid contact with skin, eyes and clothing. Do not breathe vapour.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	: Store in a place accessible by authorized persons only. Keep locked up. Keep only in the original container.
Advice on protection against fire and explosion	: Normal measures for preventive fire protection.
Further information on storage conditions	: Keep tightly closed in a dry and cool place. Keep in a well-ventilated place. Protect from frost.
Advice on common storage	: Keep away from food, drink and animal feedingstuffs.

7.3. Specific end use(s)

Specific use(s) : No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0

Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)

DNEL Workers, Acute - systemic effects, Inhalation Related to, Nickel	: 16 mg/m3
DNEL Workers, Acute - local effects, Inhalation Related to, Nickel	: 0,7 mg/m3
DNEL Workers, Long-term - local effects, Skin contact Related to, Nickel	: 0,00044 mg/cm2
DNEL Consumers, Acute - systemic effects, Ingestion Related to, Nickel	: 0,012 mg/kg bw/day
DNEL Consumers, Acute - local effects, Inhalation Related to, Nickel	: 0,4 mg/m3

DNEL	
Consumers, Long-term - systemic effects, Inhalation Related to, Nickel	: 0,00002 mg/m3
DNEL	
Consumers, Long-term - systemic effects, Ingestion Related to, Nickel	: 0,02 mg/kg bw/day
DNEL	
Consumers, Long-term - local effects, Inhalation Related to, Nickel	: 0,00002 mg/m3

Predicted No Effect Concentration (PNEC)

Fresh water (AF = 2), Related to, Nickel	: 3,6 µg/l
Marine water (AF = 2), Related to, Nickel	: 8,6 µg/l
Soil (AF = 2), Related to, Nickel	: 29,9 mg/kg
Sewage treatment plant (STP) (AF = 100), Related to, Nickel	: 0,33 mg/kg

Other Occupational Exposure Limit Values

MAK (AT)
Included in the regulation but with no data values. See regulation for further details

MAK (AT), Inhalable droplets.
Included in the regulation but with no data values. See regulation for further details

TRK (AT), TRK Short Term Exposure Limit (STEL):, Inhalable droplets., as
Ni 0,2 mg/m3

TRK (AT), TRK:, Inhalable droplets., as
Ni 0,05 mg/m3

Component: Disodium molybdate dihydrate **CAS-No. 10102-40-6**

Other Occupational Exposure Limit Values

MAK (AT), MAK:, Inhalable fraction., as
Mo 5 mg/m3

MAK (AT), MAK Short Term Exposure Limit (STEL):, Inhalable fraction., as
Mo 10 mg/m3, (4x15 minutes/shift)

8.2. Exposure controls

Appropriate engineering controls
Refer to protective measures listed in sections 7 and 8.

Personal protective equipment
Respiratory protection

Advice	:	In case of brief exposure or low pollution use breathing filter apparatus. In case of intensive or longer exposure use self-contained breathing apparatus.

Hand protection

Advice	:	Wear suitable gloves. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.
Material	:	Nitrile rubber
Break through time	:	>= 480 min
Glove thickness	:	0,35 mm

Material	:	Natural Rubber
Break through time	:	>= 480 min
Glove thickness	:	0,5 mm

Eye protection

Advice	:	Goggles or faceshield giving complete protection to the eyes

Skin and body protection

Advice	:	impervious clothing Chemical resistant apron

Environmental exposure controls

General advice	:	Should not be released into the environment. If material reaches soil inform authorities responsible for such cases. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	dark brown clear
Odour	:	odourless
Odour Threshold	:	no data available
pH	:	ca. 5,4 (20 °C)
Freezing point	:	no data available
Boiling point/boiling range	:	ca. 100 °C
Flash point	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Density	:	ca. 1,25 g/cm3 (20 °C)
Water solubility	:	completely miscible
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Explosivity	:	not applicable
Oxidizing properties	:	no data available

9.2. Other information

No further information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : No information available.

10.2. Chemical stability

Advice : No decomposition if stored and applied as directed.
No further information available.

10.3. Possibility of hazardous reactions

Hazardous reactions : No information available.

10.4. Conditions to avoid

Conditions to avoid : No information available.

10.5. Incompatible materials

Materials to avoid : No information available.

10.6. Hazardous decomposition products

Hazardous decomposition products : No information available.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	
Oral	
Acute toxicity estimate	: > 2000 mg/kg) (Calculation method)
Inhalation	
Acute toxicity estimate	: > 20 mg/l (vapour) (Calculation method)
Dermal	
	Please find this information in the listing of the component/components below in the MSDS.
Irritation	
Skin	
Result	: May have irritant effects.
Eyes	
Result	: May have irritant effects.

Sensitisation	
Result	: May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

CMR effects	
CMR Properties	
Carcinogenicity	: Carcinogenic Category 1 May cause cancer by inhalation.
Mutagenicity	: Mutagenic Category 2 Suspected of causing genetic defects.
Reproductive toxicity	: Toxic to Reproduction Category 1 May damage fertility. May damage the unborn child.

Specific Target Organ Toxicity	
Single exposure	
remark	: The substance or mixture is not classified as specific target organ toxicant, single exposure.

Repeated exposure	
remark	: May cause damage to organs through prolonged or repeated exposure.

Other toxic properties	
Repeated dose toxicity	
no data available	

Aspiration hazard	
No aspiration toxicity classification	

Component:	**cobalt dichloride hexahydrate**	**CAS-No. 7791-13-1**
Acute toxicity		
Dermal		
LDLo	: 2000 mg/kg (rat; Test substance: applies to anhydrous substance)	

SECTION 12: Ecological information

12.1. Toxicity

Component:	cobalt dichloride hexahydrate	CAS-No. 7791-13-1
Acute toxicity		
Fish		
LC50	: > 35 mg/l (Oncorhynchus mykiss; Test substance: applies to anhydrous substance)	
Toxicity to daphnia and other aquatic invertebrates		
EC50	: 11,8 mg/l (Daphnia magna; Test substance: applies to anhydrous substance)	
Bacteria		
EC50	: 64 mg/l (activated sludge; 120 h; Test substance: applies to anhydrous substance)	
M-Factor		
M-Factor (Acute Aquat. Tox.)	: 10	

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0
Acute toxicity		
Fish		
NOEC	: 0,06 - < 0,24 mg/l (fish; Test substance: Ni2+)	
Toxicity to daphnia and other aquatic invertebrates		
NOEC	: 0,01 - < 0,22 mg/l (Daphnia magna (Water flea); Test substance: Ni2+)	
M-Factor		
M-Factor (Acute Aquat. Tox.)	: 1	

Component:	cobalt sulphate heptahydrate	CAS-No. 10026-24-1

M-Factor

M-Factor (Acute Aquat. Tox.)	:	10

12.2. Persistence and degradability

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0
	Persistence and degradability	

Biodegradability

Result	:	The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

12.4. Mobility in soil

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0

Mobility

: The product is mobile in water enviroment.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment

Result	:	no data available

12.6. Other adverse effects

Additional ecological information

Result	:	Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. Danger to drinking water if even extremely small quantities leak into soil. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product	:	Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.
Contaminated packaging	:	Empty remaining contents. Packagings that cannot be cleaned are to be disposed of in the same manner as the product. Dispose of in accordance with local regulations.
European Waste Catalogue Number	:	No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.
Waste code Austria	:	59305

SECTION 14: Transport information

14.1. UN number

3082

14.2. UN proper shipping name

ADR	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cobalt-II-chloride, hexahydrate)
RID	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cobalt-II-chloride, hexahydrate)
IMDG	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cobalt-II-chloride, hexahydrate)

14.3. Transport hazard class(es)

ADR-Class	: 9
(Labels; Classification Code; Hazard identification No; Tunnel restriction code)	9; M6; 90; (E)
RID-Class	: 9
(Labels; Classification Code; Hazard identification No)	9; M6; 90
IMDG-Class	: 9
(Labels; EmS)	9; F-A, S-F

14.4. Packaging group

ADR	: III
RID	: III
IMDG	: III

14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR	: Fish and tree
Labeling according to 5.2.1.8 RID	: Fish and tree
Labeling according to 5.2.1.6.3 IMDG	: Fish and tree
Classification as environmentally hazardous according to 2.9.3 IMDG	: yes

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Risk classification according to VbF (Germany)	:	not applicable
Other regulations	:	Austria rule BGBl.I 53/1997 List of Chem. materials is in compliance with EU rule; Employment restrictions under workers actresses Protection Act are observed.
EU CARC.	:	cobalt dichloride hexahydrate: Carcinogen/Mutagen
MAK (AT)		cobalt dichloride hexahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only
		cobalt dichloride hexahydrate: Danger of respiratory and skin sensitization.
EU RA C2		cobalt dichloride hexahydrate: 231-589-4; Carcinogenicity Category 1B
EU RA R2		cobalt dichloride hexahydrate: 231-589-4; Reproductive toxicity Category 1B
MAK (AT)		cobalt dichloride hexahydrate: Danger of respiratory and skin sensitization.
		cobalt dichloride hexahydrate: F - May impair fertility.
		cobalt dichloride hexahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only
EU COS II		cobalt dichloride hexahydrate: 453; Listed
EU CARC.	:	nickel dichloride hexahydrate: Carcinogen/Mutagen

EU RA C1	nickel dichloride hexahydrate: 231-743-0; Carcinogenicity Category 1A
EU RA R2	nickel dichloride hexahydrate: 231-743-0; Reproductive toxicity Category 1B
MAK (AT)	nickel dichloride hexahydrate: Danger of respiratory and skin sensitization.
	nickel dichloride hexahydrate: Danger of skin sensitization.
	nickel dichloride hexahydrate: D - Can damage the unborn child.
	nickel dichloride hexahydrate: Carcinogens Group: III A1; Carcinogen - human evidence only
MAK (AT)	: cobalt sulphate heptahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only
EU CARC.	cobalt sulphate heptahydrate: Carcinogen/Mutagen
MAK (AT)	cobalt sulphate heptahydrate: Danger of respiratory and skin sensitization.
EU RA C2	cobalt sulphate heptahydrate: 233-334-2; Carcinogenicity Category 1B
EU RA R2	cobalt sulphate heptahydrate: 233-334-2; Reproductive toxicity Category 1B
EU COS II	cobalt sulphate heptahydrate: 454; Listed

15.2. Chemical Safety Assessment

no data available

SECTION 16: Other information

Full text of R-phrases referred to under sections 2 and 3.

R22	Harmful if swallowed.
R23/25	Also toxic by inhalation and if swallowed.
R34	Causes burns.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R42/43	May cause sensitisation by inhalation and skin contact.

R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R48/23	Also toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.
R50	Very toxic to aquatic organisms.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.
R60	May impair fertility.
R61	May cause harm to the unborn child.
R68	Possible risk of irreversible effects.

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H350i	May cause cancer by inhalation.
H360D	May damage the unborn child.
H360F	May damage fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

Key literature references and sources for data : Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Other information : The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship. The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

|| Indicates updated section.

SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

BTL TYPE BCN

Version 4.1 Print Date 07.12.2015

Revision date / valid from 05.08.2014

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Trade name : **BTL TYPE BCN**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : At this time we do not yet have information on identified uses. They will be included in this safety data sheet when available.

Uses advised against : At this moment we have not identified any uses advised against

1.3. Details of the supplier of the safety data sheet

Company : Agratech S.r.l.
Via L. Da. Vinci 12
39100 Bolzano
Telephone : ND
Telefax : ND
E-mail address : info@agratech.it
Responsible/issuing person : Environmental Consulting

1.4. Emergency telephone number

For dangerous goods incident spill, leak, fire, exposure or accident call Chemtrec day or night
Within Italy (support in Italian): +1 703-527-3887
Within USA and Canada: 1-800-424-9300. Outside USA and Canada: +1 703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	**Hazard category**	**Target Organs**	**Hazard statements**
Respiratory sensitisation	Category 1	---	H334
Skin sensitisation	Category 1	---	H317
Germ cell mutagenicity	Category 2	---	H341
Carcinogenicity (Inhalation)	Category 1A	---	H350i

Reproductive toxicity	Category 1B	---	H360FD
Specific target organ toxicity - repeated exposure	Category 2	---	H373
Acute aquatic toxicity	Category 1	---	H400
Chronic aquatic toxicity	Category 1	---	H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Directive 67/548/EEC or 1999/45/EC

Hazard symbol / Category of danger	Risk phrases
Toxic (T)Toxic to Reproduction Category 2 (Repr.Cat.2)	R60, R61
Harmful (Xn)Harmful (Xn)	R48/20
Harmful (Xn)Mutagenic Category 3 (Mut.Cat.3)	R68
Harmful (Xn)Sensitising	R42/43
Dangerous for the environment (N)Dangerous for the environment (N)	R50/53
Toxic (T)Carcinogenic Category 1 (Carc.Cat.1)	R49

For the full text of the R-phrases mentioned in this Section, see Section 16.

Most important adverse effects

Human Health : See section 11 for toxicological information.

Physical and chemical hazards : See section 9 for physicochemical information.

Potential environmental effects : See section 12 for environmental information.

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

Hazard symbols :

Signal word : Danger

Hazard statements : H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H341	Suspected of causing genetic defects.
H350i	May cause cancer by inhalation.
H360FD	May damage fertility. May damage the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statements

Prevention	:	P201	Obtain special instructions before use.
		P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
		P281	Use personal protective equipment as required.
Response	:	P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P308 + P313	IF exposed or concerned: Get medical advice/ attention.
		P310	Immediately call a POISON CENTER or doctor/ physician.

Additional Labelling:

Restricted to professional users.

Hazardous components which must be listed on the label:

- cobalt dichloride hexahydrate
- nickel dichloride hexahydrate
- cobalt sulphate heptahydrate

2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical nature : Aqueous solution

BTL TYPE BCN

Hazardous components	Amount [%]	Classification (REGULATION (EC) No 1272/2008) Hazard class / Hazard category	Hazard statements	Classification (67/548/EEC)
cobalt dichloride hexahydrate				
Index-No. : 027-004-00-5 CAS-No. : 7791-13-1 EC-No. : 231-589-4	>= 5 - < 7	Carc.1B Muta.2 Repr.1B Acute Tox.4 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360F H302 H334 H317 H400 H410	Carc.Cat.2; R49 Dangerous for the environment; N; R50-R53 R42/43 Harmful; Xn; R22 Repr.Cat.2; R60 Mut.Cat.3; R68 R68
Iron trichloride				
CAS-No. : 7705-08-0 EC-No. : 231-729-4 Registration : 01-2119497998-05-xxxx	>= 1 - < 3	Acute Tox.4 Skin Irrit.2 Eye Dam.1 Met. Corr.1	H302 H315 H318 H290	Harmful; Xn; R22 Irritant; Xi; R38 Irritant; Xi; R41
nickel dichloride hexahydrate				
Index-No. : 028-011-00-6 CAS-No. : 7791-20-0 EC-No. : 231-743-0 Registration : 01-2119486973-20-xxxx	>= 0,5 - < 1	Carc.1A Muta.2 Repr.1B Acute Tox.3 Acute Tox.3 STOT RE1 Skin Irrit.2 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360D H331 H301 H372 H315 H334 H317 H400 H410	Carc.Cat.1; R49 Mut.Cat.3; R68 Repr.Cat.2; R61 Toxic; T; R23/25-R48/23 Irritant; Xi; R38 R42/43 Dangerous for the environment; N; R50-R53
cobalt sulphate heptahydrate				
Index-No. : 027-005-00-0 CAS-No. : 10026-24-1 EC-No. : 233-334-2	>= 0,3 - < 0,5	Carc.1B Muta.2 Repr.1B Acute Tox.4 Resp. Sens.1 Skin Sens.1 Aquatic Acute1 Aquatic Chronic1	H350i H341 H360F H302 H334 H317 H400 H410	Dangerous for the environment; N; R50-R53 R42/43 Harmful; Xn; R22 Repr.Cat.2; R60 Mut.Cat.3; R68 Carc.Cat.2; R49
zinc chloride				
Index-No. : 030-003-00-2 CAS-No. : 7646-85-7 EC-No. : 231-592-0 Registration : 01-2119472431-44-xxxx	>= 0,1 - < 0,25	Acute Tox.4 Skin Corr.1B STOT SE3 Aquatic Acute1 Aquatic Chronic1	H302 H314 H335 H400 H410	Harmful; Xn; R22 Corrosive; C; R34 Dangerous for the environment; N; R50-R53

Remarks : This product contains a substance included on the candidate list according to article 59 (1, 10) of regulation EC No. 1907/2006 ('REACH') in a concentration >= 0.1% w/w.

For the full text of the R-phrases mentioned in this Section, see Section 16.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice	: First aider needs to protect himself. Remove from exposure, lie down. Take off all contaminated clothing immediately.
If inhaled	: Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Oxygen, if needed. No artificial respiration, mouth-to-mouth or mouth to nose. Use suitable instruments/apparatus. Call a physician immediately.
In case of skin contact	: Wash off immediately with soap and plenty of water. Call a physician immediately.
In case of eye contact	: Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Keep patient warm and at rest. Call a physician immediately. If a person vomits when lying on his back, place him in the recovery position.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms	: See Section 11 for more detailed information on health effects and symptoms.
Effects	: See Section 11 for more detailed information on health effects and symptoms.

4.3. Indication of any immediate medical attention and special treatment needed

Treatment	: Treat symptomatically. No further information available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	: High volume water jet

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Toxic gases, Under fire conditions: Carbon monoxide, Carbon dioxide (CO2)

5.3. Advice for firefighters

Special protective equipment for firefighters	:	In the event of fire, wear self-contained breathing apparatus.Wear appropriate body protection (full protective suit)
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains.Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	:	Use personal protective equipment. Keep people away from and upwind of spill/leak. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Wear respiratory protection. For personal protection see section 8.

6.2. Environmental precautions

Environmental precautions	:	Should not be released into the environment. If material reaches soil inform authorities responsible for such cases. If the product contaminates rivers and lakes or drains inform respective authorities.

