Plots C & I, Humber Gate, Grimsby DN31 2TT

Desk Study and Ground Investigation Report

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Report for:

REPORT & VERSION CONTROL

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EXECUTIVE SUMMARY

Section	Summary Comments (only)
Site Location	Humber Gate, Grimsby DN31 2TT
Purpose & Scope	Mayer Environmental Ltd (MEL) was commissioned by the client GRG to conduct a combined desk top study and ground investigation for due diligence purposes
Site Description & **Future Use**	The site comprises two plots of land, referenced I & C, approximately 350m south west of the Humber Estuary and 4.5km to the north west of the town of Grimsby. Development of a High Temperature Incinerator.
Historical Summary	In summary, it appears the site has had a fairly simple development history. Plot C housed part of a rifle range in the 1940s. By the 1960s rail sidings were present on this plot and the three buildings still present were constructed in the 1990s. The only development on Plot I has been rail sidings present from the 1960s. Off site a number of fibre manufacturers have inhabited works to the west with Lenzing Fibres still present. Engie, an energy company is currently housed adjacent to the west. An above ground landfill for inert fibres is also present adjacent to the east of Plot I.
Geo-Environmental Setting	
Geology:	Geological records indicate that the site is underlain by Tidal Flat Deposits, which overlies the Flamborough Chalk Formation. The Tidal Flat Deposits consist of slit, clay and fine grained sand with lenses of gravel and peat inclusions.
Hydrogeology:	The Tidal Flat Deposits have been classified by the Environment Agency as Unproductive Strata. The Flamborough Chalk Formation has been classified as a Principal Aquifer.
Hydrology	The nearest surface water features are drainage channels. Maps indicate that two drainage channels potentially run onto both plots. Oldfleet Drain borders the north-west site boundary, with other drainage channels bordering Plot I to the north east and running between the two plots. All channels are considered to link up and drain into the Humber Estuary 320 m to the south.

Summary of GI Findings	
Site Works	Site work was undertaken from the 11th to the 27th September 2023.
Ground Conditions Encountered	Plot C - Made Ground was encountered at some locations to a maximum depth of 1.7 m bgl. Below this the Tidal Flat Deposits comprising a stiff brown clay were identified, with a soft grey clay also noted in some locations. Plot I – Made Ground was not encountered on Plot I in any location. Topsoil was encountered in some locations at the surface. In all locations the stiff clay of the tidal flat deposits was encountered to a maximum thickness of 3m, which was underlain by soft grey clay with peat and organic matter inclusions. The maximum thickness of this layer was 7.3m, with the firm brown clay present again under the grey clay. This in turn was underlain by putty chalk of the Flamborough Chalk Formation from a depth of circa 20m bgl.
Conclusions	**Soils** No significant levels of contaminants were identified in the soils from Plot I. Asbestos fibres and PAHs were identified in discrete areas on Plot C. **Groundwater** No significant levels of contaminants were identified within the groundwater. **Ground Gas** Elevated levels of methane have been identified within boreholes BH03 and BH05, potentially linked to dissolved methane identified in the groundwater which is likely to be from the peat and organic matter present within the clay. **Asbestos** Asbestos cladding is potentially present on the existing buildings on Plot C.
Final Conceptual Site Model	Overall the main pollutant linkage of concern is considered to be the presence of ground gas and the potential impact it may have on the proposed development. Further monitoring is required to further establish the significance of these ground gases.
Recommendations	Further gas monitoring is required comprising in-situ continuous gas monitoring and surface gas monitoring.
The Executive Summary is based on the information presented in the full report and does not form a full assessment of the available data. This summary is to be read in conjunction with the full report.	

1 INTRODUCTION

1.1 Background

Mayer was commissioned by the client GRG to conduct a combined desk top study and ground investigation for due diligence purposes for a site located at the Humber Gate, Grimsby DN31 2TT.

Mayer have worked alongside geotechnical specialist Eccles Associates Ltd (EAL) who have advised on geotechnical aspects on the ground investigation and testing scopes of works as well as assessment and interpretation of the subsequent data. Sections 7, 8 and 9 within this report have been written by EAL.

1.2 Purpose & Scope

Mayer understand that a number of parcels of freehold land are available for purchase for industrial development at Humber Gate. GRG have identified two adjoining parcels of land that are being assessed for feasibility for developing a High Temperature Incinerator (HTI). Consequently, further information on existing ground conditions on the plots is required to determine if they are suitable for the proposed development.

1.3 Provided Information

To inform the desk study reporting and gain an understanding of the environmental and historical setting of the site for contaminative purposes; an Enviro Insight report by Groundsure was requested. Also, the following documents were provided to Mayer by GRG for information.

TABLE 1.1 DOCUMENTS RECEIVED

Document / Report Title	Company Ref	Date
Groundsure Report	GS-O2P-IB2-NLY-4N8	August 2023
Humber Gate , Grimsby – Selling Agents Brochure	-	July 2023
Conveyancing Plan	21815-BSB-00-XX-DR-A-0114-P2	August 2023
Proposed Layout Plans	231-CK-001-2 Rev A Option 2 Preferred	September 2023

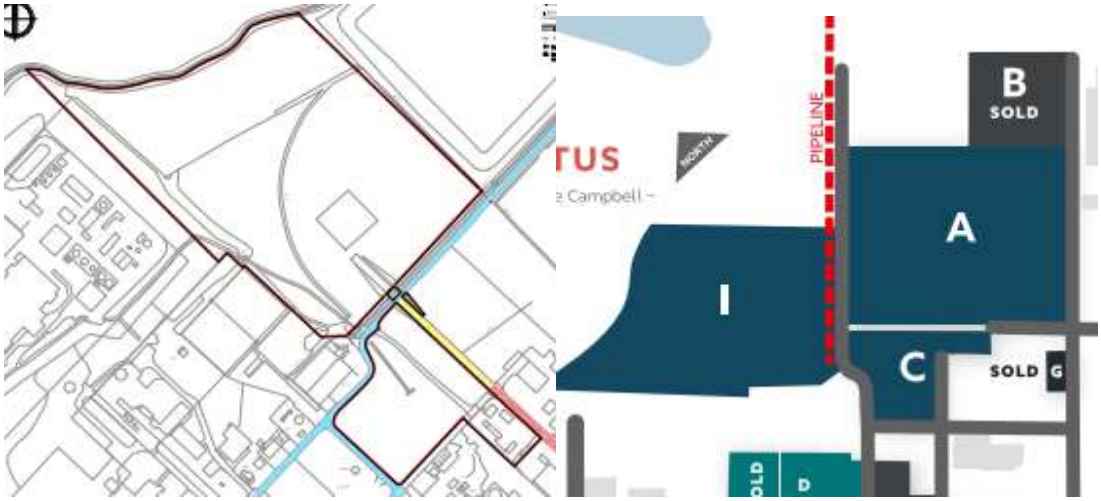
The proposed layout plan has been used to target the ground investigation as it is anticipated that only a part of Plot I will be required to house the proposed development. A copy of this plan is included in Appendix A.

2 SITE DESCRIPTION

2.1 Site Location

The site comprises two plots of land, referenced I & C, approximately 350m south west of the Humber Estuary and 4.5km to the north west of the town of Grimsby. The location of the site and the approximate outline of the site area are shown on the plan below and also provided in Appendix A.

IMAGE 2.1 PLANS SHOWING THE LOCATION OF PLOTS I & C



2.2 Site Description

A site visit was undertaken during sunny, dry weather on 22nd August 2023 to review any constraints before the ground investigation and view general site conditions and geo-environmental factors relevant to this report. Table 2.1 provides a summary of the conditions and observations from the visit. Please refer to Appendix A for the Site Plan and Appendix B for photographs from the site visit.

TABLE 2.1 SUMMARY SITE CONDITIONS

Feature	Brief Description
Access and Area	The site is approximately 10 ha comprising both Plot C & Plot I. Plot I is accessed via a bridge from Plot C and the adjacent Lenzing Fibers factory. Plot C is accessed from the main route on the industrial park.
National Grid Reference	523705, 412714 Post code DN31 2TT.
Topography	The site is generally flat.
Land Use	Both plots show evidence of previously housing industrial uses. Two tall corrugated concrete clad (possibly asbestos containing) buildings are located in the south-eastern corner of Plot C with a smaller building in front of them. Both tall buildings have fans on the top but their former use is unclear. Herras fencing surrounds the buildings. A pallet

	with asbestos cladding (asbestos warning stickers noted) was present behind the buildings. A pallet of used tins of paints was also noted behind the buildings, close to a corrugated metal workshop. No access was gained to the workshop. Above ground service runs were noted to run from the Lenzing factory to the south, across the entrance road to Plot C and also down to the buildings. It is unclear what the services are and if they are still active. The rest of the area comprising Plot C is made up of a gravel roadway leading towards Plot I and scrub vegetation. Close to the Lenzing factory a storage area of pallets and scaffolding was noted. Small areas of fly tipping were also noted in this area. Evidence of rail sidings were also noted running down towards Plot I. A roadway runs between the plots with a pipeline in a ditch running alongside the roadway. The pipeline runs towards the Humber Estuary (approximately 350m to the north east of the site) and is thought to carry trade effluent out into the estuary. *Note that the roadway and pipeline are outside of both plot boundaries.* Plot I is covered by vegetation. The majority of the plot is covered by long grass. Two areas of dense vegetation are also present; a square area in the centre of the site and a triangular area that appears to be bordered by rail sidings on the western area of the site. These areas were not able to be accessed during the walkover. The northern boundary of Plot I is bounded by the Oldfleet Ditch, with a second ditch running along the eastern boundary. Dense hedgerow surrounds the other two boundaries. A number of blue borehole covers were noted during the walkover on both plots; these appear to be positioned in a straight line. Wooden pylons and electricity cables were noted to run east to west across the Plot.	
Boundaries and Surroundings	The site is located to the rear of an industrial estate located off Energy Park Way. Large areas of the estate appear to be disused, particularly to the south east and south west of the subject site. Other industries on the estate include a technical absorbents company, Engie (renewable energy company), FM Zinc (zinc oxide manufacturer) and Lenzing Fibers Ltd (fibre manufacturer). There is no residential housing within 2km of the site.	
Site Boundary	North	Oldfleet Drain with open farmland beyond. At a distance of 400m north west the South Humber Bank Power Station is located
	East	Unnamed drain with raised landfill area beyond. Information from the land agent indicates that the landfill is for inert fibres and is not considered to pose any significant risk to the surrounding environment. However, it should be noted that during the walkover metal vents were noted on the landfill suggesting that ground gases may be present. In addition a sign was noted on south-western tip of the landfill that stated a warning for hazardous ground gases.
	South	Directly south of Plot I is Plot C. To the south of Plot C Engie and FBM Zinc are located. Two tall chimneys and two retention lagoons appear to be associated with FBM Zinc. A strong sulphurous odour was noted close to the smaller lagoon next to the bridge access to Plot I. The pipeline

		mentioned in the site description above appears to run from this lagoon.
	West	Lenzing Fibers Ltd is located to the west of Plot I

3 ENVIRONMENTAL SETTING

Information in this section is informed by the commissioned Groundsure report included in Appendix C.

3.1 Geological Setting

3.1.1 Geology

Geological records (British Geological Survey Map 1:50,000 sheet EW081_082_patrington_and_spurn_v4) indicate that part of Plot C is underlain by Made Ground. With regard to superficial deposits both plots are underlain by the Tidal Flat Deposits comprising clay and silt. These deposits in turn are underlain by the Flamborough Chalk Formation.

British Geological Survey (BGS) map sheet TA21SW at 1:10,560 scale (1987) indicates the site to be underlain by superficial marine and estuarine alluvial deposits (tidal flat deposits) associated with the Humber Estuary, noted as “silty clay soil with rare shells”. Made ground is shown to overlie these deposits in the south west corner of Plot I and the south west half of Plot C and is described as “MADE GROUND up to 1m thick comprising chalk rubble, till, tarmacadam and some refuse”. Other made ground deposits are shown in the site vicinity to the north east comprising “Industrial waste”. Below the made ground and tidal flat deposits, glacial boulder clay is likely to be present, with bedrock at depth comprising chalk rock of the Cretaceous Flamborough Chalk Formation.

Borehole records held by BGS (with exploratory holes 190m north east of the site (ref TA21SW442) and 380m south east (ref TA21SW239)) indicate 2.1m of Made Ground (TA21SW442) comprising mainly clay and silt, or 0.3m of topsoil (TA21SW239) with tidal flat/alluvial deposits underlying this consisting of soft dark coloured clay with occasional silt lenses, organic matter and peat beds. From 13m below ground level (bgl) and 8.7m bgl, glacial boulder clay is present comprising a stiff or very stiff clay with chalk, chert, limestone and sandstone gravels and occasional organic matter, underlain from 19m and 17.2m bgl by sand with chalk gravel. The maximum depth of the borehole records is 20m bgl and the Flamborough Chalk Formation is not recorded on either indicating it is present at >20m bgl.

3.1.2 Estimated Background Soil Chemistry

Records of estimated background soil chemistry, as provided by GroundSure, are provided for the subject site. The values provided would not be considered an issue when considering the proposed end use of the site.

3.1.3 Ground Stability Hazards

Whilst not a geotechnical assessment, generally ground stability hazards are considered to be comparatively low potential risk.

TABLE 3.0 GROUND STABILITY HAZARDS

Hazard	Hazard Rating
Shrink Swell Clays	Low
Running Sands	Very Low - Moderate
Compressible Deposit	Very Low - Moderate
Collapsible Deposits	Negligible
Landslides	Very Low
Ground Dissolution	Negligible

3.1.4 Mining & Surface Ground Workings

Information contained within the GroundSure report indicates the subject site is located in an area that is not affected by coal mining, underground mine workings and surface workings.

3.1.5 Natural Cavities

There are no records of natural cavities within 1000m of the site.

3.1.6 Radon Gas

The site is in a lower probability radon area with less than 1% of homes above the action level. The British Geological Survey advises that no radon protective measures are necessary in the construction of new dwellings.

3.2 Hydrogeology

The Tidal Flat Deposits have been classified by the Environment Agency as Unproductive Strata. These are drift deposits with low permeability that have negligible significance for water supply or river water base flow.

The Flamborough Chalk Formation is classified as a Principal Aquifer due to its high fracture permeability and usually provides a high level of water storage and may support water supply / river base flow on a strategic scale.

In respect of groundwater vulnerability, the subject site overlies an area of Tidal Flat Deposits, likely to have low vertical permeability. The leaching class of soils at the surface has been determined as high, likely due to the open nature of the site and lack of hardstanding to attenuate the infiltration of any diffuse source pollution.

In the assessment of groundwater vulnerability, a number of factors need to be taken into account. These include geology, hydrogeology and soil type.

Information within the Enviro Insight report produced by GroundSure indicates that the subject site is overlying Unproductive strata (Tidal Flat Deposits) with the surface soils having a high leaching potential. However, the presence of the Tidal Flat Deposits with low vertical permeability are likely to afford significant protection to the underlying Principal Aquifer in the bedrock.

RISK RATING	
Groundwater Vulnerability	Low

The risk rating is based on the site sensitivity assessment for the water environment as set out in Annex 2 of R&D 66 (NHBC). A summary of this assessment is included in Appendix E.

3.2.1 Source Protection Zones (SPZ)

The Enviro Insight report produced by GroundSure indicates there are no source protection zones (SPZ) within 500m of the subject site.

3.2.2 Licensed Abstraction Points from Groundwater

The Enviro Insight report produced by GroundSure indicates there are no licensed abstraction points from groundwater within a 1000m radius of the subject site.

3.2.3 Pollution Incidents to Groundwater

There have been no reported pollution incidents to ground water within 500m of the subject site. Discharge Consents to Groundwater

No records of discharge consents to groundwater were found within 500m of the site.

3.3 Hydrology

3.3.1 Surface Water Features

The hydrology map within the GroundSure report indicates that two small drainage channels run onto the site in the north of Plot C and the south of Plot I. It also indicates that potentially an underground drain runs onto the site at the most northern tip of Plot I. Off-site, the nearest surface water feature runs along the north western boundary of Plot I and comprises the Oldfleet Drain. A number of other surface drains are located within the vicinity of the site boundary and are likely to all be linked. At its closest point, the subject site is 320m to the south west of the Humber Estuary.

3.3.2 Flooding

Parts of the site are classified within the Risk of Flooding from Rivers and Seas (RoFRaS) models by the Environment Agency as at high risk of flooding from rivers taking into account flood defences and their condition. This classification indicates that potentially there is greater than or equal to a 1 in 30 chance of flooding in any given year. The model is based on cells of 50m and the cells classified as high risk are mainly located in the north and south of the site. The central area ranges between low (less than 1 in 100 chance) and moderate. The site is also recorded as being within a Flood Zone 2 when the presence of flood defences are ignored. Flood defences are noted to be located 188m north east on the Humber Estuary.

With regard to historical flood events, one event was recorded on site in 1953 where tidal flooding was caused by overtopping of defences.

With regard to surface water flooding, some areas of the site are shown to have a high risk (1 in 30 year 0.1m -0.3m) of flooding due to extreme rainfall events i.e. parts of the site may be vulnerable to surface water ponding or flooding.

With regard to groundwater flooding, one small area on Plot C is noted to be at moderate to high risk of flooding, potentially linked to Made Ground recorded in this area. The majority of the site is not shown to be at risk from groundwater flooding.

3.3.3 Discharge Consents to Surface Water

The GroundSure report indicates one surface water discharge consent within a 500m search radius of the subject site. The consent is for historic unspecified trade discharges to the River Humber by an unnamed factory located at DN31 2SS. The record is located 315m north east of the subject site.

3.3.4 Licensed Abstraction Points from Surface Water

1 record of surface water abstraction has been identified within 1000m of the site. The record is located 775m east and its status is recorded as historical despite the recorded start date of 2019 and the expiry

date of 2030. The abstraction record was held by NE Lincolnshire Council for a point abstract on Mawmbridge Drain for a transfer between sources. No further information is provided.

3.3.5 Pollution Incidents to Surface Water

Two reported pollution incidents to surface water are recorded within 500m of the subject site. Both incidents resulted in only minor impacts on the water environment from organic chemicals/products in 2002 located 304m north east and 339m east of the site.

3.3.6 Surface Water Risk Assessment

In the assessment of surface water vulnerability, a number of factors need to be taken into account. These include proximity and quality of the watercourse and potential transmission of pollutants via groundwater to the watercourse.

The Humber Estuary is located 350m north east of the site with a network of drains running within close prolixity of the site. There are a small number of small channels running onto the site and the potential for one to run under the site. Due to the low permeability of the underlying superficial deposits, there is unlikely to be significant potential for baseflow to the channels. However, the presence of Made Ground under the site may give rise to the potential for base flow.

RISK RATING	
Surface Water Vulnerability	Moderate to High

The risk rating is based on site sensitivity assessment for the water environment as set out in Annex 2 of R&D 66 (NHBC). A summary of this assessment is included in Appendix E.

3.4 Environmentally Sensitive Areas

3.4.1 Designated Environmentally Sensitive Sites

The Enviro Insight report produced by GroundSure, using Natural England data, has identified a number of Designated Environmentally Sensitive Sites (DESS) within a 1000m search radius of the subject site. The table below summarises the information.

TABLE 3.1 SUMMARY OF DESIGNATED ENVIRONMENTALLY SENSITIVE SITES

Distance From Site (m)	Direction From Site	DESS	Further Details
189	NE	Site of Special Scientific Interest (SSSI), Conserved Wetland Site (Ramsar Site), Special Area of Conversation (SAC) & Special Protection Area (SPA)	Humber Estuary
846	E	SSSI	Humber Estuary

Distance From Site (m)	Direction From Site	DESS	Further Details
969	E	Conserved Wetland Site (Ramsar Site)	Humber Estuary

3.4.2 Nitrate Vulnerable Zones

The Enviro Insight report produced by GroundSure, using DEFRA data, has identified two Nitrate Vulnerable Zones within 1000m of the subject site. One of these is located on site for the North Beck Drain. These are areas considered to be at risk from agricultural nitrate pollution.

4 HISTORICAL AND INDUSTRIAL SETTING

4.1 Site History

Published historical County Series maps and previous Ordnance Survey plans have been consulted to evaluate previous development on the site, and its surroundings, that may affect the site. A summary is included in Table 3 and the historical plans are included in Appendix C (from the Groundsure Report, August 2023).

Please note that due to the gaps between publication dates, potentially contaminative / significant developments may have appeared and disappeared without appearing on any map edition. Also, distances are approximate.

TABLE 4.0 SUMMARY OF HISTORICAL PLANS & KEY FEATURES

Edition & Scale	Main Features Onsite	Offsite
County Series 1:2,500 1888 -1889 **County Series 1:10,560 1854, 1887, 1886-1887, 1892,**	The site is situated on an area of open land The Oldfleet Drain is shown along the north east boundary in the same position as today flowing towards the Humber Estuary. Another drainage channel looks to run along Plot C from south west to north east.	The surrounding land is shown as open with numerous land drains crossing the area.
County Series 1:2,500 1902 **County Series 1:10,560 1906, 1906-1907, 1930-1931, 1938, 1947, 1946-1947, 1956**	The map from 1906 shows the site much as it was with the only change being a small square in the east of Plot I that is possibly an orchard. The map of 1931 indicates that the southern part of Plot C may have been part of a rifle range. By the plans of 1946-1947 the rifle range is still present but off-site to the east.	There is little change to the surrounding area until the map of 1931 which shows a rifle range present to the east, extending down to the estuary and covering part of Plot C. The rifle range is no longer shown on the site on the map of 1946-1947 although it is shown off site to the east until the map of 1956.
County Series 1:2,500 1965 **County Series 1:10,560 1965, 1968, 1980, 1988**	The map of 1965 shows that the orchard area is still present but there are now two rail lines / sidings running across the site. The main line runs from the site to the west across the northern section of Plot I and off site to the east where it stops. A second line branches off this and runs in a curve past the orchard and down to Plot C where it splits into a number of rail sidings. The line appears to run across a drainage	The map from 1965 shows the land adjacent to the south west has been developed as a works. A number of buildings, tracks and a chimney are shown with rail tracks and sidings that run onto the subject site. By the map of 1980 the works have extended to the south and east of the site with numerous additional buildings and chimneys.

	channel, implying that there may have been a bridge present.	
1999, 2009, 2015, 2016 – Aerial Photograph **2003 1:1,250 Landline** **2001, 2010 1:10,000 National Grid**	The aerial photographs and maps from 1999 onwards show little change to Plot I with the overgrown vegetated areas noted during the walkover already very clear and changed very little until the present day. The aerial photograph from 1999 shows the buildings on Plot C for the first time. The three buildings identified during the walkover are present. The rest of Plot C appears to be more open that it is today with less vegetation.	The aerial plans from 1999 show the works much as before with the large water retention lagoons adjacent to the site much as seen today. The aerial plans from 2009 onwards appear to show the works to the south west reduced significantly in size with just the footprints of the majority of the buildings present. South Humber Power Station, 400m to the north, is shown for the first time on the map of 2001.
Current – Aerial Photograph **2023 1:10,000 National Grid**	The most recent maps and aerial photograph show the site as it is today. Plot C has more vegetation present with little change to Plot I.	Redevelopment of the former works area to the south west appears to have started again in recent years with ongoing development noted during the site walkover. The Groundsure report indicates that a number of recent/current industrial land uses are located to the south and associated with the works. Chimneys are recorded as 18m and 84m south with a number of electrical substations located between 88m and 121m to the south and south west.

Additional online research was undertaken to further understand the works adjacent to the site. Courtaulds, known locally as Grimsby 'Fibro' Plant, was present within the 1950s and produced wood-based viscose rayon stable fibre (fibro) using a carbon disulphide process. The works expanded in 1959 with a new courtelle (acrylic fibre) factory. Both factories expanded again in the 1960s and 1970s before the sites were sold in 1998 to Accordis UK and the Lenzing Group. Lenzing's acquisition of the Tencel group in 2004 expanded production on site for this semi-synthetic fibre. The factory is still present to this day. The Groundsure report lists a number of waste transfers recorded to Lenzing Fibres Ltd, including fibre rejects, degreasing wastes, mineral-based non-chlorinated engine, gear and lubricating oils, and oily water from oil/water separators.

Acordis were acquired by the Blue Star Group (carbon fibre product) in 2006 until 2015. Research indicates that the works were then developed into a gas powered combined heat and power (CHP) power station. The works is now owned and operated by Engie, a sustainable energy company. The Groundsure report lists a number of waste transfers undertaken by Engie that include septic tank sludge, degreasing wastes including dangerous substances, fluorescent tubes and other mercury containing waste and other engine, gear and lubricating oils.

As noted during the site walkover, a raised landfill is present to the east of Plot I. Anecdotal evidence from the land agent indicates that it was used by Courtaulds and Blue Star for inert fibre materials and

the Environment Agency never had any concerns with it. In addition, the agent has also stated that a similar landfill is present 150m to the north of Plot C which was monitored until 2012 with no issues recorded.

4.2 Unexploded Ordnance

A search of the online Zetica Unexploded Ordnance (UXO) risk maps was undertaken for the site and the risk of UXO was determined as low with no further action required.

4.3 Historical Tank Database

The Enviro insight report produced by GroundSure reported five historical tanks within a 50m search radius of the subject site, with a further 38 no. within 500m of the site.

The majority of the tanks are associated with the works to the south and south-west and are noted as unspecified tanks or just tanks. The furthest tanks are associated with the Power Station.

4.4 Historical Garage, Petrol and Fuel Site Database

No records of historical garage, petrol and fuel sites were noted within 500m of the site.

4.5 Historical Energy Features

The only historical energy feature noted is the Power Station to the north, although it is still present today.

4.6 Active or Recent Landfill Sites

One recent landfill is recorded 17m to the east and was operated by Acordis UK under WML number 70836 for an industrial waste landfill. This is considered to be the landfill mentioned in section 4.1 above which was monitored until 2012 with no issues recorded.

4.7 Historic Landfill Sites

EA records indicate that an historic landfill is present on site, although an assessment of the map suggests that it is the raised landfill to the east of Plot I. The landfill is recorded as No. 3 Landfill and was operated by Acordis UK Ltd. The licence was issued in 1983 and surrendered in 2008.

BGS records also indicate an historic landfill 476m to the east along the edge of the estuary. The information provided indicated it was operated by Courtaulds and poses no risk to the aquifer. Further information from the EA records indicates it is referenced as Courtaulds No 2 Landfill and had various licences in place from 1970 until 2008 under both Courtaulds and Acordis.

4.8 Historical Waste Sites

The GroundSure report indicates a record of one historical waste site within 500m of the subject site. This, however, is considered to be a planning application for a tyre pyrolysis plant that was not utilised.

4.9 Licensed Waste Facilities

The Groundsure report records 11 no. licensed waste sites within 500m of the subject site. The two closest sites refer to the No. 3 Landfill commented on in section 4.7 above.

Of the remaining records, the next closest is located 104m south for Moody Lane Materials Recycling Facility for the treatment of waste to produce soil. The remaining records relate to the landfills commented on in the sections above.

4.10 Sites Determined as Contaminated Land

The Groundsure report indicates one off site record determined as contaminated land. The record is located 109m to the east and references two site assessments undertaken in 2009 and 2014 that highlighted a deterioration in surface water quality within land drains. The record is associated with the Acordis landfill where the EA found the potential for leachate overtopping the bund to be significant. Work is recorded as ongoing with the original year recorded as 2017.

4.11 Licensed Industrial Facilities Part A(1)

The Groundsure report records 45 records within 500m of installations regulated under the Environmental Permitting (England & Wales) Regulations 2016 for the release of substances to the environment.

Seven records (located 53m south and 63m south east) relate to the Grimsby Fibres Power station for combustion of any fuel. Last noted as effective March 2023.

Eleven records are located 49m south east for the Grimsby Acrylic Fibres Factory (Blue Tsar Fibres Company Ltd) for organic chemicals, plastic materials, gasification, liquefaction and refining of any pyrolysis heat treatment of coals, carbonaceous material, distillation and other processes. Last noted as effective March 2023.

The remaining records relate mainly to Lenzing Fibres for associated processes.

4.12 List 1 & 2 Dangerous Substances

The Groundsure report list one record for discharge of substances identified under List 1 & 2 of European Directive E 2006/11/EC. The record is located 9m south and is associated with Bluestar Fibres Ltd for mercury & cadmium (List 1) and chromium, copper, nickel, pH and zinc (List 2). It is considered that this is linked to the effluent pipe present between the two plots.

4.13 Registered Radioactive Substances Authorisations

The GroundSure Reports indicates no records within 250m of the subject site where Radioactive Substances Authorisation are present.

4.14 Control of Major Accident Hazards (COMAH) and Notification of Installations Handling Hazardous Substances (NIHHS)

The Groundsure report identifies two on site records for Historical NIHHS sites relating to the Blue Star Fibres Company Ltd and Courtaulds.

4.15 Hazardous Substance Storage / Usage

The Groundsure report identifies seven records of hazardous substance storage and usage within 500m of the subject site. The two closest relate to historical consents for Bluestar Fibres for the manufacture of acrylic fibre from acrylonitrile and other co-monomers, manufacture of viscose rayon and man-made fibres from cellulose wood pulp. No enforcements were notified for these records.

Two other records are within 250m of the subject site. Both records relate to an historical consent for the storage of 20,000 tonnes of ethanol for RWE Npower Renewables Ltd is located 179m north west.

The remaining three records are located 284m south for storage of hazardous substances relating to bioethanol production and are recorded as belonging to Vireol Plc (former Acordis site) and Solenis UK Industries. Application dates are recorded as 2010.

4.16 Historical Licensed Industrial Activities (IPC)

There are 23 Integrated Pollution Control (IPC) records within 500m of site. Six records are located 354m south and relate to combustion processes at Humber Energy Ltd with permit dates from 1992 to 2005. A remaining records are located 404m south for Technical Absorbents (manufacture and use of organic chemicals), Lenzing Fibers Ltd (paper and pulp manufacturing processes), Bluestar Fibres Ltd (manufacture and use of organic chemicals), and Acordis UK Ltd (inorganic chemical processes).

5 PRELIMINARY CONCEPTUAL MODEL

The risk assessment process is one that develops as more information becomes available to the risk assessor. Potential sources of contamination, exposure pathways and sensitive receptors are identified and placed in to the context of a conceptual site model.

At this stage of the risk assessment, the aim is to:

- Determine the sources of potential contamination and to identify specific potential contaminants of concern.
- Identify where these potential contaminants may reside – soils, ground or surface waters, ground gases etc.
- Identify possible target receptors and their relative sensitivity to these contaminants if exposed.
- Identify and characterise potential contaminant migration pathways to determine whether a linkage exists.
- Create a conceptual model for the site displaying the potential sources – pathways – targets identified placing them in to context to demonstrate how the site may present a risk.

The conceptual site model is a dynamic representation of the site, to be refined and developed at each stage of the site investigation process. It is also to be used to direct and inform future investigation by highlighting areas requiring further investigation or eliminating those considered to be of insignificant or acceptable risk.

The conceptual site model contains the three elements the:

- **Source** - probable or actual contaminants their nature and location.
- **Receptor**– existing and, within reason, foreseeable targets upon which the source may impact these may be either on or off site.
- **Pathway –** means by which the source and the receptor may come in to contact.

Where a **source – pathway – receptor** pollutant linkage is envisaged, an estimation of the risk posed by this linkage can be made. Should any one of the three elements be absent, then there is no risk.

5.1 Significant Geo-Environmental Findings

The underlying site geology comprises Tidal Flat Deposits, overlying the Flamborough Chalk Formation. Made Ground is noted to potentially be present under Plot C. The Tidal Flat Deposits comprise silt and clay with organic odours and rotting organic matter noted to be present in historic borehole logs.

The Tidal Flat Deposits have been classified by the Environment Agency as Unproductive Strata. The Flamborough Chalk Formation has been classified as a Principal Aquifer.

With regards to surface water, the Oldfleet Drain runs adjacent to the north western boundary of Plot C with additional unnamed drains running adjacent to the north eastern and south eastern site boundaries. The Groundsure report identified two additional ditches, on in the south of Plot I and one

in the north of C. It is considered that these are present, although heavily overgrown. It is likely that all of the drains are connected and drain into the Humber Estuary which is recorded as a SSSI, Ramsar site, SAC and SPA.

With regards to the subject site, there has been a fairly simple history of development. Plot C housed part of a rifle range in the 1930s with the range still present but off site by the 1940s. By the 1960s a rail siding is shown running onto Plot C and in the 1990s, the three buildings still present on Plot C are shown for the first time. With regards to Plot I the only development has been in the form of rail sidings present from the 1960s. Currently both plots are vacant and heavily vegetated. On Plot C there is the potential for Made Ground to be present and during the site walkover paint cans and asbestos sheeting were noted close to the existing buildings.

Off site a number of potentially contaminative land uses have been identified including the rifle range that extended onto Plot C. From the 1960s a number of works associated with the rail sidings on site appeared which mainly comprised fibre manufacturing from Courtaulds, Accordis, Blue Star and Lenzing. Lenzing is still present as are a number of other local industries, such as Engie, an energy company with associated chimneys and electrical substations. Further afield the South Humber Power Station has been present from the 2001. In addition, two landfills associated with the fibre factories are located adjacent to the east of the site and 150m to the north. Both are recorded as above ground for inert fibres, although it was noted during the walkover that the landfill adjacent to the site had metal extraction fans present and a sign warning about hazardous ground gases.

5.2 Potentially Contaminative Uses

Table 5.0 summarises the main potential sources of contamination that may currently affect the site from former processes on and around the site. Note, due to the significant number of potential sources due to the site's industrial setting, only those within close proximity to the site, or those that are considered to be significant sources, are considered here.

TABLE 5.0 POTENTIAL SOURCES OF CONTAMINATION

Potentially Contaminative Land Use	Associated contaminants	Probability of Risk
On-site		
Current - Plot C Paint cans and asbestos sheeting	Asbestos, solvents, metals.	**High risk** due to the visual presence of both sources.
Current - Suspected asbestos sheeting on buildngs on Plot C	Asbestos	**Low risk** if undisturbed.
Current – fly tipping and storage of materials close to Lenzing.	Asbestos, solvents, metlas, petroelum hydrocarbons, PAHs.	**Medium to High** as materials and fly tipping straight onto soft ground.