6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up	:	Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal.
Further information	:	Treat recovered material as described in the section "Disposal considerations".

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling	:	Keep container tightly closed. Use personal protective equipment. Avoid contact with the skin and the eyes. Do not breathe vapours or spray mist. Use respirator with appropriate filter if vapours or aerosol are released. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity. Plan first aid action before beginning work with this product. All processes must be supervised by specialists or authorised personnel.

Hygiene measures : Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday. Take off all contaminated clothing immediately. Keep working clothes separately. Avoid contact with skin, eyes and clothing. Do not breathe vapour.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in a place accessible by authorized persons only. Keep locked up. Keep only in the original container.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Further information on storage conditions : Keep tightly closed in a dry and cool place. Keep in a well-ventilated place. Protect from frost.

Advice on common storage : Keep away from food, drink and animal feedingstuffs.

7.3. Specific end use(s)

Specific use(s) : No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Component: nickel dichloride hexahydrate	CAS-No. 7791-20-0
Derived No Effect Level (DNEL)/Derived Minimal Effect Level (DMEL)	

DNEL
Workers, Acute - systemic effects, Inhalation : 16 mg/m3
Related to, Nickel

DNEL
Workers, Acute - local effects, Inhalation : 0,7 mg/m3
Related to, Nickel

DNEL
Workers, Long-term - local effects, Skin contact : 0,00044 mg/cm2
Related to, Nickel

DNEL
Consumers, Acute - systemic effects, Ingestion : 0,012 mg/kg bw/day
Related to, Nickel

DNEL
Consumers, Acute - local effects, Inhalation : 0,4 mg/m3

Related to, Nickel		
DNEL		
Consumers, Long-term - systemic effects, Inhalation Related to, Nickel	:	0,00002 mg/m3
DNEL		
Consumers, Long-term - systemic effects, Ingestion Related to, Nickel	:	0,02 mg/kg bw/day
DNEL		
Consumers, Long-term - local effects, Inhalation Related to, Nickel	:	0,00002 mg/m3

Predicted No Effect Concentration (PNEC)

Fresh water (AF = 2), Related to, Nickel	:	3,6 µg/l
Marine water (AF = 2), Related to, Nickel	:	8,6 µg/l
Soil (AF = 2), Related to, Nickel	:	29,9 mg/kg
Sewage treatment plant (STP) (AF = 100), Related to, Nickel	:	0,33 mg/kg

Other Occupational Exposure Limit Values

MAK (AT)
Included in the regulation but with no data values. See regulation for further details

MAK (AT), Inhalable droplets.
Included in the regulation but with no data values. See regulation for further details

TRK (AT), TRK Short Term Exposure Limit (STEL):, Inhalable droplets., as
Ni 0,2 mg/m3

TRK (AT), TRK:, Inhalable droplets., as
Ni 0,05 mg/m3

8.2. Exposure controls

Appropriate engineering controls
Refer to protective measures listed in sections 7 and 8.

Personal protective equipment
Respiratory protection

Advice	:	In case of brief exposure or low pollution use breathing filter apparatus.

In case of intensive or longer exposure use self-contained breathing apparatus.

Hand protection

Advice	:	Wear suitable gloves. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Protective gloves should be replaced at first signs of wear.
Material	:	Nitrile rubber
Break through time	:	>= 480 min
Glove thickness	:	0,35 mm
Material	:	Natural Rubber
Break through time	:	>= 480 min
Glove thickness	:	0,5 mm

Eye protection

Advice	:	Goggles or faceshield giving complete protection to the eyes

Skin and body protection

Advice	:	impervious clothing Chemical resistant apron

Environmental exposure controls

General advice	:	Should not be released into the environment. If material reaches soil inform authorities responsible for such cases. If the product contaminates rivers and lakes or drains inform respective authorities.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form	:	liquid
Colour	:	dark brown clear
Odour	:	odourless
Odour Threshold	:	no data available
pH	:	ca. 5,47 (20 °C)

Freezing point	:	no data available
Boiling point/boiling range	:	ca. 100 °C
Flash point	:	no data available
Evaporation rate	:	no data available
Flammability (solid, gas)	:	no data available
Upper explosion limit	:	no data available
Lower explosion limit	:	no data available
Vapour pressure	:	no data available
Relative vapour density	:	no data available
Density	:	ca. 1,24 g/cm3 (20 °C)
Water solubility	:	completely miscible
Partition coefficient: n-octanol/water	:	no data available
Auto-ignition temperature	:	no data available
Thermal decomposition	:	no data available
Viscosity, dynamic	:	no data available
Explosivity	:	not applicable
Oxidizing properties	:	no data available

9.2. Other information

No further information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Advice : No information available.

10.2. Chemical stability

Advice : No decomposition if stored and applied as directed.
No further information available.

10.3. Possibility of hazardous reactions

Hazardous reactions : No information available.

10.4. Conditions to avoid

Conditions to avoid : No information available.

10.5. Incompatible materials

Materials to avoid : No information available.

10.6. Hazardous decomposition products

Hazardous decomposition products : No information available.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity		
Oral		
Acute toxicity estimate	:	> 2000 mg/kg) (Calculation method)
Inhalation		
Acute toxicity estimate	:	> 20 mg/l (vapour) (Calculation method)
Dermal		
Please find this information in the listing of the component/components below in the MSDS.		
Irritation		
Skin		
Result	:	May have irritant effects.
Eyes		
Result	:	May have irritant effects.
Sensitisation		
Result	:	May cause an allergic skin reaction. May cause allergy or asthma symptoms or breathing difficulties if inhaled.

CMR effects

CMR Properties

Carcinogenicity	:	Carcinogenic Category 1 May cause cancer by inhalation.
Mutagenicity	:	Mutagenic Category 2 Suspected of causing genetic defects.
Reproductive toxicity	:	Toxic to Reproduction Category 1 May damage fertility. May damage the unborn child.

Specific Target Organ Toxicity
Single exposure
remark : The substance or mixture is not classified as specific target organ toxicant, single exposure.
Repeated exposure
remark : May cause damage to organs through prolonged or repeated exposure.

Other toxic properties
Repeated dose toxicity
no data available
Aspiration hazard
No aspiration toxicity classification

Component:	**cobalt dichloride hexahydrate**	**CAS-No. 7791-13-1**
Acute toxicity		
Dermal		
LDLo	: 2000 mg/kg (rat; Test substance: applies to anhydrous substance)	

SECTION 12: Ecological information

12.1. Toxicity

Component:	**cobalt dichloride hexahydrate**	**CAS-No. 7791-13-1**
Acute toxicity		

Fish		
LC50	:	> 35 mg/l (Oncorhynchus mykiss; Test substance: applies to anhydrous substance)
Toxicity to daphnia and other aquatic invertebrates		
EC50	:	11,8 mg/l (Daphnia magna; Test substance: applies to anhydrous substance)
Bacteria		
EC50	:	64 mg/l (activated sludge; 120 h; Test substance: applies to anhydrous substance)
M-Factor		
M-Factor (Acute Aquat. Tox.)	:	10
Component:	**nickel dichloride hexahydrate**	**CAS-No. 7791-20-0**
Acute toxicity		
Fish		
NOEC	:	0,06 - < 0,24 mg/l (fish; Test substance: Ni2+)
Toxicity to daphnia and other aquatic invertebrates		
NOEC	:	0,01 - < 0,22 mg/l (Daphnia magna (Water flea); Test substance: Ni2+)
M-Factor		
M-Factor (Acute Aquat. Tox.)	:	1
Component:	**cobalt sulphate heptahydrate**	**CAS-No. 10026-24-1**
M-Factor		
M-Factor (Acute Aquat. Tox.)	:	10

12.2. Persistence and degradability

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0
	Persistence and degradability	
	Biodegradability	

Result : The methods for determining the biological degradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

12.4. Mobility in soil

Component:	nickel dichloride hexahydrate	CAS-No. 7791-20-0

Mobility

: The product is mobile in water enviroment.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment

Result : no data available

12.6. Other adverse effects

Additional ecological information

Result : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.
Danger to drinking water if even extremely small quantities leak into soil.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Do not let product enter drains. Contact waste disposal services.

Contaminated packaging : Empty remaining contents. Packagings that cannot be cleaned are to be disposed of in the same manner as the

product. Dispose of in accordance with local regulations.

European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

Waste code Austria : 59305

SECTION 14: Transport information

14.1. UN number

3082

14.2. UN proper shipping name

(nickel dichloride hexahydrate, Cobalt-II-chloride, hexahydrate)

(nickel dichloride hexahydrate, Cobalt-II-chloride, hexahydrate)

(nickel dichloride hexahydrate, Cobalt-II-chloride, hexahydrate)

14.3. Transport hazard class(es)

ADR-Class	: 9
(Labels; Classification Code; Hazard identification No; Tunnel restriction code)	9; M6; 90; (E)
RID-Class	: 9
(Labels; Classification Code; Hazard identification No)	9; M6; 90
IMDG-Class	: 9
(Labels; EmS)	9; F-A, S-F

14.4. Packaging group

ADR	: III
RID	: III
IMDG	: III

14.5. Environmental hazards

Labeling according to 5.2.1.8 ADR	: Fish and tree
Labeling according to 5.2.1.8 RID	: Fish and tree
Labeling according to 5.2.1.6.3 IMDG	: Fish and tree
Classification as environmentally hazardous according to 2.9.3 IMDG	: yes

14.6. Special precautions for user

Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Risk classification according to VbF (Germany)	:	not applicable
Other regulations	:	Austria rule BGBl.I 53/1997 List of Chem. materials is in compliance with EU rule; Employment restrictions under workers actresses Protection Act are observed.
EU CARC.	:	nickel dichloride hexahydrate: Carcinogen/Mutagen
EU RA C1		nickel dichloride hexahydrate: 231-743-0; Carcinogenicity Category 1A
EU RA R2		nickel dichloride hexahydrate: 231-743-0; Reproductive toxicity Category 1B
MAK (AT)		nickel dichloride hexahydrate: Danger of respiratory and skin sensitization. nickel dichloride hexahydrate: Danger of skin sensitization. nickel dichloride hexahydrate: D - Can damage the unborn child. nickel dichloride hexahydrate: Carcinogens Group: III A1; Carcinogen - human evidence only
EU CARC.	:	cobalt dichloride hexahydrate: Carcinogen/Mutagen
MAK (AT)		cobalt dichloride hexahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only cobalt dichloride hexahydrate: Danger of respiratory and skin sensitization.
EU RA C2		cobalt dichloride hexahydrate: 231-589-4; Carcinogenicity Category 1B

EU RA R2		cobalt dichloride hexahydrate: 231-589-4; Reproductive toxicity Category 1B
MAK (AT)		cobalt dichloride hexahydrate: Danger of respiratory and skin sensitization.
		cobalt dichloride hexahydrate: F - May impair fertility.
		cobalt dichloride hexahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only
EU COS II		cobalt dichloride hexahydrate: 453; Listed
MAK (AT)	:	cobalt sulphate heptahydrate: Carcinogens Group: III A2; Carcinogen - animal evidence only
EU CARC.		cobalt sulphate heptahydrate: Carcinogen/Mutagen
MAK (AT)		cobalt sulphate heptahydrate: Danger of respiratory and skin sensitization.
EU RA C2		cobalt sulphate heptahydrate: 233-334-2; Carcinogenicity Category 1B
EU RA R2		cobalt sulphate heptahydrate: 233-334-2; Reproductive toxicity Category 1B
EU COS II		cobalt sulphate heptahydrate: 454; Listed

15.2. Chemical Safety Assessment

no data available

SECTION 16: Other information

Full text of R-phrases referred to under sections 2 and 3.

R22	Harmful if swallowed.
R23/25	Also toxic by inhalation and if swallowed.
R34	Causes burns.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R42/43	May cause sensitisation by inhalation and skin contact.
R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R48/23	Also toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.

R50	Very toxic to aquatic organisms.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R53	May cause long-term adverse effects in the aquatic environment.
R60	May impair fertility.
R61	May cause harm to the unborn child.
R68	Possible risk of irreversible effects.

Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335	May cause respiratory irritation.
H341	Suspected of causing genetic defects.
H350i	May cause cancer by inhalation.
H360D	May damage the unborn child.
H360F	May damage fertility.
H360FD	May damage fertility. May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

Key literature references and sources for data : Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Other information : The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship. The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

|| Indicates updated section.

SAFETY DATA SHEET

Automotive Diesel Fuel

Section 1. Identification

GHS product identifier Automotive Diesel Fuel

Other means of identification Truck diesel, G10, BP 10 ppm diesel fuel, Ultra Low Sulphur diesel fuel, Automotive Diesel fuel, AD20, AD40, Alpine Diesel and Biodiesel up to B5.

Product code 0000002718

SDS no. 0000002718

Historic SDS no. AD0K1

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Fuel for compression ignition diesel engines.

Manufacturer

Supplier

BP Australia Pty Ltd
Level 17, 717 Bourke Street
Docklands, Victoria 3008
ABN 53 004 085 616

www.bp.com.au

Technical Helpline Number: 1300 139 700

EMERGENCY TELEPHONE NUMBER 1800 638 556

Section 2. Hazard(s) identification

Classification of the substance or mixture

FLAMMABLE LIQUIDS - Category 4
ACUTE TOXICITY (inhalation) - Category 4
SKIN CORROSION/IRRITATION - Category 2
CARCINOGENICITY - Category 2
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
ASPIRATION HAZARD - Category 1

GHS label elements

Hazard pictograms



Signal word DANGER

Hazard statements

H227 - Combustible liquid.
H304 - May be fatal if swallowed and enters airways.
H315 - Causes skin irritation.
H332 - Harmful if inhaled.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure. (bone marrow, liver, thymus)

Precautionary statements

General

P102 - Keep out of reach of children.
P101 - If medical advice is needed, have product container or label at hand.

Section 2. Hazard(s) identification

Prevention

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P281 - Use personal protective equipment as required.
P280 - Wear protective gloves, protective clothing and eye or face protection.
P210 - Keep away from flames and hot surfaces. No smoking.
P271 - Use only outdoors or in a well-ventilated area.
P260 - Do not breathe vapour or spray.
P264 - Wash hands thoroughly after handling.

Response

P308 + P313 - IF exposed or concerned: Get medical attention.
P304 + P340, P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.
P301 + P310, P331 - IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting.
P362 - Take off contaminated clothing and wash before reuse.
P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
P332 + P313 - If skin irritation occurs: Get medical attention.

Storage

P405 - Store locked up.
P403 + P235 - Store in a well-ventilated place. Keep cool.

Disposal

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Not applicable.

Other hazards which do not result in classification

Static accumulating flammable liquid can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite liquid and vapour may cause flash fire or explosion.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency.
See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

Section 3. Composition and ingredient information

Substance/mixture Mixture

May contain Fatty Acid Methyl Esters (FAME). May also contain small quantities of proprietary performance additives. Contains small quantities of polycyclic aromatic hydrocarbons (PAHs).

Ingredient name	% (w/w)	CAS number
Fuels, diesel	≥75	68334-30-5
Alkanes, C10-20-branched and linear	≤20	928771-01-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.

Inhalation

If inhaled, remove to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention.

Section 4. First aid measures

Skin contact

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Drench contaminated clothing with water before removing. This is necessary to avoid the risk of sparks from static electricity that could ignite contaminated clothing. Contaminated clothing is a fire hazard. Contaminated leather, particularly footwear, must be discarded. Clean shoes thoroughly before reuse. Get medical attention.

Ingestion

Do not induce vomiting. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Aspiration hazard if swallowed. Can enter lungs and cause damage. Get medical attention immediately.

Most important symptoms/effects, acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects. Product can be aspirated on swallowing or following regurgitation of stomach contents, and can cause severe and potentially fatal chemical pneumonitis, which will require urgent treatment. Because of the risk of aspiration, induction of vomiting and gastric lavage should be avoided. Gastric lavage should be undertaken only after endotracheal intubation. Monitor for cardiac dysrhythmias.

Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis.
Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

Specific treatments

No specific treatment.

Protection of first-aiders

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet.

Specific hazards arising from the chemical

Combustible liquid. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. Vapours can form explosive mixtures with air. Vapours are heavier than air and can spread along the ground or float on water surfaces to remote ignition sources. Vapours may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. This product is a poor conductor of electricity and can become electrostatically charged. If sufficient charge is accumulated, ignition of flammable mixtures can occur. To reduce potential for static discharge, use proper bonding and grounding procedures. This liquid may accumulate static electricity when filling properly-grounded containers. Static accumulation may be significantly increased by the presence of small quantities of water or other contaminants. Liquid will float and may reignite on surface of water.

Section 5. Firefighting measures

Hazardous thermal decomposition products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

Special protective actions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling. Eliminate all ignition sources.

For emergency responders

Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus. Wear a suitable chemical protective suit. Chemical resistant boots. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. In case of small spillages in closed waters (i.e. ports), contain product with floating barriers or other equipment. Collect spilled product by absorbing with specific floating absorbents. If possible, large spillages in open waters should be contained with floating barriers or other mechanical means. If this is not possible, control the spreading of the spillage, and collect the product by skimming or other suitable mechanical means. The use of dispersants should be advised by an expert, and, if required, approved by local authorities. Collect recovered product and other contaminated materials in suitable tanks or containers for recycle, recovery or safe disposal.

Methods and material for containment and cleaning up

Small spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres.

Large spill

Eliminate all ignition sources. Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Dike spill area and do not allow product to reach sewage system and surface or ground water. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Use spark-proof tools and explosion-proof equipment. Contaminated absorbent material may pose the same hazard as the spilt product. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not swallow. Aspiration hazard if swallowed. Can enter lungs and cause damage. Never siphon by mouth. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not reuse container. Avoid contact of spilt material and runoff with soil and surface waterways. Handling operations that can promote accumulation of static charges include but are not limited to: mixing, filtering, pumping at high flow rates, splash filling, creating mists or sprays, tank and container filling, tank cleaning, sampling, gauging, switch loading, vacuum truck operations. Restrict flow velocity according to API 2003 (2008), NFPA 77 (2007), and Laurence Britton, “Avoiding Static Ignition Hazards in Chemical Operations”. To reduce potential for static discharge, ensure that all equipment is properly grounded and bonded and meets appropriate electrical classification requirements.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

Light hydrocarbon vapours can build up in the headspace of tanks. These can cause flammability/explosion hazards even at temperatures below the normal flash point (note: flash point must not be regarded as a reliable indicator of the potential flammability of vapour in tank headspaces). Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, ullaging and sampling from storage tanks. Do not enter storage tanks. If entry to vessels is necessary, follow permit to work procedures. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. When the product is pumped (e.g. during filling, discharge or ullaging) and when sampling, there is a risk of static discharge. Ensure equipment used is properly earthed or bonded to the tank structure. Electrical equipment should not be used unless it is intrinsically safe (i.e. will not produce sparks). Explosive air/vapour mixtures may form at ambient temperature. If product comes into contact with hot surfaces, or leaks occur from pressurised fuel pipes, the vapour or mists generated will create a flammability or explosion hazard. Product contaminated rags, paper or material used to absorb spillages, represent a fire hazard, and should not be allowed to accumulate. Dispose of safely immediately after use.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Fuels, diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (measured as total hydrocarbons) 8 hours. Issued/Revised: 1/2007 Form: Inhalable fraction and vapor

Appropriate engineering controls

All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection

Chemical splash goggles.

Skin protection

Hand protection

Wear chemical resistant gloves. Recommended: Nitrile gloves.

Do not re-use gloves. Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture). Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis. The frequency of replacement will depend upon the circumstances of use.

Skin protection

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.
Wear suitable protective clothing.
Footwear highly resistant to chemicals.
When there is a risk of ignition wear inherently fire resistant protective clothes and gloves.
When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and

Section 8. Exposure controls and personal protection

gloves should all be anti-static.
When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.
Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Other skin protection

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

Use with adequate ventilation.
If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.
The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product.

Recommended: If ventilation is inadequate, use respirator that will protect against organic vapour and dust/mist.

Refer to standards:

Respiratory protection:AS/NZS 1715 and AS/NZS 1716
Gloves:AS/NZS 2161.1
Eye protection:AS/NZS 1336 and AS/NZS 1337

Section 9. Physical and chemical properties

Appearance

Physical state Liquid.

Colour Water white to straw including fluorescent green, blue or yellow.

Odour Mild

Odour threshold 0.7 ppm (Based on Fuels, diesel)

pH Not applicable. Based on Solubility in Water (Very slightly soluble in water)

Melting point -29 to -18°C (-20.2 to -0.4°F) (Based on Fuels, diesel)

Boiling point 180 to 380°C (356 to 716°F)

Flash point Closed cup: >61.5°C (>142.7°F) [Pensky-Martens.]

Evaporation rate Not relevant/applicable due to nature of the product. Based on low volatility

Flammability (solid, gas) Not applicable. Based on - Physical state

Lower and upper explosive (flammable) limits Lower: 0.5%
Upper: 7.5%

Vapour pressure 0.1 kPa (0.755 mm Hg) (Based on Concawe Category: Vacuum Gas Oils, Hydrocracked Gas Oils & Distillate Fuels (VHGO))

Vapour density >1 [Air = 1]

Relative density 0.83

Density 820 to 850 kg/m³ (0.82 to 0.85 g/cm³) at 15°C

Solubility Very slightly soluble in water

Partition coefficient: n-octanol/water Not applicable. Based on Fuels, diesel - Substance is a hydrocarbon UVCB. Standard tests for this endpoint are intended for single substances and are not appropriate for this complex substance.

Auto-ignition temperature 240°C (464°F) (Based on Fuels, diesel)

Decomposition temperature Not observed to decompose by final boiling point: 380°C (716°F)

Viscosity Kinematic: 2 to 4.5 mm^2/s (2 to 4.5 cSt) at 40°C

Section 10. Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid all possible sources of ignition (spark or flame). Avoid excessive heat.
Incompatible materials	Reactive or incompatible with the following materials: oxidising materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuels, diesel	LC50 Inhalation Dusts and mists	Rat	4.1 mg/l	4 hours
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Dermal	Rabbit	>4300 mg/kg	-
	LD50 Oral	Rat	17900 mg/kg	-
	LD50 Oral	Rat	7600 mg/kg	-

Conclusion/Summary Harmful if inhaled.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Fuels, diesel	Skin - Irritation	Rabbit	-	-	-
	Skin - Irritation	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-
	Eyes - Non-irritating to the eyes.	Rabbit	-	-	-

Skin Causes skin irritation.

Eyes Not classified. Based on available data, the classification criteria are not met.

Sensitisation

Product/ingredient name	Route of exposure	Species	Result
Fuels, diesel	skin	Guinea pig	Not sensitising
	skin	Guinea pig	Not sensitising

Skin Not classified. Based on available data, the classification criteria are not met.

Mutagenicity

Product/ingredient name	Test	Experiment	Result
Fuels, diesel	OECD 471	Experiment: In vitro Subject: Non-mammalian species	Positive
	Equivalent to OECD 476	Experiment: In vitro Subject: Mammalian-Animal Cell: Germ	Negative
	not guideline	Experiment: In vivo Subject: Unspecified Cell: Somatic	Negative

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Carcinogenicity

Product/ingredient name	Result	Species	Dose	Exposure

Fuels, diesel	Positive - Dermal - Unspecified	Mouse	-	2 years

Conclusion/Summary Suspected of causing cancer.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Developmental toxin	Species	Dose	Exposure
Fuels, diesel	-	-	Negative	Rat	Dermal	20 days
	-	-	Negative	Rat	Dermal	10 days
	-	-	Negative	Rat	Dermal	10 days

Conclusion/Summary Development: Not classified. Based on available data, the classification criteria are not met.
Fertility: Not classified. Based on available data, the classification criteria are not met.
Effects on or via lactation: Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Fuels, diesel	Category 2	-	bone marrow, liver, thymus

Aspiration hazard

Name	Result
Fuels, diesel	ASPIRATION HAZARD - Category 1
Alkanes, C10-20-branched and linear	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact No known significant effects or critical hazards.

Inhalation Harmful if inhaled.

Skin contact Causes skin irritation.

Ingestion Irritating to mouth, throat and stomach. Aspiration hazard if swallowed -- harmful or fatal if liquid is aspirated into lungs.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Skin contact Adverse symptoms may include the following:
irritation
redness

Ingestion Adverse symptoms may include the following:
nausea or vomiting

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Section 11. Toxicological information

Eye contact Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Inhalation Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Skin contact As with all such products containing potentially harmful levels of polycyclic aromatic hydrocarbons, prolonged or repeated skin contact may eventually result in dermatitis or more serious irreversible skin disorders including cancer.

Ingestion If swallowed, may irritate the mouth, throat and digestive system. If swallowed, may cause abdominal pain, stomach cramps, nausea, vomiting, diarrhoea, dizziness and drowsiness.

General May cause damage to organs through prolonged or repeated exposure. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer. Vapour, mists or fumes may contain polycyclic aromatic hydrocarbons some of which are known to produce skin cancer.

Carcinogenicity Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity No known significant effects or critical hazards.

Teratogenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Inhalation (dusts and mists)	4.1 mg/l

Other information Diesel exhaust particulates have been classified by the National Toxicological Program (NTP) to be a reasonably anticipated human carcinogen. Exposure should be minimized to reduce potential risk.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Fuels, diesel	EL50 >1000 mg/l Nominal Fresh water	Micro-organism	40 hours
	NOELR 3.217 mg/l Nominal Fresh water	Micro-organism	40 hours
	Acute EL50 22 mg/l Nominal Fresh water	Algae	72 hours
	Acute EL50 210 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute EL50 68 mg/l Nominal Fresh water	Daphnia	48 hours
	Acute ErL50 78 mg/l Nominal Fresh water	Algae	72 hours
	Acute LL50 65 mg/l Nominal Fresh water	Fish	96 hours
	Acute LL50 21 mg/l Nominal Fresh water	Fish	96 hours
	Acute NOELR 10 mg/l Nominal Fresh water	Algae	72 hours
	Acute NOELR 1 mg/l Nominal Fresh water	Algae	72 hours

Section 12. Ecological information

	Acute NOELR 46 mg/l Nominal Fresh water	Daphnia	48 hours
	Chronic NOEL 0.083 mg/l Nominal Fresh water	Fish	14 days
	Chronic NOELR 0.2 mg/l Nominal Fresh water	Daphnia	21 days

Conclusion/Summary Toxic to aquatic life with long lasting effects.

Persistence and degradability

Expected to be biodegradable.

Product/ingredient name	Test	Result	Dose	Inoculum
Fuels, diesel	OECD 301 F	60 % - Readily - 28 days	30 mg/l	-
	OECD 301 F	57.5 % - Not readily - 28 days	25 mg/l	-
	Equivalent to EPA OTS 796.3100	35 % - Not readily - 28 days	5 mg/l	-

Conclusion/Summary Persistent per IMO criteria

Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination. This material may accumulate in sediments.

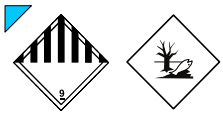
Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

Section 13. Disposal considerations

Disposal methods The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapour from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Special Precautions for Landfill or Incineration Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

Section 14. Transport information

	ADG	IMDG	IATA
UN number	Not regulated.	UN3082	UN3082
UN proper shipping name	-	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.. Marine pollutant (Fuels, diesel)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Fuels, diesel)
Transport hazard class(es)	-	9 	9 
Packing group	-	III	III
Environmental hazards	No.	Yes.	Yes.
Additional information	**Remarks** Combustible liquid Class C1 (AS 1940).	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. **Emergency schedules** F-A, S-F	This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Special precautions for user Not available.

Transport in bulk according to IMO instruments **Proper shipping name** MARPOL Annex 1 rules apply for bulk shipments by sea.
Category: gas oils, including ship's bunkers

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

Not scheduled

Consumer products - This product is exempt per Appendix A of the SUSMP.
Industrial Products - Labelling requirements for SUSMP do not apply to a poison that is packed and sold solely for industrial, laboratory or manufacturing use. However, this product is labelled in accordance with NOSHC National Code of Practice for labelling of workplace substances.

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Montreal Protocol

Ingredient name	List name	Status
Not listed.		

Stockholm Convention on Persistent Organic Pollutants

Ingredient name	List name	Status
Not listed.		

Rotterdam Convention on Prior Informed Consent (PIC)

Section 15. Regulatory information

Ingredient name	List name	Status
Not listed.		

International lists

National inventory

REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.
Australia inventory (AICS)	Contact local supplier or distributor.
Canada inventory	Not determined.
China inventory (IECSC)	Not determined.
Japan inventory (ENCS)	Not determined.
Korea inventory (KECI)	Not determined.
Philippines inventory (PICCS)	Not determined.
Taiwan Chemical Substances Inventory (TCSI)	Not determined.
United States inventory (TSCA 8b)	Not determined.

Section 16. Any other relevant information

History

Date of printing	5/14/2021
Date of issue/Date of revision	5/14/2021
Date of previous issue	8/6/2019
Version	4
Prepared by	Product Stewardship
Key to abbreviations	ADG = Australian Dangerous Goods ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) NOHSC = National Occupational Health and Safety Commission REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006] STEL = Short term exposure limit SUSMP = Standard Uniform Schedule of Medicine and Poisons UN = United Nations TWA = Time weighted average VOC = Volatile Organic Compound SADT = Self-Accelerating Decomposition Temperature Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5, 64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1, 64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0, 72623-87-1

Procedure used to derive the classification

Section 16. Any other relevant information

Classification	Justification
FLAMMABLE LIQUIDS - Category 4	On basis of test data
ACUTE TOXICITY (inhalation) - Category 4	Calculation method
SKIN CORROSION/IRRITATION - Category 2	Calculation method
CARCINOGENICITY - Category 2	Calculation method
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2	Calculation method
ASPIRATION HAZARD - Category 1	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Safety Data Sheet

According to Annex II to REACH - Regulation (EU) 2020/878 and to Annex II to UK REACH

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Code:	**ENZYMAX-**
Product name	**ENZYMAX Apr'23**
Chemical name and synonym	**ENZYMAX**

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	**ENZYMATIC PROCESSES ENHANCER**

1.3. Details of the supplier of the safety data sheet

Name	**AGRATECH SRL**
Full address	**Via L. da Vinci 12**
District and Country	**39100 Bolzano (BZ) Italy**
	Tel. +39-392-2329629
	Fax n.d.
e-mail address of the competent person responsible for the Safety Data Sheet	**info@agratech.it**

1.4. Emergency telephone number

For urgent inquiries refer to

MARCO MARANO CAV.Osp.Pediatrico Bambino Gesù, DIP.Emergenza e Accettazione DEA. ROMA Piazza Sant'Onofrio 4, CAP 00165
TEL.06 68593726

M.CATERINA GRASSI CAV POLICLINICO"Umbert I" ROMA V.le del Policlinico 155, CAP161 TEL. 06 49978000

FRANCESCO GAMBASSI Az.Osp."Careggi" U.O. Tossicologia Medica FIRENZE Largo Brambilla 3, CAP 50134
TEL. 055 7947819
CARLO LOCATELLI CAV Centro Nazionale di Informazione Tossicologica PAVIA Via Salvatore Maugeri 10, CAP 27100
TEL. 0382 24444

FRANCA DAVANZO Osp.Niguarda Ca'Granda MILANO Piazza Ospedale Maggiore 3, CAP 20163
TEL. 02 66101029
BACIS GIUSEPPE Azienda Ospedaliera Papa Giovanni XXII BERGAMO Piazza OMS 1, CAP 24127
TEL. 800 883300

GIORGIO RICCI Azienda Ospedaliera Integrata Verona VERONA Piazzale Aristide Stefani 1, CAP 37126
TEL. 800011858

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

The product is not classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP).
However, since the product contains hazardous substances in concentrations such as to be declared in section no. 3, it requires a safety data sheet with appropriate information, compliant to (EU) Regulation 2020/878.

Hazard classification and indication: --

SECTION 2. Hazards identification ... / >>

2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms: --

Signal words: --

Hazard statements:
EUH210 Safety data sheet available on request.

Precautionary statements: --

2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

The product does not contain substances with endocrine disrupting properties in concentration ≥ 0.1%.

SECTION 3. Composition/information on ingredients

3.2. Mixtures

Contains:

Identification	**x = Conc. %**	**Classification (EC) 1272/2008 (CLP)**
ENZYMAX Apr'23		
CAS	96 ≤ x < 100	**EUH208**
EC		
INDEX		

The full wording of hazard (H) phrases is given in section 16 of the sheet.

SECTION 4. First aid measures

4.1. Description of first aid measures

Not specifically necessary. Observance of good industrial hygiene is recommended.

4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product are unknown.

4.3. Indication of any immediate medical attention and special treatment needed

Information not available

SECTION 5. Firefighting measures

5.1. Extinguishing media

SUITABLE EXTINGUISHING EQUIPMENT
The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder and water spray.
UNSUITABLE EXTINGUISHING EQUIPMENT
None in particular.

5.2. Special hazards arising from the substance or mixture

HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE
Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.

5.3. Advice for firefighters

GENERAL INFORMATION

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.
SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS
Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

SECTION 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use breathing equipment if fumes or powders are released into the air. These indications apply for both processing staff and those involved in emergency procedures.

6.2. Environmental precautions

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

6.3. Methods and material for containment and cleaning up

Confine using earth or inert material. Collect as much material as possible and eliminate the rest using jets of water. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet. Avoid leakage of the product into the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities

Keep the product in clearly labelled containers. Keep containers away from any incompatible materials, see section 10 for details.

7.3. Specific end use(s)

Information not available

SECTION 8. Exposure controls/personal protection

8.1. Control parameters

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for particulate not otherwise classified (PNOC respirable fraction: 3 mg/m3; PNOC inhalable fraction: 10 mg/m3). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment. The above values are not TLVs, but guide values, to be used for particles that do not have their own TLV and that are insoluble or poorly soluble in water and have low toxicity.

8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.
When choosing personal protective equipment, ask your chemical substance supplier for advice.
Personal protective equipment must be CE marked, showing that it complies with applicable standards.
HAND PROTECTION
In the case of prolonged contact with the product, protect the hands with penetration-resistant work gloves (see standard EN 374).
Work glove material must be chosen according to the use process and the products that may form. Latex gloves may cause sensitivity reactions.
SKIN PROTECTION
Wear category I professional long-sleeved overalls and safety footwear (see Regulation 2016/425 and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.
EYE PROTECTION
Wear airtight protective goggles (see standard EN ISO 16321).
RESPIRATORY PROTECTION

SECTION 8. Exposure controls/personal protection ... / >>

Use a type P filtering facemask, whose class (1, 2 or 3) and effective need, must be defined according to the outcome of risk assessment (see standard EN 149).
ENVIRONMENTAL EXPOSURE CONTROLS
The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with environmental standards.

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Properties	Value	Information
Appearance	powder	
Colour	light grey	
Odour	characteristic	
Melting point / freezing point	not available	
Initial boiling point	not applicable	
Flammability	not available	
Lower explosive limit	not available	
Upper explosive limit	not available	
Flash point	not applicable	
Auto-ignition temperature	not available	
pH	6,5-8	
Kinematic viscosity	not available	
Solubility	not available	
Partition coefficient: n-octanol/water	not available	
Vapour pressure	not available	
Density and/or relative density	not available	
Relative vapour density	not available	
Particle characteristics	not available	

9.2. Other information

9.2.1. Information with regard to physical hazard classes

Information not available

9.2.2. Other safety characteristics

Information not available

SECTION 10. Stability and reactivity

10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

10.2. Chemical stability

The product is stable in normal conditions of use and storage.