Current – Tidal Flat Deposits with rotting organic material	Methane generation	**Medium risk**
Current / Historical – Made Ground	Metals, Polychlorinated Bipehnyls (PCBs), Poly Aromatic Hydrocarbons (PAHs), petroleum hydrocarbons, asbestos in soils, potential solvents.	**Medium to High** risk.
Historical – Plot C Rifle Range (1930s – 1940s)	Metals, solvents	**Low to Medium** risk due to age of feature
Historical – rail sidings across both plots (from 1960s)	Petroleum hydrocarbons, PCBs, asbestos in soils, metals, solvents	**Medium** risk due to extent of feature.
Within 500m of Site		
Current - Industrial Works including Lenzing and Engie.	Fibrous waste, asbestos, solvents, petroleum hydrocarbons, PAHs, PCBs, acidic and alkaline waste.	**Medium to high** risk due to proximity of industries.
Current – South Humber Power Station (400m north)	Petroleum hydrocarbons. PAHs, PCBs, solvents.	**Low** risk due to distance from site.
Recent / Historic – Inert Fibre Landfills adjacent and to the north	Ground gas, leachate	**Medium to High** risk due to uncertainty of materials in landfil (recorded as inert but evidence of ground gas being generated identified during walkover)
Historic - Fibre factory (Accordis / Blue Star)	Fibrous waste, asbestos, solvents, petroleum hydrocarbons, PAHs, PCBs, acidic and alkaline waste.	**Medium** risk due to current industries close to the site.

5.3 Potential Exposure Pathways

TABLE 5.1 POTENTIAL PATHWAYS

Exposure Pathway	Qualifying Comments
Direct contact – Contact with exposed skin or eyes with soil, dusts (in or outdoors) or water (in or out doors).	Direct contact to skin and eyes considered likely. Although the proposed development will include hardstanding it will not cover all of the subject site and areas are likely to be left as they are. The potential for contact with potentially contaminated groundwater is unlikely. There are no recorded groundwater extraction points on or within the

	vicinity of the site. The risk of groundwater flooding is considered to be low. The potential for contact with surface water is considered low as it will be unlikely that easy access to the drainage channels will be part of the proposed development.
Ingestion – Consumption of soils, dust (in or outdoors) water (in or outdoors)	Ingestion considered possible outside of development area due to reasons given above.
Inhalation – Inhalation of soil dust, fibres or vapours, gases (in and outdoors)	Ingestion considered possible outside of development area due to reasons given above.
Soil leaching – Water soluble contaminants leaching through soil to impact on groundwaters and surface waters and potentially contacting human receptors (lateral/ vertical migration via the saturated/unsaturated zone)	Soil leaching considered possible but unlikely due to the nature of the Tidal Flat Deposits underlying the site. Lateral and vertical migration of water within these silts and clays is unconsidered unlikely.
Structures / Services – Migration of ground gases or mobile contaminants along service runs or site structures	Migration of ground gases or mobile contaminants may be possible within the proposed development if these contaminants are identified as present.

5.4 Potential Receptors

TABLE 5.2 POTENTIAL RECEPTORS FOR FUTURE USE

Receptor	Qualifying Comments
Site users – current	The site is vacant and the only likely current users will be trespassers. There is a risk to people being on the site in its current condition, particularly Plot C where asbestos sheeting has been identified.
Site users – future	Potential risk of contact with soils and surface water in areas outside of proposed development. Potential asphyxiation from ground gas in proposed buildings and confined areas if identified as present.
Site neighbours – industrial	Potential risk not considered significant due to low likelihood of lateral migration through anticipated clay and silt deposits. However there is some potential for any dust born contaminants from the site to affect site neighbours.
Groundwater – Unproductive Strata overlying Principal Aquifer.	Low risk due to presence of Tidal Flat Deposits affording protection to underlying Flamborough Chalk Deposits.
Surface water – Oldfleet Drain and connected drains draining into Humber Estuary	Potential risk for run off into drains. Lateral migration unlikely due to presence of clay and silt.
Ecology	Potential risk to sensitive ecology on site and to the Humber Estuary. Note that ecological specialists are also being consulted on the site and proposed development.
Buried services – water mains, power or other below ground services	Potential risk to proposed site structures if placed in contaminated ground.
Ground workers	Potential risk of contact with contaminated soils during proposed development.

5.5 Initial Conceptual Site Model

The following table details the potential sources, pathways and receptors present and determines if a contaminant linkage is potentially present. Any potential contaminant sources identified as negligible or low risk in section 5.2 are not included as they are not considered potentially significant. **Note that the conceptual model below is based on the subject site's current and proposed use of an HTI . If this changes the model will need to be revised.**

Potential Source	Identified Pathways	Receptors	Consequence	Probability	Risk Rating	Comments on Linkage Significance
On-site						
Plot C - asbestos sheeting, paint cans, fly tipping, Made Ground (all present) Historically the presence of the rifle range and the rail sidings **Plot I –** rail sidings **Presence of organic materials in Tidal Flat Deposits** (ground gas generation potential)	• Direct Contact • Ingestion	• Site users – current and future	Medium	Unlikely	**Low risk**	The majority of the site is covered by soft ground with no hardstanding present. The proposed development will cover parts of the site with hardstanding minimising direct contact in this areas. It is unlikely that areas of the site not utilised for the development will be easily accessible.
	• Inhalation (fibres)	• Site users – current and future	Severe	Unlikely	**Moderate/Low Risk**	Asbestos sheeting has been identified as being stored on Plot C. A severe consequence has been determined due to this presence of asbestos. Asbestos sheeting is also thought to be present on the existing buildings. An asbestos survey is recommended to confirm this if the buildings are to be demolished or re-used.
	• Direct Contact • Ingestion • Inhalation (Vapours/fibres)	• Groundworkers	Medium	Likely	**Moderate Risk**	Groundworkers on site would suggest that development works are being undertaken and the concrete has been removed.
	• Soil leaching	• Groundwater • Site neighbours • Surface water • Local ecological systems	Mild	Unlikely	**Very Low Risk**	Soil leaching considered unlikely due to presence of clays and silts.

Potential Source	Identified Pathways	Receptors	Consequence	Probability	Risk Rating	Comments on Linkage Significance
		• Site structures • Buried services	Medium	Low Likelihood	**Moderate/ Low Risk**	Any contaminants present on site have the potential to impact on proposed site structures in contact with the underlying soils and buried services.
	• Inhalation (Vapours / ground gases)	• Future site users • Serve runs / site structures	Severe	Low likelihood	**Moderate Risk**	The potential presence of rotting organic materials in the underlying Tidal Flat Deposits may cause the generation of ground gases (in particular methane). The pathway from the potential ground gas source to site users at the surface may be minimised due to the assumed low permeability of the natural soils, although migration through proposed structures and service runs may need to be considered.
Off-site						
Current – Industrial works including Lenzing and Engie and associated chimneys and substations	• Soil leaching	• Site users • Groundworkers	Mild	Unlikely	**Very Low Risk**	Any contaminants leaching on site are unlikely to impact on site users due to the nature of the Tidal Flat Deposits underlying the area.
Recent / Historic – Inert Fibre Landfills adjacent and 150m N	• Gas Migration	• Site Users • Ground Workers	Severe	Unlikely	**Moderate / Low Risk**	There is the potential for gas generation from the adjacent landfill. The landfill is recorded as being above ground and inert but there is little detailed information available. The presence of the drainage ditch between the site and the landfill and the low permeability of the Tidal Flat Deposits suggests that the potential for gas migration is low.
Historic - Fibre Factory (Acordis / Blue Star)	• Soil leaching	• Site users • Groundworkers	Mild	Unlikely	**Very Low Risk**	Any contaminants leaching on site are unlikely to impact on site users due to the nature of the Tidal Flat Deposits underlying the area.

Based on the initial conceptual site model an environmental risk assessment has been undertaken. Where a pollution linkage has been identified, a qualitative classification of the consequence and probability is undertaken to determine the risk. The simple risk classification matrix provided in Annex 4 of R&D 66 (NHBC) helps provide consistency in the decision making process. The risk classification for each pollution linkage is used to determine the overall associated risk rating for the site. Each risk classification also helps inform the scope of further investigations if required.

6 GROUND INVESTIGATION

6.1 Site Works & Methodology

The work has been done to provide information for both environmental and geotechnical purposes. Mayer have worked alongside geotechnical specialists EAL on the following scope and interpretation of the subsequent findings and data.

Prior to any work being undertaken an underground utilities report was obtained for the site. Prior to commencing, services were scanned for at all exploratory hole locations. Locations of the exploratory holes are marked on the site plan included in Appendix A. Logs and installation details are included in Appendix F.

The main ground investigation was undertaken between 11th and 27th September 2023 with a Seismic Survey undertaken on 3rd October 2023 by Zetica Ltd and a resistivity survey undertaken on 16th October 2023 by EAL.

Soil samples were collected in accordance with the laboratory requirements for analysis, appropriately commensurate with BS 10175: 2011+A1:2013.

The following tables summarise the rationale for exploratory points and details of those undertaken.

TABLE 6.0 GROUND INVESTIGATION – PLOT C

Exploratory Holes	Depth (m bgl)	Method	Purpose	Notes / Installations
TP01, TP02, TP10	Max 2m bgl	Trial Pitting (JCB 3CX)	Establish ground conditions across Plot C focussing on areas of fly tipping.	Backfilled
TP09	3.0	Trial Pitting (JCB 3CX)	Establish ground conditions closest to existing buildings where asbestos sheeting and cans of paint stored.	Backfilled
WS05, WS06	Max 4m bgl	Tracked window sampling rig	Establish ground conditions across Plot C	Backfilled
TP11, TP12, TP13	Max 3.1m bgl	Trial Pitting (JCB 3CX)	Establish conditions under current roadway in anticipation of new roadway being located in same area.	Backfilled

TABLE 6.1 GROUND INVESTIGATION – PLOT I

Exploratory Holes	Depth (m bgl)	Method	Purpose	Notes / Installations
WS01 through WS04	Max 4m bgl	Tracked window sampling rig	Establish ground conditions across Plot I in area of proposed development with installation wells to establish if any ground gas moving on site from adjacent inert landfill.	Installed with 50mm Ø monitoring well to full depth drilled.
BH01, BH03, BH05	Max 27m bgl	Cable Percussion	Establish ground conditions across Plot I in area of proposed development and establish depth of chalk.	Installed with 50mm Ø monitoring well to 10m bgl.
BH02	23m bgl	Cable Percussion	Establish ground conditions in area of proposed chimney.	Installed with 150mm Ø plain pipe to 21m bgl for seismic survey.
BH04	21m bgl	Cable Percussion	Establish ground conditions across Plot I in area of proposed development.	Backfilled
TP03 through TP08	Max 4m bgl	Trial Pitting (JCB 3CX)	Establish ground conditions across Plot I in area of proposed development.	Backfilled
CBR01 through CBR09	Excavations max 1m bgl	Test Pits & CBR (Jackson Drilling) by JCB 3CX.	Establish ground conditions across Plot I in area of proposed development.	Backfilled
CPT 1-1, CPT 2-2, CPT 3-3, CPT 4-6, CPT 5-5, CPT 6-4	Excavations max 1.2m bgl	Test Pits by JCB 3CX. SPTs by 200KN Crawler CPT Rig operated by Central Alliance Ltd	Establish ground conditions across Plot I in area of proposed development.	Backfilled

6.2 Strata Encountered

Soils were logged in accordance with BS5930, logs and cross sections are included in Appendix F and Appendix G and a summary is included in the following tables.

TABLE 6.2 SUMMARY OF STRATA ENCOUNTERED

Strata	General Description	Depth to Top (m bgl)	Depth to Base (max) (m bgl)	Max Thickness (m bgl)
Made Ground	Topsoil, Brick, concrete, ash, surface roadstone, concrete and brickwork layers, limestone slab, pieces of rubber and fabric.	Surface	2.00	2.00
Tidal Flat	(Firm crust) Soft and very soft silty clay, clayey silt, peat,	0.0 – 2.0	8.9	8.9
Glacial Till	Firm brown clay with gravel Sand and gravel	7.0 – 8.9	22.1	13.2
Chalk	Chalk	18.5 – 22.1	N/A	Base not proven

Made Ground was encountered in most locations in Plot C and in only two locations in Plot I.

In Plot I, Made ground was encountered in BH01 and in TP08, comprising soils with brick to 0.3m and cobbles of brick and concrete with occasional plastic 0.5m, respectively.

In Plot C, all of the positions except TP10 encountered made ground, up to a maximum of 2m depth (WS05, TP09). The made ground generally comprised demolition type materials (brick and concrete, including whole bricks), surface concrete and roadstone (WS06, WS07) and gravelly ashy material with clinker, anthracite and slag (TP12, TP01). Layers of possible former slabs (concrete / limestone) and brickwork were found in TP 11, TP12 and TP13.

Some positions encountered more than one layer of fill: In TP09, brick and concrete gravel and cobbles 0.4m thick were over a layer of boulders of chalk to 1m depth. In TP01, two layers were observed with a 0.3m layer of ashy made ground with flint brick and concrete, above a layer of ashy made ground with brick, concrete, anthracite and pieces of rubber and fabric to 0.85m depth.

Topsoil type materials were noted, typically 0.4m thick in TP03, TP04, TP06, TP07 (including piece of wood and metal) and TP10. Shallower topsoil materials, overlying made ground, were found in TP11 (5cm thickness) TP12 and TP 13 (0.2m).

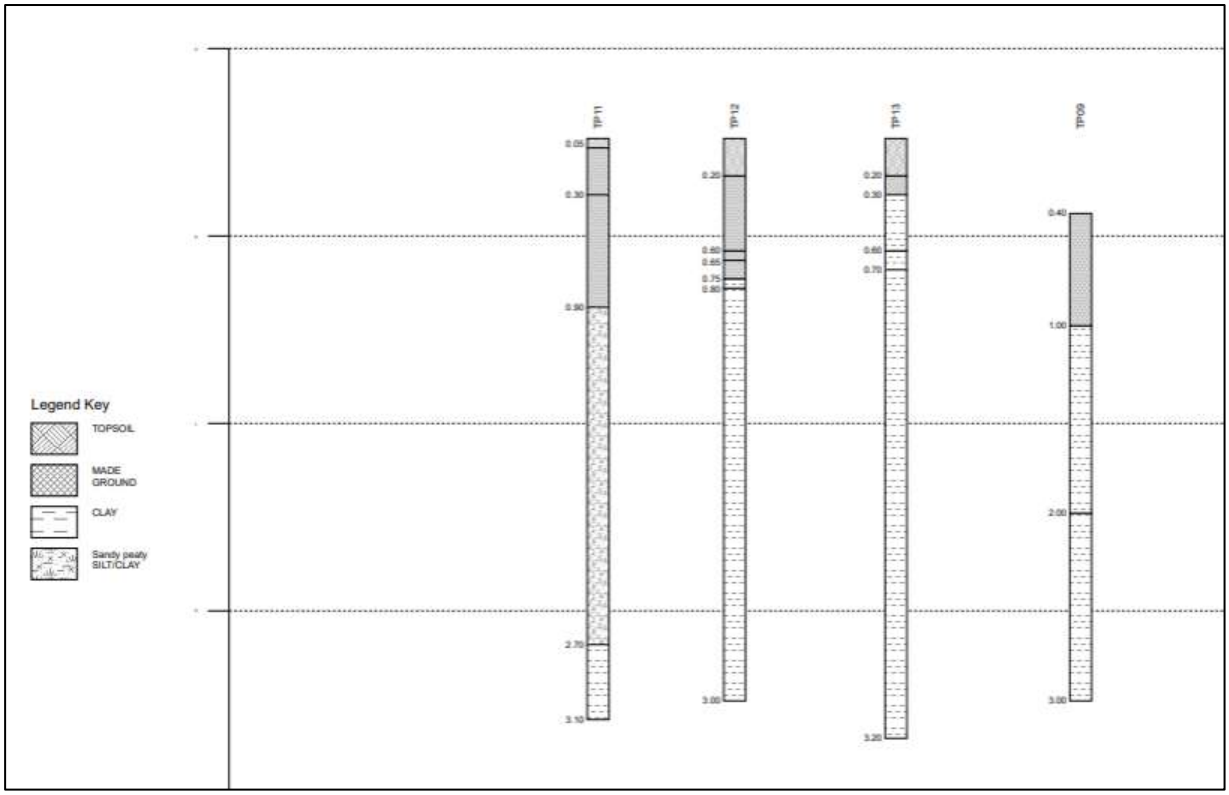
Below the made ground or topsoil, or from surface where made ground / topsoil was absent, strata comprised layered tidal flat deposits of mixed silts, clays, and peat. In the boreholes, it was possible to discern a “crust” of slightly more competent material to around 2m depth, but in general, the material was very soft and soft.

From between around 7m to 9m depth, glacial clay was encountered which became stiffer with depth and included layers of sand and gravel, which were associated with water strikes.

Chalk bedrock was encountered from 18.5 to 22m depth, initially comprising chalk gravel or clay wit chalk gravel, with competent rock proven from around 20m. SPT tests undertaken in the chalk in BH1 from 19.5m to 27.0m depth indicate variable strength, which is typical of the material.

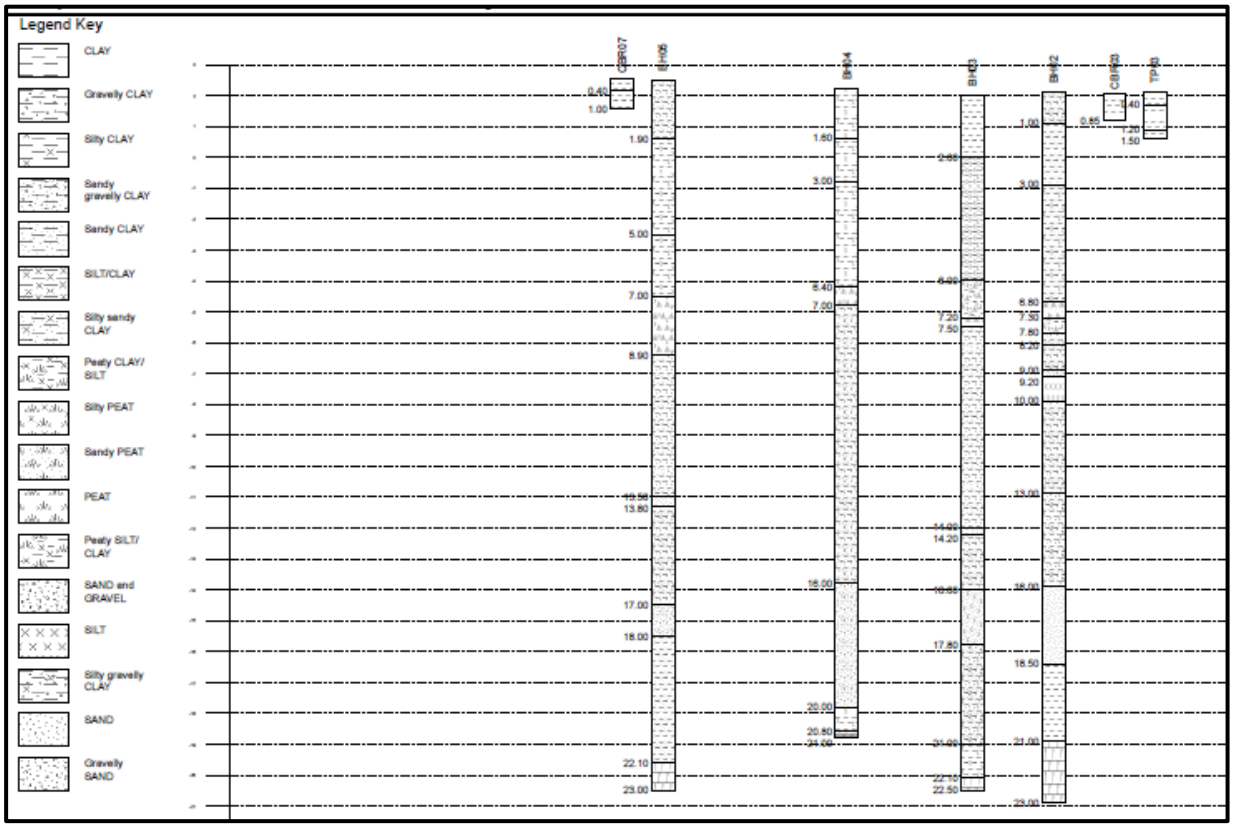
The diagram below shows a cross section of the underlying geology of Plot C running north to south. The Cross Section is also included in Appendix G.

SECTION 1 PLOT C CROSS SECTION RUNNING NORTH TO SOUTH ON PLOT C



The diagram below shows a cross section of the geology underlying Plot I running from the Oldfleet drain towards Plot C. The full cross section is included in Appendix G.

SECTION 2 PLOT I CROSS SECTION RUNNING OLDFLEET DRAIN TO PLOT C



6.3 Site Observations

From the ground investigation undertaken, the following table summarises the observations noted in each exploratory point, comprising subsurface structures or features and any visual or olfactory evidence of contamination.

Typically, contamination that can be apparent from visual or olfactory evidence includes (but not exclusively) organics / hydrocarbons, sulphurous materials, metals, free cyanides and cemented asbestos fragments.

TABLE 6.3 SUMMARY OF SITE OBSERVATIONS

Exploratory Point	Depth	Observation
TP01 – Plot C	0.0 – 0.3	Ashy Made Ground
	0.3 – 0.85	Ashy Made Ground
TP07 – Plot I	0.0 – 0.4	Made Ground with fragments of wood (potentially remnants of sidings) and metal bolt.
TP12 – Plot C	0.2 – 0.65	Made Ground, fragments of clinker and slag
WS06/06A Plot C	0.0 – 1	Ashy Made Ground

6.4 Scheduled Chemical Analysis

6.4.1 Soils

Representative samples of the Made Ground and natural soils were submitted for chemical analysis at a NAMAS / UKAS accredited laboratory with MCERTS certificates (where available) for analytes.

TABLE 6.4 SUMMARY OF SOIL ANALYSIS – PLOT C

Soil Analysis Suite	Made Ground	Natural Clay
ME2	7	5
Asbestos	7	1
TPH CWG	7	5
PCB	5	0
SVOC / VOC	5	0

TABLE 6.5 SUMMARY OF SOIL ANALYSIS – PLOT I

Soil Analysis Suite	Made Ground	Topsoil	Natural Clay	Chalk
ME2	1	4	19	1
Asbestos	1	1	0	0
TPH CWG	1	2	19	1
PCB	1	1	3	0
SVOC / VOC	1	2	3	0
LF1 (Waste Assessment)	0	1	1	0

Note that minimal Made Ground was encountered on Plot I and therefore very few samples were available for testing. In addition, Chalk was only encountered at sufficient depth to enable sampling at location BH01 due to the presence of artesian groundwater across the site.

6.4.2 Groundwater

To provide a general indication of the groundwater quality, three groundwater samples from BH01, BH03 and BH05, were collected on the 30th October 2023 and submitted for the general Mayer suite of contaminants and TPHCWG analysis.

The data is presented in the certificates of analysis in Appendix I.

6.5 Groundwater Conditions

The following table details the groundwater levels in locations with well installations noted during the ground investigation and afterwards, during monitoring. The groundwater monitoring records are included in Appendix M.

TABLE 6.4 GROUNDWATER LEVELS, DURING MONITORING

	BH01	BH03	BH05	Tide Level
During GI	16.5 m bgl	14 m bgl	17 m bgl	n/a
16.10.2023	0.22 m bgl	0.79 m bgl	1.12 m bgl	Falling
30.10.2023	0.05 m bgl	0.44mbgl	0.67 m bgl	Rising
09.11.2023	Above GL	Not recorded	Not recorded	Rising
16.11.2023	Above GL	1.15 m bgl	1.7 m bgl	Falling

The groundwater monitoring data suggests that during the drilling the groundwater was encountered at depth. Subsequent monitoring indicates that the groundwater is near surface. This could be due to the monitoring wells creating preferential pathways for the groundwater, making it appear higher than it actually is. Within the trial pits, groundwater seepage was noted at the base of some of the pits at approximately 4m bgl. Artesian groundwater, that can rise to the surface under its own pressure, was encountered at all borehole locations (BH01 through BH05) once the chalk was reached. This limited the depth of drilling as it was considered prudent to seal the boreholes once the artesian water was encountered. BH01 was drilled to depth to establish the presence and significance of the artesian water and was sealed prior to installing the monitoring well. However, the recent monitoring data indicates that the groundwater level in BH01 is still rising.

Comparing the groundwater levels to the rise and fall of the tide suggest that there is a tidal influence on the groundwater underlying the site.

Groundwater sampling for chemical analysis was undertaken in the BHs referred to on 30th October 2023. The wells were purged of three well volumes and the water purged from the wells was generally noted to be of dark grey and dark brown in colour, with some suspended sediment. No sheens or other odours were noted during the sampling.

7 GEOTECHNICAL TESTING (EAL)

7.1 Soil Testing

A total of 51 No. soil samples of Made Ground and natural strata were submitted for geotechnical laboratory testing, which included:

- Moisture Content (BS 1377:1990 Part 2 Clause 3.2);
- Liquid Limit (BS 1377:1990 Part 2 Clause 4.3);
- Plastic Limit (BS 1377:1990 Part 2 Clause 5);
- Particle Size Distribution (PSD) by Wet Sieve (BS 1377:1990 Part 2 Clause 9.2);
- Particle Size Distribution (PSD) by Sedimentation (BS 1377:1990 Part 2 Clause 9.5);
- Particle Density (BS 1377-2: 1990: Clause 8.2)
- One Dimensional Consolidation Oedometer (BS 1377:1990 Part 5 Clause 3);
- Undrained Shear Strength (Single Stage) in Triaxial Compression (BS 1377:1990 Part 7 Clause 8); and
- pH and Sulphate testing to BRE Special Digest 1

The completed Geotechnical Laboratory Soil Analysis Reports and a summary of the full record of geotechnical soil testing are presented in Appendix J (laboratory report ref: 23-61503-1 and 23-61503 (pH and sulphates)).

7.2 Rock Testing

Rock cores, although initially planned as part of the investigation, were not undertaken. Ground conditions were reviewed throughout the fieldworks, and the glacial till was found to be relatively stiff, and thicker than originally anticipated, with variable and less competent results found in the chalk. It was anticipated that foundations would be within the glacial till rather than the rock, hence rock information would not be required.

7.3 In-Situ Field Testing

In-Situ field and geotechnical testing comprised the following has been undertaken across the site:

- 87 No. SPTs were completed at approximate 1m intervals to a maximum depth of 27m bgl in Made Ground and natural strata.
- 6 No. cone penetration tests (CPTs) to final depths of between 15.00 and 25.00m bgl.
- 1 No. set of downhole seismic testing (comprising P/S wave velocity and soil engineering properties including shear modulus, bulk modulus, Young's modulus) completed to a maximum depth of 30m bgl in BH02.
- 9 No. Plate Load Tests to obtain approximate CBR Value at a typical depth of 0.1m below ground surface (formation level).

8 GEOTECHNICAL TEST RESULTS (EAL)

The results of the geotechnical in-situ testing and laboratory testing have been included as factual data only. Interpretation with regards to future foundation design will need to be carried out by specialist designers once the design is completed and the loads are known.

8.1 SPT Testing

The Standard Penetration Test (SPT) is an in-situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The number of blows to penetrate 450 mm is recorded. The number of blows to penetrate the initial 150 mm is disregarded to account for material disturbed by the borehole process. Hence the SPT N_{300} value is the number of blow counts to penetrate 300 mm of undisturbed ground. The full test procedure is described in more detail in BS ISO 22476-3.

In-situ field geotechnical testing comprised 87 No. SPT tests generally undertaken at 1m intervals within Made Ground and natural strata across the site to a maximum depth of 27m bgl. The SPT results indicate that the ground strength varied laterally and vertically across the site. The SPT results from the testing undertaken are summarised in the table below and in Figure 1.

TABLE 8.1 - SUMMARY OF SPT TEST RESULTS

Strata	No. of SPTs	SPT N-Value Minimum	SPT N-Value Average	SPT N-Value Maximum
Made Ground	2	17	17.5	18
Tidal Flat	19	0	2.3	8
Peat	5	0	0.8	3
Glacial Till (Cohesive)	23	4	23.7	50
Glacial Till (Granular)	9	8	33	50
Chalk	10	21	39.6	50

Note that there is a wide range of SPT N-value in the granular till and the chalk. This is due to a range of factors:

- The low SPT N-values in the glacial sands are probably due to drilling with water balance not being correctly maintained. All N-values below 8 to 10 are probably affected by 'piping' reducing the density.
- High N-values in the gravels are probably due to the influence of coarse gravel and cobbles of flint on the relatively small diameter of the SPT sampler giving high results which are a function of particle size rather than the density of the ground.

- The variable SPTs in the chalk are due to variable weathering creating low density & strength zones and the high N-values due to coarse gravel and cobbles of chalk.

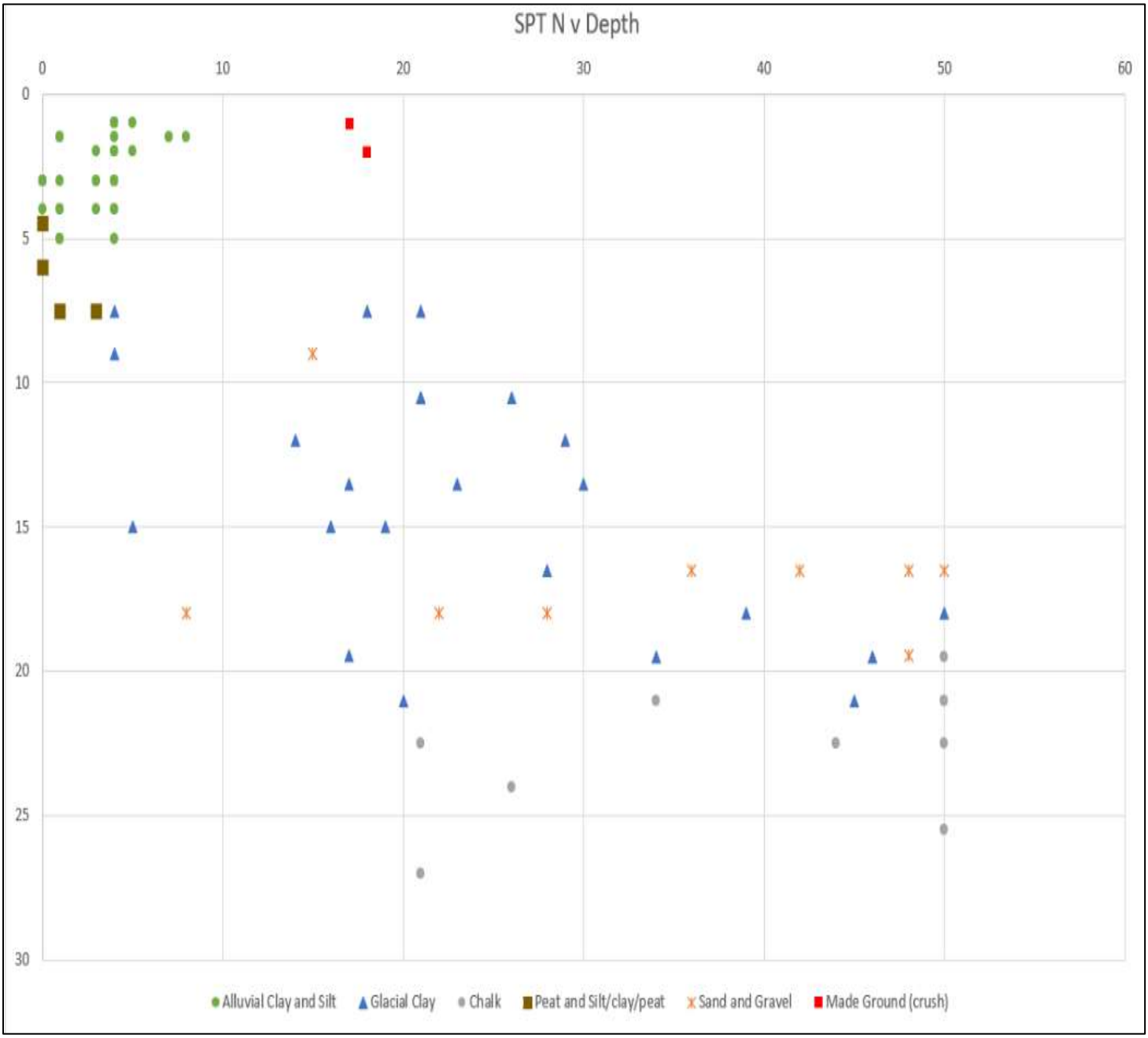


FIGURE 1 - SUMMARY OF SPT TESTS BY MATERIAL TYPE -SPT N-VALUE AGAINST DEPTH

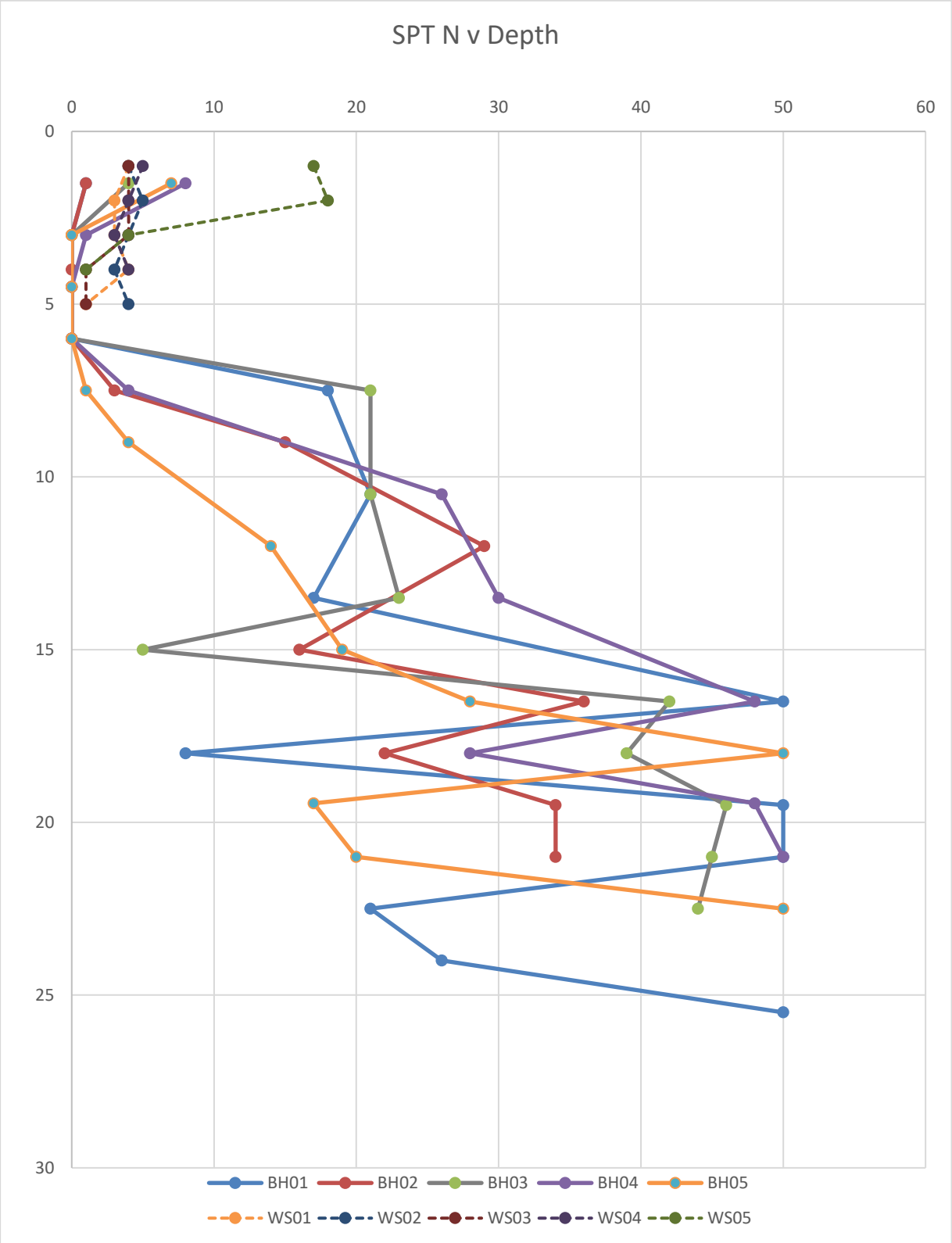


FIGURE 2 - SUMMARY OF SPT TESTS BY EXPLORATORY HOLE -SPT N-VALUE AGAINST DEPTH

8.2 CBR Plate Load Testing

Plate Loads were undertaken at nine locations to determine CBR values. At each location, the top 0.1m was removed and the test was undertaken at formation level.

TABLE 8.2 - SUMMARY OF PLATE LOAD TEST (AND CBR) RESULTS

Sample ID	Depth (m bgl)	Plate Diameter (mm)	Approximate CBR Value (%)
CBR1	0.10	**300**	**1.8**
CBR2	0.10	**300**	**10**
CBR3	0.10	**300**	**0.7**
CBR4	0.10	**300**	**15**
CBR5	0.10	**300**	**2.4**
CBR6	0.10	**300**	**6.3**
CBR7	0.10	**300**	**1.9**
CBR8	0.10	**300**	**0.9**
CBR9	0.10	**300**	2.9

8.3 Cone Penetration Testing

Cone penetration testing was undertaken to ascertain soil property information for use in settlement analysis and geotechnical modelling. The testing comprised 6No. CPTs. The CPTs were carried out in general accordance with BS ISO 22476-1:2012 using a 20-tonne tracked rig utilising a piezocone. Four of the six CPTs terminated on granular bands in the glacial till with only two of them penetrating these granular layers.

As can be seen by reference to the CPT report (attached as Appendix K), a series of soil properties have been derived from the end cone resistance and sleeve friction resistance results using empirical relationships and published data. These include equivalent SPT N_{60}, modulus of volume change potential (m_v), Young's modulus E_o, Friction angle Φ', and relative density. The correlations used to derive many of these properties are based on research and data conducted in clean sands or relatively homogenous clays, akin to the glacial till encountered beneath the site. The correlation for m_v makes use of the constrained modulus, which is intended for all soil types. The average results from the CPTs are summarised in the table below. Summary plots of CPT data are presented in Figure 2 with approximate indication of strata (note the boundaries vary from location to location so boundaries are approximate).

TABLE 8.3 - SUMMARY OF CPT DERIVED APPROXIMATE GEOTECHNICAL PARAMETERS

Test Location Ref	Depth to Refusal (m bgl)	Undrained Shear Strength (kPa)	Volume Change Coefficient (m_v)	Friction Angle (Φ') (°)	Youngs Modulus €	Unit Weight γ_B (kN/m³)
CPT01	24.94	Alluvium: Very Soft to firm Clay: stiff	0.1 - >4 Alluvium 0.1 Glacial Clay	10 – 40 in sands	125 Alluvium 250 Clays 300 sands	Alluvium 17-18 Clay 18 - 19 Sand 19
CPT02	16.85					
CPT03	14.85					
CPT04	21.15					
CPT05	15.01					
CPT06	15.12					

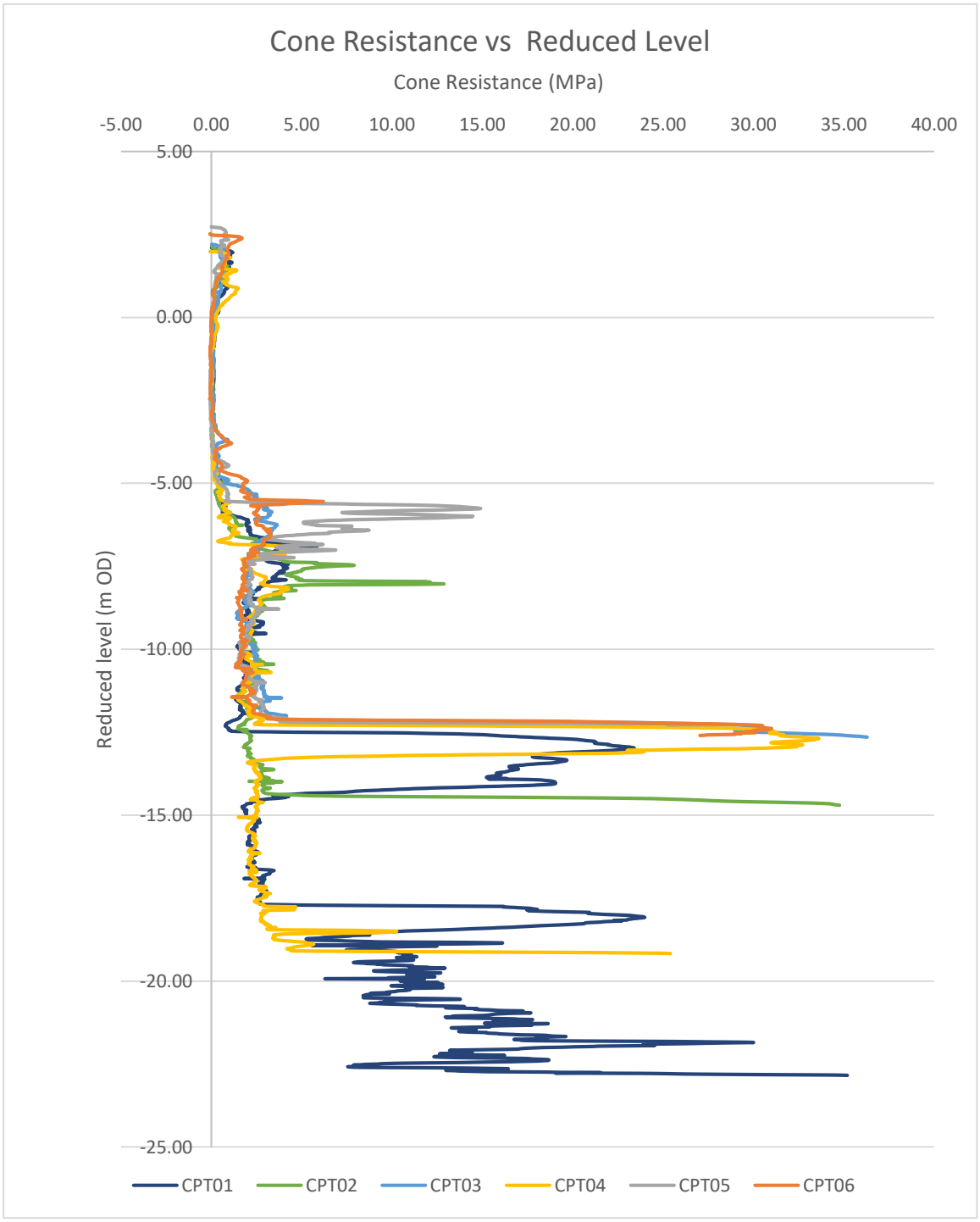


FIGURE 3 - SUMMARY OF CPT TESTS – CONE RESISTANCE AGAINST REDUCED LEVEL

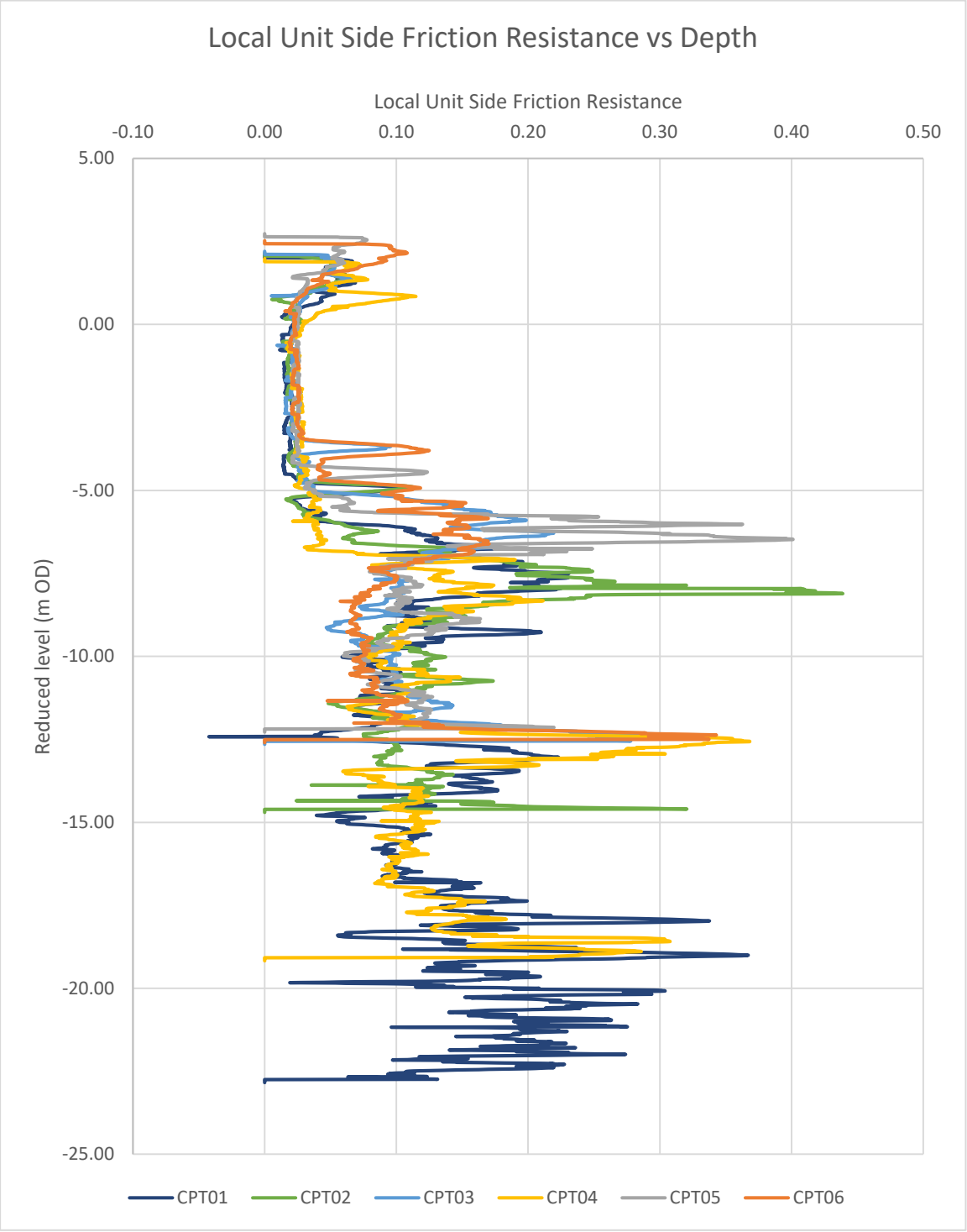


FIGURE 4 - SUMMARY OF CPT TESTS – LOCAL UNIT SIDE FRICTION AGAINST REDUCED LEVEL

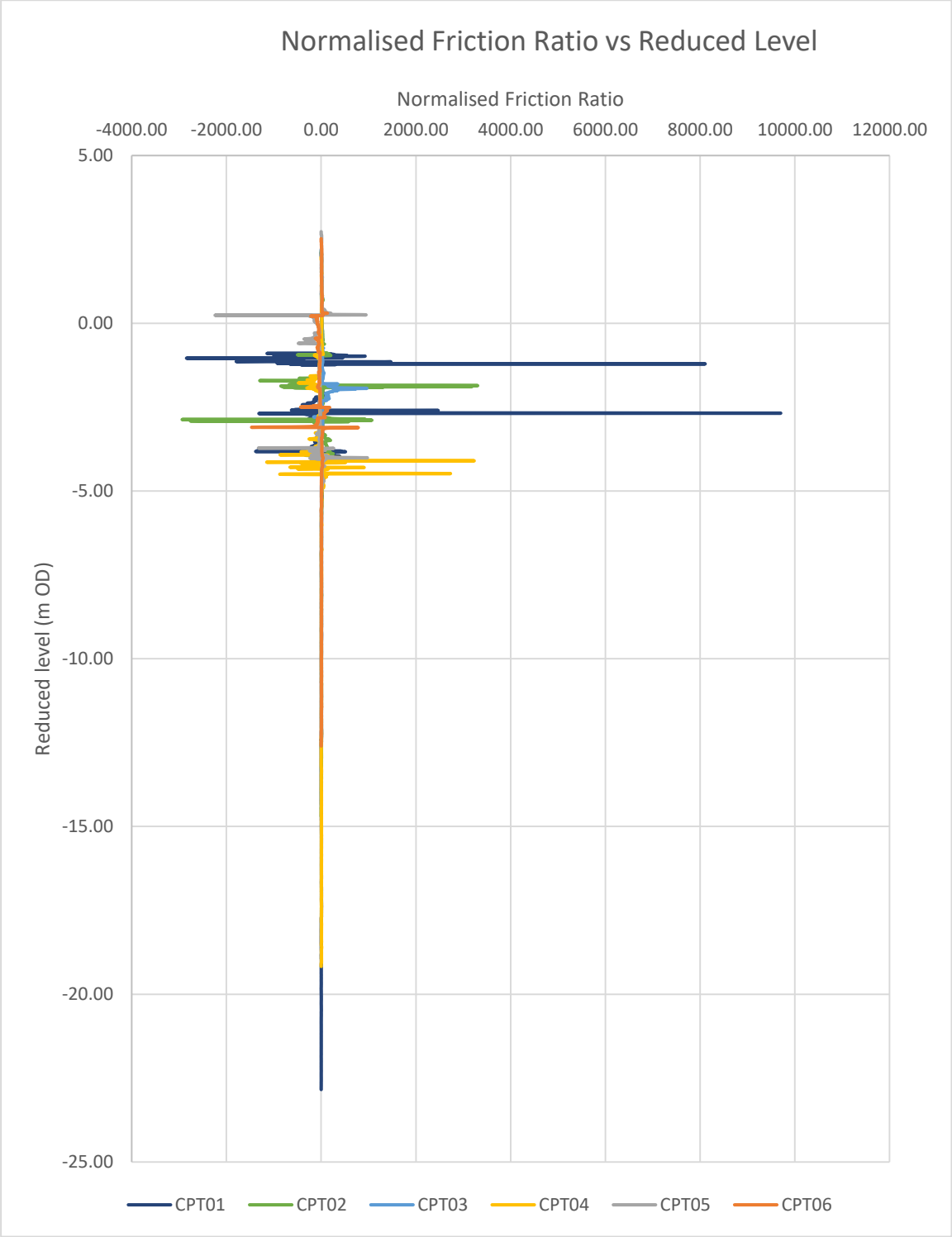


FIGURE 5 - SUMMARY OF CPT TESTS – NORMALISED FRICTION RATIO AGAINST REDUCED LEVEL

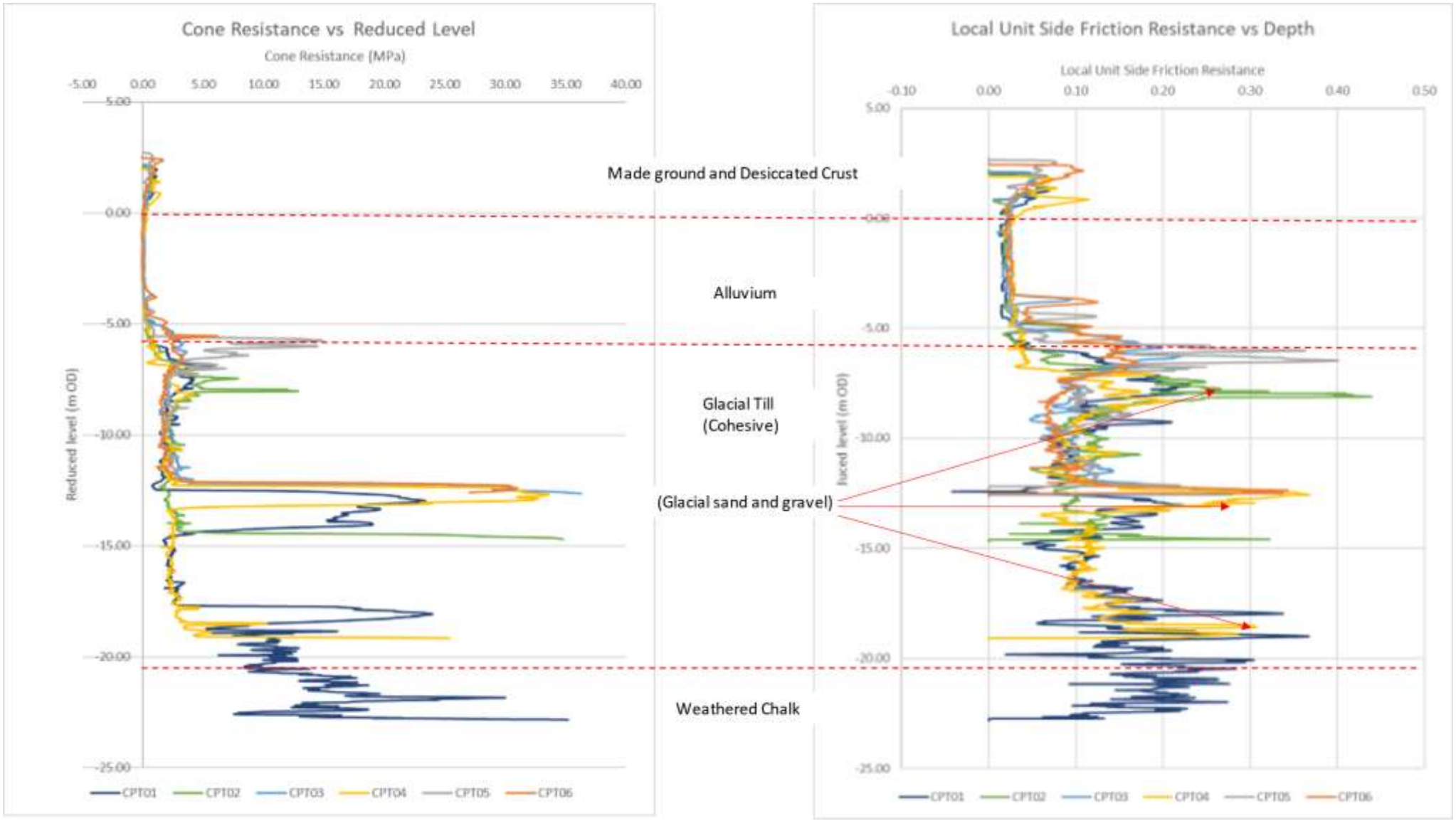


FIGURE 6 - SUMMARY OF CPT TESTS

8.4 Seismic Surveying

A downhole seismic test (measuring P/S wave velocity and soil engineering properties including shear modulus, bulk modulus, Young's modulus) were completed to a maximum of 20m bgl in BH02.

Reference should be made to the factual report attached in Appendix L, which is summarised below:

The P-wave velocity was observed to decrease slightly at around 13m depth, which implies that the clays and sand below this point are highly saturated and the clays have a consistent Young's Modulus below this depth but the shear modulus reduces in the lower part of the glacial till,

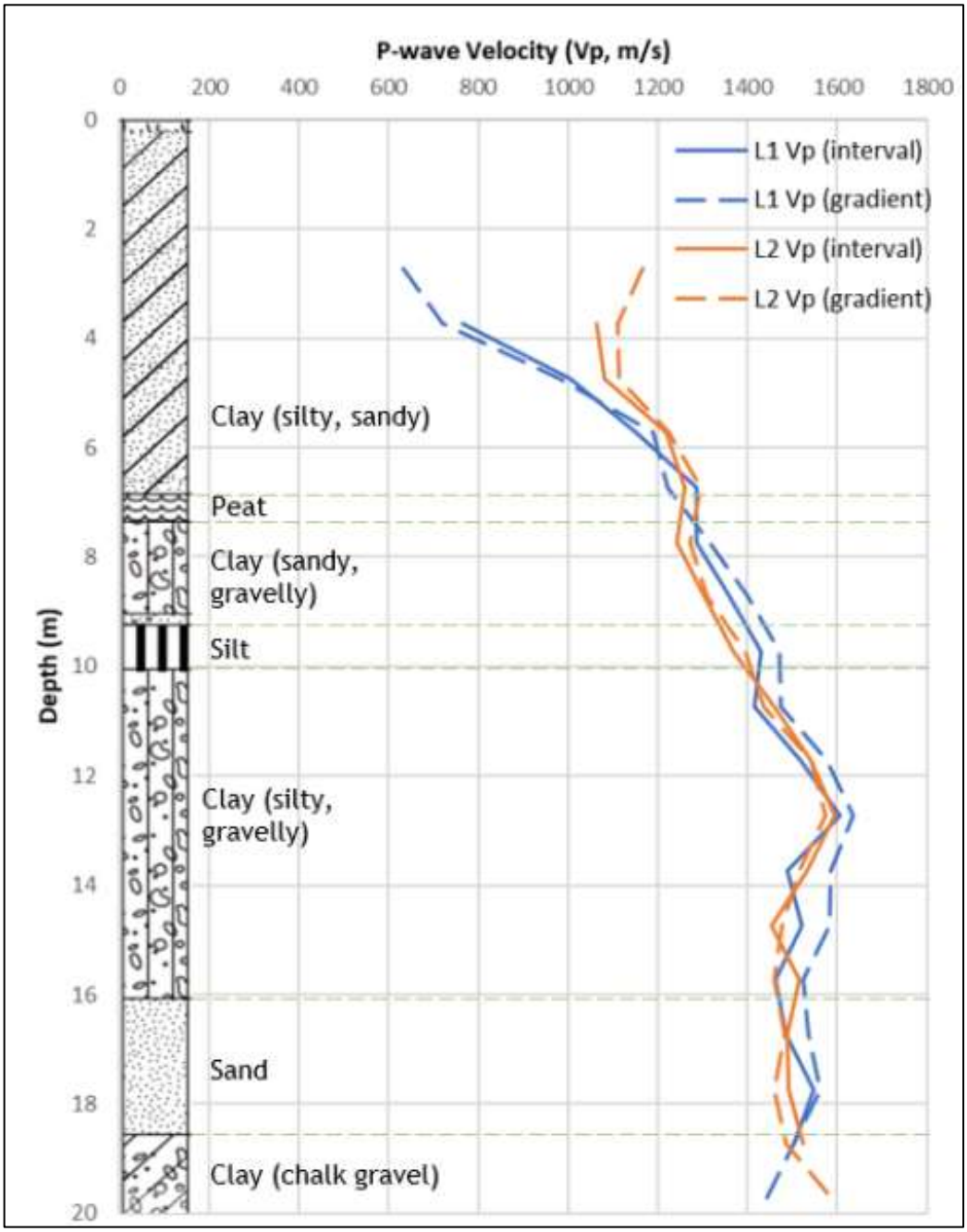


FIGURE 7: P-WAVE VELOCITY AGAIST REDUCEND LEVEL FROM ZETICA SEISMIC SURVEY REPORT

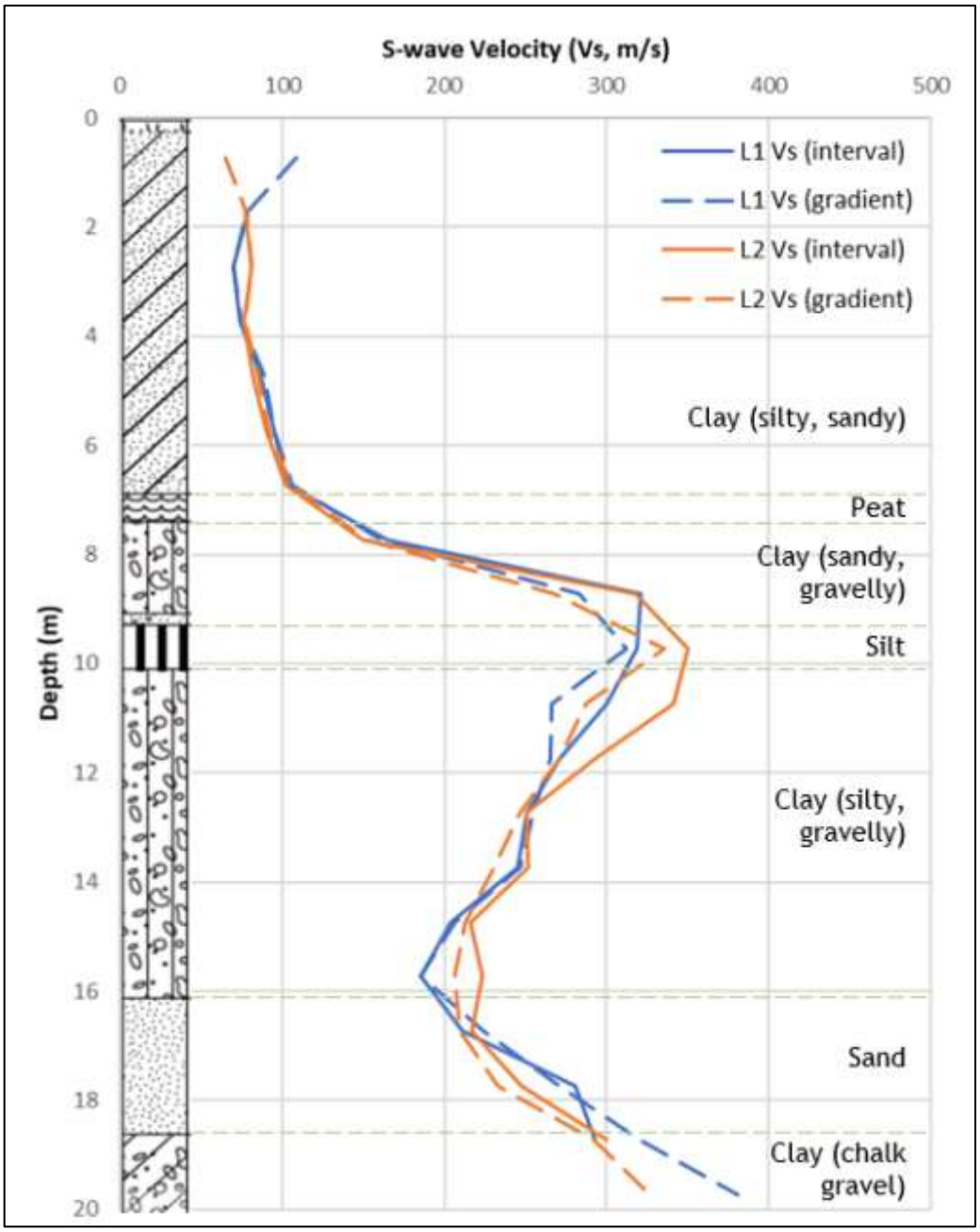


FIGURE 8: S-WAVE VELOCITY AGAIST REDUCEND LEVEL FROM ZETICA SEISMIC SURVEY REPORT

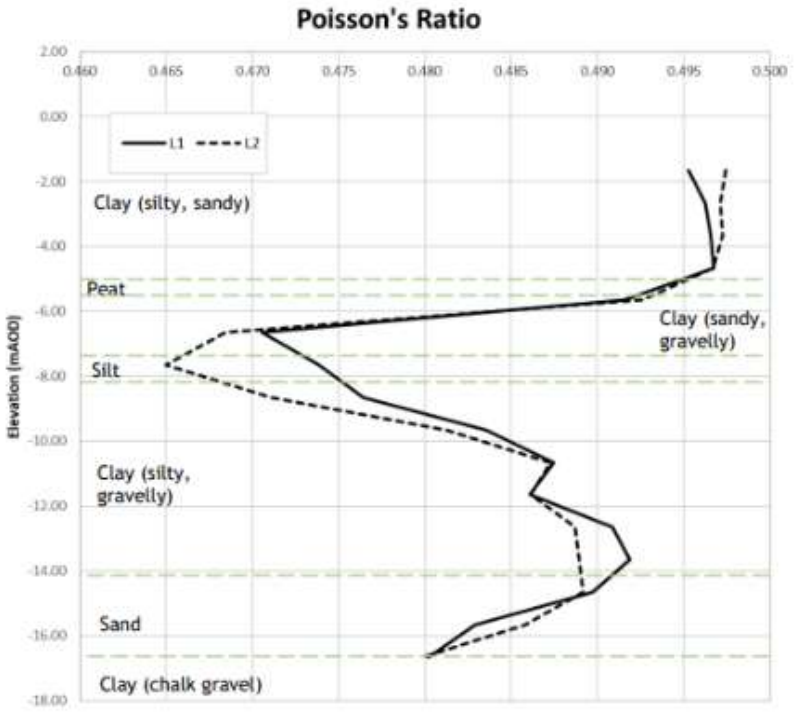


Figure 16: Poisson's Ratio calculated from the velocities derived from the L1 and L2 source locations, varying with elevation (mAOD).

FIGURE 9: POISSON'S RATIO FROM ZETICA SEISMIC SURVEY REPORT

TABLE 8.4 – CALCULATED DESIGN PARAMETERS FROM SEISMIC TESTING

Geotechnical results calculated from the L1 shot location (3 m offset)									
Depth (m)	Elevation (mOD)	Vs (m/s)	Vp (m/s)	Estimated Bulk Density (kg/m3)*	Velocity Ratio	Soil Engineering Properties (ref: https://doi.org/10.1016/0148-9062(88)90985-0)			
					V_p/V_s	Shear Modulus (G_{hh}) (MN/m^2)	Poisson's Ratio	Young's Modulus E_v (MN/m^2)	Bulk Modulus K (MN/m^2)
1.73	0.34	79							
2.73	-0.66	70							
3.73	-1.66	74	764	1700	10.3	9	0.50	28	980
4.73	-2.66	87	1004	1600	11.5	12	0.50	36	1597
5.73	-3.66	95	1151	1550	12.1	14	0.50	42	2035
6.73	-4.66	103	1285	1500	12.5	16	0.50	48	2456
7.73	-5.66	165	1285	1800	7.8	49	0.49	146	2907
8.73	-6.66	321	1361	1850	4.2	191	0.47	561	3173
9.73	-7.66	319	1431	1850	4.5	188	0.47	555	3537
10.73	-8.66	300	1414	1850	4.7	167	0.48	492	3477
11.73	-9.66	271	1518	1850	5.6	136	0.48	403	4082
12.73	-10.66	251	1605	1850	6.4	117	0.49	347	4610
13.73	-11.66	245	1489	1850	6.1	111	0.49	330	3954
14.73	-12.66	204	1521	1850	7.5	77	0.49	230	4177
15.73	-13.66	185	1461	1900	7.9	65	0.49	194	3969
16.73	-14.66	211	1486	1900	7.0	85	0.49	252	4083
17.73	-15.66	281	1546	1900	5.5	150	0.48	445	4341
18.73	-16.66	293	1502	1900	5.1	163	0.48	483	4069