10.3. Possibility of hazardous reactions

The powders are potentially explosive when mixed with air.

10.4. Conditions to avoid

Avoid environmental dust build-up.

10.5. Incompatible materials

Information not available

10.6. Hazardous decomposition products

Information not available

SECTION 11. Toxicological information

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.
It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Metabolism, toxicokinetics, mechanism of action and other information

Information not available

Information on likely routes of exposure

Information not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Information not available

Interactive effects

Information not available

ACUTE TOXICITY

ATE (Inhalation) of the mixture:	Not classified (no significant component)
ATE (Oral) of the mixture:	Not classified (no significant component)
ATE (Dermal) of the mixture:	Not classified (no significant component)

SKIN CORROSION / IRRITATION

Does not meet the classification criteria for this hazard class

SERIOUS EYE DAMAGE / IRRITATION

Does not meet the classification criteria for this hazard class

RESPIRATORY OR SKIN SENSITISATION

Does not meet the classification criteria for this hazard class

Respiratory sensitization

Information not available

Skin sensitization

Information not available

GERM CELL MUTAGENICITY

Does not meet the classification criteria for this hazard class

CARCINOGENICITY

Does not meet the classification criteria for this hazard class

REPRODUCTIVE TOXICITY

Does not meet the classification criteria for this hazard class

Adverse effects on sexual function and fertility

Information not available

SECTION 11. Toxicological information ... / >>

Adverse effects on development of the offspring

Information not available

Effects on or via lactation

Information not available

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

Target organs

Information not available

Route of exposure

Information not available

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

Target organs

Information not available

Route of exposure

Information not available

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

11.2. Information on other hazards

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with human health effects under evaluation.

SECTION 12. Ecological information

Use this product according to good working practices. Avoid littering. Inform the competent authorities, should the product reach waterways or contaminate soil or vegetation.

12.1. Toxicity

Information not available

12.2. Persistence and degradability

Information not available

12.3. Bioaccumulative potential

Information not available

12.4. Mobility in soil

Information not available

12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any PBT or vPvB in percentage ≥ than 0,1%.

SECTION 12. Ecological information ... / >>

12.6. Endocrine disrupting properties

Based on the available data, the product does not contain substances listed in the main European lists of potential or suspected endocrine disruptors with environmental effects under evaluation.

12.7. Other adverse effects

Information not available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Reuse, when possible. Neat product residues should be considered special non-hazardous waste.
Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.
CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

SECTION 14. Transport information

The product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Rail (RID), of the International Maritime Dangerous Goods Code (IMDG), and of the International Air Transport Association (IATA) regulations.

14.1. UN number or ID number

not applicable

14.2. UN proper shipping name

not applicable

14.3. Transport hazard class(es)

not applicable

14.4. Packing group

not applicable

14.5. Environmental hazards

not applicable

14.6. Special precautions for user

not applicable

14.7. Maritime transport in bulk according to IMO instruments

Information not relevant

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Seveso Category - Directive 2012/18/EU: None

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006
Contained substance
Point 75

Regulation (EU) 2019/1148 - on the marketing and use of explosives precursors
not applicable

SECTION 15. Regulatory information ... / >>

Substances in Candidate List (Art. 59 REACH)
On the basis of available data, the product does not contain any SVHC in percentage ≥ than 0,1%.

Substances subject to authorisation (Annex XIV REACH)
None

Substances subject to exportation reporting pursuant to Regulation (EU) 649/2012:
None

Substances subject to the Rotterdam Convention:
None

Substances subject to the Stockholm Convention:
None

Healthcare controls
Information not available

German regulation on the classification of substances hazardous to water (AwSV, vom 18. April 2017)
WGK 3: Severe hazard to waters

15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the preparation/for the substances indicated in section 3.

SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

EUH208	Contains <name of sensitising substance>. May produce an allergic reaction.
EUH210	Safety data sheet available on request.

LEGEND:
- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- ATE: Acute Toxicity Estimate
- CAS: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE: Identifier in ESIS (European archive of existing substances)
- CLP: Regulation (EC) 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: Regulation (EC) 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA: Time-weighted average exposure limit
- TWA STEL: Short-term exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

GENERAL BIBLIOGRAPHY
1. Regulation (EC) 1907/2006 (REACH) of the European Parliament
2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
3. Regulation (EU) 2020/878 (II Annex of REACH Regulation)

SECTION 16. Other information ... / >>

4. Regulation (EC) 790/2009 (I Atp. CLP) of the European Parliament
5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
12. Regulation (EU) 2016/1179 (IX Atp. CLP)
13. Regulation (EU) 2017/776 (X Atp. CLP)
14. Regulation (EU) 2018/669 (XI Atp. CLP)
15. Regulation (EU) 2019/521 (XII Atp. CLP)
16. Delegated Regulation (UE) 2018/1480 (XIII Atp. CLP)
17. Regulation (EU) 2019/1148
18. Delegated Regulation (UE) 2020/217 (XIV Atp. CLP)
19. Delegated Regulation (UE) 2020/1182 (XV Atp. CLP)
20. Delegated Regulation (UE) 2021/643 (XVI Atp. CLP)
21. Delegated Regulation (UE) 2021/849 (XVII Atp. CLP)
22. Delegated Regulation (UE) 2022/692 (XVIII Atp. CLP)
23. Delegated Regulation (UE) 2023/707

- The Merck Index. - 10th Edition
- Handling Chemical Safety
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- IFA GESTIS website
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

Note for users:
The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.
This document must not be regarded as a guarantee on any specific product property.
The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.
Provide appointed staff with adequate training on how to use chemical products.

CALCULATION METHODS FOR CLASSIFICATION
Chemical and physical hazards: Product classification derives from criteria established by the CLP Regulation, Annex I, Part 2. The data for evaluation of chemical-physical properties are reported in section 9.
Health hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 3, unless determined otherwise in Section 11.
Environmental hazards: Product classification is based on calculation methods as per Annex I of CLP, Part 4, unless determined otherwise in Section 12.

SAFETY DATA SHEET

according to Regulation UK SI 2019/758 and UK SI 2020/1577 as amended

Creation Date 02-Feb-2010 **Revision Date** 13-Oct-2023 **Revision Number** 12

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product Description:	**Ethylene glycol**
Cat No. :	**BP230-1; BP230-4**
Synonyms	Monoethylene glycol; 1,2-Ethanediol
Index No	603-027-00-1
CAS No	107-21-1
EC No	203-473-3
Molecular Formula	C2 H6 O2
REACH registration number	-

1.2. Relevant identified uses of the substance or mixture and uses advised against

Recommended Use	Laboratory chemicals.
Sector of use	SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category	PC21 - Laboratory chemicals
Process categories	PROC15 - Use as a laboratory reagent
Environmental release category	ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against	No Information available

1.3. Details of the supplier of the safety data sheet

Company

UK entity/business name
Fisher Scientific UK
Bishop Meadow Road,
Loughborough, Leicestershire LE11 5RG,
United Kingdom

EU entity/business name
Thermo Fisher Scientific
Janssen Pharmaceuticalaan 3a, 2440 Geel,
Belgium

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

For information **US** call: 001-800-227-6701 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No. **US:**001-800-424-9300 / **Europe:**001-703-527-3887

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567

Physical hazards

Based on available data, the classification criteria are not met

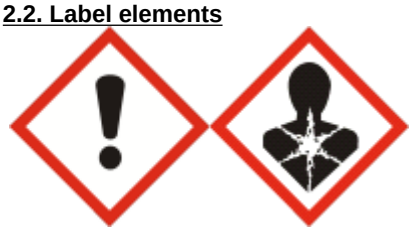
Health hazards

Acute oral toxicity	Category 4 (H302)
Specific target organ toxicity - (repeated exposure)	Category 2 (H373)

Environmental hazards
Based on available data, the classification criteria are not met

Full text of Hazard Statements: see section 16

2.2. Label elements



Signal Word **Warning**

Hazard Statements
H302 - Harmful if swallowed
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary Statements
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)

Toxic to terrestrial vertebrates
This product does not contain any known or suspected endocrine disruptors

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Component	CAS No	EC No	Weight %	CLP Classification - According to GB-CLP Regulations UK SI 2019/720 and UK SI 2020/1567
Ethylene glycol	107-21-1	EEC No. 203-473-3	>95	Acute Tox. 4 (H302) STOT RE 2 (H373)

REACH registration number	-

Full text of Hazard Statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately.

Inhalation Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

4.2. Most important symptoms and effects, both acute and delayed

Difficulty in breathing.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically. Symptoms may be delayed.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Water spray, carbon dioxide (CO2), dry chemical, alcohol-resistant foam.

Extinguishing media which must not be used for safety reasons
No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Carbon monoxide (CO), Carbon dioxide (CO_2).

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment as required.

6.2. Environmental precautions

Should not be released into the environment. See Section 12 for additional Ecological Information.

6.3. Methods and material for containment and cleaning up

Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not breathe mist/vapors/spray. Avoid contact with skin, eyes or clothing.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash hands before breaks and after work.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame.

Technical Rules for Hazardous Substances (TRGS) 510 Storage Class (LGK) (Germany) Class 10

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits
List source(s): **EU** - Commission Directive (EU) 2019/1831 of 24 October 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC and amending Commission Directive 2000/39/EC **UK** - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. **IRE -** 2021 Code of Practice for the Chemical Agents Regulations, Schedule 1. Published by the Health and Safety Authority

Component	The United Kingdom	European Union	Ireland
Ethylene glycol	STEL: 40 ppm 15 min STEL: 104 mg/m³ 15 min STEL: 30 mg/m³ 15 min TWA: 10 mg/m³ 8 hr TWA: 20 ppm 8 hr TWA: 52 mg/m³ 8 hr	TWA: 20 ppm (8h) TWA: 52 mg/m³ (8h) STEL: 40 ppm (15min) STEL: 104 mg/m³ (15min) Skin	TWA: 20 ppm 8 hr. TWA: 52 mg/m³ 8 hr. STEL: 40 ppm 15 min STEL: 104 mg/m³ 15 min Skin

	Skin		

Biological limit values
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Derived No Effect Level (DNEL) / Derived Minimum Effect Level (DMEL)
See table for values

Component	Acute effects local (Dermal)	Acute effects systemic (Dermal)	Chronic effects local (Dermal)	Chronic effects systemic (Dermal)
Ethylene glycol 107-21-1 (>95)				DNEL = 106mg/kg bw/day

Component	Acute effects local (Inhalation)	Acute effects systemic (Inhalation)	Chronic effects local (Inhalation)	Chronic effects systemic (Inhalation)
Ethylene glycol 107-21-1 (>95)			DNEL = 35mg/m^3 DNEL = 33.5mg/m^3	DNEL = 70mg/m^3

Predicted No Effect Concentration (PNEC)
See values below.

Component	Fresh water	Fresh water sediment	Water Intermittent	Microorganisms in sewage treatment	Soil (Agriculture)
Ethylene glycol 107-21-1 (>95)	PNEC = 10mg/L PNEC = 85.9mg/L	PNEC = 37mg/kg sediment dw PNEC = 312mg/kg sediment dw PNEC = 317mg/kg sediment dw	PNEC = 10mg/L PNEC = 130mg/L	PNEC = 199.5mg/L PNEC = 200mg/L	PNEC = 1.53mg/kg soil dw PNEC = 12.7mg/kg soil dw PNEC = 13.1mg/kg soil dw

Component	Marine water	Marine water sediment	Marine water intermittent	Food chain	Air
Ethylene glycol 107-21-1 (>95)	PNEC = 1mg/L PNEC = 8.59mg/L	PNEC = 3.7mg/kg sediment dw PNEC = 31.2mg/kg sediment dw PNEC = 31.7mg/kg sediment dw	PNEC = 10mg/L		

8.2. Exposure controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Wear safety glasses with side shields (or goggles) (European standard - EN 166)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	EU standard	Glove comments
Viton (R)	See manufacturers	-		(minimum requirement)

recommendations	EN 374

Skin and body protection Long sleeved clothing.

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

Respiratory Protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Large scale/emergency use Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced
Recommended Filter type: Organic gases and vapours filter Type A Brown conforming to EN14387

Small scale/Laboratory use Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Recommended half mask:- Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141
When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls No information available.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical State	Viscous liquid Liquid	
Appearance	Colorless	
Odor	Odorless	
Odor Threshold	No data available	
Melting Point/Range	-13 °C / 8.6 °F	
Softening Point	No data available	
Boiling Point/Range	196 - 198 °C / 384.8 - 388.4 °F	@ 760 mmHg
Flammability (liquid)	No data available	
Flammability (solid,gas)	Not applicable	Liquid
Explosion Limits	**Lower** 3.2 vol % **Upper** 28 vol %	
Flash Point	111 °C / 231.8 °F	**Method -** DIN 51758
Autoignition Temperature	413 °C / 775.4 °F	
Decomposition Temperature	> 500°C	
pH	5.5-7.5	50% aq. sol
Viscosity	21 cP (20°C)	
Water Solubility	Miscible	
Solubility in other solvents	No information available	
Partition Coefficient (n-octanol/water)		
Component	**log Pow**	
Ethylene glycol	-1.36	
Vapor Pressure	0.12 mmHg @ 20 °C	
Density / Specific Gravity	1.113	
Bulk Density	Not applicable	Liquid
Vapor Density	2.14 (Air = 1.0)	(Air = 1.0)

Particle characteristics Not applicable (liquid)

9.2. Other information

Molecular Formula C2 H6 O2
Molecular Weight 62.06
Evaporation Rate No information available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Hygroscopic.

10.3. Possibility of hazardous reactions

Hazardous Polymerization Hazardous polymerization does not occur.
Hazardous Reactions None under normal processing.

10.4. Conditions to avoid

Incompatible products. Excess heat. Exposure to moist air or water.

10.5. Incompatible materials

Strong oxidizing agents. Strong acids. Strong bases. Aldehydes.

10.6. Hazardous decomposition products

Carbon monoxide (CO). Carbon dioxide (CO_2).

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Product Information

(a) acute toxicity;
Oral Category 4
Dermal Based on available data, the classification criteria are not met
Inhalation Based on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Ethylene glycol	7712 mg/kg (Rat)	LD50 = 9530 µL/kg (Rabbit) LD50 = 10600 mg/kg (Rat) LD50 > 3500 mg/kg (mice)	LC50 > 2.5 mg/L (Rat) 6 h

(b) skin corrosion/irritation; Based on available data, the classification criteria are not met

(c) serious eye damage/irritation; Based on available data, the classification criteria are not met

(d) respiratory or skin sensitization;
Respiratory Based on available data, the classification criteria are not met
Skin Based on available data, the classification criteria are not met

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

(f) carcinogenicity; Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Based on available data, the classification criteria are not met

(i) STOT-repeated exposure; Category 2

Target Organs Central nervous system (CNS), Liver, Kidney.

(j) aspiration hazard; Based on available data, the classification criteria are not met

Symptoms / effects,both acute and delayed No information available.

11.2. Information on other hazards

Endocrine Disrupting Properties Assess endocrine disrupting properties for human health. This product does not contain any known or suspected endocrine disruptors.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects Do not empty into drains. .

Component	Freshwater Fish	Water Flea	Freshwater Algae
Ethylene glycol	LC50: = 41000 mg/L, 96h (Oncorhynchus mykiss) LC50: = 27540 mg/L, 96h static (Lepomis macrochirus) LC50: 14 - 18 mL/L, 96h static (Oncorhynchus mykiss) LC50: = 40761 mg/L, 96h static (Oncorhynchus mykiss) LC50: 40000 - 60000 mg/L, 96h static (Pimephales promelas) LC50: = 16000 mg/L, 96h static (Poecilia reticulata)	EC50: = 46300 mg/L, 48h (Daphnia magna)	EC50: 6500 - 13000 mg/L, 96h (Pseudokirchneriella subcapitata)

12.2. Persistence and degradability

Readily biodegradable

Persistence Persistence is unlikely.

12.3. Bioaccumulative potential

Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
Ethylene glycol	-1.36	No data available

12.4. Mobility in soil The product is water soluble, and may spread in water systems Will likely be mobile in the environment due to its water solubility. Highly mobile in soils

12.5. Results of PBT and vPvB assessment Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Endocrine disrupting properties

Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors

12.7. Other adverse effects

Persistent Organic Pollutant This product does not contain any known or suspected substance

Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste from Residues/Unused Products Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point.

European Waste Catalogue (EWC) According to the European Waste Catalog, Waste Codes are not product specific, but application specific.

Other Information Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains.

SECTION 14: TRANSPORT INFORMATION

IMDG/IMO Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

ADR Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

IATA Not regulated

14.1. UN number
14.2. UN proper shipping name
14.3. Transport hazard class(es)
14.4. Packing group

14.5. Environmental hazards No hazards identified

14.6. Special precautions for user No special precautions required.

14.7. Maritime transport in bulk according to IMO instruments Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Europe (EINECS/ELINCS/NLP), China (IECSC), Taiwan (TCSI), Korea (KECL), Japan (ENCS), Japan (ISHL), Canada (DSL/NDSL), Australia (AICS), New Zealand (NZIoC), Philippines (PICCS). US EPA (TSCA) - Toxic Substances Control Act, (40 CFR Part 710)

Component	CAS No	EINECS	ELINCS	NLP	IECSC	TCSI	KECL	ENCS	ISHL
Ethylene glycol	107-21-1	203-473-3	-	-	X	X	KE-13169	X	X

Component	CAS No	TSCA	TSCA Inventory notification - Active-Inactive	DSL	NDSL	AICS	NZIoC	PICCS
Ethylene glycol	107-21-1	X	ACTIVE	X	-	X	X	X

Legend: X - Listed '-' - Not Listed **KECL** - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

Authorisation/Restrictions according to EU REACH Not applicable

Component	CAS No	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	REACH Regulation (EC 1907/2006) article 59 - Candidate List of Substances of Very High Concern (SVHC)
Ethylene glycol	107-21-1	-	-	-

Seveso III Directive (2012/18/EC)

Component	CAS No	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Ethylene glycol	107-21-1	Not applicable	Not applicable

Regulation (EC) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of dangerous chemicals

Not applicable

Contains component(s) that meet a 'definition' of per & poly fluoroalkyl substance (PFAS)?