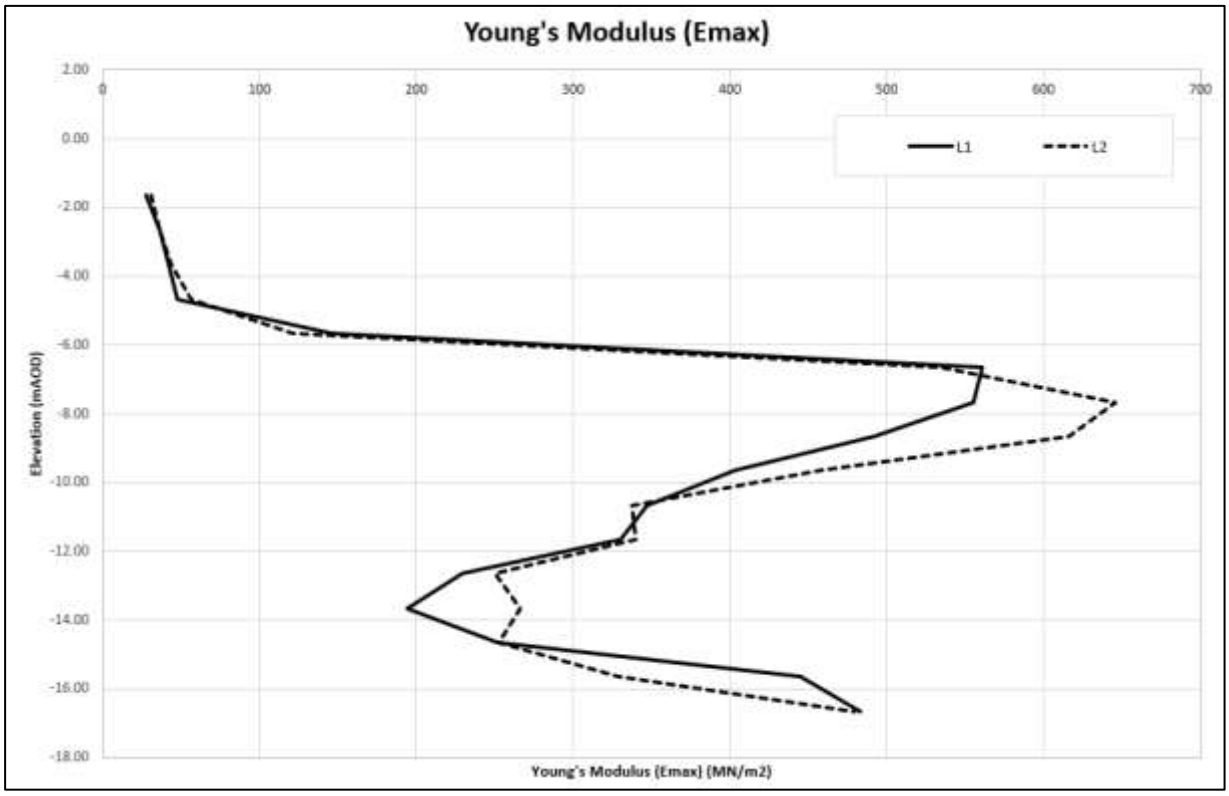


FIGURE 10: YOUNG'S MODULUS AGAINST DEPTH DERIVED FROM ZETICA SEISMIC SURVEY REPORT

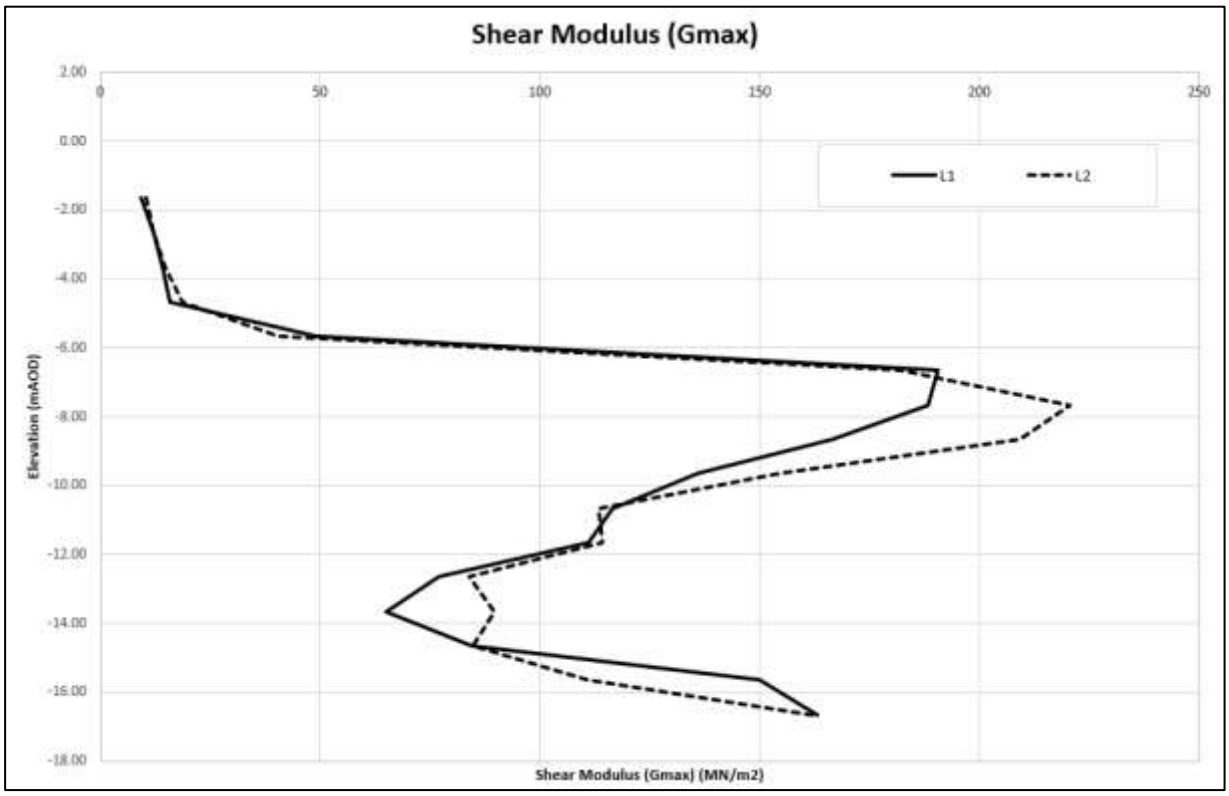


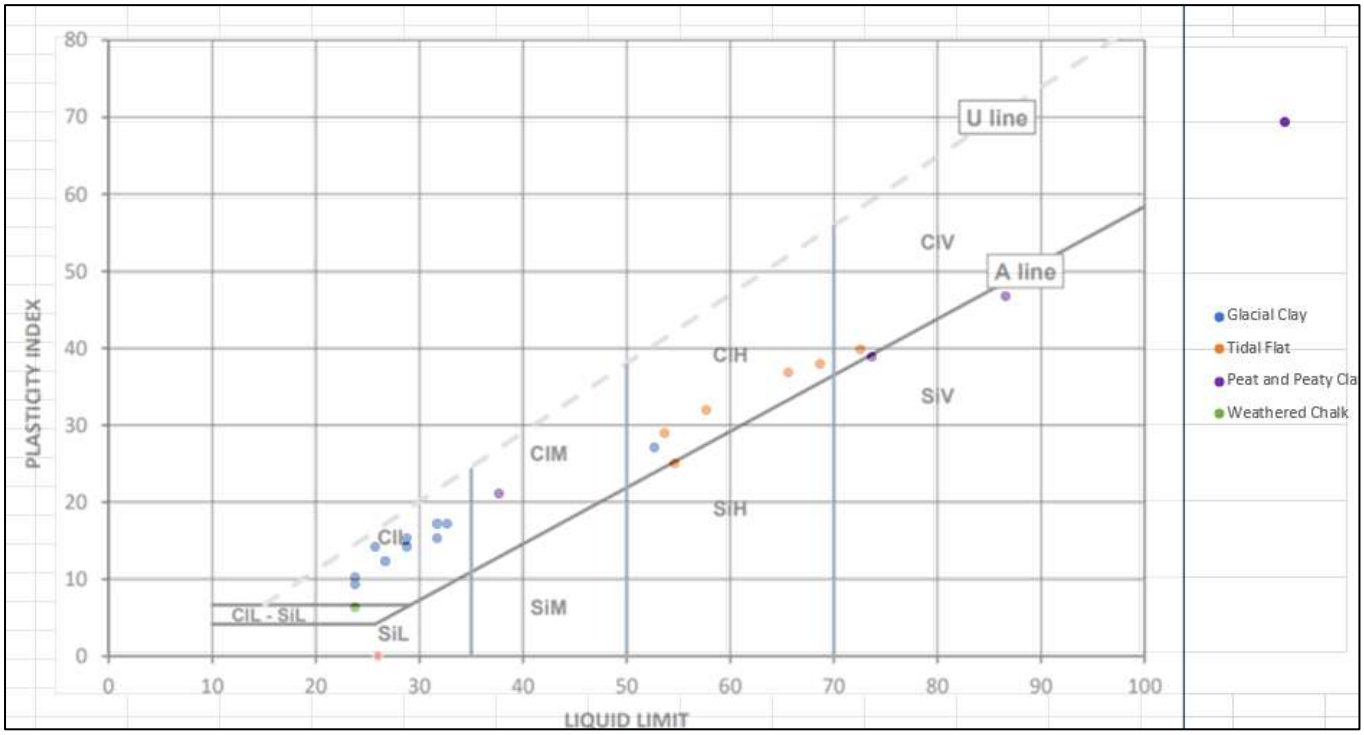
FIGURE 11: SHEAR MODULUS AGAINST DEPTH DERIVED FROM ZETICA SEISMIC SURVEY REPORT

8.5 Geotechnical Laboratory Testing

Representative samples of the subsurface were collected and scheduled for geotechnical laboratory testing as detailed in the factual report (report ref: 603.02.01). The test results are summarised in the sections below.

8.5.1 Geotechnical Laboratory Testing Results

Atterberg limit testing has indicated the tidal flat deposits to be mainly clays of high plasticity. Peaty clay was assessed as a more borderline silt/clay material of high and very high plasticity. The glacial clays were of low plasticity. The weathered chalk material was also of low plasticity. A Summary is presented as Figure 10.



- FIGURE 10: SUMMARY OF LIQUID AND PLASTIC LIMIT TEST SOIL CLASSIFICATION TESTS

Particle density testing indicated 2.68 and 2.70 Mg/m^3 for glacial clay

Moisture contents in the peat material were between 30% and 365%.

Particle Size Distribution curves have shown the weathered chalk to be variable, comprising mainly silt and fine sand in three samples, with the deepest (least weathered) sample comprising mainly gravel. The tidal flat deposits comprised mainly silt sized particles and around 15 to 50% clay.

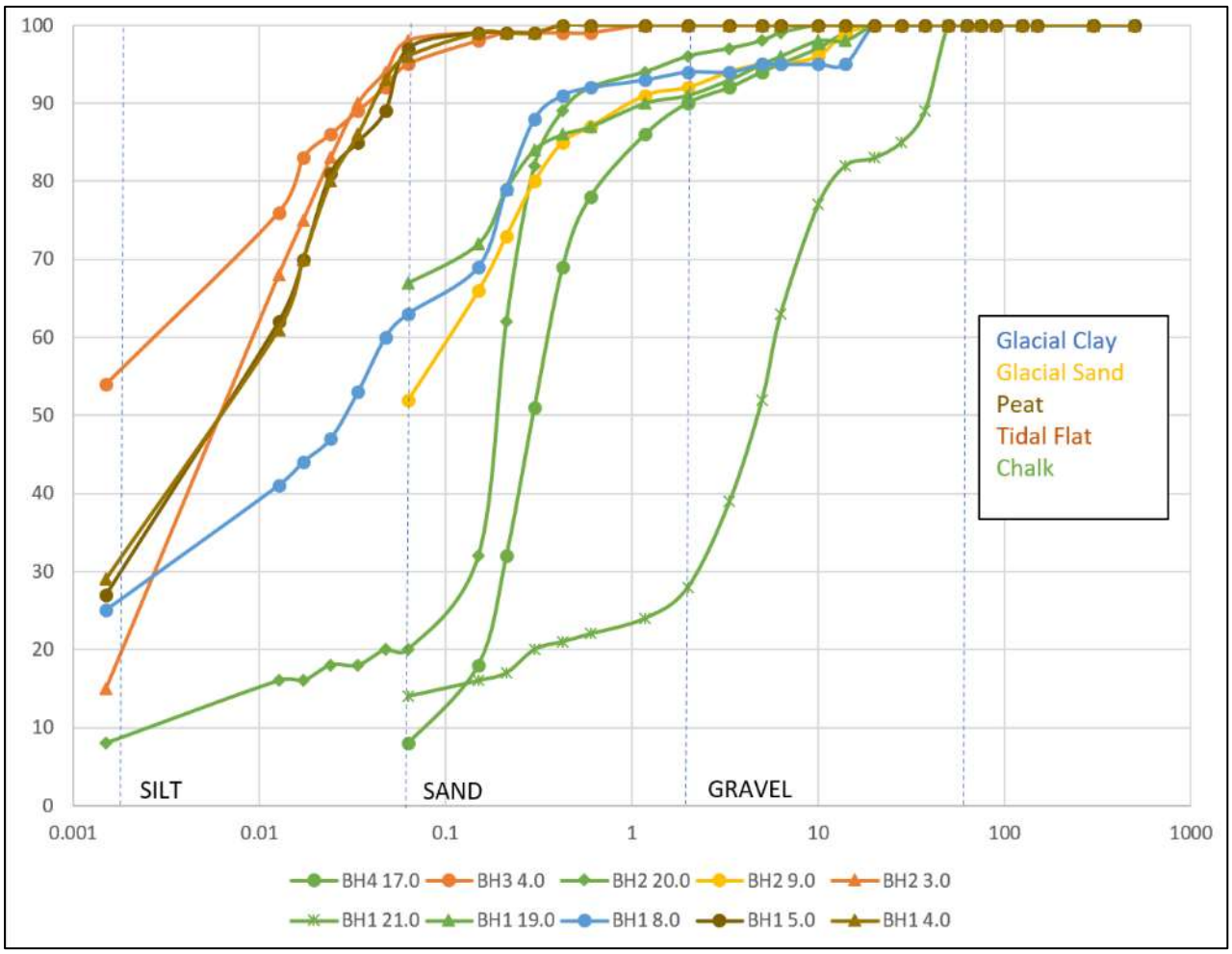


FIGURE 11 PARTICLE SIZE DISTRIBUTION TEST SUMMARY

Some shear strength and oedometer testing scheduled on undisturbed samples had to be cancelled due to the very stiff nature of the samples. Photographs are presented in Figure 12.

Results for samples that were tested had high shear strengths and low compressibility.

TABLE 8.5 - RECOMMENDED DESIGN PARAMETERS

Glacial Clay U100 Samples	Average result
BH1 9m: 204 kPa BH1 12m: 253kPa BH1 15m: 62 kPa BH2 10.5m: 109 kPa BH3 9.0m: 205 kPa BH3 12m: 389 kPa BH4 15m: 372 kPa BH5 10.5m: 236 kPa	228 kPa

FIGURE 12: ILLUSTRATING VERY STIFF CLAY SAMPLES THAT COULD NOT BE TESTED

One-Dimensional Consolidation (Oedometer) tests were all on the U100 samples in the glacial clay. Mv measured at the approximate overburden values (P_0) to P_0+100kPa was between 0.18 and 0.052 m^2/MN.

8.5.2 pH & Sulphate Testing Summary

11No. samples were submitted for the full BRE SD1 Suite. This suite of testing is used to determine the risks of pH and other ions on below ground content. The suite includes water soluble sulphate, acid soluble sulphate and total sulphur testing. The test results are used to assess aggressive ground conditions for use in foundation design when concrete foundation solutions are proposed.

pH values were between 7.7 and 8.9, however, the laboratory were unable to obtain a pH value for the sample of peat. Typically, peat is acidic. Corresponding soluble sulphate concentrations were between 7.1 and 7680 mg/l. High sulphate results were recorded in the tidal flat and peaty deposits (125 mg/l to 7680 mg/l, average 2061 mg/l). Glacial clay, glacial sand and weathered chalk had a maximum sulphate concentration of 136 mg/l.

Peat soils can contain pyrite (FeS_2), have elevated sulphates and have a low pH. It is possible that the pyrite could be disturbed for example if foundation loads are taken down through the alluvial deposits to the glacial clays. When disturbed, pyrite can oxidise to form sulphates. The high levels of oxidisable sulphates calculated to be present in the tidal flat deposits suggest this may be occurring.

The recommended Design Sulphate Class is DS-5 and corresponding ACEC Class AC-5, assuming a mobile groundwater condition for any below ground concrete. If additional testing is carried out on shallow soils it may be possible to derive a lower ACEC Design Class for the foundation slab and any concrete hard standings.

9 MATERIAL PROPERTIES REVIEW (EAL)

9.1 Fieldwork and Laboratory Data Review

As described in Section 5, the ground conditions can be simplified into four main stratum types:

- Made Ground
- Tidal Flat Deposits including Peat,
- Glacial Till
- Chalk

The material properties of each stratum type are summarised below.

9.2 Made Ground

Made Ground was encountered in most locations in Plot C up to 2m deep, and in only two locations in Plot I up to 0.5m deep. The Made Ground was generally granular.

In Plot I, Made Ground was encountered in BH01 and in TP08, comprising soils with brick to 0.3m and cobbles of brick and concrete with occasional plastic 0.5m, respectively.

In Plot C, all of the positions except TP10 encountered made ground, up to a maximum of 2m depth (WS05, TP09). The Made Ground generally comprised demolition type materials (brick and concrete, including whole bricks), surface concrete and roadstone (WS06, WS07) and gravelly ashy material with clinker, anthracite and slag (TP12, TP01). Layers of possible former slabs (concrete / limestone) and brickwork were found in TP 11, TP12 and TP13.

Some positions encountered more than one layer of fill: In TP09, brick and concrete gravel and cobbles 0.4m thick were over a layer of boulders of chalk to 1m depth. In TP01, two layers were observed with a 0.3m layer of ashy Made Ground with flint brick and concrete, above a layer of ashy made ground with brick, concrete, anthracite and pieces of rubber and fabric to 0.85m depth.

Topsoil type materials were noted, typically 0.4m thick in TP03, TP04, TP06, TP07 (including piece of wood and metal) and TP10. Shallower topsoil materials, overlying made ground, were found in TP11 (5cm thickness) TP12 and TP 13 (0.2m).

There are two SPT tests in the crush material from WS5 but these cannot be considered representative of the Made Ground elsewhere on the site.

Material properties, for use in design, are taken from material descriptions and published values:

TABLE 9.1 - RECOMMENDED DESIGN PARAMETERS MADE GROUND

Made Ground Type	Bulk Unit Weight (kN/m3)	SPT N
Granular Made Ground	15 - 20	Could vary from 0 to 20
Topsoil	15 - 18	N/A

9.3 Tidal Flat Deposits

Below the made ground or topsoil, or from surface where made ground / topsoil was absent, strata comprised layered tidal flat deposits of mixed silts, clays, and peat. In the boreholes, it was possible to discern a "crust" of slightly more competent material to around 2m depth, but in general, the material was very soft and soft.

The in situ CBR tests were all carried out in Plot I at 0.1m depth. It is assumed that this is within the tidal flat deposits. Values were between 0.7% and 6.3%, with two higher results of 10 and 15%. with most results averaging at 2.4%. A value of 2.4% is recommended for design.

Testing has indicated the tidal flat material to principally be a high plasticity clay. The material contains organic horizons hence it will be more compressible than a non-organic clay. The widespread presence of beds of peat up to 1.90 m thick (BH05) also means that there are areas of the site where very high settlements and deformations could occur if the peat is loaded. The large settlement and also the time dependency of the settlement of peat should be noted.

TABLE 9.2 - RECOMMENDED DESIGN PARAMETERS TIDAL FLAT DEPOSITS

Parameter	Value
Bulk Unit Weight	17 kN/m^3 reducing below ~2.0m depth to 15 kN/m^3
Moisture Content	Generally 30 - 50 % but in more organic rich layers/peat up to 80 %
Plasticity	High to very high
SPT N	0 to 8. Characteristic: 1
Undrained shear strength	10 to 40 kPa Characteristic: 10kPa
Effective cohesion, c'	Zero
Effective angle of friction, ϕ'	0 - 10
Coefficient of volume compressibility. Mv	>4 (from CPT)
Youngs Modulus	30 increasing to 50MN/m^2 (from Seismic Testing)
CBR	2.0%

9.4 Glacial Till

From between around 7m to 9m depth, glacial clay was encountered which became stiffer with depth and included layers of sand and gravel, which were associated with water strikes.

This stratum is 10.7 to 13.5m thick. It is generally cohesive, and typically firm to stiff, stiff, or very stiff with medium dense granular horizons. One low SPT N value (N=5 at 15m) was noted at depth in BH03 and in BH01 (N=8 at 18m), which may be due to the drilling technique and artesian water conditions in these holes. Other holes showed a general increase in strength with depth.

The glacial clay is typically of low plasticity.

TABLE 9.3 - RECOMMENDED DESIGN PARAMETERS GLACIAL TILL

Parameter	Value
Bulk Unit Weight	18-19 kN/m^3
Moisture Content	15-20%
Plasticity	Low
SPT N	4 – 50. Characteristic: 15, increasing to 30 - 40 at depth
Undrained shear strength	75kPa, increasing to 200kPa at depth
Effective cohesion, c'	0 to 2 kPa
Effective angle of friction, ϕ'	20-40° in sands (from CPT)
Coefficient of volume compressibility. Mv	0.1 m^2/MN
Youngs Modulus	500MN/m^2 reducing to 200MN/m^2 (From Seismic Testing)

9.5 Chalk

The top of the chalk was encountered at a depth of 18.5 to 22.1 m and was penetrated by up to 7m (BH1). SPT tests in the chalk in BH1 show variable strength which is typical for chalk, with SPT N values of between 21 and 50.

The upper part of the chalk was logged as a silty clay with chalk gravel or as gravel of chalk.

10 GEOTECHNICAL ASSESSMENT & RECOMMENDATIONS (EAL)

10.1 General Considerations

In general, there is only a thin coverage of Made Ground, typically less than 1m. Some remnant foundations are present, and one location with chalk boulders to 2m depth (TP09).

The upper natural strata are tidal flat deposits which go to a depth of 7.0 to 8.9m. This is a sequence of mainly very low strength and high compressibility clay with very high compressibility peat beds. The tidal flat deposits overlies glacial clays which have sporadic sand beds, which in turn overlie chalk. The chalk bedrock was encountered below a depth of 18.50 to 21.1 m. The top of the chalk was weathered to clay and chalk gravel.

There is artesian groundwater in some of the glacial sands and in the chalk.

The tidal flat deposits have the potential to undergo significant primary consolidation on loading and also a much longer-term secondary settlement over a period of several years. The presence of the relatively thick bed of very low strength and very high compressibility material governs the options available to develop the site in terms of geotechnics.

10.2 Construction of the Development Platform

The first stage of the development after site clearance will be to form a development platform, which will involve raising levels. Raising the land will cause high settlements due to the high compressibility tidal flat deposits. The time for settlement will also have to be considered with regard to required construction programmes. It is recommended that a working platform of either a geogrid reinforced granular layer or a cement stabilised layer of fill is used to form a suitable construction platform.

10.3 Foundations for Lightly Loaded Structures

In general, most of the structures will need to be constructed on deep (e.g. piled) foundations but any smaller lightly loaded structures such as amenity buildings could possibly be constructed on a raft foundation. As a general rule, it is recommended that an allowable bearing pressure of 30 kPa is taken for preliminary design purposes for shallow foundations for lightly loaded structures on rafts which are not sensitive to differential settlements.

However, it is recommended that the gatehouse/weighbridge office and weighbridge should have deep foundations because weighbridges are relatively sensitive to differential movement unless the weighbridge can be designed so that it can be re-levelled to cope with future settlement and ensure serviceability.

10.4 Foundations for Main Plant & Structures

Given the presence of high compressibility and low strength material with peat beds, and that the main structures will impose high loadings on the ground, shallow spread foundations will not be applicable. The loads are likely to be too high and the shear strength of the tidal flat deposits too low for ground

improvement techniques such as vibro (stone) columns or vibro concrete columns to be suitable. In addition, the poor and variable nature of the upper layers of chalk at depth is not ideal for deep piles which would have to penetrate a significant depth into the chalk.

Controlled Modulus Columns (CMCs) are an alternative deep foundation solution comprising a hybrid ground improvement/displacement pile technique which may be appropriate on this site. CMCs increase the stiffness of the ground, remove inhomogeneity and also transfer some load down to the stronger deposits at depth, such as the glacial clays at this site. CMCs may be more economic than piles in the ground conditions at this site. Like other ground improvement methods, the CMCs could also be installed below floors.

When designing piles appropriate allowance should be made for negative skin friction (down-drag) on the piles due to consolidation of the tidal flat deposits due to the land raising and from pre pressures set up by the piling itself. Due to the thickness of the tidal flat deposits, there is likely to be relatively high down-drag forces calculated relative to the positive support on pile shafts from the glacial clay. Alternatively, consideration could be given to applying a slip-coat to the piles to reduce negative skin friction on the pile shaft through the soft clay/peat layer.

Where large concentrations of driven piles are required, consideration of the effects of heave of the ground should be considered and higher proportions of the total maximum down-drag forces will act on piles. Even with small displacement driven piles, a driving pattern should be followed which minimises the gross effect of pressure in the ground; i.e. piles should be driven from the centre of an overall piling scheme outwards rather than working from one end. Driven piles should be levelled and checked as driving proceeds; any piles showing uplift should be re-driven. Spacing of piles should not generally be closer than three pile diameters.

A specialist contractor should be contacted with regards to the selection of appropriate CMC design and construction method. Geotechnical information within this report should be provided to give design parameters.

Chalk is susceptible to karst type weathering and localised deep weathering can occur although voids are rare in chalk. No such features were encountered during the investigation, but a variable depth of weathering was encountered. Should it be decided that piles need to extend into the chalk, an additional investigation will be required to further characterise the weathering profile and determine appropriate design characteristics. Reference should be made to Section 6 of CIRIA Report 574: Engineering in Chalk (2002) and more recent good practice set out in the ICE Proceedings of the conference on Engineering in Chalk (2018).

The design of the foundations for the site's 30 m high chimney will need additional assessment as part of the design and this will have to take into account variable wind loadings transferred to the foundations with the parameters from the seismic testing providing information for this part of the design.

Any piling works undertaken from existing ground levels will require a suitable piling mat/platform constructed in accordance with BRE Report 470 (2004). A geotextile may be incorporated into the platform to reduce the required thickness and the platform could be designed as part of the engineering fill required for any earthworks to alter final site levels.

10.5 Piling Risk Assessment

Piled foundations have the potential to form a pathway for contaminants to migrate between different groundwater bodies. The Environment Agency generally require that a Piling Risk Assessment be undertaken prior to piling, taking account of the following Environment Agency documents:

"Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention" (Ref: NC/99/73, 2001);
"Piling into contaminated sites" (2002);
"Piling in Layered Ground: risks to groundwater and archaeology" (SC020074SR,2006).

The controlled Waters Risk Assessment (see Section 12) has shown that there is limited potential to be a significant source of mobile contamination to the identified controlled waters receptors. There is no requirement for any groundwater mitigation measures. The tidal flat deposits are relatively thick and the clays will be of low permeability. Given this, any piles (either, bored, or CFA or driven, or CMCs) will not form a pathway as the tidal flat deposits clays around the piles will form a 'thick' low permeability layer. Given that there is a very limited potential contaminant source term and a very unlikely pathway, there is a negligible risk from the use of piled foundations to either the groundwater in the glacial sand layers or bedrock Principal Aquifer for this development.

10.6 Shallow Groundwater & Excavations

This section just applies for excavations through the Made Ground and into the upper natural layers. Shallow excavations to 1.0 to 1.2 m will likely remain stable only in the short-term, if dry. Temporary side support will be required to maintain stability or if groundwater is present. Where excavations require man entry they will require assessment of temporary support and dewatering in order to ensure the safety of construction workers.

Excavations below the groundwater table will require full face sheeting and sump pumping in order to prevent instability of the sides of excavations. Basal heave will also have to be considered. All excavations should be carried out in accordance with CIRIA Report 97 "Trenching Practice" and BS6031: 2009: Code of Practice for Earthworks. Dewatering guidance can be found in CIRIA Report C515: Groundwater Control Design and Practice (2000).

If deep manholes are required into the tidal flat deposits, consideration will have to be made as to whether or not these will be required to be piled/treated.

10.7 Road & Pavement Design

The design of the development should use a CBR of 2.0% for the material at 0.1m depth. There will be areas of fill used to raise ground levels to the required formations and the design CBR for these materials will depend upon the type of material and properties of the imported soils used to form the fill below the construction platform.

10.8 Buried Concrete and Pipework

The recommended Design Sulphate Class is DS-5 and corresponding ACEC Class AC-5, assuming a mobile groundwater condition, in accordance with BRE Special Digest 1, 2005 (the Design Concrete Class). If additional testing is carried out on shallow soils it may be possible to derive a lower ACEC Design Class for the foundation slab and any concrete hard standings.

11 SOIL ANALYSIS

Soil chemical analysis results are included in Appendix H, undertaken by Chemtest. The following sections provide the assessment and comparison against relevant screening values of the chemical analysis undertaken.

11.1 Interpretation of Soil Analysis Data

Comments on the significance of the testing results and our recommendations are based on MEL Guidelines for the Assessment of Soil Quality and current UK good practice. Further information on this is included in Appendix E.

11.2 General

The following analytes have been assessed in accordance with good practice and respective guidance.

11.2.1 Asbestos in Soils

11.2.1.1 Plot C

Asbestos was encountered within the Made Ground at location TP09, close to the existing buildings where asbestos sheeting was noted as being stored, within samples from 0.4m bgl and 1m bgl. It was identified as fibres/clumps of chrysotile and crocidolite in both samples.

Asbestos was not identified in any other location in Plot C.

11.2.1.2 Plot I

Asbestos was not identified in any of the samples screened on Plot I.

11.2.2 pH

The soil pH values in the samples across both plots typically varied between slightly alkaline to alkaline (pH values from 7.4 to 8.8). The sample analysed from the chalk in BH01 was noted to be more alkaline with a pH value of 9.1, which is to be expected due to the nature of the geology.

11.2.3 Sulphur & Sulphides

From the sampling and analysis undertaken, concentrations of total sulphur and sulphides detected within the soil samples across both plots were not considered significant.

11.3 Human Health Risk Assessment Explanation

Contaminant linkages for human health have been risk assessed by comparing the reported soil laboratory results to Tier 1 Screening Values. Following the rationale of Land Contamination Risk Management (LCRM) guidance, Environment Agency, October 2020 (formerly CLR11), this Tier 2 assessment uses soil screening values for the Contaminated Land Exposure Assessment (CLEA) land end use relevant to commercial end use, commensurate to the proposed land use of the site.

Soil screening values used are the Soil Guideline Values (SGVs) to assess the long term exposure of chemicals in soil to human health, generic assessment criteria (GAC) from CLEA; with updates from more recent Category 4 Screening level (C4SL) and Suitable for Use Levels (S4UL) from CIEH / LQM used where applicable, (for simplicity all are referred to as GAC).

For the statistical computations of the chemical analysis, where less than the detection limits (e.g. <0.01) has been reported to enable the statistical calculations, the detection limit has been chosen (e.g. for <0.01, the value 0.01 used for the statistics). This enables a reasonable conservative value for the statistics generated.

The background behind the statistical tests is included in Appendix E. The tests have been undertaken using excel-based spreadsheet calculations.

11.4 Plot C

11.4.1 Metals / Metalloids

TABLE 11.0 METALS – MADE GROUND PLOT C

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Arsenic	mg/kg	7	5.3	25	16.04	24.4	640	640	0	0
Boron	mg/kg	7	<0.4	2.7	1.46	2.43	240000	-	0	-
Cadmium	mg/kg	7	0.16	0.38	0.24	0.35	190	410	0	0
Chromium	mg/kg	7	<0.5	40	18.76	37.9	8600	-	0	-
Chromium VI	mg/kg	7	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Copper	mg/kg	7	14	120	57.29	113.7	68000	-	0	-
Lead	mg/kg	7	16	84	45.29	77.7	-	2330	-	0
Mercury	mg/kg	7	<0.05	0.22	0.10	0.19	1100	-	0	-
Nickel	mg/kg	7	7.3	50	26.47	45.8	980	-	0	-
Selenium	mg/kg	7	0.33	2.7	1.18	2.4	12000	-	0	-
Zinc	mg/kg	7	95	550	220.29	502	730000	-	0	-

No significant levels of metals were identified within any of the samples analysed from the Made Ground from Plot C.

No significant levels of metals were identified within any of the samples from the natural ground in Plot C either.

11.4.2 Phenols

Phenols were below the limit of detection (<0.30mg/kg) in all of the soil samples analysed from Plot C, from both the Made Ground and Natural Ground.

11.4.3 Polychlorinated Biphenyls (PCB's)

PCBs were recorded below the limit of detection (LOD) in all samples analysed across Plot C.

11.4.4 Poly Aromatic Hydrocarbons

TABLE 11.1 PAHS – MADE GROUND PLOT C (6% SOM BASED ON SITE DATA)

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Naphthalene	mg/kg	7	0.1	13	4.51	11.44	1100	-	0	-
Acenaphthylene	mg/kg	7	0.1	2.2	1.17	2.14	100000	-	0	-
Acenaphthene	mg/kg	7	0.1	1.2	0.70	1.14	100000	-	0	-
Fluorene	mg/kg	7	0.1	3.3	1.69	3.15	71000	-	0	-
Phenanthrene	mg/kg	7	0.1	9.7	4.35	9.34	23000	-	0	-
Anthracene	mg/kg	7	0.1	4.4	1.76	4.22	540000	-	0	-
Fluoranthene	mg/kg	7	0.1	41	12.86	35.3	23000	-	0	-
Pyrene	mg/kg	7	0.1	47	14.27	40.1	54000	-	0	-
Benzo(a)Anthracene	mg/kg	7	0.1	29	8.24	24.5	180	-	0	-
Chrysene	mg/kg	7	0.1	32	9.39	27.2	350	-	0	-
Benzo(b)Fluoranthene	mg/kg	7	0.1	37	11.21	32.2	45	-	0	-
Benzo(k)Fluoranthene	mg/kg	7	0.1	15	4.77	13.11	1200	-	0	-
Benzo(a)Pyrene	mg/kg	7	0.1	28	8.50	24.1	36	77	0	0
Indeno(123-cd)Pyrene	mg/kg	7	0.1	18	5.68	15.9	510	-	0	-
Dibenzo(ah)Anthracene	mg/kg	7	0.1	5.2	2.00	4.78	3.6	-	**2**	-
Benzo(ghi)Perylene	mg/kg	7	0.1	16	5.14	13.9	4000	-	0	-
PAH(total)	mg/kg	7	2	350	142.43	332	-	-	-	-

From the sampling and analysis undertaken, the GAC for dibenzo(ah)anthracene (3.6mg/kg) was exceeded in the Made Ground at two locations; TP11 0.35m (3.8 mg/kg) and TP13 0.3m (5.2 mg/kg).

TABLE 11.2 PAHS – NATURAL CLAY (2.5% SOM BASED ON SITE DATA)

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Arsenic	mg/kg	5	9	18	14.20	18	640	640	0	0
Boron	mg/kg	5	<0.4	4.9	2.46	4.84	240000	-	0	-
Cadmium	mg/kg	5	0.1	0.23	0.16	0.22	190	410	0	0
Chromium	mg/kg	5	23	45	33.60	44.6	8600	-	0	-
Chromium VI	mg/kg	5	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Copper	mg/kg	5	9.2	99	39.24	86.8	68000	-	0	-
Lead	mg/kg	5	17	64	40.20	63.8	-	2330	-	0
Mercury	mg/kg	5	<0.05	0.15	0.08	0.136	1100	-	0	-
Nickel	mg/kg	5	18	41	30.60	39.8	980	-	0	-
Selenium	mg/kg	5	1	2.4	1.28	2.12	12000	-	0	-
Zinc	mg/kg	5	48	390	157.80	346	730000	-	0	-

PAHs in the natural clay sampled from Plot C did not exceed the relevant GAC screening values.

11.4.5 Petroleum Hydrocarbons

The data provided is based on the findings of the TPH Criteria Working Group (TPH CWG). TPH CWG analysis involves the samples to be subjected to a column clean up to extract both the aromatic and aliphatic fractions, which are then quantified. The clean-up also removes any plant-derived materials.

None of the speciated and fractionated hydrocarbon band concentrations within both the Made Ground and Natural Clay samples were shown to be above the laboratory LOD and therefore were not in excess of their respective GACs.

11.4.6 Semi Volatile Organic Compounds (SVOCs) & Volatile Organic Compounds (VOCs)

From the sampling and analysis undertaken, no SVOC or VOC concentrations were in excess of their respective GACs in the samples analysed from Plot I.

11.5 Plot I

11.5.1 Metals/Metalloids

11.5.1.1 Near Surface Materials

TABLE 11.3 METALS/METALLOIDS – TOPSOIL PLOT I

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Arsenic	mg/kg	4	12	22	18.50	21.85	640	640	0	0
Boron	mg/kg	4	<0.4	0.63	0.51	0.612	240000	-	0	-
Cadmium	mg/kg	4	<0.1	0.2	0.15	0.1925	190	410	0	0
Chromium	mg/kg	4	15	44	32.75	43.25	8600	-	0	-
Chromium VI	mg/kg	4	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Copper	mg/kg	4	14	52	26.50	47.5	68000	-	0	-
Lead	mg/kg	4	21	37	28.75	36.4	-	2330	-	0
Mercury	mg/kg	4	<0.05	0.09	0.07	0.0885	1100	-	0	-
Nickel	mg/kg	4	21	40	31.50	39.1	980	-	0	-
Selenium	mg/kg	4	0.74	1.4	1.05	1.355	12000	-	0	-
Zinc	mg/kg	4	69	150	106.00	144	730000	-	0	-

No significant levels of metals were identified within any of the topsoil samples analysed from Plot I. Minimal Made Ground was identified as present on Plot I and only one sample from this strata was submitted for analysis. No elevated levels were identified within this sample.