Not applicable

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work .

Take note of Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values

National Regulations

UK - Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment

WGK Classification See table for values

Component	Germany - Water Classification (AwSV)	Germany - TA-Luft Class
Ethylene glycol	WGK1	

Component	France - INRS (Tables of occupational diseases)
Ethylene glycol	Tableaux des maladies professionnelles (TMP) - RG 84

Component	Switzerland - Ordinance on the Reduction of Risk from handling of hazardous substances preparation (SR 814.81)	Switzerland - Ordinance on Incentive Taxes on Volatile Organic Compounds (OVOC)	Switzerland - Ordinance of the Rotterdam Convention on the Prior Informed Consent Procedure
Ethylene glycol 107-21-1 (>95)	Prohibited and Restricted Substances		

15.2. Chemical safety assessment

A Chemical Safety Assessment/Report (CSA/CSR) has been conducted by the manufacturer/importer

SECTION 16: OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3

H302 - Harmful if swallowed
H373 - May cause damage to organs through prolonged or repeated exposure

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
ENCS - Japanese Existing and New Chemical Substances
AICS - Australian Inventory of Chemical Substances
NZIoC - New Zealand Inventory of Chemicals

WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic
TWA - Time Weighted Average
IARC - International Agency for Research on Cancer
Predicted No Effect Concentration (PNEC)
LD50 - Lethal Dose 50%
EC50 - Effective Concentration 50%
POW - Partition coefficient Octanol:Water
vPvB - very Persistent, very Bioaccumulative

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor
ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
MARPOL - International Convention for the Prevention of Pollution from Ships
ATE - Acute Toxicity Estimate
VOC - (Volatile Organic Compound)

Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.
Chemical incident response training.
Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

Creation Date	02-Feb-2010
Revision Date	13-Oct-2023
Revision Summary	Not applicable.

This safety data sheet complies with Regulation UK SI 2019/758 and UK SI 2020/1577 as amended.

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Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name **Hyspin AWS 32**

Product code 456615-BE02

SDS # 456615

Product type Liquid.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Hydraulic fluid.
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

1.3 Details of the supplier of the safety data sheet

Supplier Lubricants UK Limited,
Chertsey Road,
Sunbury On Thames,
Middlesex,
TW16 7BP

+44 (0)345 600 8125

E-mail address MSDSadvice@bp.com

1.4 Emergency telephone number

EMERGENCY TELEPHONE NUMBER Carechem: +44 (0) 1235 239 670 (24/7)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Hazardous ingredients Not applicable.

Supplemental label elements Not applicable.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Special packaging requirements

SECTION 2: Hazards identification

Containers to be fitted with child-resistant fastenings	Not applicable.
Tactile warning of danger	Not applicable.

2.3 Other hazards

Results of PBT and vPvB assessment	Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.
Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Other hazards which do not result in classification	Defatting to the skin. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product definition Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

This product does not contain any hazardous ingredients at or above regulated thresholds.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops.
Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Potential acute health effects

Inhalation	Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.
Ingestion	No known significant effects or critical hazards.
Skin contact	Defatting to the skin. May cause skin dryness and irritation.
Eye contact	No known significant effects or critical hazards.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation	Overexposure to the inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.
Ingestion	Ingestion of large quantities may cause nausea and diarrhoea.
Skin contact	Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
Eye contact	Potential risk of transient stinging or redness if accidental eye contact occurs.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 4: First aid measures

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet. The use of a water jet may cause the fire to spread by splashing the burning product.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

5.3 Advice for firefighters

Special precautions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. Put on appropriate personal protective equipment.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 5 for firefighting measures.
See Section 8 for information on appropriate personal protective equipment.
See Section 12 for environmental precautions.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures Put on appropriate personal protective equipment.

Advice on general occupational hygiene Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store and use only in equipment/ containers designed for use with this product. Do not store in unlabelled containers.

Not suitable Prolonged exposure to elevated temperature

7.3 Specific end use(s)

Recommendations See section 1.2 and Exposure scenarios in annex, if applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits No exposure limit value known.

Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapour or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Recommended monitoring procedures Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived No Effect Level

No DNELs/DMELs available.

Predicted No Effect Concentration

No PNECs available

8.2 Exposure controls

Appropriate engineering controls Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Eye/face protection Safety glasses with side shields.

Skin protection

SECTION 8: Exposure controls/personal protection

Hand protection

General Information:

Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. The correct choice of protective gloves depends upon the chemicals being handled, and the conditions of work and use. Most gloves provide protection for only a limited time before they must be discarded and replaced (even the best chemically resistant gloves will break down after repeated chemical exposures).

Gloves should be chosen in consultation with the supplier / manufacturer and taking account of a full assessment of the working conditions.

Recommended: Nitrile gloves.
Breakthrough time:

Breakthrough time data are generated by glove manufacturers under laboratory test conditions and represent how long a glove can be expected to provide effective permeation resistance. It is important when following breakthrough time recommendations that actual workplace conditions are taken into account. Always consult with your glove supplier for up-to-date technical information on breakthrough times for the recommended glove type.
Our recommendations on the selection of gloves are as follows:

Continuous contact:

Gloves with a minimum breakthrough time of 240 minutes, or >480 minutes if suitable gloves can be obtained.
If suitable gloves are not available to offer that level of protection, gloves with shorter breakthrough times may be acceptable as long as appropriate glove maintenance and replacement regimes are determined and adhered to.

Short-term / splash protection:

Recommended breakthrough times as above.
It is recognised that for short-term, transient exposures, gloves with shorter breakthrough times may commonly be used. Therefore, appropriate maintenance and replacement regimes must be determined and rigorously followed.

Glove Thickness:

For general applications, we recommend gloves with a thickness typically greater than 0.35 mm.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.

- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Skin and body

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

SECTION 8: Exposure controls/personal protection

Refer to standards:

Respiratory protection: EN 529
Gloves: EN 420, EN 374
Eye protection: EN 166
Filtering half-mask: EN 149
Filtering half-mask with valve: EN 405
Half-mask: EN 140 plus filter
Full-face mask: EN 136 plus filter
Particulate filters: EN 143
Gas/combined filters: EN 14387

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Physical state Liquid.

Colour Yellow. [Light]

Odour Not available.

Odour threshold Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range Not available.

Flammability Not available.

Lower and upper explosion limit Not available.

Flash point Open cup: >190°C (>374°F) [Cleveland ASTM D 92]

Auto-ignition temperature Not available.

Decomposition temperature Not available.

pH Not applicable.

Kinematic viscosity Kinematic: 32 mm^2/s (32 cSt) at 40°C
Kinematic: 5.26 mm^2/s (5.26 cSt) at 100°C (ASTM D 445)

Solubility

Media	Result
water	Not soluble

Partition coefficient n-octanol/water (log value) Not applicable.

Vapour pressure

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Distillates (petroleum), hydrotreated heavy paraffinic	<0.08	<0.011	ASTM D 5191			

Density and/or Relative density <1000 kg/m³ (<1 g/cm³) at 15°C

Relative vapour density Not available.

Particle characteristics

Median particle size Not applicable.

9.2 Other information

Evaporation rate Not available.

Explosive properties Not available.

Oxidising properties Not available.

Pour point -27 °C

SECTION 10: Stability and reactivity

10.1 Reactivity No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

10.2 Chemical stability The product is stable.

10.3 Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur.
Under normal conditions of storage and use, hazardous polymerisation will not occur.

10.4 Conditions to avoid Avoid all possible sources of ignition (spark or flame).

10.5 Incompatible materials Reactive or incompatible with the following materials: oxidising materials.

10.6 Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity estimates

Not available.

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.

Ingestion No known significant effects or critical hazards.

Skin contact Defatting to the skin. May cause skin dryness and irritation.

Eye contact No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation No specific data.

Ingestion No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Eye contact No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation Overexposure to the inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.

Ingestion Ingestion of large quantities may cause nausea and diarrhoea.

Skin contact Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Eye contact Potential risk of transient stinging or redness if accidental eye contact occurs.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

Remarks - Endocrine disruptor - Health Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Environmental hazards Not classified as dangerous

12.2 Persistence and degradability

Expected to be biodegradable.

12.3 Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

12.5 Results of PBT and vPvB assessment

Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.

12.6 Endocrine disrupting properties Not available.

Remarks - Endocrine disruptor - Environment Not available.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

12.7 Other adverse effects No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Hazardous waste Yes.

European waste catalogue (EWC)

Waste code	Waste designation
13 01 10*	mineral based non-chlorinated hydraulic oils

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Waste code	European waste catalogue (EWC)
15 01 10*	packaging containing residues of or contaminated by hazardous substances

Special precautions This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

References Commission 2014/955/EU
Directive 2008/98/EC

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-

SECTION 14: Transport information

14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 Special precautions for user Not available.

14.7 Maritime transport in bulk according to IMO instruments Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Other regulations

REACH Status The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

United States inventory (TSCA 8b) All components are active or exempted.

Australia inventory (AIIC) All components are listed or exempted.

Canada inventory All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (CSCL) All components are listed or exempted.

Korea inventory (KECI) All components are listed or exempted.

Philippines inventory (PICCS) At least one component is not listed.

Taiwan Chemical Substances Inventory (TCSI) All components are listed or exempted.

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

EU - Water framework directive - Priority substances

SECTION 15: Regulatory information

None of the components are listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for one or more of the substances within this mixture. A Chemical Safety Assessment has not been carried out for the mixture itself.

SECTION 16: Other information

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EWC = European Waste Catalogue
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SADT = Self-Accelerating Decomposition Temperature
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVCB = Complex hydrocarbon substance
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative
Varies = may contain one or more of the following 64741-88-4 / RRN 01-2119488706-23, 64741-89-5 / RRN 01-2119487067-30, 64741-95-3 / RRN 01-2119487081-40, 64741-96-4/ RRN 01-2119483621-38, 64742-01-4 / RRN 01-2119488707-21, 64742-44-5 / RRN 01-2119985177-24, 64742-45-6, 64742-52-5 / RRN 01-2119467170-45, 64742-53-6 / RRN 01-2119480375-34, 64742-54-7 / RRN 01-2119484627-25, 64742-55-8 / RRN 01-2119487077-29, 64742-56-9 / RRN 01-2119480132-48, 64742-57-0 / RRN 01-2119489287-22, 64742-58-1, 64742-62-7 / RRN 01-2119480472-38, 64742-63-8, 64742-65-0 / RRN 01-2119471299-27, 64742-70-7 / RRN 01-2119487080-42, 72623-85-9 / RRN 01-2119555262-43, 72623-86-0 / RRN 01-2119474878-16, 72623-87-1 / RRN 01-2119474889-13

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Not classified.	

Full text of abbreviated H statements Not applicable.

Full text of classifications [CLP/GHS] Not applicable.

SECTION 16: Other information

History

Date of issue/ Date of revision	11/09/2023.
Date of previous issue	10/03/2023.
Prepared by	Product Stewardship

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name **Hyspin AWS 220**

Product code 456882-BE02

SDS # 456882

Product type Liquid.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/ mixture Hydraulic fluid
For specific application advice see appropriate Technical Data Sheet or consult our company representative.

1.3 Details of the supplier of the safety data sheet

Supplier Lubricants UK Limited,
Chertsey Road,
Sunbury On Thames,
Middlesex,
TW16 7BP

+44 (0)345 600 8125

E-mail address MSDSadvice@bp.com

1.4 Emergency telephone number

EMERGENCY TELEPHONE NUMBER Carechem: +44 (0) 1235 239 670 (24/7)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

Signal word No signal word.

Hazard statements No known significant effects or critical hazards.

Precautionary statements

Prevention Not applicable.

Response Not applicable.

Storage Not applicable.

Disposal Not applicable.

Hazardous ingredients Not applicable.

Supplemental label elements Not applicable.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Special packaging requirements

SECTION 2: Hazards identification

Containers to be fitted with child-resistant fastenings	Not applicable.
Tactile warning of danger	Not applicable.

2.3 Other hazards

Results of PBT and vPvB assessment	Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.
Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Other hazards which do not result in classification	Defatting to the skin. Note: High Pressure Applications Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. See 'Notes to physician' under First-Aid Measures, Section 4 of this Safety Data Sheet.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product definition Mixture

Highly refined base oil (IP 346 DMSO extract < 3%). Proprietary performance additives.

This product does not contain any hazardous ingredients at or above regulated thresholds.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention.
Skin contact	Wash skin thoroughly with soap and water or use recognised skin cleanser. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if irritation develops.
Inhalation	If inhaled, remove to fresh air. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Potential acute health effects

Inhalation	Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.
Ingestion	No known significant effects or critical hazards.
Skin contact	Defatting to the skin. May cause skin dryness and irritation.
Eye contact	No known significant effects or critical hazards.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation	Overexposure to the inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.
Ingestion	Ingestion of large quantities may cause nausea and diarrhoea.
Skin contact	Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.
Eye contact	Potential risk of transient stinging or redness if accidental eye contact occurs.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 4: First aid measures

Notes to physician

Treatment should in general be symptomatic and directed to relieving any effects.
Note: High Pressure Applications
Injections through the skin resulting from contact with the product at high pressure constitute a major medical emergency. Injuries may not appear serious at first but within a few hours tissue becomes swollen, discoloured and extremely painful with extensive subcutaneous necrosis. Surgical exploration should be undertaken without delay. Thorough and extensive debridement of the wound and underlying tissue is necessary to minimise tissue loss and prevent or limit permanent damage. Note that high pressure may force the product considerable distances along tissue planes.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media

Do not use water jet. The use of a water jet may cause the fire to spread by splashing the burning product.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture

In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products

Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

5.3 Advice for firefighters

Special precautions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. Put on appropriate personal protective equipment.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Small spill

Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill

Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 5 for firefighting measures.
See Section 8 for information on appropriate personal protective equipment.
See Section 12 for environmental precautions.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures Put on appropriate personal protective equipment.

Advice on general occupational hygiene Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep away from heat and direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Store and use only in equipment/ containers designed for use with this product. Do not store in unlabelled containers.

Not suitable Prolonged exposure to elevated temperature.

7.3 Specific end use(s)

Recommendations See section 1.2 and Exposure scenarios in annex, if applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits No exposure limit value known.

Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapour or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Recommended monitoring procedures Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived No Effect Level

No DNELs/DMELs available.

Predicted No Effect Concentration

No PNECs available

8.2 Exposure controls

Appropriate engineering controls Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection In case of insufficient ventilation, wear suitable respiratory equipment.
The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.

Eye/face protection Safety glasses with side shields.

Skin protection

SECTION 8: Exposure controls/personal protection

Hand protection

General Information:

Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. The correct choice of protective gloves depends upon the chemicals being handled, and the conditions of work and use. Most gloves provide protection for only a limited time before they must be discarded and replaced (even the best chemically resistant gloves will break down after repeated chemical exposures).

Gloves should be chosen in consultation with the supplier / manufacturer and taking account of a full assessment of the working conditions.

Recommended: Nitrile gloves.
Breakthrough time:

Breakthrough time data are generated by glove manufacturers under laboratory test conditions and represent how long a glove can be expected to provide effective permeation resistance. It is important when following breakthrough time recommendations that actual workplace conditions are taken into account. Always consult with your glove supplier for up-to-date technical information on breakthrough times for the recommended glove type.
Our recommendations on the selection of gloves are as follows:

Continuous contact:

Gloves with a minimum breakthrough time of 240 minutes, or >480 minutes if suitable gloves can be obtained.
If suitable gloves are not available to offer that level of protection, gloves with shorter breakthrough times may be acceptable as long as appropriate glove maintenance and replacement regimes are determined and adhered to.

Short-term / splash protection:

Recommended breakthrough times as above.
It is recognised that for short-term, transient exposures, gloves with shorter breakthrough times may commonly be used. Therefore, appropriate maintenance and replacement regimes must be determined and rigorously followed.

Glove Thickness:

For general applications, we recommend gloves with a thickness typically greater than 0.35 mm.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

- Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.

- Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Skin and body

Use of protective clothing is good industrial practice.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.

SECTION 8: Exposure controls/personal protection

Refer to standards:

Respiratory protection: EN 529
Gloves: EN 420, EN 374
Eye protection: EN 166
Filtering half-mask: EN 149
Filtering half-mask with valve: EN 405
Half-mask: EN 140 plus filter
Full-face mask: EN 136 plus filter
Particulate filters: EN 143
Gas/combined filters: EN 14387

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Physical state Liquid.

Colour Amber. [Light]

Odour Not available.

Odour threshold Not available.

Melting point/freezing point Not available.

Initial boiling point and boiling range Not available.

Flammability Not available.

Lower and upper explosion limit Not available.

Flash point Closed cup: >190°C (>374°F) [Pensky-Martens]

Auto-ignition temperature Not available.

Decomposition temperature Not available.

pH Not applicable.

Kinematic viscosity Kinematic: 220 mm^2/s (220 cSt) at 40°C
Kinematic: 18.7 mm^2/s (18.7 cSt) at 100°C

Solubility

Media	Result
water	Not soluble

Partition coefficient n-octanol/water (log value) >3

Vapour pressure

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Residual oils (petroleum), solvent-dewaxed	<0.08	<0.011	ASTM D 5191			
Residual oils (petroleum), hydrotreated	<0.08	<0.011	ASTM D 5191			
Distillates (petroleum), solvent-dewaxed heavy paraffinic	<0.08	<0.011	ASTM D 5191			
Distillates (petroleum), hydrotreated heavy paraffinic	<0.08	<0.011	ASTM D 5191			

Density and/or Relative density <1000 kg/m^3 (<1 g/cm^3) at 15°C

Relative vapour density Not available.

Particle characteristics

Median particle size Not applicable.

9.2 Other information

Evaporation rate Not available.

SECTION 9: Physical and chemical properties

Explosive properties Not available.

Oxidising properties Not available.

Pour point -18 °C

SECTION 10: Stability and reactivity

10.1 Reactivity No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

10.2 Chemical stability The product is stable.

10.3 Possibility of hazardous reactions Under normal conditions of storage and use, hazardous reactions will not occur.
Under normal conditions of storage and use, hazardous polymerisation will not occur.

10.4 Conditions to avoid Avoid all possible sources of ignition (spark or flame).

10.5 Incompatible materials Reactive or incompatible with the following materials: oxidising materials.

10.6 Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity estimates

Not available.

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation Vapour inhalation under ambient conditions is not normally a problem due to low vapour pressure.

Ingestion No known significant effects or critical hazards.

Skin contact Defatting to the skin. May cause skin dryness and irritation.

Eye contact No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation No specific data.

Ingestion No specific data.

Skin contact Adverse symptoms may include the following:
irritation
dryness
cracking

Eye contact No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation Overexposure to the inhalation of airborne droplets or aerosols may cause irritation of the respiratory tract.

Ingestion Ingestion of large quantities may cause nausea and diarrhoea.

Skin contact Prolonged or repeated contact can defat the skin and lead to irritation and/or dermatitis.

Eye contact Potential risk of transient stinging or redness if accidental eye contact occurs.

Potential chronic health effects

General No known significant effects or critical hazards.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

SECTION 11: Toxicological information

Remarks - Endocrine disruptor - Health Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Environmental hazards Not classified as dangerous

12.2 Persistence and degradability

Expected to be biodegradable.

12.3 Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility Spillages may penetrate the soil causing ground water contamination.

12.5 Results of PBT and vPvB assessment

Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.

12.6 Endocrine disrupting properties Not available.

Remarks - Endocrine disruptor - Environment Not available.

Other ecological information Spills may form a film on water surfaces causing physical damage to organisms. Oxygen transfer could also be impaired.

12.7 Other adverse effects No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Hazardous waste Yes.

European waste catalogue (EWC)

Waste code	Waste designation
13 01 10*	mineral based non-chlorinated hydraulic oils

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Waste code	European waste catalogue (EWC)
15 01 10*	packaging containing residues of or contaminated by hazardous substances

Special precautions This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

References Commission 2014/955/EU
Directive 2008/98/EC

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	-	-	-	-

14.6 Special precautions for user Not available.

14.7 Maritime transport in bulk according to IMO instruments Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Other regulations

REACH Status The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

United States inventory (TSCA 8b) All components are active or exempted.

Australia inventory (AIIC) All components are listed or exempted.

Canada inventory All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (CSCL) All components are listed or exempted.

Korea inventory (KECI) All components are listed or exempted.

Philippines inventory (PICCS) At least one component is not listed.

Taiwan Chemical Substances Inventory (TCSI) All components are listed or exempted.

Ozone depleting substances (1005/2009/EU)

Not listed.

SECTION 15: Regulatory information

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

EU - Water framework directive - Priority substances

None of the components are listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for one or more of the substances within this mixture. A Chemical Safety Assessment has not been carried out for the mixture itself.

SECTION 16: Other information

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EWC = European Waste Catalogue
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SADT = Self-Accelerating Decomposition Temperature
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVCB = Complex hydrocarbon substance
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative
Varies = may contain one or more of the following 64741-88-4 / RRN 01-2119488706-23, 64741-89-5 / RRN 01-2119487067-30, 64741-95-3 / RRN 01-2119487081-40, 64741-96-4/ RRN 01-2119483621-38, 64742-01-4 / RRN 01-2119488707-21, 64742-44-5 / RRN 01-2119985177-24, 64742-45-6, 64742-52-5 / RRN 01-2119467170-45, 64742-53-6 / RRN 01-2119480375-34, 64742-54-7 / RRN 01-2119484627-25, 64742-55-8 / RRN 01-2119487077-29, 64742-56-9 / RRN 01-2119480132-48, 64742-57-0 / RRN 01-2119489287-22, 64742-58-1, 64742-62-7 / RRN 01-2119480472-38, 64742-63-8, 64742-65-0 / RRN 01-2119471299-27, 64742-70-7 / RRN 01-2119487080-42, 72623-85-9 / RRN 01-2119555262-43, 72623-86-0 / RRN 01-2119474878-16, 72623-87-1 / RRN 01-2119474889-13

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

SECTION 16: Other information

Classification	Justification
Not classified.	

Full text of abbreviated H statements Not applicable.

Full text of classifications [CLP/GHS] Not applicable.

History

Date of issue/ Date of revision 11/09/2023.

Date of previous issue 09/11/2022.

Prepared by Product Stewardship

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from BP Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The BP Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material. Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the BP Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

Technical Publication

Calor Safety Data Sheet - Liquefied Propane Gas

Safety Data Sheet No 2 Revision 11
Replaces Revisions 03/00, 04/03, 08/05, 03/06, 06/09, 02/10, 12/10, 07/11, 12/14, 09/16

This safety data sheet (SDS) has been prepared in accordance with the requirements of EU Regulations 1907/2006 & 453/2010(REACH) and 1272/2008 & 2015/830(CLP).

1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier	
Substance Name	Liquefied Propane Gas (odorised)
Product Description	Liquefied Propane Gas consisting predominately C_3 Hydrocarbons supplied as a fuel in a closed system meeting the requirements for commercial propane of BS4250 with <0.1% 1,3 Butadiene.
Trade Name(s)	Calor Propane, Calor Autogas, Calor Patio Gas & Calor High Purity Propane
CAS Number	68476-85-7
EC Number	270-704-2
Reach Registration Number	Exempt (Annex V) as Liquefied Petroleum Gas (LPG)
1.2 Relevant identified uses of the substance or mixture and uses advised against	
Identified Use(s)	Multi-purpose product intended for uses including fuels for equipment which has been specifically designed to run on commercial propane, an internal combustion engine and fuel feedstock for the petrochemical industry
Uses Advised Against	Anything other than the above
1.3 Details of the Supplier of the safety data sheet	
Company:	Calor Gas Limited
Address:	Athena House, Athena Drive, Tachbrook Park, Warwick, CV34 6RL
Telephone:	01926 330088
Web Address:	www.calor.co.uk
National Contact:	01926 318497 (Technical Help Desk)
E-mail (competent person)	healthandsafety@calor.co.uk
1.4 Emergency telephone number	
Emergency Number:	0345 7 444 999 (Availability 24/7)
Language spoken	English

2. Hazards Identification

2.1 Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC
F+; R12 - extremely flammable

Classification according to Regulation (EC) No 1272/2008 as amended.

Physical Hazards	
Flammable gas , category 1	H220: extremely flammable gas
Gases under pressure	H280: contains gas under pressure; may explode if heated

2.2 Label Elements

Label elements according to Regulation (EC) No. 1272/2008

Hazard Pictograms



Signal words: Danger

Hazard statements: H220: extremely flammable gas
H280: contains gas under pressure; may explode if heated

Precautionary Statement

Prevention: P102 Keep out of the reach of Children
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243: Take precautions against static discharge

Response: P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381: Eliminate all ignition sources if safe to do so.

Storage: P410 + P403: Protect from sunlight. Store in a well-ventilated place.

2.3 Other Hazards Cold burns (frostbite) will result from skin/eye contact with liquid product.

Vapour is heavier than air and may travel to remote sources of ignition (e.g. along drainage systems, into basements etc.).

Abuse involving wilful inhalation of very high concentrations of vapour, even for short periods can produce unconsciousness and might prove fatal. Inhalation may cause irritation to the nose and throat, headache, nausea, vomiting, dizziness and drowsiness. In poorly ventilated or confined spaces, unconsciousness or asphyxiation may result.

The material does not meet the criteria for PBT or vPvB in accordance with REACH Annex XIII

3. Composition and Information on Ingredients

3.1 Substance Not Applicable. The material is regulated as a mixture

3.2 Mixtures Product is to a mixture according to regulation 1907/2006/EC

Identifier Name	Index No.	CAS No.	EC No.	%v/v
Petroleum gases, liquefied	649-202-00-6	68476-85-7	270-704-2	>99%
1,3 Butadiene	601-013-00-X	106-99-0	203-450-8	<0.1%
Methanol (anti-icing agent)	603-001-00-X	67-56-1	200-659-6	<0.125
Ethyl Mercaptan (odorant)	016-022-00-9	75-08-01	200-837-3	<0.005

4. First Aid Measures

4.1 Description of first aid measures

Inhalation: Remove the affected person to fresh air. Keep the patient warm and at rest. If breathing has stopped administer artificial respiration. Give external cardiac massage if necessary. If the person is breathing, but unconscious, place them in the recovery position. Obtain medical assistance immediately.

Skin Contact: Burns should be flushed with tepid water to normalise temperature and until circulation returns. Cover the burns with sterile dressings. Do not apply ointments or powders. Obtain medical assistance immediately.

Eye Contact: Cold burns should be flushed immediately with tepid water to normalise temperature. Hold eyelids apart while flushing to rinse entire surface of the eye and lids with water. Cover the eye with a sterile dressing and obtain medical assistance immediately.

Ingestion: Not applicable

Protection for First-Aiders: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

Frostbite (cold burn). The vapour may have narcotic effect. Overexposure may cause adverse effect such as drowsiness, dizziness, disorientation, vertigo. Severity of the symptoms will vary dependent on the concentration and the length of exposure

4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor - treat symptomatically

5. Fire Fighting Measures

5.1 Extinguishing Media

Large Fires

- None. Product flow must be stopped and container cooled by water spray. Water fog should be used to assist approach to source of the fire. Large fires should only be fought by the Fire Brigade.
- DO NOT USE WATER JET

Small Fires

- Dry powder
- DO NOT USE WATER OR FOAM

5.2 Special hazards arising from the substance or mixture

These materials are delivered, stored and used at temperatures above their flash point. Avoid all naked flames, sparks, cigarettes, etc.

IN CASE OF FIRE, EVACUATE THE AREA AND IMMEDIATELY ALERT THE FIRE BRIGADE

- Ensure an escape path is always available from any fire.
- If gas has ignited, do not attempt to extinguish but, if safe to do so, stop gas flow and allow to burn out.
- Use water spray to cool heat-exposed containers and to protect surrounding areas and personnel effecting shut-off.

- Beware of vapour accumulating to form explosive concentrations. Explosive vapours may travel, be ignited at remote locations and flash back. A water spray may be used for vapour dispersal.

Pressurised containers are liable to explode violently when subjected to high temperatures

Every precaution must be taken to keep containers cool to avoid the possibility of a boiling liquid expanding vapour explosion (BLEVE).

Fires in confined spaces should be dealt with by trained personnel wearing approved breathing apparatus.

5.3 Advice for the fire-fighters

Fight fire with normal precautions from a reasonable distance. Fight fighters should wear complete protective clothing including self-contained breathing apparatus. Keep containers cool by spraying with water if exposed to fire. Avoid release to the environment.

6. Accident Release Measures

6.1 Personal Precautions, Protective equipment and Emergency Procedures

Immediate Emergency Action:	• Clear people away from the area to a safe place • Do not operate electrical equipment unless flameproof • Summon aid of emergency services • Treat or refer casualties if necessary
Further Action – Fire, if safe to do so	• Stop product flow • Use dry powder or carbon dioxide extinguishers • Cool containers exposed to fire by water fog/spray
Further Action – Spillage, if safe to do so	• Extinguish naked lights, e.g. cigarettes – AVOID MAKING SPARKS. Do not use a mobile phone • Isolate power from sources of ignition and ventilate the area • Position fire fighting equipment • Try to stop the flow of liquid product • Cover drains and sewers. Disperse vapour with water spray ***Note:*** *Vapour may collect in confined spaces*

6.2 Environmental Precautions

Avoid release to the environment. Contain the spillage. Any large spillage into water courses must be informed to the relevant authorities.

6.3 Methods and material for containment and cleaning up

Only trained and properly protected personnel must be involved in clean-up operations.

Small scale: Contain spillages with sand, earth or any suitable adsorbent material. Allow small spillages to evaporate provided there is adequate ventilation. Transfer to a lidded container for disposal or recovery. Ventilate the area and wash spill site after material pick-up is complete.

Large scale: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion. Notify police and fire brigade as soon as possible.

6.4 Reference to other sections

See sections 8 & 13

7. Handling and Storage

General

Cylinders containing Calor Liquefied Propane Gas are designed to give liquid or vapour offtake.

- Vapour offtake cylinders must be used in the vertical position with the outlet valve at the top.
- Liquid offtake cylinders must be stored and used in the position indicated on the cylinder.

A face shield or safety goggles and impervious rubber gloves should be worn when transferring this product as a liquid.

7.1 Precautions for safe handling

- No smoking or naked lights
- Switch off mobile phones
- Ensure good ventilation
- Avoid inhalation of vapour
- Avoid contact with liquid and cold storage containers
- When handling cylinders wear protective footwear and suitable gloves.
- Avoid contact with eyes.

7.2 Conditions for safe storage, including any incompatibilities

Calor Liquefied Propane Gas must be stored in purpose designed mild steel cylinder(s) or tank(s) or other systems of suitable pressure rating. These should be segregated from oxidant gases and other oxidants in store. Reference should be made to the relevant Codes of Practice for Safe Storage and Handling of LPG produced by HSE and UKLPG (See Section 16)

- No smoking or naked lights
- Switch off mobile phones
- Store and use only equipment/containers designed for use with this product
- Store and dispense only in well ventilated areas away from heat and sources of ignition.
- Containers must be labelled properly
- Do not remove warning labels from containers
- Check that cylinders are within test date. If overdue for inspection they must be returned to Calor Gas Limited.
- Ensure that Pipework and handling equipment are designed for the purpose, inspected and maintained and are electrically bonded and grounded (earthed) to prevent accumulation of static charge
- Explosive air/vapour mixtures may form at ambient temperature

7.3 Specific End Use(s)

Calor Liquefied Propane Gas is a multi-purpose product intended for uses including;

- Fuel for equipment which has been specifically designed to be powered by Commercial Propane;
- Internal combustion engine fuel;
- Feedstock for petrochemical industry.

Note: *Product spilt on clothing may give rise to delayed evaporation and subsequent fire hazard*

8. Exposure Controls / Personal Protection

8.1 Control Parameters
The following limits are taken from the Health and Safety Executives Guidance Note EH40 Workplace Exposure Limits.

8.1.1 Occupational Exposure Limit Values
Calor Gas Liquefied Propane Gas* is not subject to a specific OEL. However as a Liquefied Petroleum Gas the following OEL should be applied:

	LTEL (8hr TWA)	**STEL** (15 min Period)
Liquefied Petroleum Gas	1000 ppm (1750 mg/m^3)	1250 ppm (2180 mg/m^3)

** Pure Propane is identified as a simple asphyxiant and EH40 paragraphs 57 & 59 apply*.

Recommended Monitoring Procedures Personal or workplace atmosphere monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

8.1.2 Biological limit value: None established

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls
Provide natural or explosion-proof ventilation that is adequate to ensure flammable gas does not reach its lower explosive limit.

8.2.2 Individual protection measures, such as Personal Protective Equipment (PPE)

Protective clothing

- Wear suitable gloves and overalls to prevent cold burns and frostbite (Neoprene or LPG resistant Gauntlet Glove).
- In filling operations wear protective clothing including impervious gloves, safety goggles or face shields to BS EN 166,167 & 168. (Note: at retail Autogas applications alternative arrangements may be put in place).
- When handling cylinders wear protective footwear to BS EN345

Respiratory protection

- If operations are such that significant exposure to vapour may be anticipated, then suitable approved respiratory equipment should be worn.
- Respiratory Protective Equipment (RPE) may be used and the selection of RPE must be based on actual or anticipated exposure levels and the safe working limits of the selected RPE.
  Material: Filter AX
  Guidance: EN14387, *Respiratory protective devices. Gas filter(s) and combined filter(s). Requirements testing and marking.*
- Respirators **must not** be used in oxygen-deficient atmospheres. If there is a risk of oxygen depletion, then suitable breathing apparatus is required.
- The use of respiratory equipment must be strictly in accordance with manufacturers' instructions and any statutory requirements governing its selection and use.
- All wearers of respiratory protection must be trained in its use. The nature of the atmosphere and the working environment will determine the protection required. Equipment must be to the

relevant British and European Standards and this may be determined by reference to BS4275: *Recommendations for the selection, use and maintenance of respiratory protective equipment.*

8.2.3 Environmental Exposure Controls

Not applicable. The substance is a vapour at normal temperature and pressure. In normal use it is not discharged into the atmosphere but used as a fuel.

9. Physical and Chemical Properties

9.1 General Information

Appearances:	Colourless liquefied gas
Odour:	Odorant added to provide a distinctive smell
Odour Threshold:	<20% of Lower Flammable Limit
pH:	Not Applicable
Melting Point:	-159°C
Boiling Point:	-42°C
Flash Point:	-104 °C (PMCC)
Evaporation Rate:	Not Available
Flammability Limits:	2% to 11% in air
Autoflammability:	460-580 °C
Vapour Pressure:	7.5 bar at 15 °C
Specific Gravity of Liquid:	0.512 at 15 °C (Water = 1.0)
Specific Gravity of Vapour:	1.5 at 15 °C (Air = 1.0)
Solubility in Water:	Negligible
Viscosity:	Not established
Explosive properties:	Vapour may create explosive atmospheres
Oxidising properties:	Not oxidising

9.2 Other Information

No other information is relevant to this product.

10. Stability and Reactivity

10.1 Reactivity: Stable under normal conditions

10.2 Chemical Stability: Calor Liquefied Propane is stable at ambient temperatures. Hazardous polymerization will not occur, however, it can form explosive mixture with air.

10.3 Possibility of Hazardous Reactions: Hazardous polymerisation will not occur

10.4 Conditions to avoid:
- Sources of ignition
- Storage at above 50°C.

10.5 Materials to avoid: Propane reacts violently with strong oxidising agents (e.g. chlorates which may be used in agriculture), peroxide, plastics, chlorine dioxide and concentrated nitric acid.