11.5.1.2 Natural Ground

TABLE 11.4 METALS / METALLOIDS – NATURAL CLAY

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Arsenic	mg/kg	19	0.8	25	13.89	21.4	640	640	0	0
Boron	mg/kg	19	<0.1	9.7	2.22	5.38	240000	-	0	-
Cadmium	mg/kg	19	<0.1	0.22	0.12	0.202	190	410	0	0
Chromium	mg/kg	19	2.4	44	32.17	42.2	8600	-	0	-
Chromium VI	mg/kg	19	<0.5	<0.5	<0.5	<0.5	-	-	-	-
Copper	mg/kg	19	0.97	31	16.64	31	68000	-	0	-
Lead	mg/kg	19	1.1	36	21.61	35.1	-	2330	-	0
Mercury	mg/kg	19	<0.05	0.1	0.06	0.1	1100	-	0	-
Nickel	mg/kg	19	2.3	45	30.67	43.2	980	-	0	-
Selenium	mg/kg	19	0.25	1.2	0.74	1.11	12000	-	0	-
Zinc	mg/kg	19	5	110	74.63	110	730000	-	0	-

No significant levels of metals were identified within any of the natural clay samples analysed from Plot I. In addition, the one sample of the chalk submitted for analysis did not display any significant levels of metals.

11.5.2 Phenols

Phenols were below the limit of detection (<0.30mg/kg) in all of the soil samples analysed from Plot I, from both the Made Ground and Natural Ground.

11.5.3 Polychlorinated Biphenyls (PCB's)

PCBs were recorded below the limit of detection (LOD) in all samples analysed across Plot C.

11.5.4 Poly Aromatic Hydrocarbons

11.5.4.1 Near Surface Materials

TABLE 11.5 PAHS – TOPSOIL PLOT I (2.5% SOM BASED ON SITE DATA)

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Naphthalene	mg/kg	4	<0.1	12	3.08	<0.1	460	-	0	-
Acenaphthylene	mg/kg	4	<0.1	1.8	0.53	<0.1	97000	-	0	-
Acenaphthene	mg/kg	4	<0.1	1.6	0.48	<0.1	97000	-	0	-
Fluorene	mg/kg	4	<0.1	3.8	1.03	<0.1	68000	-	0	-
Phenanthrene	mg/kg	4	<0.1	4.7	1.25	4.01	22000	-	0	-
Anthracene	mg/kg	4	<0.1	0.51	0.20	<0.1	540000	-	0	-
Fluoranthene	mg/kg	4	<0.1	2.4	0.68	2.055	23000	-	0	-
Pyrene	mg/kg	4	<0.1	2.7	0.75	2.31	54000	-	0	-
Benzo(a)Anthracene	mg/kg	4	<0.1	1.2	0.38	<0.1	170	-	0	-
Chrysene	mg/kg	4	<0.1	1.3	0.40	<0.1	350	-	0	-
Benzo(b)Fluoranthene	mg/kg	4	<0.1	1.5	0.45	<0.1	44	-	0	-
Benzo(k)Fluoranthene	mg/kg	4	<0.1	0.51	0.20	<0.1	1200	-	0	-
Benzo(a)Pyrene	mg/kg	4	<0.1	1.1	0.35	<0.1	35	77	0	0
Indeno(123-cd)Pyrene	mg/kg	4	<0.1	0.65	0.24	<0.1	510	-	0	-
Dibenzo(ah)Anthracene	mg/kg	4	<0.1	0.4	0.18	<0.1	3.6	-	0	-
Benzo(ghi)Perylene	mg/kg	4	<0.1	1.4	0.43	<0.1	4000	-	0	-
PAH(total)	mg/kg	4	<2	38	11.00	<2	-	-	-	-

No significant levels of PAHs were identified in any of the topsoil samples analysed from Plot I or from the Made Ground sample submitted.

11.5.4.2 Natural Ground

TABLE 11.6 PAHS – NATURAL CLAY PLOT I (2.5% SOM BASED ON SITE DATA)

Parameter	Units	No of Samples Analysed	Minimum Conc.	Maximum Conc.	Mean	95th %ile	Tier 1 Screening Values		No. of Exceedances	
							S4UL	C4SL	S4UL	C4SL
Naphthalene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	460	-	0	-
Acenaphthylene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	97000	-	0	-
Acenaphthene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	97000	-	0	-
Fluorene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	68000	-	0	-
Phenanthrene	mg/kg	19	<0.1	0.25	0.11	0.151	22000	-	0	-
Anthracene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	540000	-	0	-
Fluoranthene	mg/kg	19	<0.1	0.26	0.11	0.188	23000	-	0	-
Pyrene	mg/kg	19	<0.1	0.31	0.12	0.247	54000	-	0	-
Benzo(a)Anthracene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	170	-	0	-
Chrysene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	350	-	0	-
Benzo(b)Fluoranthene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	44	-	0	-
Benzo(k)Fluoranthene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	1200	-	0	-
Benzo(a)Pyrene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	35	77	0	0
Indeno(123-cd)Pyrene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	510	-	0	-
Dibenzo(ah)Anthracene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	3.6	-	0	-
Benzo(ghi)Perylene	mg/kg	19	<0.1	<0.1	<0.1	<0.1	4000	-	0	-
PAH(total)	mg/kg	19	<2	<2	<2	<2	-	-	-	-

No significant levels of PAHs were identified in any of the natural clay samples analysed from Plot I or from the chalk sample submitted.

11.5.5 Petroleum Hydrocarbons

None of the speciated and fractionated hydrocarbon band concentrations within the topsoil, Made Ground, natural clay and chalk samples were shown to be above the laboratory LOD and therefore were not in excess of their respective GACs.

11.5.6 Semi Volatile Organic Compounds (SVOCs) & Volatile Organic Compounds (VOCs)

From the sampling and analysis undertaken, no SVOC or VOC concentrations were in excess of their respective GACs in the samples analysed from Plot I.

11.6 Waste Classification (WM3) Assessment & Waste Acceptance Criteria

One sample of the brown clay (WS02 2-3m) and one sample of the topsoil (WS04 0-0.4m) were scheduled for laboratory analysis in accordance with a suite of analysis suitable for classifying them as non-hazardous or hazardous, and identifying a suitable disposal option.

The suite includes pH, electrical conductivity, metals, sulphide, water soluble sulphate, total phenols, total cyanide, speciated poly aromatic hydrocarbons (PAHs) (WAC17), polychlorinated biphenyls (PCBs) EC7, BTEX and total petroleum hydrocarbons (TPH) (C6-C10), (C10-C40) and (C25-C40).

In addition, the samples were submitted for an asbestos screen, and quantification (for when asbestos is detected during screening). The suite also includes leachate analysis in accordance with the British Standard BS EN 12457-2 2002, which is the relevant procedure to yield data for comparison with the Waste Acceptance Criteria (WAC). WAC also provides thresholds relevant for disposal of non-hazardous waste as inert. All analysis was undertaken by a MCERTs & UKAS accredited laboratory, where applicable.

The classification of the waste has been carried out in accordance with the Environment Agency WM3 document 'Guidance on the classification and assessment of waste', (1st Edition v1.2.GB) Technical Guidance WM3, October 2021.

The results of the analysis are presented on the laboratory certificates provided in Appendix H, and waste acceptance criteria certificates also provided in Appendix H.

Based on the nature of the samples and source of the material, the following mirror entry from the European Waste Catalogue (EWC) has been suggested for the waste arisings.

17 CONSTRUCTION & DEMOLITION WASTES (including excavated soils from contaminated sites)

17 05 Soil (including excavated soil from contaminated sites), stones & dredging spoil

17 05 03* soils and stones containing dangerous substances – mirror hazardous

17 05 04 soils and stones other than those mentioned in 17 05 03 – mirror non-hazardous

As this is a 'mirror hazardous' or 'mirror non-hazardous' entry, the waste classification process involves the identification of any dangerous substances in the waste. Where it has not been possible through analysis to identify a specific compound (for example, the metals), a 'worst case' substance has been assumed for each hazardous property. Worst case substances are substances which may reasonably exist in the waste, and are the most likely to result in a hazardous property applying.

Once the dangerous substances are identified, each hazardous property is assessed against the relevant section of the WM3 guidance to determine whether the concentration, or combined concentrations, of the dangerous substances are sufficiently elevated to classify the waste as hazardous. This will determine which of the above two EWC codes applies.

In accordance with the WM3 document, information relating to hazardous properties (including hazard statement codes) have been taken primarily from the Mandatory Classification List (MCL) of the GB CLP Regulations, and where not available, from other sources.

This waste classification assessment considers the following hazardous properties: HP4 (Irritant), HP5 (Specific Target Organ Toxicity / Aspiration Toxicity), HP6 (Acute Toxicity), HP7 (Carcinogenic), HP8 (Corrosive), HP10 (Toxic for Reproduction), HP11 (Mutagenic), HP13 (Sensitising) and HP14 (Ecotoxic).

No compounds with appropriate hazard statement codes listed in the MCL are considered to be relevant to the following hazardous properties: HP1 (Explosive), HP2 (Oxidising), HP3 (Flammable), HP9 (Infectious), HP12 (Produces toxic gases in contact with water, air or acid) and HP15 (waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste).

11.6.1 Waste Acceptance Criteria (WAC)

In relation to the WAC thresholds relevant to inert waste, sample WS02 2-3m met all of the relevant thresholds. Sample WS04 0-4m displayed elevated concentrations of Total Organic Carbon (TOC).

11.6.2 Conclusions

Neither of the samples were found to contain asbestos.

Based on the chemical parameters tested, the material represented by samples 'WS02 2-3m' and 'WS04 0-0.4m' would be classified as **Non-Hazardous waste**. From the suggested mirror entry above, the relevant EWC code would be **17 05 04.** In addition, the material represented by sample 'WS02 2-3m' could be disposed of as inert waste.

The material represented by the samples could be disposed of to a non-hazardous waste landfill subject to the waste treatment requirements set out below.

The Waste Framework Directive requires that all wastes are treated prior to being disposed of to landfill. Treatment must reduce the quantity or environmental impact of the waste and meet a three point test as defined by the Regulators. Confirmation of the pre-treatment should be obtained from your waste management contractor.

It is recommended that the waste classification and disposal option is verified by the landfill operator, as site specific conditions may apply.

Characterising waste materials can range from a small number of samples to extensive investigations and testing. The degree of uncertainty will depend upon the budget and scope of work authorised by the client. Some degree of uncertainty will always exist. No responsibility can therefore be accepted for contamination that has not been revealed by the sampling and analysis undertaken.

This waste classification is correct as of November 2023 until such time as further amendments to the MCL or WM3 Technical Guidance become applicable.

12 GROUNDWATER CONDITIONS & ANALYSIS

12.1 Summary of Groundwater Conditions

Groundwater samples were collected 30th October 2023 from the three deeper boreholes (BH01, BH03 and BH05). As discussed in section 6.5, groundwater levels recorded indicate that there is a tidal influence on the groundwater levels. The groundwater appears to sit within the Tidal Flat Deposits, likely within the higher permeability strata within the clay such as the sands and gravels layers identified. It is also considered that the artesian groundwater is still affecting the groundwater levels in BH01.

The groundwater levels recorded to date indicate that the groundwater flow is towards the estuary as would be expected.

During sampling, in the northern area of the site (BH12) the groundwater had a visible sheen and hydrocarbon odour.

12.2 Screening / Comparison Values

To assess the groundwater analysis, conservative UK Drinking Water Standards (DWS) or Environmental Quality Standards (EQS) that are relevant to controlled waters as a receptor have been sourced with a dilution of factor of one to two orders of magnitude (i.e. DWS / EQS x10 or 100) calculated as a comparison value (CV) for the groundwater analysis assessment. The DWS & EQS are the only quality standards available in the UK for assessment and are considered highly conservative; therefore these will be highly protective when taking into account that the site is not located within a Source Protection Zone (SPZ).

12.3 Analysis Results

12.3.1 Metals

Low concentrations of metals were detected at all locations at levels that would not be considered significant and were below the relevant screening values.

12.3.2 Organics

In summary, all hydrocarbons and VOCs were below the limit of detection. A small number of PAHs were detected within samples from BH03 and BH05 but at levels below the relevant screening criteria and would therefore not be considered significant.

13 GROUND GAS

13.1 Ground Gas Monitoring

Ground gas monitoring on window sample locations WS01 through WS04 was undertaken on three occasions from lmid-October to mid-November 2023, using a portable landfill gas monitoring equipment during, as reasonably practicable, periods of falling atmospheric pressure, in accordance with BS 8485:2015. Gas monitoring on the boreholes BH01, BH03 and BH05 was undertaken on the final three occasions; on the first monitoring visit the gas bungs in the boreholes had been removed and therefore monitoring was unable to be undertaken on this occasion.

An analox infrared monitor was used to measure concentrations of methane, carbon dioxide and oxygen. The analox instrument is intrinsically safe and displays the presence of the three gases in the range of 0.1% to 100% concentration. The instrument samples continuously by pumping air over its detectors and displaying the concentration of methane, carbon dioxide and oxygen. Atmospheric pressure was also recorded. The presence of volatile organic compounds (VOCs) was recorded using a photo ionisation detector (PID). Initially, the PID and GFM 436 meters were turned on and 'fresh air' was pumped though to confirm zero and stable readings. Once the meters were calibrated, the GFM 436 gas monitor was attached to the borehole using the pipe for recording airflow, the gas valve was opened and any positive or negative flow rate was recorded. The gas valve was closed and the pipe removed. The pipe used for 'standard gas monitoring' was attached to the borehole and the valve opened. The PID meter was attached to the outflow tubing. At every 30-second interval (for a maximum of 300 seconds (five minutes)) the oxygen, carbon dioxide, methane, hydrogen sulphide, carbon monoxide and VOCs were recorded. The data is presented in the certificates of analysis in Appendix F and the following table summarises the ground gas monitoring data collected, of stabilised readings.

TABLE 13.0 SUMMARY OF GROUND GAS MONITORING DATA - BOREHOLES

Borehole	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Flow (l/hr)	PID (ppm)	Atm. Pressure (mb)	Tide Level
BH01	16	1.2	15.9	-	<0.1	995	Rising
	<0.1	<0.1	20.4	-	1	991	Rising
	3.2	2.2	17.7	<0.1	3.5	1013	Falling
BH03	71.9	3.5	3.5	-	<0.1	995	Rising
	<0.1	<0.1	20.4	-	1	991	Rising
	87.9	4	0.1	3	<0.1	1012	Falling
BH05	36.9	2.1	8.9	-	<0.1	995	Rising
	<0.1	<0.1	20.5	-	0.9	991	Rising
	42.6	5.4	0.1	3	<0.1	1012	Rising

It can be seen that on two occasions the levels of methane identified in BH03 and BH05 were extremely elevated. On the second monitoring visit methane was not identified at either location.

Due to the elevated levels of methane identified within the boreholes, particularly BH03 and BH05 on the final monitoring visit, samples of the groundwater were collected from each borehole and submitted for analysis for dissolved methane. The analysis identified the following levels:

- BH01 – 9.3 mg/l
- BH03 – 9.9 mg/l
- BH05 – 9.2 mg/l

It is considered likely that the presence of the alluvium within the grey clay is the source of the methane within the groundwater and within the headspace of the monitoring wells. The groundwater levels monitored at all locations have been close to the surface and therefore there has been minimal headspace within the wells. In addition, the groundwater levels appear to affected by the tide and fluctuate.

Due to the levels of dissolved methane identified within the groundwater, it is considered likely that the elevated gas concentrations in the well headspace could be due to continuous partitioning of methane in and out of the gaseous phase. The gas becomes trapped within the headspace and can give high concentrations during monitoring, particularly when the response zone of the well is flooded.

Typically, in accordance with CIRIA C665, the ground gas concentrations and flow rates recorded during the monitoring visit would be used to determine potential risks to future site users. However, using the maximum concentration of methane identified and highest flow reading would immediately indicate the highest characteristic situation is present which may not be the case.

It is likely that further monitoring will be required to further establish patterns of ground gas levels due to the erratic presence of the methane within the well headspace. In addition, the presence of the stiff brown clay above the grey clay layer is likely to afford some protection to any development at the surface, effectively acting as a capping layer. However, further monitoring will be required to establish if this is the case.

TABLE 13.1 SUMMARY OF GROUND GAS MONITORING DATA – WINDOW SAMPLE LOCATIONS

Borehole	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Flow (l/hr)	PID (ppm)	Atm. Pressure (mb)	Tide Level
WS01	<0.1	3.6	12.7	<0.1	<0.1	1021	Falling
	2.3	0.7	19.4	-	2.3	995	Rising
	<0.1	<0.1	20.4	-	1.0	995	Rising
	5	3.6	16.5	<0.1	3.9	1012	Falling
WS02	1.9	2.1	15.4	<0.1	<0.1	1021	Falling
	8	1.5	14.8	-	2.3	995	Rising
	<0.1	<0.1	20.3	-	1	995	Rising
	9.6	2.7	13.9	<0.1	8.5	1012	Falling
WS03	<0.1	0.9	18.2	<0.1	<0.1	1021	Falling
	<0.1	1.6	15.8	-	1	995	Rising
	<0.1	<0.1	20.5	<0.1	0.9	995	Rising
	<0.1	2.3	16.4	<0.1	1	1011	Falling
WS04	<0.1	0.9	16.5	<0.1	<0.1	1021	Falling
	<0.1	0.8	18.7	-	1	995	Rising
	<0.1	<0.1	20.5	-	1	995	Rising
	<0.1	1.8	18.9	-1.9	1	1012	Falling

The gas data from the window sampler locations has shown the presence of methane within locations WS01 and WS02, located closest to the adjacent above ground landfill. The wells are installed with response zones that include the top of the grey clay and therefore the peat layers present may also have an impact on the ground gas levels identified.

In accordance with CIRIA C665, the ground gas concentrations and flow rates recorded during the monitoring visit have been used to determine potential risks to future site users.

The assessment uses the ground gas concentrations and flow rates recorded to define a characteristic situation based on a calculated Gas Screening Value (GSV) where:

GSV (l/hr) = borehole flow rate (l/hr) x gas concentration (%v/v)

Where the recorded ground gas flow rates is below instrument's limit of detection this limit has been conservatively used as the gas flow rate.

The GSVs calculated for the boreholes, based on the maximum concentrations measured and the highest flow rates recorded are summarised in the following table, from monitoring during mid-October to mid-November, 2023 (four visits, refer to Section 6.6). Typically the CIRIA C665 guidance recommends a minimum of six to ten ground gas monitoring visits should be undertaken before making decisions regarding a ground gas regime and should cover periods of differing atmospheric pressure to determine best and worst case conditions. It also recommends that the visits are made over a minimum period of three months. Consequently, the assessment is considered to be preliminary.

TABLE 13.2 SUMMARY OF GAS SCREENING VALUES, PRELIMINARY 4 VISITS

Borehole	Methane GSV	Carbon Dioxide GSV
WS01	*CS2	CS1
WS02	*CS2	CS1
WS03	CS1	CS1
WS04	*CS1*	*CS1*

CS Characteristic Situation

** Increased to CS2 based on ground gas concentration identified*

The preliminary characteristic situation (CS) was initially indicated as CS1 for all boreholes. However, where ground gas concentrations for methane are above 1% and / or carbon dioxide above 5%, an increase to CS2 is to be considered; on this basis it is prudent to increase the characterisation to CS2 for either methane or carbon dioxide. Consequently, the preliminary ground gas characterisation for the site based on the shallow monitoring wells is CS2, in accordance with C665.

14 GEO-ENVIRONMENTAL CONCLUSIONS

In summary, from the ground investigation undertaken the site is considered suitable for an industrial development, although further gas monitoring is required to further establish the significance of the findings so far. The site does not appear to be a significant contaminative liability to neighbours.

14.1 Soils, Human Health

With regards to the soils tested on Plot I no significant levels of contaminants were identified.

With regard to Plot C, asbestos fibres were identified in the Made Ground at one location (TP09) where asbestos sheeting was noted to be stored. In addition, exceedances of Dibenzo(ah)anthracene were identified in two locations (TP11 0.35m and TP13 0.3).

14.2 Groundwater

The groundwater initially identified during the drilling was present at depth within the Tidal Flat Deposits. Subsequently, artesian groundwater was identified within the chalk underlying the clay which limited drilling deeper into the chalk. The artesian groundwater appears to be influencing BH01 still as the groundwater level at this location is considered to be above ground level.

The monitored groundwater levels during October and November 2023 were noted to be much closer to the surface than those identified during drilling. The presence of the wells has potentially created preferential pathways that the groundwater is travelling along and the actual groundwater may sit at a slightly lower depth.

The monitoring data suggests that there is a groundwater flow towards the estuary, as expected, although the gradient is fairly shallow.

Sampling and analysis of groundwater from the three deeper boreholes did not determine any significant levels of potential contaminants.

14.3 Ground Gas

In summary, significantly elevated levels of methane were identified in BH03 and BH05 on two monitoring occasions. Methane was also detected in the window sampler locations, although at lower levels. It is considered likely that the peat deposits underlying the site could be the source of the methane and the high concentrations attributed to the small headspace in the wells due to high groundwater levels as dissolved methane was also identified within the groundwater. There is potential for the adjacent landfill to be a ground gas source as ground gases were identified in WS02 closest to the landfill.

We would recommend that further monitoring is undertaken to establish further the effect of the tidal influence on the groundwater on the methane concentrations detected. In addition, surface gas monitoring should be undertaken to determine if the stiff clay layers above the soft clay where the peat layers are present, may afford some protection to the proposed development.

With regard to the proposed industrial use, the levels of ground gases currently identified may pose a significant risk and therefore work is required to further clarify this.

15 RISK ASSESSMENT & CONCEPTUAL SITE MODEL

Completing the risk assessment process requires that the potential pollutant linkages be re-assessed from the proposed conceptual model within Section 5.

With respect to the site, the results of analysis indicate that in general there is no significant contamination within the majority of soils on site. The ground investigation identified the presence of asbestos fibres and individual PAHs within the Made Ground on Plot C. In addition, elevated levels of ground gases, particularly methane, have been identified on Plot I.

The following table provides a revised assessment of the preliminary conceptual model, included in Section 5, based on the findings from the ground investigation.

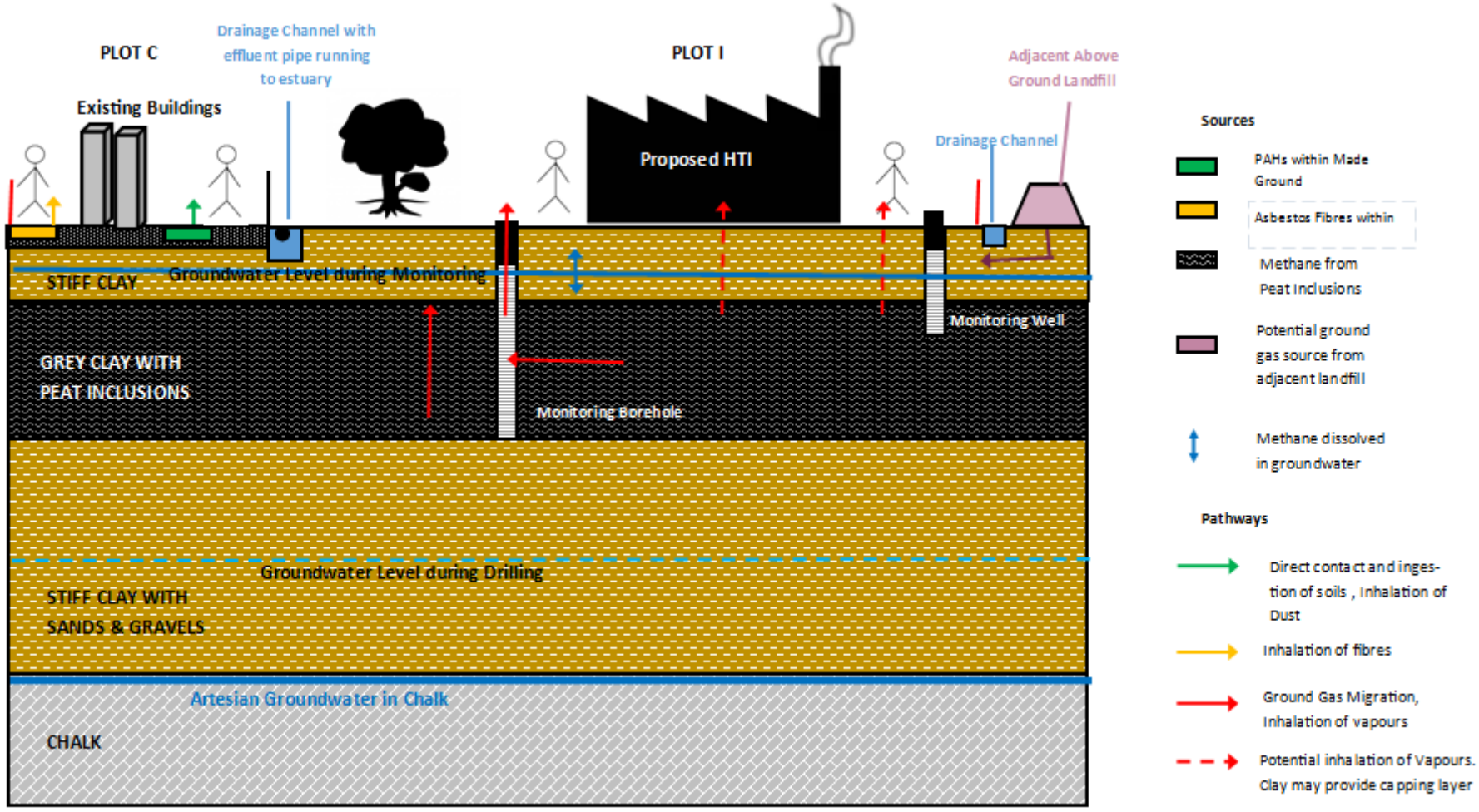
TABLE 15.1 REVISED CONCEPTUAL SITE MODEL

SOURCE	IDENTIFIED PATHWAYS	RECEPTORS	CONSEQUENCE	PROBABILITY	RISK RATING	COMMENTS ON LINKAGE SIGNIFICANCE
Location TP09 **Plot C (** **Soils:** Asbestos fibres	• Inhalation (fibres) •	• Ground Workers • Site Neighbours • Site Users	Severe	Likely	**High Risk**	Potential high risk as the asbestos fibres identified are in the Made Ground near surface with no hardstanding present currently. The risk will decrease if the ground is not further disturbed or capped with hardstanding.
Potential asbestos cladding on existing buildings on Plot C	• Inhalation (fibres)	• Ground Workers Site Users	Severe	Unlikely	**Moderate / Low Risk**	Potential Moderate / Low risk currently as the cladding appears visually to be in satisfactory condition and the buildings are not easily accessible. It is recommended that an asbestos survey is undertaken to establish the presence of asbestos within the cladding, particularly if the buildings are to be demolished.
Dibenzo(ah)anthracene present in TP11 (0.3m) and TP13 (0.3m)	• Ingestions (soils) • Direct Contact (Soils) • Inhalation (dust)	• Ground workers • Site Users • Site Neighbours	Medium	Unlikely	**Low Risk**	Potential Low Risk as the Made Ground the PAH is present in is under a roadway. Should this area be excavated, standard hygiene practices and dust suppression should be observed.

Methane Significantly elevated levels in BH03 and BH05 Present within WS01 and WS02 Potential sources are underlying peat and organic deposits and the adjacent landfill.	• Inhalation (vapours)	• Site Users for Proposed Development	Severe	Likely	**High Risk**	The significance of the methane levels identified need to be further established. In addition, the potential for the upper stiff clay layers to act as capping layers also needs to be further established. The current data suggests that there is a significant risk from the presence of the methane under the site, but further data will be necessary to form an informed decision on how this may affect the proposed development.

Below is a pictorial representation of the Conceptual Site Model.

CONCEPTUAL SITE MODEL FOR PROPOSED DEVELOPMENT



16 RECOMMENDATIONS

16.1 General

The ground investigation found minor soil contamination to be sporadic in hotspots on Plot C with no significant soil contamination identified on Plot I.

It is anticipated that if the soils close to the buildings on Plot C are not disturbed, then the asbestos fibres identified within the Made Ground at this location are unlikely to pose a significant risk. However, should works be done, the presence of the fibres will need to be considered for any works going forward with regard to impact on the ground workers. It is recommended that if the area is to be used and the Made Ground left in-situ, hardstanding should be placed to encapsulate the asbestos fibres and remove the inhalation pathway identified.

The PAHs identified under the roadway on Plot C do not currently pose a significant risk if left under the road. However, should redevelopment of this area occur, standard high hygiene practices should be adhered to for ground workers. If the Made Ground is left in-situ, again it is recommended that it is encapsulated under hard standing to eliminate any direct contact or inhalation pathways.

The buildings present on Plot C potentially have asbestos cladding on them. We would recommend that an asbestos survey is undertaken to establish this, particularly if the buildings are to be demolished.

With regard to the methane identified on Plot I, further work is required to further establish the levels and any patterns present. It is proposed to do this in two ways:

- In-situ continuous ground gas monitoring to determine ground gas patterns over time and tidal influence
- Surface gas survey (such as flux box survey) to determine if the near surface clay layers will afford protection to the above ground development and act as a capping layer.

Once further information on the ground gas regime is obtained decision can be made on the remedial strategy for the site. It is currently considered that a strategy would need to be put in place to deal with the potential creation of pathways to the surface by piling. This could be a pile location specific strategy or a site wide (incorporating the development area) solution such as installing a low permeability layer under the development to siphon any ground gas present away from the development area.

16.2 Ground Workers

From the ground gas monitoring undertaken, oxygen depletion (below the HSE recommendation for oxygen above 19.5%), was widespread across the site; partially due to the elevated levels of methane identified.

Although risks to construction workers are not generally discussed in this report, and ground gas concentrations are not necessarily those in the breathing zone; this report with ground gas monitoring data should be provided to all future parties / stakeholders, including contractors and maintenance workers, to assess health and safety measures for subsurface confined spaces, including trenches, for possible measures to allow temporary / permanent works to be undertaken.

Consideration will also need to be given to the protection of construction workers during development

16.3 Waste Classification

The two samples tested (one from the topsoil and from the clay) have been identified as non-hazardous. This should be used as an initial assessment only. Any material to be removed from site during development works would need to be tested specifically.

17 REPORT LIMITATIONS

17.1 Site Specific Comments

It is anticipated that Regulatory authorities will require additional ground gas monitoring to characterise the site in more detail and fully comply with CIRIA 665. When further monitoring is undertaken, the conclusions of this report will need to be updated.

17.2 General

This report presents our observations, borehole logs, laboratory results and interpretation of these logs, observations and results from the ground investigation undertaken between dates 11th September – 25th September 2023. The scope of works was agreed with GRG prior to the ground investigation being carried out and, on this basis, Mayer Environmental & Eccles Associates Ltd have used reasonable skill, care and diligence in its design. Although every reasonable effort has been made to gather relevant information, all potential environmental and geotechnical constraints or liabilities associated with the site may not have been revealed.

On any site, and in particular on sites of potentially contaminative previous uses, ground conditions can change rapidly over short distances and there may be variability in ground conditions between exploratory positions. Ground conditions between exploratory points are inferred. It should be noted that investigation beneath building footprints has not been possible. No responsibility can therefore be accepted for varying ground conditions, between exploratory points, not revealed during the ground investigation.

No assessment has been undertaken for the presence of radioactive substances or unexploded ordnance, unless stated otherwise.

Third party information has been used in good faith and taken at face value. Mayer Environmental cannot guarantee the accuracy or completeness of Third Party information. It is assumed that previous reports provided have been assigned to the Client and can be relied upon. Should this not be the case, Mayer Environmental should be informed, as additional work may be required.

Site assessments can range from limited observations to extensive investigations, and testing. The degree of uncertainty in interpreting a site's environmental condition will depend upon the budget and scope of work authorised by the client. Some degree of uncertainty will always exist.

Groundwater and ground gas monitoring observations are applicable to those dates on which they were made and concentrations may vary.

Chemical analysis was formulated to comply with land / groundwater quality assessment for Part 2A, Environmental Protection Act, 1990 (as amended) assessment. Analysis was not formulated to comply with drinking water supply requirements; unless stated otherwise.

The phrase 'suitable for use' is in keeping with the terminology used in planning designation and does not imply any specific warranty or guarantee.

This report may identify risks to site workers, including those during demolition, maintenance and redevelopment. Guidance on occupational health and safety issues is beyond the brief and scope of this report and appropriate advice should be sought by the client.

Please note that notwithstanding any site observations, including the presence or otherwise of archaeology; flora / fauna, including invasive weeds e.g. Japanese Knotweed, and / or asbestos-containing materials, this report does not comprise a formal survey and expert survey(s) / advice should be sought.

The recommendations in this report assume that ground levels will remain as those during the investigation, unless stated otherwise. If re-profiling is undertaken, then the conclusions and recommendations made may need re-evaluating. Any site boundary line on plans does not imply legal ownership of land.

This report has been prepared solely for the benefit of our client, GRG, for the purpose as outlined above. New site information, changes in practice / guidance or new legislation may require revised interpretation of the report, subsequent to its issue.

No warranty is offered to any third party and no responsibility or liability will be accepted for any loss or damage in the event that this report is relied upon, either in its entirety or in part, by a third party or used in circumstances for which it was not originally intended. This report shall not be transferred to or relied upon by any other party without express written permission of Mayer Environmental Ltd.

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Appendix A

Site Plans

NORTH

NOTES

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This drawing originates from the CAD file:

S:\2021\21815_Humber Gate, Grimsby\010_BSB Drawings+\020_Current Issue+\050 Conveyancing\21815-BSB-00-XX-M2-A-0110-P4_0111-P3_0113-P1_0114-P2.dwg

REVISIONS

Rev	Description	Dwn	Date	Chk	Date
P1	First Issue	jnh	21/07/23	jpm	21/07/23
P2	Land around bridge added & strip south of C added	jnh	04/08/23	jpm	04/08/23

0 50 100

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CLIENT
Humber Land (Grimsby) Unit Trust

PROJECT
Site C & I Disposal
Humber Gate, Energy Park Way
Grimsby, North East Lincolnshire

DRAWING TITLE
Conveyancing Plan 1

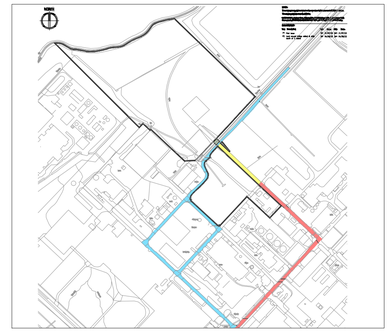
Drawing Status	Scale	Sheet Size
For Information_S2	1:2500	A3
	Drawn: jnh	Date: 21/07/23
	Checked: jpm	Date: 21/07/23
Drawing No.		Revision
21815-BSB-00-XX-DR-A-0114		P2

OPTION 2

NORTH

NOTES:

KEYPLAN



Notes:

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3) BROWNFIELD SITE SO CONTRACTOR TO MITIGATE AGAINST RISK OF HITTING OR COMPROMISING LEGACY UNDERGROUND INFRASTRUCTURE.
4) GROUND TO BE ASSESSED FOR STABILITY PRIOR TO SETTING UP ANY PLANT / EQUIPMENT. GROUND IMPROVEMENTS TO BE RESPONSIBILITY OF GEOTECHNICAL COMPANY.
5) GEOTECHNICAL INVESTIGATION TO TAKE INTO ACCOUNT FINDINGS OF ECOLOGY AND APPLICABLE ENVIRONMENT STUDY REPORTS AND INFORMATION.

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1) Castell Bach Engineering Ltd. Have not been engaged as Principal Designer or Principal Contractor and accept no responsibility for associated responsibilities under CDM Regulations.
2) Castell Bach Engineering Ltd. as a Designer, would like to inform Client of their responsibilities under CDM Regs 2015. Including but not limited to:
   a) Providing pre-construction information to designer and contractor;
   b) Providing suitable welfare facilities for duration of project;
   c) Allowing sufficient time and resources at each stage of the Project;
   d) Prepares and updates the site Health and Safety file.for site and/or project.
2) Principal Contractor should provide a construction phase plan before construction work begins.
3) Principal Designer should base design on Client provided information, elimination foreseeable health and safety risks and take steps to reduce or control any risks that cannot be eliminated.

REV	DATE	DESCRIPTION	DESIGN	DRAWN	CHK	APP
A	5TH_SEP_23	ISSUED_FOR_INFO	JW			

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GRG WASTE UK

Castell Bach Engineering Ltd

PROJECT
HUMBER
PHASE_1

TITLE
CONCEPT_LAYOUT_OPTION_2
SITE_NORTH

SCALE	PROJECT No	DOCUMENT No	REV
1:1750	231	231-CK-001_SHT2	X

Project Id:	129-002870	Title:	Site Plan
Project Title:	Humber Gate, Grimsby	Scale:	1:3500
Location:	Humber Gate, Energy Park Way, DN31 2TT	Engineer:	Rebecca Beddard
Client:	Mayer Environmental Ltd		

Legend Key

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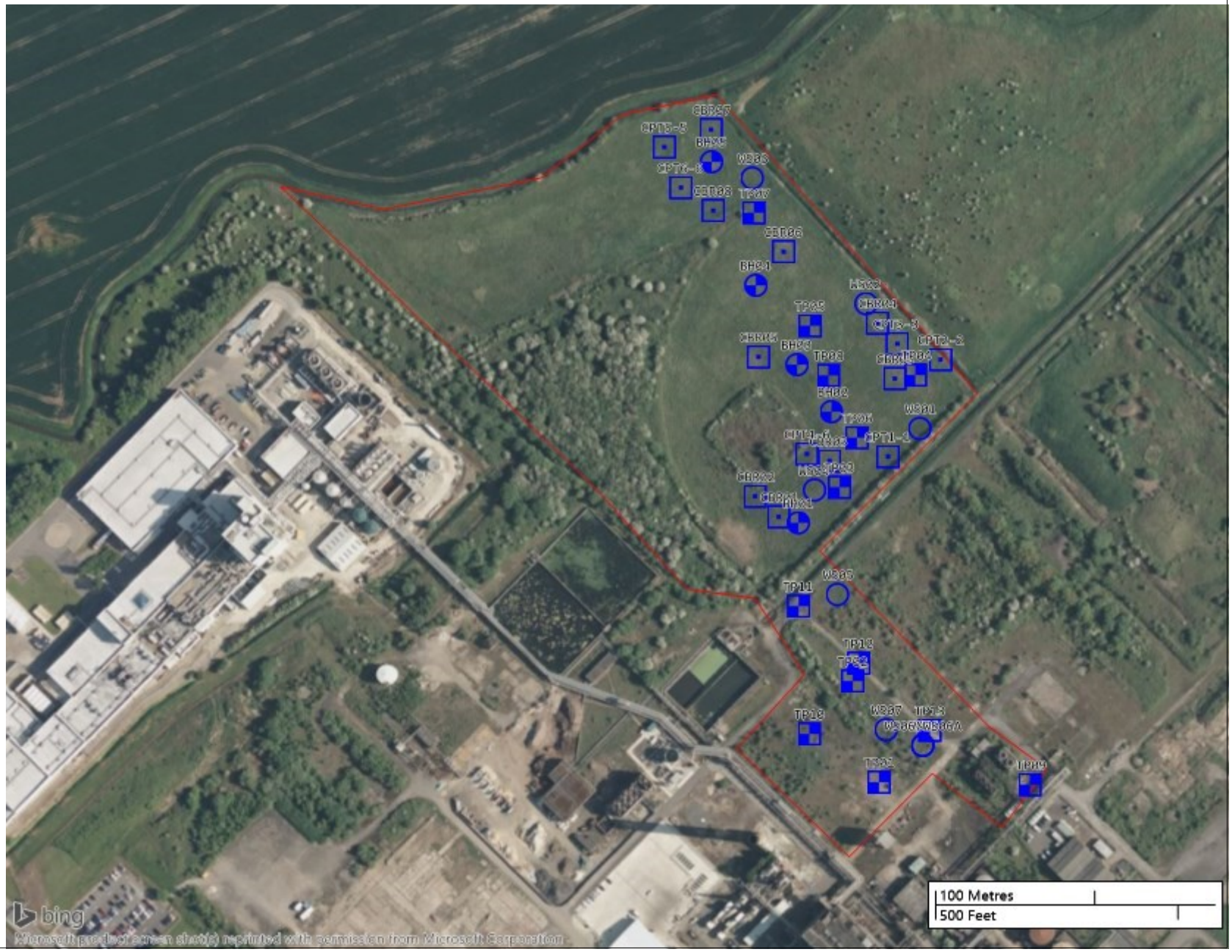
- Locations By Type - CP
- Locations By Type - IP
- Locations By Type - TP
- Locations By Type - WLS
- Project Bounds - Project Bounds



Appendix B

Photographs

SITE WALKOVER

Photograph 1 – Scrub vegetation on Plot C

Photograph 2 – Effluent pipe running between Plot C & Plot I

Photograph 3 – Lagoons associated with Lenzing adjacent to site

Photograph 4 – Existing buildings on Plot C with suspected asbestos cladding

Photograph 5 – Paint cans stored on Plot C

Photograph 6 – Area behind buildings on Plot C

Photograph 7 – Evidence of fly tipping on Plot C

Photograph 8 – Densely vegetated area on Plot I

Photograph 9 – view across Plot I from entrance near Plot C

Photograph 10 – View towards adjacent industrial estate

Photograph 11 – Oldfleet Drain looking towards Power Station

Photograph 12 – Hazardous gas sign close to adjacent landfill

GROUND INVESTIGATION

Photograph 13 – TP01 on Plot C

photograph 14 – WS05 on Plot C

Photograph 15 – TP12 on Plot C

Photograph 16 – TP04 on Plot I showing stiff brown clay above soft dark grey clay typical of ground conditions across Plot I

Photograph 17 – Cores from WS01 (Plot I)

Photograph 18 – TP06 (Plot I) showing general strata layers of brown and grey clay

Appendix C

Groundsure Report

Groundsure
LOCATION INTELLIGENCE

Enviro+Geo Insight

Humber Gate, Grimsby Plots I & C, DN31 2TT

Order Details

Date: 27/07/2023

Your ref: 129-002870__HTI_Grimsby_

Our Ref: GS-O2P-IB2-NLY-4N8

Site Details

Location: 523705 412714

Area: 9.16 ha

Authority: North East Lincolnshire Council ↗

Summary of findings p. 2 >

Aerial image p. 9 >

OS MasterMap site plan p.14 >

groundsure.com/insightuserguide ↗

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

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 >	7	3	12	3	-
17 >	1.2 >	Historical tanks >	0	5	20	3	-
18 >	1.3 >	Historical energy features >	0	0	0	1	-
18	1.4	Historical petrol stations	0	0	0	0	-
19	1.5	Historical garages	0	0	0	0	-
19	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
20 >	2.1 >	Historical industrial land uses >	10	9	20	6	-
22 >	2.2 >	Historical tanks >	0	6	32	6	-
24 >	2.3 >	Historical energy features >	0	0	0	2	-
24	2.4	Historical petrol stations	0	0	0	0	-
25	2.5	Historical garages	0	0	0	0	-
Page	Section	Waste and landfill >	On site	0-50m	50-250m	250-500m	500-2000m
26 >	3.1 >	Active or recent landfill >	0	1	0	0	-
27 >	3.2 >	Historical landfill (BGS records) >	0	0	0	1	-
27	3.3	Historical landfill (LA/mapping records)	0	0	0	0	-
27 >	3.4 >	Historical landfill (EA/NRW records) >	1	0	2	2	-
28 >	3.5 >	Historical waste sites >	0	0	1	0	-
29 >	3.6 >	Licensed waste sites >	0	2	5	4	-
32 >	3.7 >	Waste exemptions >	0	0	9	0	-
Page	Section	Current industrial land use >	On site	0-50m	50-250m	250-500m	500-2000m
34 >	4.1 >	Recent industrial land uses >	0	1	9	-	-
35	4.2	Current or recent petrol stations	0	0	0	0	-
35	4.3	Electricity cables	0	0	0	0	-
35	4.4	Gas pipelines	0	0	0	0	-
36 >	4.5 >	Sites determined as Contaminated Land >	0	0	1	0	-

36 >	4.6 >	Control of Major Accident Hazards (COMAH) >	2	0	0	3	-
37	4.7	Regulated explosive sites	0	0	0	0	-
37 >	4.8 >	Hazardous substance storage/usage >	0	0	4	3	-
38 >	4.9 >	Historical licensed industrial activities (IPC) >	0	0	0	25	-
41 >	4.10 >	Licensed industrial activities (Part A(1)) >	0	0	24	21	-
49 >	4.11 >	Licensed pollutant release (Part A(2)/B) >	0	0	0	1	-
49	4.12	Radioactive Substance Authorisations	0	0	0	0	-
49 >	4.13 >	Licensed Discharges to controlled waters >	0	0	0	1	-
50	4.14	Pollutant release to surface waters (Red List)	0	0	0	0	-
50	4.15	Pollutant release to public sewer	0	0	0	0	-
50 >	4.16 >	List 1 Dangerous Substances >	0	1	0	0	-
50 >	4.17 >	List 2 Dangerous Substances >	0	1	0	0	-
51 >	4.18 >	Pollution Incidents (EA/NRW) >	0	0	1	3	-
51 >	4.19 >	Pollution inventory substances >	0	0	3	4	-
54 >	4.20 >	Pollution inventory waste transfers >	0	0	2	2	-
60	4.21	Pollution inventory radioactive waste	0	0	0	0	-

Page	Section	Hydrogeology >	On site	0-50m	50-250m	250-500m	500-2000m
61 >	5.1 >	Superficial aquifer >	Identified (within 500m)				
62 >	5.2 >	Bedrock aquifer >	Identified (within 500m)				
63 >	5.3 >	Groundwater vulnerability >	Identified (within 50m)				
64	5.4	Groundwater vulnerability- soluble rock risk	None (within 0m)				
64	5.5	Groundwater vulnerability- local information	None (within 0m)				
65 >	5.6 >	Groundwater abstractions >	0	0	0	0	29
71 >	5.7 >	Surface water abstractions >	0	0	0	0	1
72	5.8	Potable abstractions	0	0	0	0	0
72 >	5.9 >	Source Protection Zones >	0	0	0	1	-
72	5.10	Source Protection Zones (confined aquifer)	0	0	0	0	-

Page	Section	Hydrology >	On site	0-50m	50-250m	250-500m	500-2000m
73 >	6.1 >	Water Network (OS MasterMap) >	5	4	9	-	-

75 >	6.2 >	Surface water features >	1	3	6	-	-
75 >	6.3 >	WFD Surface water body catchments >	1	-	-	-	-
76 >	6.4 >	WFD Surface water bodies >	0	0	1	-	-
76 >	6.5 >	WFD Groundwater bodies >	1	-	-	-	-
Page	Section	**River and coastal flooding >**	On site	0-50m	50-250m	250-500m	500-2000m
77 >	7.1 >	Risk of flooding from rivers and the sea >	High (within 50m)				
78 >	7.2 >	Historical Flood Events >	1	0	0	-	-
78 >	7.3 >	Flood Defences >	0	0	1	-	-
79	7.4	Areas Benefiting from Flood Defences	0	0	0	-	-
79	7.5	Flood Storage Areas	0	0	0	-	-
80 >	7.6 >	Flood Zone 2 >	Identified (within 50m)				
81 >	7.7 >	Flood Zone 3 >	Identified (within 50m)				
Page	Section	**Surface water flooding >**					
82 >	8.1 >	Surface water flooding >	1 in 30 year, 0.3m - 1.0m (within 50m)				
Page	Section	**Groundwater flooding >**					
84 >	9.1 >	Groundwater flooding >	High (within 50m)				
Page	Section	**Environmental designations >**	On site	0-50m	50-250m	250-500m	500-2000m
85 >	10.1 >	Sites of Special Scientific Interest (SSSI) >	0	0	1	0	1
86 >	10.2 >	Conserved wetland sites (Ramsar sites) >	0	0	1	0	1
90 >	10.3 >	Special Areas of Conservation (SAC) >	0	0	1	0	0
90 >	10.4 >	Special Protection Areas (SPA) >	0	0	1	0	3
92	10.5	National Nature Reserves (NNR)	0	0	0	0	0
92	10.6	Local Nature Reserves (LNR)	0	0	0	0	0
92	10.7	Designated Ancient Woodland	0	0	0	0	0
93	10.8	Biosphere Reserves	0	0	0	0	0
93	10.9	Forest Parks	0	0	0	0	0
93	10.10	Marine Conservation Zones	0	0	0	0	0
93	10.11	Green Belt	0	0	0	0	0
93	10.12	Proposed Ramsar sites	0	0	0	0	0

94	10.13	Possible Special Areas of Conservation (pSAC)	0	0	0	0	0
94	10.14	Potential Special Protection Areas (pSPA)	0	0	0	0	0
94	10.15	Nitrate Sensitive Areas	0	0	0	0	0
94 >	10.16 >	Nitrate Vulnerable Zones >	1	0	1	0	3
96 >	10.17 >	SSSI Impact Risk Zones >	5	-	-	-	-
98 >	10.18 >	SSSI Units >	0	0	1	1	5
Page	Section	Visual and cultural designations	On site	0-50m	50-250m	250-500m	500-2000m
113	11.1	World Heritage Sites	0	0	0	-	-
113	11.2	Area of Outstanding Natural Beauty	0	0	0	-	-
113	11.3	National Parks	0	0	0	-	-
113	11.4	Listed Buildings	0	0	0	-	-
114	11.5	Conservation Areas	0	0	0	-	-
114	11.6	Scheduled Ancient Monuments	0	0	0	-	-
114	11.7	Registered Parks and Gardens	0	0	0	-	-
Page	Section	Agricultural designations >	On site	0-50m	50-250m	250-500m	500-2000m
115 >	12.1 >	Agricultural Land Classification >	Grade 3 (within 250m)				
116	12.2	Open Access Land	0	0	0	-	-
116	12.3	Tree Felling Licences	0	0	0	-	-
116	12.4	Environmental Stewardship Schemes	0	0	0	-	-
116	12.5	Countryside Stewardship Schemes	0	0	0	-	-
Page	Section	Habitat designations >	On site	0-50m	50-250m	250-500m	500-2000m
117 >	13.1 >	Priority Habitat Inventory >	1	0	2	-	-
118 >	13.2 >	Habitat Networks >	1	1	3	-	-
118	13.3	Open Mosaic Habitat	0	0	0	-	-
118	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
119 >	14.1 >	10k Availability >	Identified (within 500m)				
120	14.2	Artificial and made ground (10k)	0	0	0	0	-
121	14.3	Superficial geology (10k)	0	0	0	0	-

121	14.4	Landslip (10k)	0	0	0	0	-
122	14.5	Bedrock geology (10k)	0	0	0	0	-
122	14.6	Bedrock faults and other linear features (10k)	0	0	0	0	-
Page	Section	**Geology 1:50,000 scale >**	On site	0-50m	50-250m	250-500m	500-2000m
123 >	15.1 >	50k Availability >	Identified (within 500m)				
124 >	15.2 >	Artificial and made ground (50k) >	1	2	3	1	-
125 >	15.3 >	Artificial ground permeability (50k) >	1	2	-	-	-
126 >	15.4 >	Superficial geology (50k) >	1	0	1	0	-
127 >	15.5 >	Superficial permeability (50k) >	Identified (within 50m)				
127	15.6	Landslip (50k)	0	0	0	0	-
127	15.7	Landslip permeability (50k)	None (within 50m)				
128 >	15.8 >	Bedrock geology (50k) >	1	0	0	0	-
129 >	15.9 >	Bedrock permeability (50k) >	Identified (within 50m)				
129	15.10	Bedrock faults and other linear features (50k)	0	0	0	0	-
Page	Section	**Boreholes >**	On site	0-50m	50-250m	250-500m	500-2000m
130 >	16.1 >	BGS Boreholes >	0	0	1	-	-
Page	Section	**Natural ground subsidence >**					
131 >	17.1 >	Shrink swell clays >	Low (within 50m)				
132 >	17.2 >	Running sands >	Moderate (within 50m)				
134 >	17.3 >	Compressible deposits >	Moderate (within 50m)				
136 >	17.4 >	Collapsible deposits >	Negligible (within 50m)				
137 >	17.5 >	Landslides >	Very low (within 50m)				
138 >	17.6 >	Ground dissolution of soluble rocks >	Negligible (within 50m)				
Page	Section	Mining and ground workings	On site	0-50m	50-250m	250-500m	500-2000m
140	18.1	BritPits	0	0	0	0	-
140	18.2	Surface ground workings	0	0	0	-	-
140	18.3	Underground workings	0	0	0	0	0
140	18.4	Underground mining extents	0	0	0	0	-
141	18.5	Historical Mineral Planning Areas	0	0	0	0	-

141	18.6	Non-coal mining	0	0	0	0	0
141	18.7	JPB mining areas	None (within 0m)				
141	18.8	The Coal Authority non-coal mining	0	0	0	0	-
142	18.9	Researched mining	0	0	0	0	-
142	18.10	Mining record office plans	0	0	0	0	-
142	18.11	BGS mine plans	0	0	0	0	-
142	18.12	Coal mining	None (within 0m)				
142	18.13	Brine areas	None (within 0m)				
143	18.14	Gypsum areas	None (within 0m)				
143	18.15	Tin mining	None (within 0m)				
143	18.16	Clay mining	None (within 0m)				
Page	Section	Ground cavities and sinkholes	On site	0-50m	50-250m	250-500m	500-2000m
144	19.1	Natural cavities	0	0	0	0	-
144	19.2	Mining cavities	0	0	0	0	0
144	19.3	Reported recent incidents	0	0	0	0	-
144	19.4	Historical incidents	0	0	0	0	-
145	19.5	National karst database	0	0	0	0	-
Page	Section	**Radon** >					
146 >	**20.1** >	**Radon** >	Less than 1% (within 0m)				
Page	Section	**Soil chemistry** >	On site	0-50m	50-250m	250-500m	500-2000m
148 >	**21.1** >	**BGS Estimated Background Soil Chemistry** >	4	3	-	-	-
148	21.2	BGS Estimated Urban Soil Chemistry	0	0	-	-	-
149	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
150	22.1	Underground railways (London)	0	0	0	-	-
150	22.2	Underground railways (Non-London)	0	0	0	-	-
151	22.3	Railway tunnels	0	0	0	-	-
151 >	**22.4** >	**Historical railway and tunnel features** >	4	1	1	-	-
151	22.5	Royal Mail tunnels	0	0	0	-	-

152 >	**22.6 >**	**Historical railways >**	2	0	1	-	-
152	22.7	Railways	0	0	0	-	-
152	22.8	Crossrail 1	0	0	0	0	-
152	22.9	Crossrail 2	0	0	0	0	-
153	22.10	HS2	0	0	0	0	-

Recent aerial photograph

Capture Date: 17/09/2019

Site Area: 9.16ha

Recent site history - 2016 aerial photograph

Capture Date: 21/04/2016

Site Area: 9.16ha

Recent site history - 2015 aerial photograph

Capture Date: 16/08/2015

Site Area: 9.16ha

Recent site history - 2009 aerial photograph

Capture Date: 02/06/2009

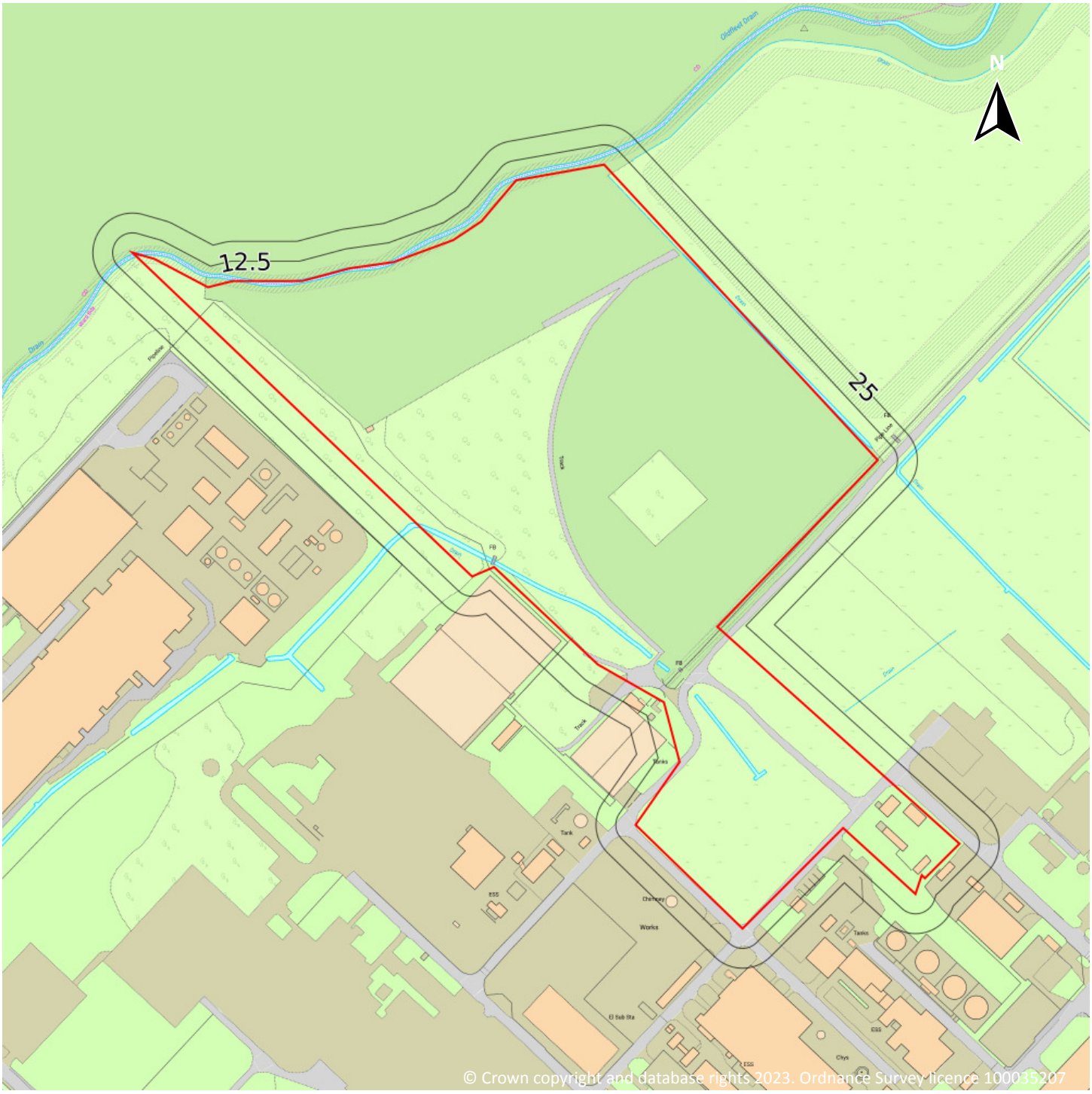
Site Area: 9.16ha

Recent site history - 1999 aerial photograph

Capture Date: 03/07/1999

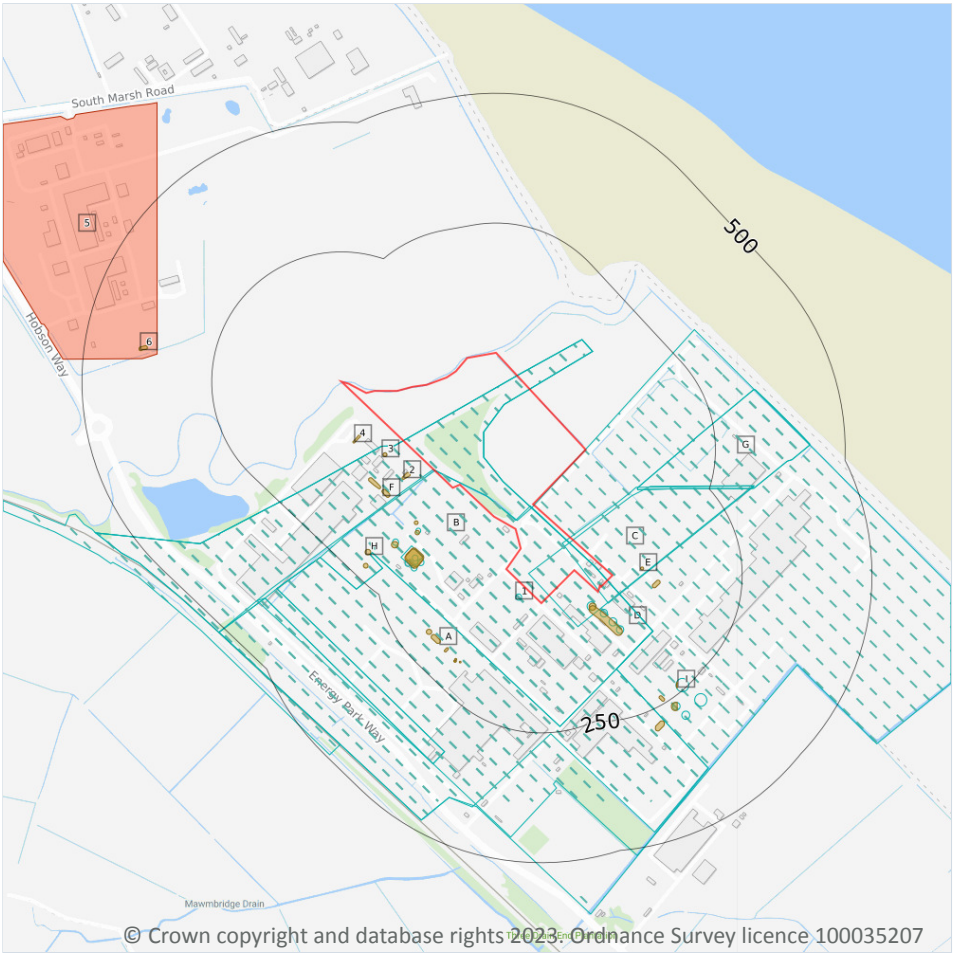
Site Area: 9.16ha

OS MasterMap site plan



Site Area: 9.16ha

1 Past land use



Site Outline

Search buffers in metres (m)

Historical industrial land uses

Historical tanks

Historical energy features

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
A	**On site**	**Unspecified Works**	**1968**	**1991062**

ID	Location	Land use	Dates present	Group ID
A	**On site**	**Unspecified Works**	**1965**	**2001495**
B	**On site**	**Railway Sidings**	**1968 - 1988**	**1991865**
B	**On site**	**Railway Sidings**	**1965**	**2001368**
C	**On site**	**Rifle Range**	**1931**	**1992410**
C	**On site**	**Rifle Range**	**1938 - 1946**	**1996056**
D	**On site**	**Unspecified Works**	**1980 - 1988**	**1992669**
1	16m S	Chimney	1965 - 1988	1991047
D	22m SE	Unspecified Tank	1968 - 1988	1990283
D	35m SE	Unspecified Tank	1980 - 1988	1998211
D	57m SE	Unspecified Tank	1980 - 1988	1994150
D	77m SE	Unspecified Tank	1980 - 1988	1999664
B	101m SW	Unspecified Tank	1980 - 1988	1992951
G	124m E	Rifle Range	1930	1990625
G	124m E	Rifle Range	1947	1999064
B	137m SW	Unspecified Tanks	1968 - 1988	1997472
B	146m SW	Unspecified Tank	1980 - 1988	1993295
B	148m SW	Unspecified Tank	1965	1986807
B	150m SW	Unspecified Tank	1965	1986808
B	164m SW	Unspecified Tank	1965	1986805
B	165m SW	Unspecified Tank	1965	1986806
I	230m SE	Unspecified Tank	1980 - 1988	1992061
I	260m SE	Unspecified Tank	1980 - 1988	1999319
I	275m SE	Unspecified Tank	1980 - 1988	2000638
I	284m SE	Unspecified Tank	1980 - 1988	2002252

This data is sourced from Ordnance Survey / Groundsure.

1.2 Historical tanks

Records within 500m	28

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
D	24m SE	Unspecified Tank	1964	333650
D	28m SE	Tanks	1996 - 1999	336871
2	37m W	Tanks	1999	332501
3	40m W	Unspecified Tank	1999	333607
4	50m W	Tanks	1999	332500
E	56m SE	Unspecified Tank	1996 - 1999	336596
E	79m SE	Tanks	1996 - 1999	337484
F	92m W	Tanks	1999	332503
B	94m SW	Unspecified Tank	1999	333606
F	94m W	Tanks	1999	332502
B	106m SW	Unspecified Tank	1996 - 1999	336537
B	137m SW	Tanks	1964	335526
B	139m SW	Tanks	1996 - 1999	334259
B	150m SW	Unspecified Tank	1996 - 1999	336468
A	187m S	Tanks	1996 - 1999	334507
A	187m S	Unspecified Tank	1996 - 1999	336645
A	187m S	Tanks	1964	332505
A	189m S	Unspecified Tank	1996 - 1999	336730
A	191m S	Unspecified Tank	1964	336557
A	194m S	Unspecified Tank	1996	335206
A	194m S	Unspecified Tank	1999	337273

ID	Location	Land use	Dates present	Group ID
H	197m SW	Unspecified Tank	1996 - 1999	337633
H	220m SW	Unspecified Tank	1996 - 1999	335779
I	232m SE	Unspecified Tank	1996 - 1999	336686
I	234m SE	Tanks	1996 - 1999	334659
I	259m SE	Tanks	1996 - 1999	335768
I	277m SE	Tanks	1964 - 1999	335942
6	379m W	Tanks	1999	332480

This data is sourced from Ordnance Survey / Groundsure.

1.3 Historical energy features

Records within 500m	1

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'.

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

ID	Location	Land use	Dates present	Group ID
5	359m W	Power Station	1998 - 1999	219862

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.

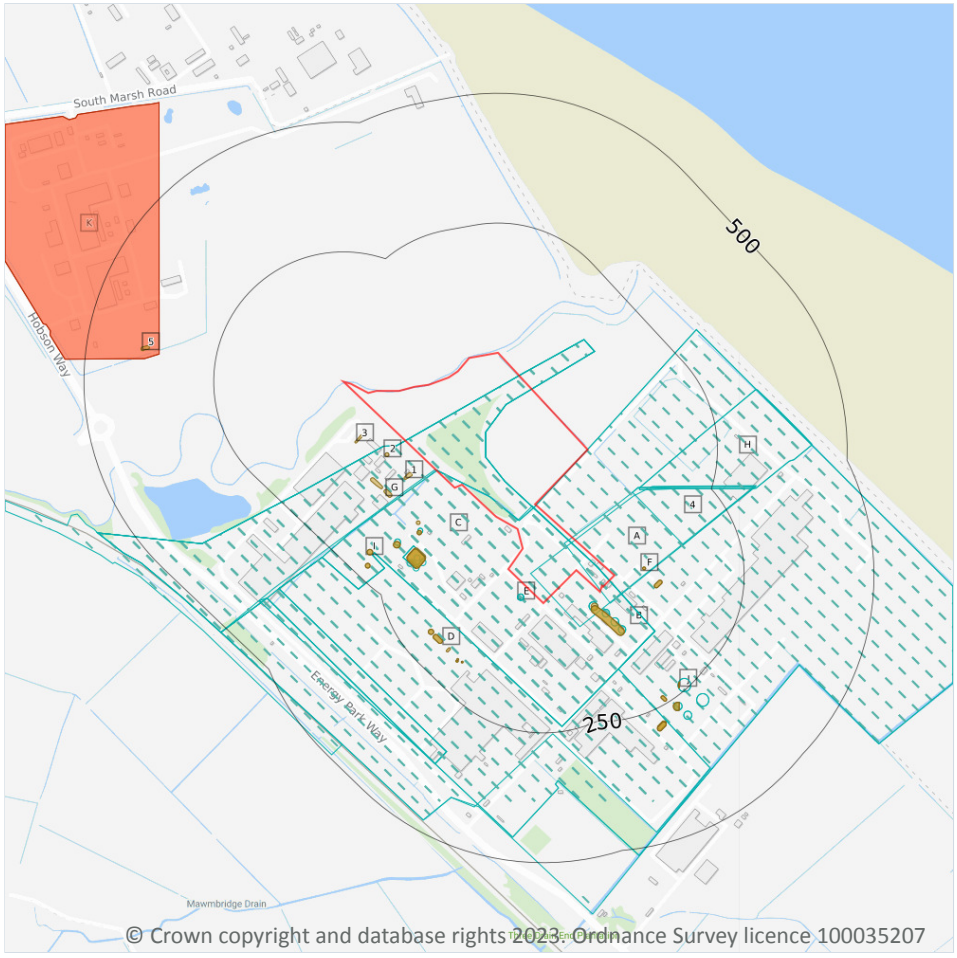
1.6 Historical military land

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

Historical energy features

2.1 Historical industrial land uses

Records within 500m	45

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 20 >**

ID	Location	Land Use	Date	Group ID
A	**On site**	**Rifle Range**	**1931**	**1992410**
A	**On site**	**Rifle Range**	**1938**	**1996056**
B	**On site**	**Unspecified Works**	**1988**	**1992669**

ID	Location	Land Use	Date	Group ID
B	**On site**	**Unspecified Works**	**1980**	**1992669**
C	**On site**	**Railway Sidings**	**1988**	**1991865**
C	**On site**	**Railway Sidings**	**1980**	**1991865**
C	**On site**	**Railway Sidings**	**1968**	**1991865**
C	**On site**	**Railway Sidings**	**1965**	**2001368**
D	**On site**	**Unspecified Works**	**1968**	**1991062**
D	**On site**	**Unspecified Works**	**1965**	**2001495**
E	16m S	Chimney	1988	1991047
E	16m S	Chimney	1980	1991047
E	16m S	Chimney	1968	1991047
E	16m S	Chimney	1965	1991047
B	22m SE	Unspecified Tank	1988	1990283
B	22m SE	Unspecified Tank	1980	1990283
B	22m SE	Unspecified Tank	1968	1990283
B	35m SE	Unspecified Tank	1988	1998211
B	35m SE	Unspecified Tank	1980	1998211
B	57m SE	Unspecified Tank	1988	1994150
B	57m SE	Unspecified Tank	1980	1994150
B	77m SE	Unspecified Tank	1988	1999664
B	77m SE	Unspecified Tank	1980	1999664
C	101m SW	Unspecified Tank	1988	1992951
C	101m SW	Unspecified Tank	1980	1992951
4	119m E	Rifle Range	1946	1996056
H	124m E	Rifle Range	1947	1999064
H	124m E	Rifle Range	1930	1990625
C	137m SW	Unspecified Tanks	1988	1997472
C	137m SW	Unspecified Tanks	1980	1997472
C	137m SW	Unspecified Tanks	1968	1997472

ID	Location	Land Use	Date	Group ID
C	146m SW	Unspecified Tank	1988	1993295
C	146m SW	Unspecified Tank	1980	1993295
C	148m SW	Unspecified Tank	1965	1986807
C	150m SW	Unspecified Tank	1965	1986808
C	164m SW	Unspecified Tank	1965	1986805
C	165m SW	Unspecified Tank	1965	1986806
J	230m SE	Unspecified Tank	1988	1992061
J	230m SE	Unspecified Tank	1980	1992061
J	260m SE	Unspecified Tank	1988	1999319
J	260m SE	Unspecified Tank	1980	1999319
J	275m SE	Unspecified Tank	1988	2000638
J	275m SE	Unspecified Tank	1980	2000638
J	284m SE	Unspecified Tank	1988	2002252
J	284m SE	Unspecified Tank	1980	2002252

This data is sourced from Ordnance Survey / Groundsure.