10.6 Hazardous Decomposition products: The substance arising from the thermal decomposition of these products will largely depend upon the conditions bringing about decomposition. The following hazardous substances may be expected from normal combustion:

- Carbon Dioxide
- Carbon Monoxide may be produced (if there is insufficient air for complete combustion).

11. Toxicological Information

11.1 Information on the toxicological effects

Eye Contact:	Contact with Calor Liquefied Propane gas will present a risk of serious damage to the eyes.
Skin Contact:	Contact with Calor Liquefied Propane gas will cause cold burns and frostbite to the skin.
Inhalation:	Low vapour concentrations may cause nausea, dizziness, headaches and drowsiness. May have a narcotic effect if high concentrations are inhaled. High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression may lead to rapid loss of consciousness.
Volatile Substance Abuse:	Under normal conditions of use the product is not hazardous; however, abuse involving deliberate inhalation of very high concentrations of vapour, even for short periods, can produce unconsciousness and/or result in a sudden fatality.
Gem cell mutagenicity:	No known behaviour. Contains <0.1% butadiene
Carcinogenicity:	No known behaviour. Contains <0.1% butadiene
Reproductive Toxicity:	No known behaviour
Aspiration hazard:	Based upon available data, the classification is not met
STOT–single exposure:	Based upon available data, the classification is not met
STOT-repeated exposure:	Based upon available data, the classification is not met
11.2 Other information	None

12. Ecological Information

12.1 Toxicity:	No known ecological damage is caused by this product. ***Air:*** Calor Liquefied Propane gas is a mixture of volatile components which, when released to air, will react rapidly with hydroxyl radicals and ozone to give carbon dioxide and water. ***Water:*** If released to water the product will rapidly evaporate. ***Soil****:* If released to soil the product will rapidly evaporate.
12.2 Persistence and Degradability:	Unlikely to cause long term adverse effects in the environment.
12.3 Bio-accumulative Potential	This material is not expected to bio-accumulate.
12.4 Mobility in soil:	Spillages are unlikely to penetrate the soil.

12.5 Results of PBT and vPvB: Assessment	Not classified as PBT or vPvB
12.6 Other adverse effects:	No known behaviour

13. Disposal Considerations

13.1 Waste treatment methods

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperature to prevent the formation of undesirable combustion products.

13.2 Additional Information

Disposal Considerations:

- Calor Gas Cylinders are the property of Calor Gas Limited and should be returned to the local dealer/ stockist when no longer required.
- Users are recommended to contact their local Calor Gas representative when they wish to dispose of surplus quantities of Calor Propane.
- Emptying of tanks containing Calor Propane is the responsibility of Calor Gas Limited
- Do not discharge product into areas where there is a risk of an explosive mixture with air.
- Empty vessels or cylinders may contain some remaining product.
- Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.
- Empty containers represent a fire hazard as they may contain flammable product residues and vapour. Never incinerate, crush, weld, solder or braze empty containers.

14. Transport Information

Dangerous for Conveyance

UN Number	1978
UN Proper Shipping name:	Propane
Transport Hazard Class:	Flammable Gas
Packing Group:	Special Containers
ADR/RID Proper Shipping Name:	Propane
Substance Identification Number:	1978
Class:	2
Classification Code:	2F
Label:	2.1
IATA / ICAO Hazard Class:	2.1 (forbidden on passenger aircraft)
IMO Hazard Class:	2.1
Marine Pollutant:	No
Hazard Identification Number:	23
Emergency Action Code:	2YE

15. Regulatory Information

15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

This material has been classified according to the requirements of the United Nations "Globally Harmonised System of Classification and Labelling of Chemicals" (GHS), EU Regulation 1271/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (the CLP Regulation) and Article 31 of EU Regulation 1907/2006 (as amended) on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

Dangerous for Supply

Hazard Statements

H220 Extremely flammable
H280 Contains gas under pressure; may explode if heated

Precautionary Statements

P102 Keep out of the reach of Children
P403 Store in a well-ventilated place
P210 Keep away from heat/sparks/ open flames / hot surfaces – NO SMOKING
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 Eliminate all ignition sources if safe to do so.

Note: *As detailed in Annex I of CLP 2008/1272 "Closed refillable cylinders and non-refillable cylinders within the scope of EN417, containing fuel gases which are only used for combustion are* ***only to be labelled with the appropriate pictogram and the hazard and precautionary statements concerning flammability****. Such cylinders are exempted from carrying the risk and safety phases relating to health effects."*

P410 & P403 may be omitted for gases filled in transportable gas cylinders in accordance with packing instruction P200 of the UN RTDG, Model Regulations

Product label

Danger Extremely Flammable Gas
Contains : Calor Propane, Calor Autogas or Patio Gas
Symbol : Flame

GHS Label



Transport Label



EU Legislation

EU Directive 2012/18/EU (SEVESO III): Listed Part 2 – Extremely Flammable
EU Regulation 1907/2006 on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH);
EU Regulation 1271/2008 on the Classification, Labelling and Packaging of Substances and Mixtures (the CLP Regulation)

Relevant UK Legislation

- Dangerous Substances and Explosive Atmospheres Regulations
- The Regulatory Reform (Fire Safety) Order 2005
- Control of Substances Hazardous to Health Regulation

- Provision and Use of Work Equipment Regulations
- Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations
- Personal Protective Equipment Regulations
- Control of Major Accident Hazards Regulations
- Chemical Hazards Information and Packaging for Supply
- Pressure Systems Safety Regulations
- Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations
- Chemical Hazard Information and Packaging for Supply Regulations
- Dangerous Substances (Notification and Marking of Sites) Regulations

15.2 Chemical Safety Assessment

Not Applicable. Liquefied Petroleum Gas (LPG) is exempt from REACH (Annex V)

16. Other Information

LEGEND

LTEL: Long Term Exposure Limit
STEL: Short Term Exposure Limit
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
PBT: Persistent, Bio-accumulative and Toxic
STOT: Specific Target Organ Toxicity
vPvB: Very Persistent and very Bio-accumulative

REFRENCES

Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to:
European Chemical Agency: Guidance on the Compilation of Safety Data Sheets
EH40 (as amended): Workplace exposure limits.
BS: 4250: Specification for Commercial Butane and Commercial Propane
UKLPG Code of Practice No. 29: Hazard Information and Packaging Labelling for Commercial LPG Cylinders
Suppliers Safety Data Sheets

Health and Safety Advisory Literature

The UKLPG produce over 30 Industry Codes of Practice which can be obtained from UKLPG. For a comprehensive publication list please access the UKLPG website www.uklpg.org.

Further guidance the legislation listed in section 15 can be obtained from www.hse.gov.uk and publications can be purchased from HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS.Tel: 01787 881165 or www.hsebooks.co.uk

This Safety Data Sheet is solely intended for this product and the information is based upon the present state of knowledge. It is intended to give guidance and believed to be accurate and represent good practice at the time of publication. It does not replace the need to consult other formal documents where further information may be required.

No responsibility or liability is accepted by Calor Gas Limited for any loss or damage arising out of the information given. It is important that users of this publication adhere to all legal requirements, Regulations, Codes of Practice and Standards, particularly, those relating to gas safety.

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SAFETY DATA SHEET

BIOGAS ODORANT

Compilation date: 09/01/2020

Revision No: 1

Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name: BIOGAS ODORANT

Product code: 16945

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of substance / mixture: Odorant for gas.

1.3. Details of the supplier of the safety data sheet

Company name: Robinson Brothers
Phoenix Street
West Bromwich
West Midlands
B70 0AH
United Kingdom

Tel: +44 (0) 121 553 2451

Fax: +44 (0) 121 500 5183

Email: cjtaylor@robinsonbrothers.co.uk

1.4. Emergency telephone number

Emergency tel: 0121 553 0356

Section 2: Hazards identification

2.1. Classification of the substance or mixture

Classification under CLP: Aquatic Chronic 2: H411; Flam. Liq. 2: H225; Skin Sens. 1: H317

Most important adverse effects: Highly flammable liquid and vapour. May cause an allergic skin reaction. Toxic to aquatic life with long lasting effects.

2.2. Label elements

Label elements:

Hazard statements: H225: Highly flammable liquid and vapour.
H317: May cause an allergic skin reaction.
H411: Toxic to aquatic life with long lasting effects.

Hazard pictograms: GHS02: Flame
GHS07: Exclamation mark
GHS09: Environmental

[cont...]



Signal words: Danger

Precautionary statements: P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P241: Use explosion-proof electrical/ventilating/lighting equipment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water .
P362+P364: Take off contaminated clothing and wash it before reuse.
P501: Dispose of contents/container to to regulated landfill site in accordance with local, regional, national and international regulations.

2.3. Other hazards

Other hazards: May be irritating to respiratory mucous membranes. In use, may form flammable / explosive vapour-air mixture. Toxic to aquatic organisms.

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

TERTIARY BUTYL MERCAPTAN - REACH registered number(s): 01-2119491288-26-XXXX

EINECS	CAS	PBT / WEL	CLP Classification	Percent
200-890-2	75-66-1	-	Flam. Liq. 2: H225; Skin Sens. 1: H317; Aquatic Chronic 2: H411	78-82%

DIMETHYLSULPHIDE. - REACH registered number(s): 01-211-9487127-32-XXXX

200-846-2	75-18-3	Substance with a Community workplace exposure limit.	Flam. Liq. 2: H225	18-22%

Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: Remove all contaminated clothes and footwear immediately. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. A residual odour may cling to skin. Consult a doctor.

Eye contact: Bathe the eye with running water for 15 minutes. Consult a doctor.

Ingestion: Wash out mouth with water. Do not induce vomiting. Consult a doctor.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. If conscious, ensure the casualty sits or lies down. If breathing becomes bubbly, have the casualty sit and provide oxygen if available. Consult a doctor.

[cont...]

4.2. Most important symptoms and effects, both acute and delayed

Skin contact: There may be irritation and redness at the site of contact. May give delayed skin sensitisation

Eye contact: There may be irritation and redness. The eyes may water profusely.

Ingestion: There may be soreness and redness of the mouth and throat. Nausea and stomach pain may occur. There may be vomiting. May be aspirated into lungs if swallowed; this can cause pulmonary oedema and chemical pneumonitis.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest. May be irritating to respiratory mucous membranes. Exposure to vapour may cause headache

Delayed / immediate effects: Immediate effects can be expected after short-term exposure. Delayed effects can be expected after long-term exposure.

4.3. Indication of any immediate medical attention and special treatment needed

Immediate / special treatment: Show this safety data sheet to the doctor in attendance. Eye bathing equipment should be available on the premises.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: Alcohol resistant foam. Carbon dioxide. Dry chemical powder. Use water spray to cool containers. Do not use strong water jet.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes of carbon dioxide / carbon monoxide. In combustion emits toxic fumes of sulphur oxides.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Do not attempt to take action without suitable protective clothing - see section 8 of SDS. Mark out the contaminated area with signs and prevent access to unauthorised personnel. Eliminate all sources of ignition. Turn leaking containers leak-side up to prevent the escape of liquid.

6.2. Environmental precautions

Environmental precautions: Contain the spillage using bunding. Do not discharge into drains or rivers. Alert National Rivers Authority or other appropriate regulatory body of spillages or uncontrolled discharges into watercourses.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: **NOTIFY LOCAL GAS SUPPLY UNDERTAKINGS FOR POSSIBLE FALSE ALARM CALLS** Do not use equipment in clean-up procedure which may produce sparks. Absorb into dry earth or

[cont...]

sand. Transfer to a closable, labelled salvage container for disposal by an appropriate method. Destroy residual odorant with sodium hypochlorite (bleach) or hydrogen peroxide. (Minor component (Dimethyl sulphide) may react with hypochlorite to produce lachrymatory chloromethyl sulphones.) Refer to section 13 of SDS for suitable method of disposal.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS. Refer to section 13 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Ensure there is exhaust ventilation of the area. Do not handle in a confined space. Avoid the formation or spread of mists in the air. Avoid direct contact with the substance. Earth any equipment used in handling. Use non-sparking tools. Take precautions against static discharges Smoking is forbidden.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. Keep away from sources of ignition. Prevent the build up of electrostatic charge in the immediate area. Ensure lighting and electrical equipment are not a source of ignition.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Hazardous ingredients:

TERTIARY BUTYL MERCAPTAN

Workplace exposure limits: **Respirable dust**

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	0.5ppm	-	-	-

DIMETHYLSULPHIDE.

UK	10ppm	-	-	-

DNEL/PNEC Values

DNEL / PNEC No data available.

8.2. Exposure controls

Engineering measures: Ensure there is exhaust ventilation of the area. Ensure lighting and electrical equipment are not a source of ignition. The floor of the storage room must be impermeable to prevent the escape of liquids.

Respiratory protection: Gas/vapour filter, type A: organic vapours (EN141). Self-contained breathing apparatus must be available in case of emergency.

[cont...]

Hand protection: PVC gloves. Rubber gloves. Glove should conform to ISO 374 and selection must take into account any solvents and other hazards present.
Eye protection: Safety glasses with side-shields. / Safety goggles. Ensure eye bath is to hand.
Skin protection: Impermeable protective clothing. Boots.
Environmental: Prevent from entering in public sewers or the immediate environment.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquid
Colour: Colourless/pale-yellow.
Odour: Pungent
Evaporation rate: No data available.
Oxidising: Non-oxidising (by EC criteria)
Solubility in water: Insoluble
Also soluble in: Most organic solvents.
Viscosity: No data available.
Boiling point/range°C: 48.9-93.3
Melting point/range°C: -45.6
Flammability limits %: lower: No data available.
upper: No data available.
Flash point°C: ca.-18
Part.coeff. n-octanol/water: No data available.
Autoflammability°C: No data available.
Vapour pressure: 8.2 PSI@38°C
Relative density: 0.816 @ 15.6°C
pH: No data available.
VOC g/l: >99

9.2. Other information

Other information: Not applicable.

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions. Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat. Flames. Sources of ignition.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

[cont...]

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes of carbon dioxide / carbon monoxide. In combustion emits toxic fumes of sulphur oxides.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

TERTIARY BUTYL MERCAPTAN

INH NOAEL, Maternal	RAT	GD 6-19, 6h/d	>/=195	ppm
INH NOAEL,Terat.	RAT	GD 6-19, 6h/d	>/=195	ppm
INH NOEL, Repeated	RAT	13 weeks	> 196	ppm
INH, NOEL, Repeated	RAT	6 h/d, 5d/wk	99.6	ppm
ORAL NOAEL, Terat.	RAT	42-53 d, daily	50	mg/kg bw/day
ORAL NOAEL, maternal	RAT	42-53 d, daily	200	mg/kg bw/day
ORAL, Reprotox NOAEL	RAT (Parent)	42-53 days, daily	200	mg/kg bw/day
ORAL, Reprotox,NOAEL	RAT (1st Gen)	42-53 days, daily	50	mg/kg bw/day
ORL	RAT	LD50	4729	mg/kg
VAPOURS	RAT	4H LC50	98.3	mg/l

DIMETHYLSULPHIDE.

DERMAL	-	LD50	>2000	mg/kg
IHL	RAT	4H LC50	102	mg/l
NOAEL (Maternal)	RAT	20 days,GD 6-19,da	1 000	mg/kg
ORAL	RAT	LD50	>2000	mg/kg
ORAL NOEL (Repeat)	RAT	14 week daily	250	mg/kg
ORAL Teratogenicity	RAT	20 d,GD 6-19,daily	1 000	mg/kg
VAPOURS NOEL	RAT	13 week,(6h,7 days)	2 783	mg/l

Relevant hazards for product:

Hazard	Route	Basis
Respiratory/skin sensitisation	DRM	Hazardous: calculated

Symptoms / routes of exposure

Skin contact: There may be irritation and redness at the site of contact. May give delayed skin sensitisation

Eye contact: There may be irritation and redness. The eyes may water profusely.

Ingestion: There may be soreness and redness of the mouth and throat. Nausea and stomach pain may

[cont...]

occur. There may be vomiting. May be aspirated into lungs if swallowed; this can cause pulmonary oedema and chemical pneumonitis.

Inhalation: There may be irritation of the throat with a feeling of tightness in the chest. May be irritating to respiratory mucous membranes. Exposure to vapour may cause headache

Delayed / immediate effects: Immediate effects can be expected after short-term exposure. Delayed effects can be expected after long-term exposure.

Other information: Not applicable.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

TERTIARY BUTYL MERCAPTAN

GREEN ALGA (Selenastrum capricornutum)	72H EC50	24	mg/l
Daphnia magna	48H EC50	6.7	mg/l
RAINBOW TROUT	96H LC50	34	mg/l

DIMETHYLSULPHIDE.

GREEN ALGA (Selenastrum capricornutum)	72H IC50	113.7	mg/l
Daphnia magna	48H EC50	29	mg/l
RAINBOW TROUT	96H LC50	213	mg/l

12.2. Persistence and degradability

Persistence and degradability: Biodegradable in part only.

12.3. Bioaccumulative potential

Bioaccumulative potential: Not expected to bioaccumulate. Bioconcentration factor (BCF) 12

12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Toxic to aquatic organisms. May taint water.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: By incineration or at authorised site as special/hazardous waste. Residual amounts of odorant can be destroyed by reaction with dilute solutions of sodium hypochlorite or hydrogen peroxide. (Minor component (Dimethyl sulphide) may react with hypochlorite to produce lachrymatory chloromethyl sulphones.)

[cont...]

Disposal of packaging: Return to supplier. / Retain for recovery.

NB: The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

Section 14: Transport information

14.1. UN number

UN number: UN3336

14.2. UN proper shipping name

Shipping name: MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.
(TERTIARY BUTYL MERCAPTAN; DIMETHYLSULPHIDE)

14.3. Transport hazard class(es)

Transport class: 3

14.4. Packing group

Packing group: II

14.5. Environmental hazards

Environmentally hazardous: Yes **Marine pollutant:** Yes

14.6. Special precautions for user

Special precautions: No special precautions.