2.2 Historical tanks

Records within 500m	**44**

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 20 >**

ID	Location	Land Use	Date	Group ID
B	24m SE	Unspecified Tank	1964	333650
B	28m SE	Tanks	1996	336871
B	28m SE	Tanks	1999	336871
1	37m W	Tanks	1999	332501
2	40m W	Unspecified Tank	1999	333607
3	50m W	Tanks	1999	332500

ID	Location	Land Use	Date	Group ID
F	56m SE	Unspecified Tank	1996	336596
F	56m SE	Unspecified Tank	1999	336596
F	79m SE	Tanks	1996	337484
F	79m SE	Tanks	1999	337484
G	92m W	Tanks	1999	332503
C	94m SW	Unspecified Tank	1999	333606
G	94m W	Tanks	1999	332502
C	106m SW	Unspecified Tank	1996	336537
C	106m SW	Unspecified Tank	1999	336537
C	137m SW	Tanks	1964	335526
C	139m SW	Tanks	1996	334259
C	139m SW	Tanks	1999	334259
C	150m SW	Unspecified Tank	1996	336468
C	150m SW	Unspecified Tank	1999	336468
D	187m S	Tanks	1996	334507
D	187m S	Tanks	1999	334507
D	187m S	Unspecified Tank	1996	336645
D	187m S	Unspecified Tank	1999	336645
D	187m S	Tanks	1964	332505
D	189m S	Unspecified Tank	1996	336730
D	189m S	Unspecified Tank	1999	336730
D	191m S	Unspecified Tank	1964	336557
D	194m S	Unspecified Tank	1996	335206
D	194m S	Unspecified Tank	1999	337273
I	197m SW	Unspecified Tank	1996	337633
I	197m SW	Unspecified Tank	1999	337633
I	220m SW	Unspecified Tank	1996	335779
I	220m SW	Unspecified Tank	1999	335779

ID	Location	Land Use	Date	Group ID
J	232m SE	Unspecified Tank	1996	336686
J	232m SE	Unspecified Tank	1999	336686
J	234m SE	Tanks	1996	334659
J	234m SE	Tanks	1999	334659
J	259m SE	Tanks	1996	335768
J	259m SE	Tanks	1999	335768
J	277m SE	Tanks	1964	335942
J	279m SE	Tanks	1996	335942
J	279m SE	Tanks	1999	335942
5	379m W	Tanks	1999	332480

This data is sourced from Ordnance Survey / Groundsure.

2.3 Historical energy features

Records within 500m	2

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'.

Features are displayed on the Past land use - un-grouped map on **page 20 >**

ID	Location	Land Use	Date	Group ID
K	359m W	Power Station	1998	219862
K	359m W	Power Station	1999	219862

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.

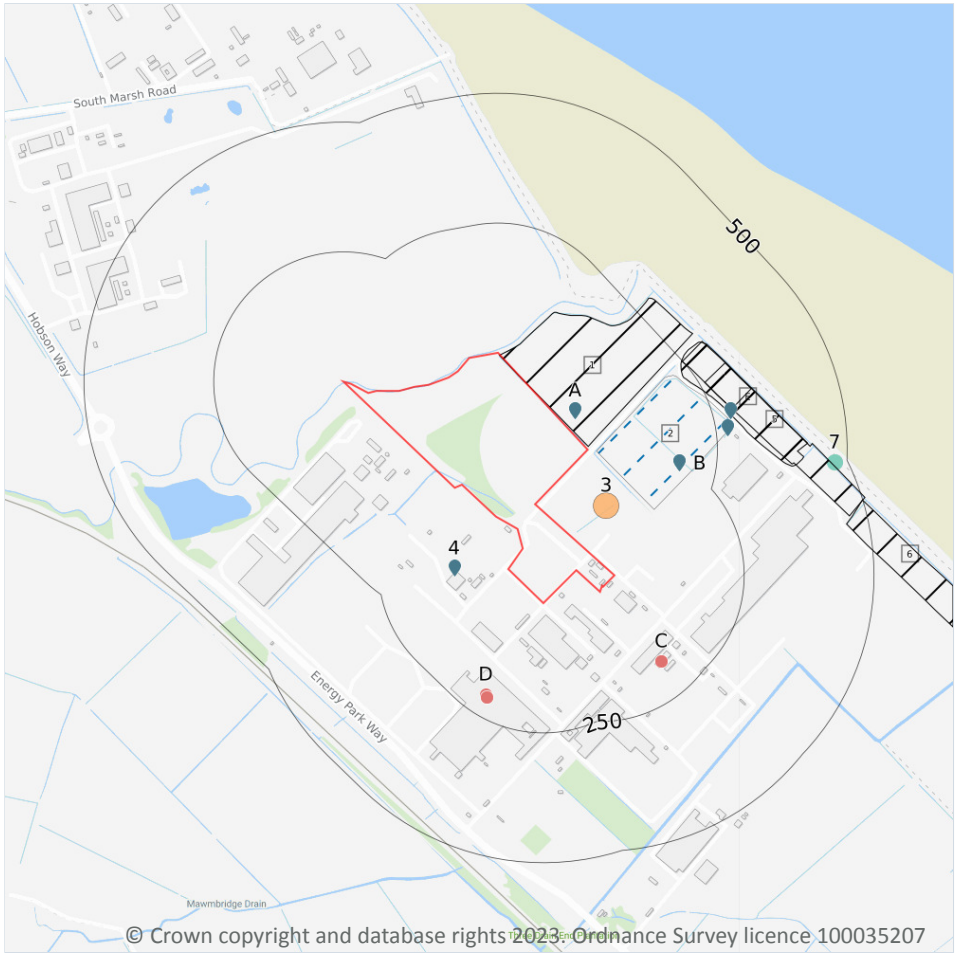
2.5 Historical garages

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)

Active or recent landfill

Historical landfill (EA/NRW)

Historical landfill (BGS)

Historical waste sites

Licensed waste sites

Waste exemptions

3.1 Active or recent landfill

Records within 500m	1

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

Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Details	
2	17m E	Operator: Acordis U K Ltd Site Address: Acordis U K Ltd, Greatcoates Works, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS	WML Number: 70836 EPR Reference: COU003 Landfill type: A07: Industrial Waste Landfill (Factory curtilage) Status: To PPC IPPC Reference: - EPR Number: EA/EPR/JP3595NK/A001

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

3.2 Historical landfill (BGS records)

Records within 500m	1

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.

Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Address	BGS Number	Risk	Waste Type
7	476m E	Courtaulds Ltd, Great Coates Works, Grimsby, Linc	1265	No risk to aquifer	N/A

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	5

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.

Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Details		
1	**On site**	**Site Address: No. 3 Landfill, P O Box 24, Grimsby, Greatcoates Works, N E Lincs** **Licence Holder Address: P O Box 24, Grimsby, Greatcoates Works, N E Lincs**	**Waste Licence: Yes** **Site Reference: -** **Waste Type: Industrial** **Environmental Permitting Regulations (Waste) Reference: -** **Licence Issue: 20/04/1983** **Licence Surrender: 13/10/2008**	**Operator: Acordis U K Ltd** **Licence Holder: Acordis U K Ltd** **First Recorded -** **Last Recorded: -**

ID	Location	Details		
E	231m NE	Site Address: Courtaulds No 2 Landfill, No 2 Landfill, Grimsby, N E Lincs Licence Holder Address: P O Box 24, Grimsby, Greatcoates, N E Lincs	Waste Licence: Yes Site Reference: - Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: YP4/L/KIR001 Licence Issue: 10/07/1995 Licence Surrender: 13/10/2008	Operator: Acordis U K Ltd Licence Holder: Acordis U K Ltd First Recorded - Last Recorded: -
5	248m NE	Site Address: Courtaulds No 2 Landfill, Greatcoates Works, Grimsby, Lincolnshire Licence Holder Address: -	Waste Licence: - Site Reference: A897, 55/16/0439 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Courtaulds Limited Licence Holder: - First Recorded 01/08/1970 Last Recorded: 31/12/1980
E	260m E	Site Address: Courtaulds No.2 Landfill, Grimsby Licence Holder Address: -	Waste Licence: Yes Site Reference: 55/19/0924, 9240, 2000/5294 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: 10/07/1995 Licence Surrender: -	Operator: - Licence Holder: - First Recorded 31/12/1995 Last Recorded: -
6	458m E	Site Address: Great Coates Site C, Grimsby Licence Holder Address: -	Waste Licence: - Site Reference: 55/16/0440 Waste Type: Industrial Environmental Permitting Regulations (Waste) Reference: - Licence Issue: - Licence Surrender: -	Operator: Acordis (formerly Courtaulds limited) Licence Holder: - First Recorded 31/12/1970 Last Recorded: -

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

3.5 Historical waste sites

Records within 500m	**1**

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

Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Address	Further Details	Date
3	64m SE	Site Address: Pyrolysis, Energy Park Way, Tenth Avenue, Grimsby, Humberside, DN31 2SY, YORK.HUMB	Type of Site: Tyre Recycling Plant Planning application reference: DM/1103/22/FUL Description: Scheme comprises proposed tyre pyrolysis plant including 20 metres high flue, associated buildings, treatment and storage plant and tanks, conveyors, chillers, silo, ground mounted solar array, emergency flare, car parking, security fencing and landscapi ng. This project also includes associated infrastructure works and access roads. Data source: Historic Planning Application Data Type: Point	19/01/2023

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

3.6 Licensed waste sites

Records within 500m	**11**

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

Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Details		
A	33m NE	Site Name: No. 3 Landfill Site Address: Acordis U K Ltd, P O Box 24, Greatcoates Works, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU002 EPR reference: EA/EPR/DP3695NM/A001 Operator: Acordis U K Ltd Waste Management licence No: 70810 Annual Tonnage: 725000	Issue Date: 20/04/1983 Effective Date: - Modified: - Surrendered Date: 13/10/2008 Expiry Date: - Cancelled Date: - Status: Surrendered
A	33m NE	Site Name: No. 3 Landfill Site Address: Acordis U K Ltd, P O Box 24, Greatcoates Works, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU002 EPR reference: EA/EPR/DP3695NM/A001 Operator: Acordis U K Ltd Waste Management licence No: 70810 Annual Tonnage: 725000	Issue Date: 20/04/1983 Effective Date: - Modified: - Surrendered Date: Oct 13 2008 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered

ID	Location	Details		
4	104m S	Site Name: Moody Lane Materials Recycling Facility Site Address: RAPID COLLECTIONS LIMITED, RPM Limited, Energy Park Way, Healing, DN31 2TT Correspondence Address: -	Type of Site: Treatment of waste to produce soil 75,000 tpy Size: Unknown Environmental Permitting Regulations (Waste) Licence Number: - EPR reference: EA/EPR/WE0503AB/A001 Operator: RAPID COLLECTIONS LIMITED Waste Management licence No: 120397 Annual Tonnage: -	Issue Date: 11/03/2021 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
B	177m E	Site Name: Landfill No 4 (bw2960il) Site Address: Acordis U K Ltd, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC026 EPR reference: EA/EPR/CP3292NZ/A001 Operator: Acordis U K Ltd Waste Management licence No: 73225 Annual Tonnage: 250000	Issue Date: 01/11/2004 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Expired
B	177m E	Site Name: Landfill No 4 Site Address: Acordis U K Ltd, Greatcoates Works, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: Acordis U K Ltd, P O Box 24, Greatcoates, Grimsby, N E Lincs, DN31 2SS	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: >= 25000 tonnes 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU003 EPR reference: - Operator: Acordis U K Ltd Waste Management licence No: 70836 Annual Tonnage: 75000	Issue Date: 10/07/1995 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued
B	177m E	Site Name: Landfill No 4 Site Address: Acordis U K Ltd, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: Acordis U K Ltd, P O Box 24, Greatcoates, Grimsby, N E Lincs, DN31 2SS	Type of Site: Household, Commercial & Industrial Waste Landfill Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC026 EPR reference: - Operator: Acordis U K Ltd Waste Management licence No: 73225 Annual Tonnage: 0	Issue Date: 01/11/2004 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued

ID	Location	Details		
B	177m E	Site Name: Landfill No 4 (bw2960il) Site Address: Acordis U K Ltd, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: IPC026 EPR reference: EA/EPR/CP3292NZ/A001 Operator: Acordis U K Ltd Waste Management licence No: 73225 Annual Tonnage: 250000	Issue Date: 01/11/2004 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: To PPC
E	272m E	Site Name: Landfill No 4 Site Address: Acordis U K Ltd, Greatcoates Works, Greatcoate, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU003 EPR reference: EA/EPR/JP3595NK/A001 Operator: Acordis U K Ltd Waste Management licence No: 70836 Annual Tonnage: 75000	Issue Date: 10/07/1995 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: To PPC
E	272m E	Site Name: Landfill No 4 Site Address: Acordis U K Ltd, Greatcoates Works, Greatcoate, No 4 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU003 EPR reference: EA/EPR/JP3595NK/A001 Operator: Acordis U K Ltd Waste Management licence No: 70836 Annual Tonnage: 75000	Issue Date: 10/07/1995 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: To PPC
E	285m E	Site Name: Courtaulds No 2 Landfill Site Address: Acordis U K Ltd, Greatcoates Works, No 2 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: >= 75000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU001 EPR reference: EA/EPR/JP3895NN/A001 Operator: Acordis U K Ltd Waste Management licence No: 70838 Annual Tonnage: 425000	Issue Date: 10/07/1995 Effective Date: - Modified: - Surrendered Date: 13/10/2008 Expiry Date: - Cancelled Date: - Status: Surrendered

ID	Location	Details		
E	285m E	Site Name: Courtaulds No 2 Landfill Site Address: Acordis U K Ltd, Greatcoates Works, No 2 Landfill, Grimsby, N E Lincs, DN31 2SS Correspondence Address: -	Type of Site: Industrial Waste Landfill (Factory curtilage) Size: 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: COU001 EPR reference: EA/EPR/JP3895NN/A001 Operator: Acordis U K Ltd Waste Management licence No: 70838 Annual Tonnage: 425000	Issue Date: 10/07/1995 Effective Date: - Modified: - Surrendered Date: Oct 13 2008 12:00AM Expiry Date: - Cancelled Date: - Status: Surrendered

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

3.7 Waste exemptions

Records within 500m	**9**

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.

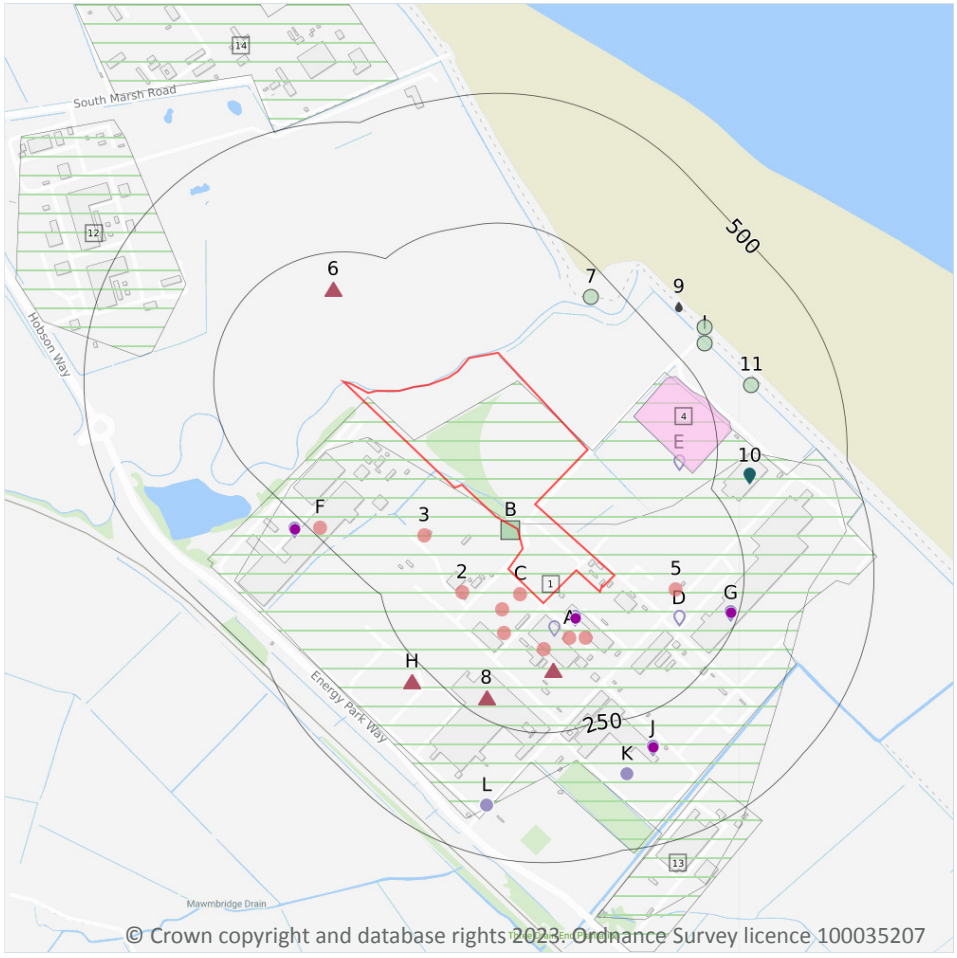
Features are displayed on the Waste and landfill map on **page 26 >**

ID	Location	Site	Reference	Category	Sub-Category	Description
C	179m SE	-	WEX262065	Using waste exemption	Not on a farm	Burning of waste as a fuel in a small appliance
C	179m SE	-	WEX262065	Storing waste exemption	Not on a farm	Storage of waste in a secure place
C	179m SE	-	WEX262065	Disposing of waste exemption	Not on a farm	Burning waste in the open
C	179m SE	-	WEX262065	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
D	208m S	Hunter Waste Energy Park Way GRIMSBY South Humberside DN31 2TT	EPR/NF0605GQ/A001	Treating waste exemption	Non-Agricultural Waste Only	Sorting mixed waste
D	213m S	Enviro, Humbergate, Moody Lane, Grimsby, DN31 2TT	WEX121885	Disposing of waste exemption	Not on a farm	Burning waste in the open
D	213m S	Enviro, Humbergate, Moody Lane, Grimsby, DN31 2TT	WEX121885	Storing waste exemption	Not on a farm	Storage of waste in a secure place

ID	Location	Site	Reference	Category	Sub-Category	Description
D	213m S	Enviro, Humbergate, Moody Lane, Grimsby, DN31 2TT	WEX121885	Treating waste exemption	Not on a farm	Preparatory treatments (baling, sorting, shredding etc)
D	213m S	Enviro, Humbergate, Moody Lane, Grimsby, DN31 2TT	WEX121885	Using waste exemption	Not on a farm	Burning of waste as a fuel in a small appliance

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
- Sites determined as Contaminated Land
- Control of Major Accident Hazards
- Hazardous substance storage/usage
- Historical licensed industrial activities
- Part A(1) industrial activities
- Licensed pollutant release (Part A(2)/B)
- Licensed Discharges to controlled waters
- List 1 Dangerous Substances
- List 2 Dangerous Substances
- Pollution Incidents (EA/NRW)
- Pollution inventory substances
- Pollution inventory waste transfers

4.1 Recent industrial land uses

Records within 250m	10

Current potentially contaminative industrial sites.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Company	Address	Activity	Category
C	18m S	Chimney	Lincolnshire, DN31	Chimneys	Industrial Features
C	64m S	Works	Lincolnshire, DN31	Unspecified Works Or Factories	Industrial Features
A	84m S	Chimney	Lincolnshire, DN31	Chimneys	Industrial Features

ID	Location	Company	Address	Activity	Category
A	88m S	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
A	92m SE	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
C	94m S	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
2	100m S	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
3	109m SW	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
5	121m SE	Electricity Sub Station	Lincolnshire, DN31	Electrical Features	Infrastructure and Facilities
F	235m W	Lenzing	-, Energy Park Way, Grimsby, Lincolnshire, DN31 2TT	Textiles, Fabrics, Silk and Machinery	Industrial Products

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	1

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

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Description	Site name	Category	Year identified
4	109m E	The EA undertook two assessments of the site, in 2009 and 2014. These highlighted a deterioration in surface water quality within land drains. Arcadis (UK) Ltd, on behalf of the EA, found the poeantial for leachate overtopping the bund to be significant. Work ongoing	Landfill Number 4, Land off Moody Lane, Great Coates, Grimsby, DN31 2SS	Contaminated Land	2017

This data is sourced from Local Authority records.

4.6 Control of Major Accident Hazards (COMAH)

Records within 500m	5

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 34 >**

ID	Location	Company	Address	Operational status	Tier
1	**On site**	**Blue Star Fibres Company Limited**	**Blue Star Fibres Company Limited, Great Coates, Grimsby, Po Box 24, Grimsby, North Lincolnshire, DN31 2SS**	**Historical NIHHS Site**	**-**
A	**On site**	**Courtaulds European Fibres Ltd**	**Courtaulds European Fibres Ltd, Pobox 24, Great Coates Works, Grimsby**	**Historical NIHHS Site**	**-**
12	355m NW	Boc Special Gases Division	Boc Special Gases Division, Hobson Way, Stallingborough, DN41 8JJ	Historical COMAH Site	-
13	417m SE	Solenis UK Industries Limited	Solenis UK Industries Limited, Grimsby, PO Box 63, Moody Lane, Grimsby, North Lincolnshire, DN31 2SY	Current COMAH Site	COMAH Upper Tier Operator

ID	Location	Company	Address	Operational status	Tier
14	498m NW	Synthomer (UK) Limited	Synthomer (UK) Limited, Grimsby, South Marsh Road, Stallingborough, Grimsby, North East Lincolnshire, DN37 8DB	Current COMAH Site	COMAH Lower 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	7

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 34 >**

ID	Location	Details	
A	130m S	Application reference number: HSC/DC/6 Application status: Historical Consent Application date: 03/11/1992 Address: Bluestar Fibres, PO Box 24, Great Coates, Grimsby, North East Lincolnshire, England, DN31 2TT	Details: Manufacture of acrylic fibre from acrylonitrile and other co-monomers, manufacture of viscose rayon and man made fibres from cellulose wood pulp. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
A	130m S	Application reference number: HSC/DC/6 Application status: Approved Application date: 03/11/1992 Address: Bluestar Fibres, PO Box 24, Great Coates, Grimsby, North East Lincolnshire, England, DN31 2TT	Details: Manufacture of acrylic fibre from acrylonitrile and other co-monomers, manufacture of viscose rayon and man made fibres from cellulose wood pulp. Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
6	179m NW	Application reference number: DC/576/07/IMM Application status: Historical Consent Application date: 16/06/2008 Address: RWE npower Renewables Ltd pka Helius Energy Plc, Land Off Hobson Way, Stallingborough, DN41 8JJ	Details: Storage Of Ethanol 20,000 Tonnes Under Schedule 8 Of The Electricity Act 1989 Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

ID	Location	Details	
8	213m S	Application reference number: No Details Application status: Approved Application date: No Details Address: RWE npower renewables PKA Helius Energy Plc, Hobson Way, Stallingborough, Grimsby, North East Lincolnshire, England, DN31 2TT	Details: No Details Enforcement: No Details Date of enforcement: No Details Comment: No Details
H	284m S	Application reference number: DC/361/10/WOL Application status: Historical Consent Application date: 02/07/2010 Address: Vireol Plc Former Acordis Site, Moody Lane, Great Coates, Grimsby, DN31 2SS	Details: Storage Of Hazardous Substances Relating To A Bioethanol Production Facility Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
H	284m S	Application reference number: DC/339/08/WOL Application status: Historical Consent Application date: 24/09/2008 Address: Vireol Plc, Moody Lane, Grimsby, DN31 2SS	Details: Consent For The Storage Of Hazardous Substances Relating To A Bioethanol Production Facility Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified
H	284m S	Application reference number: DC/361/10/WOL Application status: Approved Application date: 02/07/2010 Address: Solenis UK Industries Limited, PO Box 63, Moody Lane, Grimsby, North East Lincolnshire, England, DN31 2SS	Details: Storage Of Hazardous Substances Relating To A Bioethanol Production Facility Enforcement: No Enforcement Notified Date of enforcement: No Enforcement Notified Comment: No Enforcement Notified

This data is sourced from Local Authority records.

4.9 Historical licensed industrial activities (IPC)

Records within 500m	**25**

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.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Details	
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: AA5444	Original Permit Number: IPCAIRAPP Date Approved: 20-5-1992 Effective Date: 20-5-1992 Status: Superseded By Variation

ID	Location	Details	
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: AK0391	Original Permit Number: IPCMINVAR Date Approved: 30-9-1993 Effective Date: 30-9-1993 Status: Superseded By Variation
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: AR9931	Original Permit Number: IPCMINVAR Date Approved: 26-6-1995 Effective Date: 1-7-1995 Status: Superseded By Variation
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: AU1569	Original Permit Number: IPCMINVAR Date Approved: 14-3-1996 Effective Date: 29-3-1996 Status: Superseded By Variation
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: AX2979	Original Permit Number: IPCMAJVAR Date Approved: 26-2-1997 Effective Date: 1-3-1997 Status: Superseded By Variation
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: BD7871	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation
K	354m S	Operator: Humber Energy Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Combustion Processes Permit Number: BY9329	Original Permit Number: IPCMINVAR Date Approved: 15-4-2005 Effective Date: 1-5-2005 Status: Revoked - Now Ippc
L	404m S	Operator: Blue Star Fibres Co Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: AK6772	Original Permit Number: IPCAIRAPP Date Approved: 1-4-1994 Effective Date: 1-4-1994 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Manufacture And Use Of Organic Chemicals Permit Number: AK6829	Original Permit Number: IPCAPP Date Approved: 1-4-1994 Effective Date: 1-4-1994 Status: Superseded By Variation
L	404m S	Operator: Technical Absorbents Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: AM8261	Original Permit Number: IPCAPP Date Approved: 28-9-1994 Effective Date: 1-10-1994 Status: Superseded By Variation

ID	Location	Details	
L	404m S	Operator: Acordis UK Ltd Address: PO Box 24, Great Coates, Grimsby, DN31 2SS Process: Inorganic Chemical Processes Permit Number: AN7970	Original Permit Number: IPCAIRAPP Date Approved: 31-3-1995 Effective Date: 1-4-1995 Status: Superseded By Variation
L	404m S	Operator: Technical Absorbents Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: AS1983	Original Permit Number: IPCMINVAR Date Approved: 30-6-1995 Effective Date: 1-7-1995 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: AS5822	Original Permit Number: IPCMINVAR Date Approved: 31-7-1995 Effective Date: 1-8-1995 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: AX6222	Original Permit Number: IPCMAJVAR Date Approved: 15-5-1997 Effective Date: 1-6-1997 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: BA9754	Original Permit Number: IPCMINVAR Date Approved: 23-3-1998 Effective Date: 27-3-1998 Status: Superseded By Variation
L	404m S	Operator: Blue Star Fibres Co Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: BC6926	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation
L	404m S	Operator: Acordis UK Ltd Address: PO Box 24, Great Coates, Grimsby, DN31 2SS Process: Inorganic Chemical Processes Permit Number: BC8945	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation
L	404m S	Operator: Technical Absorbents Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: BD1814	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: BE4061	Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation

ID	Location	Details	
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: BE9454	Original Permit Number: IPCMAJVAR Date Approved: 24-2-1999 Effective Date: 1-3-1999 Status: Superseded By Variation
L	404m S	Operator: Acordis UK Ltd Address: PO Box 24, Great Coates, Grimsby, DN31 2SS Process: Inorganic Chemical Processes Permit Number: BG5077	Original Permit Number: IPCMINVAR Date Approved: 29-10-1999 Effective Date: 1-11-1999 Status: Revoked
L	404m S	Operator: Blue Star Fibres Co Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: BQ3185	Original Permit Number: IPCMINVAR Date Approved: 20-3-2002 Effective Date: 1-4-2002 Status: Superseded By Variation
L	404m S	Operator: Lenzing Fibers Ltd Address: PO Box 462, South Humberside Industrial Estate, Grimsby, North Lincs, DN31 2ZT Process: Paper And Pulp Manufacturing Processes Permit Number: BV5432	Original Permit Number: IPCMINVAR Date Approved: 18-12-2003 Effective Date: 1-1-2004 Status: Revoked - Now Ippc
L	404m S	Operator: Blue Star Fibres Co Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: BZ0424	Original Permit Number: IPCMINVAR Date Approved: 14-7-2005 Effective Date: 18-7-2005 Status: Revoked - Now Ippc
L	404m S	Operator: Technical Absorbents Ltd Address: PO Box 24, Great Coates, Grimsby, North Lincs, DN31 2SS Process: Manufacture And Use Of Organic Chemicals Permit Number: BZ6988	Original Permit Number: IPCMINVAR Date Approved: 23-2-2006 Effective Date: 1-3-2006 Status: Revoked - Now Ippc

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

4.10 Licensed industrial activities (Part A(1))

Records within 500m	**45**

Records of Part A(1) 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 34 >**

ID	Location	Details	
A	53m S	Operator: EQUANS FM LIMITED Installation Name: Grimsby Fibres Power Station EPR/AP3238ZU Process: COMBUSTION; ANY FUEL =>50MW Permit Number: DP3338DC Original Permit Number: DP3338DC	EPR Reference: EPR/DP3338DC Issue Date: 23/08/2016 Effective Date: 23/08/2016 Last date noted as effective: 25/05/2023 Status: Effective
A	63m SE	Operator: HUMBER ENERGY LIMITED Installation Name: Grimsby Fibres Power Station Process: COMBUSTION; ANY FUEL =>50MW Permit Number: EP3835LB Original Permit Number: EP3835LB	EPR Reference: EPR/EP3835LB Issue Date: 17/12/2007 Effective Date: 17/12/2007 Last date noted as effective: 25/05/2023 Status: Superseded
A	63m SE	Operator: INDUSTRIAL ENERGY SERVICES LIMITED Installation Name: Grimsby Fibres Power Station EPR/AP3238ZU Process: COMBUSTION; ANY FUEL =>50MW Permit Number: AP3238ZU Original Permit Number: AP3238ZU	EPR Reference: EPR/AP3238ZU Issue Date: 31/03/2016 Effective Date: 31/03/2016 Last date noted as effective: 25/05/2023 Status: Superseded
A	63m SE	Operator: Humber Energy Limited Installation Name: Grimsby Fibres Power Station Process: COMBUSTION; ANY FUEL =>50MW Permit Number: LP3339XA Original Permit Number: EP3835LB	EPR Reference: - Issue Date: 17/12/2007 Effective Date: 17/12/2007 Last date noted as effective: 21/03/2023 Status: Superceded
A	63m SE	Operator: Cofely Industrial Energy Services Limited Installation Name: Grimsby Fibres Power Station EPR/AP3238ZU Process: COMBUSTION; ANY FUEL =>50MW Permit Number: TP3036NM Original Permit Number: AP3238ZU	EPR Reference: - Issue Date: 03/02/2014 Effective Date: 03/02/2014 Last date noted as effective: 21/03/2023 Status: Superceded
A	63m SE	Operator: Cofely Industrial Energy Services Limited Installation Name: Grimsby Fibres Power Station EPR/AP3238ZU Process: COMBUSTION; ANY FUEL =>50MW Permit Number: UP3534AJ Original Permit Number: AP3238ZU	EPR Reference: - Issue Date: 22/12/2015 Effective Date: 01/01/2016 Last date noted as effective: 21/03/2023 Status: Superceded
A	63m SE	Operator: Industrial Energy Services Limited Installation Name: Grimsby Fibres Power Station EPR/AP3238ZU Process: COMBUSTION; ANY FUEL =>50MW Permit Number: SP3433DR Original Permit Number: AP3238ZU	EPR Reference: - Issue Date: 31/03/2016 Effective Date: 31/03/2016 Last date noted as effective: 21/03/2023 Status: Superceded

ID	Location	Details	
D	149m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: VP3335LK Original Permit Number: VP3335LK	EPR Reference: EPR/VP3335LK Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 25/05/2023 Status: Effective
D	149m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ASSOCIATED PROCESS Permit Number: VP3335LK Original Permit Number: VP3335LK	EPR Reference: EPR/VP3335LK Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 25/05/2023 Status: Effective
D	149m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: VP3335LK Original Permit Number: VP3335LK	EPR Reference: EPR/VP3335LK Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 25/05/2023 Status: Effective
D	149m SE	Operator: BLUESTAR FIBRES COMPANY LTD Installation Name: GRIMSBY ACRYLIC FIBRES FACTORY EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: FP3131DD Original Permit Number: VP3335LK	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 01/01/2017 Status: DETERMINATION
D	149m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: GRIMSBY ACRYLIC FIBRES FACTORY EPR/VP3335LK Process: GASIFICATION, LIQUIFAC. AND REFINING; ANY PYROLYSIS HEAT TREATMENT ETC OF COAL CARBONACEOUS MATERIAL ETC (UNLESS COAL DRYING/MAKING CHARCOAL)NISATION, DISTILLATION AND OTHER PROCESSES Permit Number: HP3030KB Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 28/09/2020 Status: EFFECTIVE
D	149m SE	Operator: BLUESTAR FIBRES COMPANY LTD Installation Name: GRIMSBY ACRYLIC FIBRES FACTORY EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: FP3131DD Original Permit Number: VP3335LK	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 01/01/2017 Status: DETERMINATION