Tunnel code: D/E

Transport category: 2

Section 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Specific regulations: Not applicable.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Phrases used in s.2 and s.3: H225: Highly flammable liquid and vapour.
H317: May cause an allergic skin reaction.
H411: Toxic to aquatic life with long lasting effects.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.

Annex

1. Short title of Exposure Scenario: **Distribution**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3:** Industrial Manufacturing (all)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7:** Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems
Further information	:	Lead substance(s) EC-No. 200-890-2 Ec-No. 200-846-2 Distribution of Substance: loading (including marine vessel/barge, rail/road car IBC loading), and repacking including drums and small packs of substance, including its distribution and associated laboratory activities.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Amount used

Remarks : Not applicable

2.1 Contributing scenario controlling environmental exposure for:ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7: Manufacture of substances, Formulation of preparations, Formulation in materials, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in inclusion into or onto a matrix, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids, Industrial use of monomers for manufacture of thermoplastics, Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers, Industrial use of substances in closed systems

Product characteristics

Viscosity, dynamic : 1,6 mPa.s at 20 °C

Environment factors not influenced by risk management

Flow rate : 18.000 m3/d
Dilution Factor (River) : 10
Dilution Factor (Coastal Areas) : 100

Other given operational conditions affecting environmental exposure

Number of emission days per year : 300
Emission or Release Factor: Air : 0,01 %
Emission or Release Factor: Water : 0,001 %
Emission or Release Factor: Soil : 0,001 %

Technical conditions and measures / Organizational measures

Air : Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,9 %)
Water : Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks : Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d
Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process

(synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC1, ERC2, ERC3, ERC4, ERC5, ERC6a, ERC6b, ERC6c, ERC6d, ERC7	EUSES		Freshwater		0,107 µg/L	0,016
			Marine water		0,10 µg/L	0,149
			Freshwater sediment		0,44 µg/kg	0,0379
			Marine sediment		0,411 µg/kg	0,354
			Soil		1,63 µg/kg	0,236

ERC1: Manufacture of substances
ERC2: Formulation of preparations
ERC3: Formulation in materials
ERC4: Industrial use of processing aids in processes and products, not becoming part of articles
ERC5: Industrial use resulting in inclusion into or onto a matrix
ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)
ERC6b: Industrial use of reactive processing aids
ERC6c: Industrial use of monomers for manufacture of thermoplastics
ERC6d: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
ERC7: Industrial use of substances in closed systems

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.
RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Formulation**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU 10:** Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises **PROC5:** Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting; **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC9:** Transfer of substance or preparation into small containers (dedicated filling line, including weighing) **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC2:** Formulation of preparations
Further information	:	Lead substance(s) EC-No. 200-890-2 Ec-No. 200-846-2 Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials, transfers, mixing, large and small scale packing, maintenance and associated laboratory activities.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Transfer of substance or preparation into small containers (dedicated filling

line, including weighing), Use as laboratory reagent

Amount used

Remarks	:	Not applicable

2.1 Contributing scenario controlling environmental exposure for:ERC2: Formulation of preparations

Product characteristics

Viscosity, dynamic	:	1,6 mPa.s at 20 °C

Environment factors not influenced by risk management

Flow rate	:	18.000 m3/d
Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	365
Emission or Release Factor: Air	:	0,25 %
Emission or Release Factor: Water	:	0,001 %
Emission or Release Factor: Soil	:	0,01 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,8 %)
Water	:	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks	:	Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Remarks	:	Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Mixing or blending in batch processes for formulation of mixtures and articles (multistage and/or significant contact) Industrial setting;, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated

facilities, Transfer of substance or preparation into small containers (dedicated filling line, including weighing), Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC2	EUSES		Freshwater		0,0395 µg/L	0,00589
			Marine water		0,0367 µg/L	0,0548
			Freshwater sediment		0,162 µg/kg	0,0140
			Marine sediment		0,151 µg/kg	0,130
			Soil		1,71 µg/kg	0,248

ERC2: Formulation of preparations

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.
RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Use as an intermediate**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3, SU8, SU9:** Industrial Manufacturing (all), Manufacture of bulk, large scale chemicals (including petroleum products), Manufacture of fine chemicals
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC4:** Use in batch and other process (synthesis) where opportunity for exposure arises

		PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC6a:** Industrial use resulting in manufacture of another substance (use of intermediates)
Further information	:	Lead substance(s) EC-No. 200-890-2 Ec-No. 200-846-2 Use as an isolated intermediate under strictly controlled conditions

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Amount used

Remarks	:	Not applicable

2.1 Contributing scenario controlling environmental exposure for:ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

Product characteristics

Viscosity, dynamic	:	1,6 mPa.s at 20 °C

Environment factors not influenced by risk management

Flow rate	:	18.000 m3/d
Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	300
Emission or Release Factor: Air	:	0,5 %
Emission or Release Factor: Water	:	1,0 %
Emission or Release Factor: Soil	:	0,1 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,5 %)
Water	:	Treat onsite wastewater (prior to receiving water discharge) to

provide the required removal efficiency of ≥ (%):
(Effectiveness: 99 %)

Remarks : Negligible wastewater emissions as process operates without water contact.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent : 2.000 m3/d

Remarks : Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment : External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods : External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Use in batch and other process (synthesis) where opportunity for exposure arises, Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC6a	EUSES		Freshwater		0,178 µg/L	0,0266
			Marine water		0,167 µg/L	0,249
			Freshwater sediment		0,732 µg/kg	0,0631
			Marine water		0,685 µg/kg	0,590
			Soil		2,52 µg/kg	0,364

ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.
RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

1. Short title of Exposure Scenario: **Injection as odorant in fuels – industrial**

Main User Groups	:	**SU 3:** Industrial uses: Uses of substances as such or in preparations at industrial sites
Sector of use	:	**SU3:** Industrial Manufacturing (all)
Process category	:	**PROC1:** Use in closed process, no likelihood of exposure **PROC2:** Use in closed, continuous process with occasional controlled exposure **PROC3:** Use in closed batch process (synthesis or formulation) **PROC8a:** Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities **PROC8b:** Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities **PROC15:** Use as laboratory reagent
Environmental release category	:	**ERC7:** Industrial use of substances in closed systems
Further information	:	Lead substance(s) Ec-No. 200-846-2 EC-No. 200-890-2 Covers injection as odourant in fuel and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Amount used

Remarks	:	Not applicable

2.1 Contributing scenario controlling environmental exposure for:ERC7: Industrial use of substances in closed systems

Product characteristics

Viscosity, dynamic	:	1,6 mPa.s at 20 °C

Environment factors not influenced by risk management

Flow rate	:	18.000 m3/d
Dilution Factor (River)	:	10
Dilution Factor (Coastal Areas)	:	100

Other given operational conditions affecting environmental exposure

Number of emission days per year	:	365
Emission or Release Factor: Air	:	0,25 %
Emission or Release Factor: Water	:	0,001 %
Emission or Release Factor: Soil	:	0 %

Technical conditions and measures / Organizational measures

Air	:	Treat air emission to provide the required removal efficiency of (%): (Effectiveness: > 99,8 %)
Water	:	Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of ≥ (%): (Effectiveness: 99,9 %)
Remarks	:	Soil emission controls are not applicable as there is no direct release to soil.
Remarks	:	Negligible wastewater emissions as process operates without water contact.
Remarks	:	Wastewater emissions generated from equipment cleaning with water.

Conditions and measures related to municipal sewage treatment plant

Flow rate of sewage treatment plant effluent	:	2.000 m3/d
Remarks	:	Not applicable as there is no release to wastewater.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	:	External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery Methods	:	External recovery and recycling of waste should comply with applicable local and/or national regulations.

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8a, PROC8b, PROC15: Use in closed process, no likelihood of exposure, Use in closed, continuous process with occasional controlled exposure, Use in closed batch process (synthesis or formulation), Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities, Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities, Use as laboratory reagent

Organizational measures to prevent /limit releases, dispersion and exposure

Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent / minimise exposures and to report any skin problems that may develop.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves tested to EN374.

3. Exposure estimation and reference to its source

Environment

Contributing Scenario	Exposure Assessment Method	Specific conditions	Compartment	Value type	Level of Exposure	Risk characterization ratio
ERC7	EUSES		Freshwater		0,0324 µg/L	0,00484
			Marine water		0,0301 µg/L	0,0449
			Marine sediment		0,124 µg/kg	0,107
			Freshwater sediment		0,133 µg/kg	0,0115
			Soil		1,61 µg/kg	0,233

ERC7: Industrial use of substances in closed systems

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.
RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.RMMs and OCs are described in adequate documentation at site level and efficiency is checked on a regular basis.When the recommended risk management measures (RMMs) and operational conditions (OCs) are observed, exposures are not expected to exceed the predicted PNECs and the resulting risk characterization ratios are expected to be less than 1.

SENTRON TM/MC CG 40

000003001067

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : SENTRON TM/MC CG 40

Product code : STLCGICT, STLCGJ20, STLCGIBC, STLCGDRX, STLCGDRM, STLCGDCT, STLCG, STLCGBLK

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Sub-stance/Mixture : Sentron oils are designed for use in stationary, spark-ignition, natural gas fuelled engines.

1.3 Details of the supplier of the safety data sheet

Manufacturer or supplier's details

Petro-Canada Europe Lubricants Limited
3rd Floor, 1 Ashley Road
Altrincham Cheshire WA14 2DT
United Kingdom

Telephone : +44 (0) 121 781 7264

E-mail address of person responsible for the SDS : EUSDS@hfsinclair.com

1.4 Emergency telephone number

Emergency telephone number : CHEMTREC: +1-703-741-5970;
Poison Control Centre: Consult local telephone directory for emergency number(s).

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Not a hazardous substance or mixture.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required

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2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Phenol, (tetrapropenyl) derivs., reaction products with distn. residues from manuf. of phenol (tetrapropenyl) derivs. and sulfur, calcium salts	220794-90-1	Aquatic Chronic 4; H413	1 - 2.5
Benzenesulfonic acid, methyl-, mono-C20-24-branched alkyl derivs., calcium salts	722503-68-6	Skin Sens. 1B; H317	0.1 - 1
phenol, dodecyl-, branched	121158-58-5 310-154-3 604-092-00-9	Aquatic Acute 1; H400 Aquatic Chronic 1; H410 Eye Dam. 1; H318 Repr. 1B; H360 Skin irr. 1C; H314 --- M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 10 --- specific concentration limit Repr. 1B 0.3 %	0.1 - 0.25

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled : Move to fresh air.
Artificial respiration and/or oxygen may be necessary.
Seek medical advice.

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In case of skin contact	:	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Wash clothing before reuse. Seek medical advice.
In case of eye contact	:	Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
If swallowed	:	Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.

4.2 Most important symptoms and effects, both acute and delayed

Risks	:	First aider needs to protect himself.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment	:	Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	No information available.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), phosphorus oxides (POx), calcium oxides (CaOx), zinc oxides (ZnOx), aldehydes, smoke and irritating vapours as products of incomplete combustion.

5.3 Advice for firefighters

Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Ensure adequate ventilation.
Evacuate personnel to safe areas.
Material can create slippery conditions.
Mark the contaminated area with signs and prevent access to unauthorized personnel.
Only qualified personnel equipped with suitable protective equipment may intervene.

6.2 Environmental precautions

Environmental precautions : Do not allow uncontrolled discharge of product into the environment.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Prevent further leakage or spillage if safe to do so.
Remove all sources of ignition.
Soak up with inert absorbent material.
Non-sparking tools should be used.
Ensure adequate ventilation.
Contact the proper local authorities.

6.4 Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Use only with adequate ventilation.
In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid contact with skin, eyes and clothing.
Do not ingest.
Keep away from heat and sources of ignition.
Keep container closed when not in use.

Advice on protection against fire and explosion : None known.

Hygiene measures : Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash face, hands and any exposed skin thoroughly after handling.

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7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	:	Store in original container. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in a dry, cool and well-ventilated place. Keep in properly labelled containers. To maintain product quality, do not store in heat or direct sunlight.

7.3 Specific end use(s)

Specific use(s)	:	No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Engineering measures

No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Personal protective equipment

Eye/face protection	:	Wear face-shield and protective suit for abnormal processing problems.
Hand protection		
Material	:	neoprene, nitrile, polyvinyl alcohol (PVA), Viton®.
Remarks	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Filter type	:	organic vapour filter
Protective measures	:	Wash contaminated clothing before re-use.

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SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	viscous liquid
Colour	:	Yellow or light amber.
Odour	:	Mild petroleum oil like.
Odour Threshold	:	No data available
Pour point	:	-27 °C
Boiling point/boiling range	:	No data available
Flash point	:	273 °C Method: Cleveland open cup
Fire Point	:	291 °C
Auto-Ignition Temperature	:	No data available
Evaporation rate	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	No data available
Relative vapour density	:	No data available
Relative density	:	No data available
Density	:	0.8772 kg/l (15 °C)
Solubility(ies)		
Water solubility	:	insoluble

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Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Viscosity, kinematic	:	125.8 cSt (40 °C)
		13.5 cSt (100 °C)
Flammability	:	Low fire hazard. This material must be heated before ignition will occur.
Explosive properties	:	Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Hazardous polymerisation does not occur.Stable under normal conditions.

10.4 Conditions to avoid

Conditions to avoid	:	No data available

10.5 Incompatible materials

Materials to avoid	:	Reactive with oxidising agents.

10.6 Hazardous decomposition products

Hazardous decomposition products	:	May release COx, H2S, methacrylate monomers, alkyl mercaptans, smoke and irritating vapours when heated to decomposition.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of exposure	:	Eye contact Ingestion

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Inhalation
Skin contact

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity	:	Remarks: No data available
Acute inhalation toxicity	:	Assessment: The substance or mixture has no acute inhalation toxicity Remarks: No data available
Acute dermal toxicity	:	Assessment: The substance or mixture has no acute dermal toxicity Remarks: No data available

Skin corrosion/irritation

Not classified due to lack of data.

Product:

Remarks	:	No data available

Serious eye damage/eye irritation

Not classified due to lack of data.

Product:

Remarks	:	No data available

Respiratory or skin sensitisation

Skin sensitisation: Not classified due to lack of data.
Respiratory sensitisation: Not classified due to lack of data.

Germ cell mutagenicity

Not classified due to lack of data.

Carcinogenicity

Not classified due to lack of data.

Product:

Remarks	:	All components listed in Annex VI to which Note L applies, and contained in the product, have been shown to contain less than 3% DMSO extractables as measured by IP346.

Reproductive toxicity

Not classified due to lack of data.

STOT - single exposure

Not classified due to lack of data.

STOT - repeated exposure

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Not classified due to lack of data.

Aspiration toxicity

Not classified due to lack of data.

Aspiration toxicity

Not classified due to lack of data.

SECTION 12: Ecological information

12.1 Toxicity

Product:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae/aquatic plants	:	Remarks: No data available
Toxicity to microorganisms	:	Remarks: No data available

Ecotoxicology Assessment

Chronic aquatic toxicity	:	This product has no known ecotoxicological effects. Remarks: Test data and bridging principles were applied when the ecotoxicity of the phenol, dodecyl-, branched was considered during determination of the environmental classification of this mixture.

Components:

phenol, dodecyl-, branched:

M-Factor (Acute aquatic toxicity)	:	10
M-Factor (Chronic aquatic toxicity)	:	10

12.2 Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

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12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : The product should not be allowed to enter drains, water courses or the soil.
Offer surplus and non-recyclable solutions to a licensed disposal company.
Waste must be classified and labelled prior to recycling or disposal.
Send to a licensed waste management company.
Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.

SECTION 14: Transport information

14.1 UN number or ID number

IMDG : Not regulated as a dangerous good

IATA : Not regulated as a dangerous good

14.2 UN proper shipping name

IMDG : Not regulated as a dangerous good

IATA : Not regulated as a dangerous good

14.3 Transport hazard class(es)

IMDG : Not regulated as a dangerous good

IATA : Not regulated as a dangerous good

14.4 Packing group

IMDG : Not regulated as a dangerous good

IATA (Cargo) : Not regulated as a dangerous good

IATA (Passenger) : Not regulated as a dangerous good

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14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Maritime transport in bulk according to IMO instruments

Remarks : ADR: Not Regulated
ADN: Not Regulated
RID: Not Regulated

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

UK REACH Candidate list of substances of very high concern (SVHC) for Authorisation	:	Not applicable
The Persistent Organic Pollutants Regulations (retained Regulation (EU) 2019/1021 as amended for Great Britain)	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable

The components of this product are reported in the following inventories:

DSL	:	On the inventory, or in compliance with the inventory
TSCA	:	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
NZIoC	:	On the inventory, or in compliance with the inventory
	:	HSNO: HSR002605, Lubricants (Low Hazard) Group Standard 2020

15.2 Chemical safety assessment

No Chemical Safety Assessment has been carried out for this mixture.

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SECTION 16: Other information

Full text of H-Statements

H314	:	Causes severe skin burns and eye damage.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H360	:	May damage fertility or the unborn child.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.
H413	:	May cause long lasting harmful effects to aquatic life.

Full text of other abbreviations

Aquatic Acute	:	Short-term (acute) aquatic hazard
Aquatic Chronic	:	Long-term (chronic) aquatic hazard
Eye Dam.	:	Serious eye damage/eye irritation
Repr.	:	Reproductive toxicity
Skin irr.	:	Skin corrosion/irritation
Skin Sens.	:	Skin sensitisation

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

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Further information

For Copy of SDS	:	Internet: lubricants.petro-canada.com/sds Order Email for packed goods: pcepackage@hfsinclair.com Order Email for bulk: pceorders@hfsinclair.com Telephone: +31 88313 0365 / +31 88313 0366 For Product Safety Information: 1 905-491-0565
Prepared by	:	Product Safety: +1 905-491-0565

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