ID	Location	Details	
D	149m SE	Operator: BLUESTAR FIBRES COMPANY LTD Installation Name: GRIMSBY ACRYLIC FIBRES FACTORY EPR/VP3335LK Process: ASSOCIATED PROCESS Permit Number: FP3131DD Original Permit Number: VP3335LK	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 01/01/2017 Status: DETERMINATION
D	149m SE	Operator: BLUESTAR FIBRES COMPANY LTD Installation Name: GRIMSBY ACRYLIC FIBRES FACTORY EPR/VP3335LK Process: GASIFICATION, LIQUIFAC. AND REFINING; ANY PYROLYSIS HEAT TREATMENT ETC OF COAL CARBONACEOUS MATERIAL ETC (UNLESS COAL DRYING/MAKING CHARCOAL)NISATION, DISTILLATION AND OTHER PROCESSES Permit Number: FP3131DD Original Permit Number: VP3335LK	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 01/01/2017 Status: DETERMINATION
D	149m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Acrylic Fibres Factory Process: GASIFICATION, LIQUIFAC. AND REFINING; ANY PYROLYSIS HEAT TREATMENT ETC OF COAL CARBONACEOUS MATERIAL ETC (UNLESS COAL DRYING/MAKING CHARCOAL)NISATION, DISTILLATION AND OTHER PROCESSES Permit Number: BP3037UR Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 07/03/2008 Effective Date: 07/03/2008 Last date noted as effective: 21/03/2023 Status: Superceded
D	149m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Acrylic Fibres Factory Process: ASSOCIATED PROCESS Permit Number: BP3037UR Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 07/03/2008 Effective Date: 07/03/2008 Last date noted as effective: 21/03/2023 Status: Superceded
D	149m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Acrylic Fibres Factory Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: BP3037UR Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 07/03/2008 Effective Date: 07/03/2008 Last date noted as effective: 21/03/2023 Status: Superceded
D	149m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Acrylic Fibres Factory Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: BP3037UR Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 07/03/2008 Effective Date: 07/03/2008 Last date noted as effective: 21/03/2023 Status: Superceded

ID	Location	Details	
E	177m E	Operator: ACORDIS UK LTD Installation Name: LANDFILL NO.4 Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: BW2960IL Original Permit Number: BW2960IL	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 21/03/2023 Status: Refused
E	177m E	Operator: ACORDIS UK LTD Installation Name: LANDFILL NO.4 Process: ASSOCIATED PROCESS Permit Number: BW2960IL Original Permit Number: BW2960IL	EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 21/03/2023 Status: Refused
G	235m SE	Operator: Blue Star Fibres Company Limited Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: HP3030KB Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 21/03/2023 Status: Effective
G	235m SE	Operator: Blue Star Fibres Company Limited Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: HP3030KB Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 21/03/2023 Status: Effective
G	235m SE	Operator: Blue Star Fibres Company Limited Installation Name: Grimsby Acrylic Fibres Factory EPR/VP3335LK Process: ASSOCIATED PROCESS Permit Number: HP3030KB Original Permit Number: VP3335LK	EPR Reference: - Issue Date: 21/07/2010 Effective Date: 21/07/2010 Last date noted as effective: 21/03/2023 Status: Effective
F	271m W	Operator: LENZING FIBERS GRIMSBY LIMITED Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: SP3936HE Original Permit Number: SP3936HE	EPR Reference: EPR/SP3936HE Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 25/05/2023 Status: Effective
F	271m W	Operator: Lenzing Fibers Grimsby Limited Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ASSOCIATED PROCESS Permit Number: FP3832JA Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 21/03/2023 Status: Effective

ID	Location	Details	
F	271m W	Operator: Lenzing Fibres Grimsby Ltd Installation Name: Lenzing Fibres Grimsby Limited Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: AP3634EK Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 13/12/2013 Effective Date: 13/12/2013 Last date noted as effective: 21/03/2023 Status: Superceded
F	271m W	Operator: Lenzing Fibers Grimsby Limited Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Permit Number: FP3832JA Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 21/03/2023 Status: Effective
F	271m W	Operator: Lenzing Fibers Grimsby Limited Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ORGANIC CHEMICALS; NITROGEN CONTAINING COMPOUNDS EG AMINES Permit Number: FP3832JA Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 21/03/2023 Status: Effective
F	271m W	Operator: Lenzing Fibers Grimsby Limited Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: FP3832JA Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 21/03/2023 Status: Effective
F	271m W	Operator: Lenzing Fibres Grimsby Ltd Installation Name: Lenzing Fibres Grimsby Limited Process: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Permit Number: AP3634EK Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 13/12/2013 Effective Date: 13/12/2013 Last date noted as effective: 21/03/2023 Status: Superceded
F	271m W	Operator: Lenzing Fibres Grimsby Ltd Installation Name: Lenzing Fibres Grimsby Limited Process: ASSOCIATED PROCESS Permit Number: AP3634EK Original Permit Number: SP3936HE	EPR Reference: - Issue Date: 13/12/2013 Effective Date: 13/12/2013 Last date noted as effective: 21/03/2023 Status: Superceded

ID	Location	Details	
F	271m W	Operator: LENZING FIBERS GRIMSBY LIMITED Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ORGANIC CHEMICALS; NITROGEN CONTAINING COMPOUNDS EG AMINES Permit Number: SP3936HE Original Permit Number: SP3936HE	EPR Reference: EPR/SP3936HE Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 25/05/2023 Status: Effective
F	271m W	Operator: LENZING FIBERS GRIMSBY LIMITED Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: DISPOSAL OF > 50 T/D NON-HAZARDOUS WASTE (> 100 T/D IF ONLY AD) INVOLVING PHYSICO-CHEMICAL TREATMENT Permit Number: SP3936HE Original Permit Number: SP3936HE	EPR Reference: EPR/SP3936HE Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 25/05/2023 Status: Effective
F	271m W	Operator: LENZING FIBERS GRIMSBY LIMITED Installation Name: Grimsby Lyocell Fibers Factory - EPR/SP3936HE Process: ASSOCIATED PROCESS Permit Number: SP3936HE Original Permit Number: SP3936HE	EPR Reference: EPR/SP3936HE Issue Date: 15/01/2019 Effective Date: 15/01/2019 Last date noted as effective: 25/05/2023 Status: Effective
J	317m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: Grimsby Superabsorbents Fibres Factory Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: QP3936FF Original Permit Number: QP3936FF	EPR Reference: EPR/QP3936FF Issue Date: 14/02/2013 Effective Date: 14/02/2013 Last date noted as effective: 25/05/2023 Status: Superseded
J	317m SE	Operator: BLUE STAR FIBRES COMPANY LIMITED Installation Name: Grimsby Superabsorbents Fibres Factory Process: ASSOCIATED PROCESS Permit Number: QP3936FF Original Permit Number: QP3936FF	EPR Reference: EPR/QP3936FF Issue Date: 14/02/2013 Effective Date: 14/02/2013 Last date noted as effective: 25/05/2023 Status: Superseded
J	317m SE	Operator: TECHNICAL ABSORBENTS LIMITED Installation Name: Grimsby Superabsorbents Fibres Factory Process: ASSOCIATED PROCESS Permit Number: EP3435LW Original Permit Number: EP3435LW	EPR Reference: EPR/EP3435LW Issue Date: 29/11/2006 Effective Date: 29/11/2006 Last date noted as effective: 25/05/2023 Status: Superseded

ID	Location	Details	
J	317m SE	Operator: TECHNICAL ABSORBENTS LIMITED Installation Name: Grimsby Superabsorbents Fibres Factory Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: EP3435LW Original Permit Number: EP3435LW	EPR Reference: EPR/EP3435LW Issue Date: 29/11/2006 Effective Date: 29/11/2006 Last date noted as effective: 25/05/2023 Status: Superseded
J	317m SE	Operator: TECHNICAL ABSORBENTS LIMITED Installation Name: Technical Absorbents Limited - EPR/RP3632NX Process: ASSOCIATED PROCESS Permit Number: RP3632NX Original Permit Number: RP3632NX	EPR Reference: EPR/RP3632NX Issue Date: 24/02/2022 Effective Date: 24/02/2022 Last date noted as effective: 25/05/2023 Status: Effective
J	317m SE	Operator: TECHNICAL ABSORBENTS LIMITED Installation Name: Technical Absorbents Limited - EPR/RP3632NX Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: RP3632NX Original Permit Number: RP3632NX	EPR Reference: EPR/RP3632NX Issue Date: 24/02/2022 Effective Date: 24/02/2022 Last date noted as effective: 25/05/2023 Status: Effective
J	317m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Superabsorbents Fibres Factory Process: ASSOCIATED PROCESS Permit Number: PP3534ZA Original Permit Number: QP3936FF	EPR Reference: - Issue Date: 13/02/2013 Effective Date: 14/02/2013 Last date noted as effective: 21/03/2023 Status: Superceded
J	317m SE	Operator: Bluestar Fibres Company Ltd Installation Name: Grimsby Superabsorbents Fibres Factory Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: PP3534ZA Original Permit Number: QP3936FF	EPR Reference: - Issue Date: 13/02/2013 Effective Date: 14/02/2013 Last date noted as effective: 21/03/2023 Status: Superceded
J	317m SE	Operator: Technical Absorbents Limited Installation Name: Grimsby Superabsorbents Fibres Factory - EPR/RP3632NX Process: ASSOCIATED PROCESS Permit Number: FP3535YT Original Permit Number: RP3632NX	EPR Reference: - Issue Date: 17/07/2018 Effective Date: 17/07/2018 Last date noted as effective: 21/03/2023 Status: Superceded
J	317m SE	Operator: Technical Absorbents Limited Installation Name: Grimsby Superabsorbents Fibres Factory - EPR/RP3632NX Process: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS Permit Number: FP3535YT Original Permit Number: RP3632NX	EPR Reference: - Issue Date: 17/07/2018 Effective Date: 17/07/2018 Last date noted as effective: 21/03/2023 Status: Superceded

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 34 >**

ID	Location	Address	Details	
10	316m E	Pyreenergy EP Ltd, West Factory Bale Store, Moody Lane, Grimsby, DN31 2TT	Process: Combustion & Incineration Status: Current Permit 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	1

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

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Address	Details	
9	315m NE	FACTORY AT GREAT COATES, GRIMSBY, HUMBERSIDE, DN31 2SS	Effluent Type: TRADE DISCHARGES - UNSPECIFIED Permit Number: PR3NF774 Permit Version: 1 Receiving Water: River Humber	Status: PRE NRA LEGISLATION WHERE ISSUE DATE 01-SEP-89 (HISTORIC ONLY) Issue date: 03/06/1969 Effective Date: 03/06/1969 Revocation Date: 18/05/1995

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	1

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.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Name	Status	Receiving Water	Authorised Substances
B	9m S	Bluestar Fibres Company Limited	Not Active	Humber, River Humber	Mercury (other), Cadmium

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

4.17 List 2 Dangerous Substances

Records within 500m	1

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.

Features are displayed on the Current industrial land use map on **page 34 >**

ID	Location	Name	Status	Receiving Water	Authorised Substances
B	9m S	Bluestar Fibres Company Limited	Active	R. Humber	Chromium, Copper, Lead, Nickel, pH, Zinc

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

4.18 Pollution Incidents (EA/NRW)

Records within 500m	4

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 34 >**

ID	Location	Details	
7	204m NE	Incident Date: 22/09/2007 Incident Identification: 533391 Pollutant: Specific Waste Materials Pollutant Description: Tyres	Water Impact: Category 4 (No Impact) Land Impact: Category 2 (Significant) Air Impact: Category 4 (No Impact)
I	304m NE	Incident Date: 23/09/2002 Incident Identification: 109915 Pollutant: Organic Chemicals/Products Pollutant Description: Dyes and Inks	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
I	325m NE	Incident Date: 19/11/2001 Incident Identification: 43668 Pollutant: Organic Chemicals/Products Pollutant Description: Other Organic Chemical or Product	Water Impact: Category 4 (No Impact) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
11	339m E	Incident Date: 19/06/2002 Incident Identification: 85794 Pollutant: Organic Chemicals/Products Pollutant Description: Dyes and Inks	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	7

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.

Features are displayed on the Current industrial land use map on **page 34 >**

ID: A, Location: 64m SE, Permit: DP3338DC
Operator: ENGIE FM Limited
Activity: COMBUSTION; ANY FUEL =>50MW
Address: Grimsby Fibres Power Station Po Box 24 Great Coates N E Lincolnshire DN31 2SS
Sector: Combustion, Sub-sector: Power
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Air	Carbon dioxide	10000000kg	88254000kg

ID: A, Location: 64m SE, Permit: DP3338DC
Operator: ENGIE FM Limited
Activity: COMBUSTION; ANY FUEL =>50MW
Address: Grimsby Fibres Power Station Po Box 24 Great Coates N E Lincolnshire DN31 2SS
Sector Combustion, Sub-sector: Power
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Air	Particulate matter - total	10000kg	Below Reporting Threshold
Controlled Waters	Mercury	0.1kg	Below Reporting Threshold
Air	Sulphur oxides (SO2 and SO3) as SO2	100000kg	Below Reporting Threshold
Controlled Waters	Cadmium	1kg	Below Reporting Threshold
Air	Carbon monoxide	100000kg	Below Reporting Threshold
Air	Nitrogen oxides (NO and NO2) as NO2	100000kg	Below Reporting Threshold
Air	Non-methane volatile organic compounds (NMVOCs)	10000kg	Below Reporting Threshold

ID: G, Location: 236m SE, Permit: VP3335LK
Operator: Blue Star Fibres Company Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Acrylic Fibres Factory PO Box 24 Moody Lane PO Box 24 North East Lincolnshire DN312SS
Sector Chemicals, Sub-sector: Chemicals
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Controlled Waters	Copper	20kg	Below Reporting Threshold
Controlled Waters	Lead	20kg	Below Reporting Threshold
Controlled Waters	Mercury	0.1kg	Below Reporting Threshold
Controlled Waters	Nickel	20kg	Below Reporting Threshold
Controlled Waters	Zinc	100kg	Below Reporting Threshold
Controlled Waters	Cadmium	1kg	Below Reporting Threshold

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Controlled Waters	Chromium	20kg	Below Reporting Threshold

ID: F, Location: 272m W, Permit: SP3936HE
Operator: Lenzing Fibers Grimsby Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Lyocell Fibers Factory Energy Park Way Grimsby North East Lincolnshire DN31 2TT
Sector Chemicals, Sub-sector: Chemicals
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Controlled Waters	Total organic carbon (TOC)	50000kg	365729kg

ID: F, Location: 272m W, Permit: SP3936HE
Operator: Lenzing Fibers Grimsby Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Lyocell Fibers Factory Energy Park Way Grimsby North East Lincolnshire DN31 2TT
Sector Chemicals, Sub-sector: Chemicals
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Air	Particulate matter - total	10000kg	Below Reporting Threshold
Controlled Waters	Mercury	0.1kg	Below Reporting Threshold
Controlled Waters	Cadmium	1kg	Below Reporting Threshold
Air	Carbon dioxide	10000000kg	Below Reporting Threshold
Air	Chlorine and inorganic chlorine compounds - as HCl	10000kg	Below Reporting Threshold
Air	Non-methane volatile organic compounds (NMVOCs)	10000kg	Below Reporting Threshold
Air	Particulate matter - PM10	1000kg	Below Reporting Threshold
Air	Hydrofluorocarbons (HFCs)	100kg	Below Reporting Threshold
Air	Hydrochlorofluorocarbons (HCFCs)	1kg	Below Reporting Threshold
Controlled Waters	Chlorides - as Cl	2000000kg	Below Reporting Threshold
Controlled Waters	Nitrogen - as total N	50000kg	Below Reporting Threshold

ID: F, Location: 272m W, Permit: SP3936HE
Operator: Lenzing Fibers Grimsby Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Lyocell Fibers Factory Energy Park Way Grimsby North East Lincolnshire DN31 2TT
Sector: Chemicals, Sub-sector: Chemicals
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Controlled Waters	Phosphorus - as total P	5000kg	69785kg

ID: J, Location: 318m SE, Permit: RP3632NX
Operator: TECHNICAL ABSORBENTS LIMITED
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Superabsorbents Fibres Factory 1 Moody Lane Grimsby North East Lincolnshire DN31 2SS
Sector: Chemicals, Sub-sector: Chemicals
Releases:

Route	Substance	Reporting threshold (kg)	Quantity (kg)
Controlled Waters	Total organic carbon (TOC)	50000kg	Below Reporting Threshold

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

4.20 Pollution inventory waste transfers

Records within 500m	**4**

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.

Features are displayed on the Current industrial land use map on **page 34 >**

ID: A, Location: 64m SE, Permit: DP3338DC
Operator: ENGIE FM Limited
Activity: COMBUSTION; ANY FUEL =>50MW
Address: Grimsby Fibres Power Station Po Box 24 Great Coates N E Lincolnshire DN31 2SS
Sector: Combustion, Sub-sector: Power
Releases:

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
D1	Deposit into or onto land (eg landfill, etc.)	9.6	absolute value	20 03 01	mixed municipal waste	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	1.452	absolute value	15 01 06	mixed packaging	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	3.87	absolute value	20 03 04	septic tank sludge	No
R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	0.08	absolute value	11 01 13	degreasing wastes containing dangerous substances	Yes
R4	Recycling/reclamation of metals and metal compounds	0.2	absolute value	20 01 21	fluorescent tubes and other mercury-containing waste	Yes
R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	4.32	absolute value	13 02 08	other engine, gear and lubricating oils	Yes

ID: G, Location: 236m SE, Permit: VP3335LK
Operator: Blue Star Fibres Company Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Acrylic Fibres Factory PO Box 24 Moody Lane PO Box 24 North East Lincolnshire DN312SS
Sector: Chemicals, Sub-sector: Chemicals
Releases:

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
D2	Land treatment (eg biodegradation of liquid or sludgy discards in soils, etc.)	33.8	absolute value	19 08 05	sludges from treatment of urban waste water	No
R4	Recycling/reclamation of metals and metal compounds	19.76	absolute value	17 04 02	aluminium	No

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
R4	Recycling/reclamation of metals and metal compounds	2118.6	absolute value	20 01 40	metals	No
D10	Incineration on Land	132	absolute value	20 03 01	mixed municipal waste	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	33.5	absolute value	17 02 01	wood	No
R4	Recycling/reclamation of metals and metal compounds	26.5	absolute value	16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	No
R5	Recycling/reclamation of other inorganic materials	7559	absolute value	17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	No
R4	Recycling/reclamation of metals and metal compounds	352	absolute value	17 04 05	iron and steel	No
D10	Incineration on Land	77	absolute value	16 03 03	inorganic wastes containing dangerous substances	Yes
D10	Incineration on Land	50.9	absolute value	06 01 06	other acids	Yes

ID: F, Location: 272m W, Permit: SP3936HE
Operator: Lenzing Fibers Grimsby Limited
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Lyocell Fibers Factory Energy Park Way Grimsby North East Lincolnshire DN31 2TT
Sector: Chemicals, Sub-sector: Chemicals
Releases:

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
D1	Deposit into or onto land (eg landfill, etc.)	340.22	absolute value	03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	343.54	absolute value	03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation	No

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
D15	Storage pending any of the operations numbered D1 to D14 (excluding temporary storage pending collection, on the site where it is produced)	0.36	absolute value	11 01 14	degreasing wastes other than those mentioned in 11 01 13	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	275.16	absolute value	15 01 01	paper and cardboard packaging	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	25.72	absolute value	15 01 03	wooden packaging	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	92.418	absolute value	15 01 05	composite packaging	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	16.66	absolute value	20 01 01	paper and cardboard	No
R4	Recycling/reclamation of metals and metal compounds	38.04	absolute value	20 01 40	metals	No
D2	Land treatment (eg biodegradation of liquid or sludgy discards in soils, etc.)	427	absolute value	20 03 04	septic tank sludge	No
R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	1.1	absolute value	13 02 05	mineral-based non-chlorinated engine, gear and lubricating oils	Yes
R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	1.6	absolute value	13 05 07	oily water from oil/water separators	Yes

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
R13	Storage of wastes pending any of the operations numbered R1 to R12 (excluding temporary storage, pending collection, on the site where it is produced)	0.64	absolute value	15 02 02	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Yes
D10	Incineration on Land	2.863	absolute value	15 02 02	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Yes
D10	Incineration on Land	2.863	absolute value	16 03 03	inorganic wastes containing dangerous substances	Yes

ID: J, Location: 318m SE, Permit: RP3632NX
Operator: TECHNICAL ABSORBENTS LIMITED
Activity: ORGANIC CHEMICALS; PLASTIC MATERIALS EG POLYMERS
Address: Grimsby Superabsorbents Fibres Factory 1 Moody Lane Grimsby North East Lincolnshire DN31 2SS
Sector: Chemicals, Sub-sector: Chemicals
Releases:

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
D1	Deposit into or onto land (eg landfill, etc.)	48	absolute value	07 02 15	wastes from additives other than those mentioned in 07 02 14	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	2.4	absolute value	15 01 01	paper and cardboard packaging	No
R1	Use principally as a fuel or other means to generate energy	114	absolute value	16 03 06	organic wastes other than those mentioned in 16 03 05	No
R1	Use principally as a fuel or other means to generate energy	9.34	absolute value	20 03 01	mixed municipal waste	No

Route	Route description	Quantity (tonnes)	Release level	EWC code	EWC description	Hazardous waste
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	2.9	absolute value	17 04 05	iron and steel	No
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	0.1	absolute value	16 05 06	laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals	Yes
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	0.05	absolute value	15 02 02	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	Yes
D5	Specially engineered landfill (eg placement into lined discrete cells which are capped and isolated from one another and the environment, etc)	0.25	absolute value	17 06 01	insulation materials containing asbestos	Yes
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	0.02	absolute value	16 05 04	gases in pressure containers (including halons) containing dangerous substances	Yes
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	0.15	absolute value	15 01 10	packaging containing residues of or contaminated by dangerous substances	Yes
R3	Recycling/Reclamation of organic substances which are not used as solvents (including composting and other biological transformatin processes)	0.3	absolute value	20 01 21	fluorescent tubes and other mercury-containing waste	Yes

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

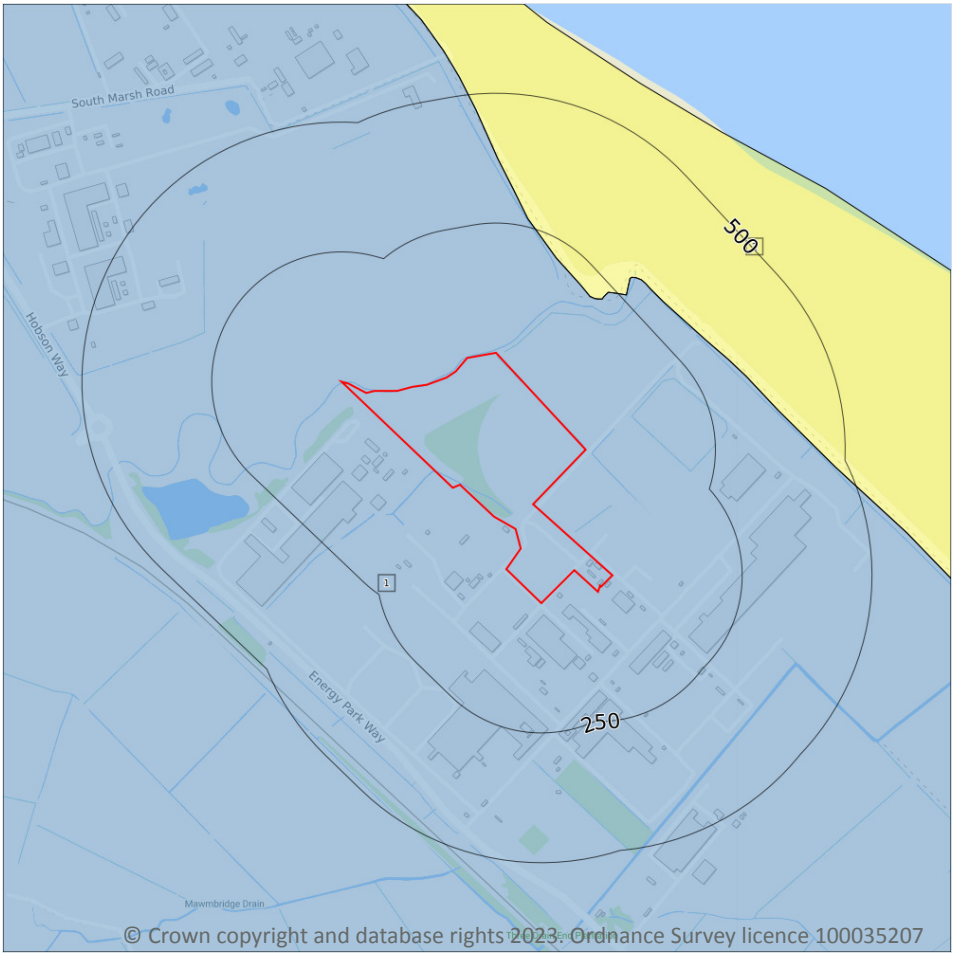
4.21 Pollution inventory radioactive waste

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	2

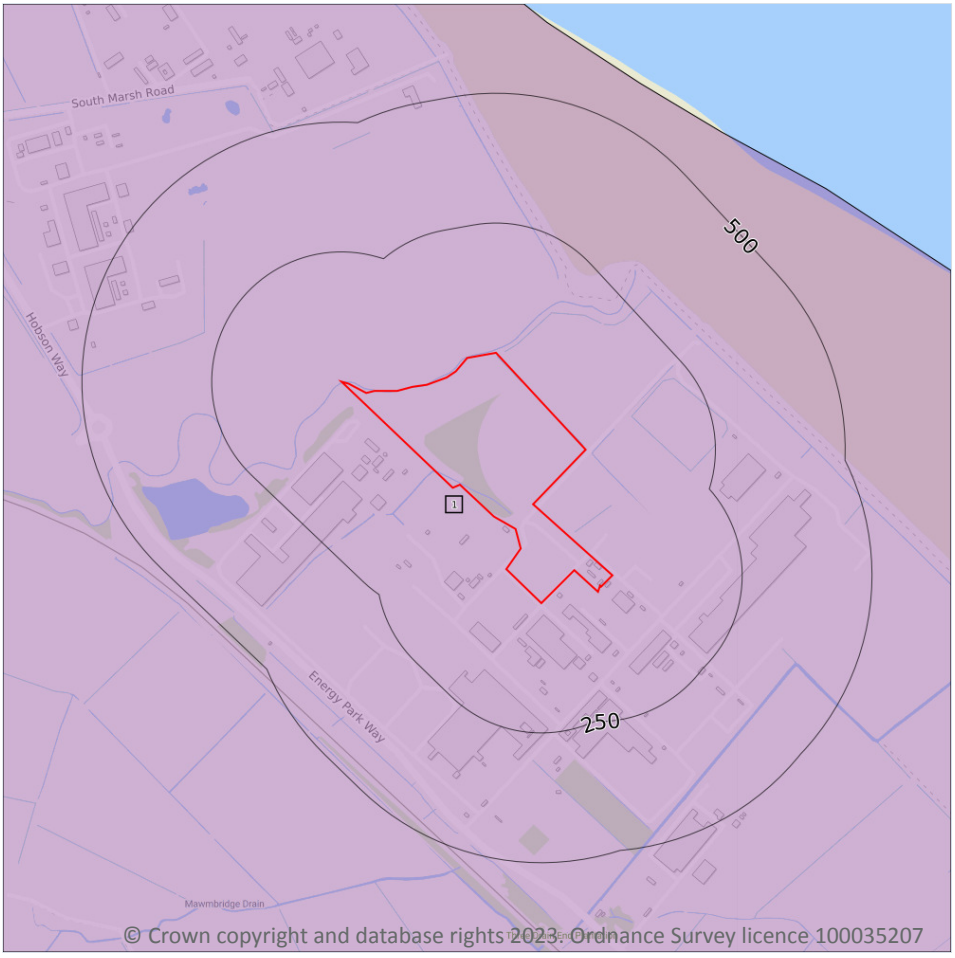
Aquifer status of groundwater held within superficial geology.

Features are displayed on the Hydrogeology map on **page 61 >**

ID	Location	Designation	Description
1	**On site**	**Unproductive**	**These are rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow**
2	207m NE	Secondary Undifferentiated	Assigned where it is not possible to attribute either category A or B to a rock type. In general these layers have previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type

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	1

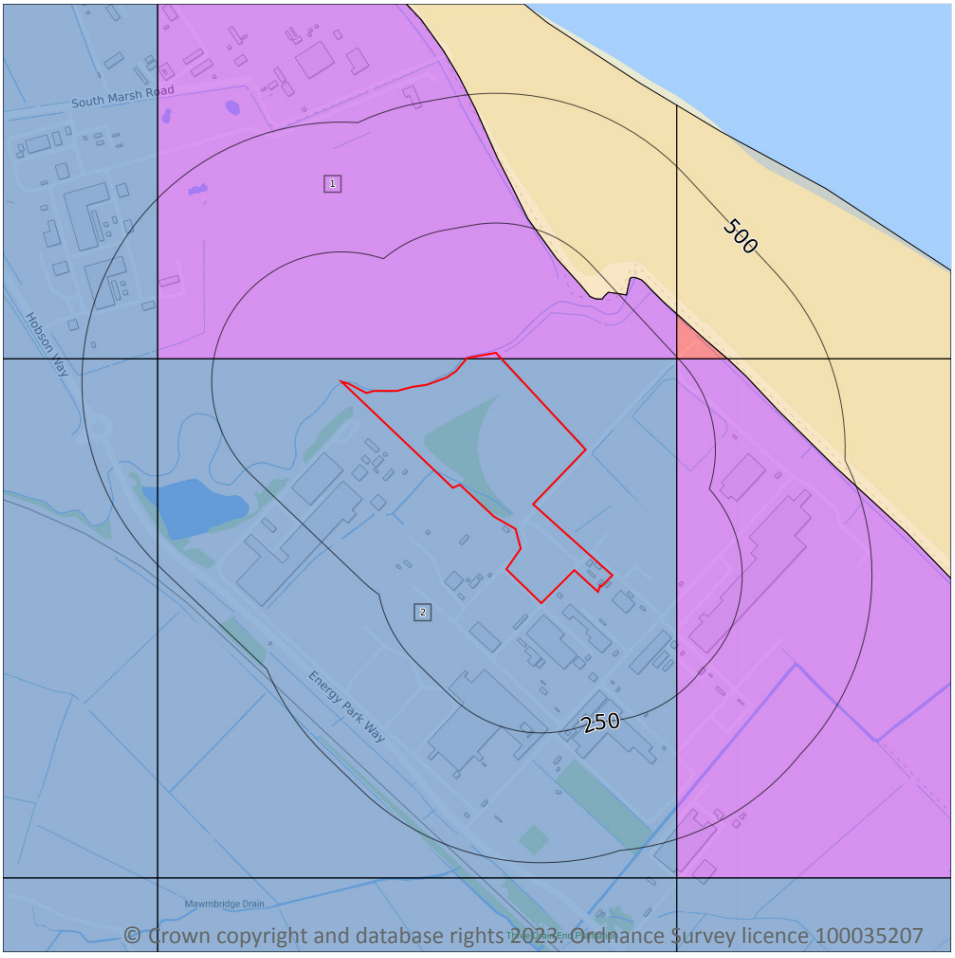
Aquifer status of groundwater held within bedrock geology.

Features are displayed on the Bedrock aquifer map on **page 62 >**

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

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

Groundwater vulnerability



Site Outline

Search buffers in metres (m)

Superficial vulnerability

- Principal superficial aquifer, high vulnerability
- Secondary superficial aquifer, high vulnerability
- Principal superficial aquifer, medium vulnerability
- Secondary superficial aquifer, medium vulnerability
- Principal superficial aquifer, low vulnerability
- Secondary superficial aquifer, low vulnerability

Bedrock vulnerability

- Principal bedrock aquifer, high vulnerability
- Secondary bedrock aquifer, high vulnerability
- Principal bedrock aquifer, medium vulnerability
- Secondary bedrock aquifer, medium vulnerability
- Principal bedrock aquifer, low vulnerability
- Secondary bedrock aquifer, low vulnerability

Other information

- Unproductive aquifer
- Soluble rock risk
- Local information

5.3 Groundwater vulnerability

Records within 50m	2

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 63 >**

ID	Location	Summary	Soil / surface	Superficial geology	Bedrock geology
1	On site	Summary Classification: Principal bedrock aquifer - Medium Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: High Infiltration value: No Data% Dilution value: No Datamm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: >10m Patchiness value: >90% Recharge potential: No Data	Vulnerability: Medium Aquifer type: Principal Flow mechanism: Well connected fractures
2	On site	Summary Classification: Principal bedrock aquifer - Low Vulnerability Combined classification: Productive Bedrock Aquifer, Unproductive Superficial Aquifer	Leaching class: High Infiltration value: >70% Dilution value: <300mm/year	Vulnerability: Unproductive Aquifer type: Unproductive Thickness: >10m Patchiness value: >90% Recharge potential: Low	Vulnerability: Low Aquifer type: Principal 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	0

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

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	29

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 65 >**

ID	Location	Details	
-	1345m SE	Status: Historical Licence No: 4/29/10/*G/0024 Details: Transfer between sources Direct Source: GROUND WATER SOURCE OF SUPPLY Point: RECHARGE BOREHOLE C AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524800 Northing: 411600	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1352m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Non-Evaporative Cooling Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE A AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411500	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1352m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Evaporative Cooling Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE A AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411500	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1352m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE A AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411500	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1366m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 9 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522150 Northing: 412310	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -

ID	Location	Details	
-	1366m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 9 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522150 Northing: 412310	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1384m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 8 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522140 Northing: 412290	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1384m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 8 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522140 Northing: 412290	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1420m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 7 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522110 Northing: 412270	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1420m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 7 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522110 Northing: 412270	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -

ID	Location	Details	
-	1439m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 6 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522100 Northing: 412250	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1439m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 6 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522100 Northing: 412250	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1461m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 5 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522080 Northing: 412240	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1461m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 5 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522080 Northing: 412240	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1502m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 4 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522050 Northing: 412210	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -

ID	Location	Details	
-	1502m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 4 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522050 Northing: 412210	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1521m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 3 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522040 Northing: 412190	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1521m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 3 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522040 Northing: 412190	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1553m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 2 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 522020 Northing: 412160	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1553m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 2 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 522020 Northing: 412160	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -

ID	Location	Details	
-	1594m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 1 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 521990 Northing: 412130	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1594m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 1 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 521990 Northing: 412130	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1597m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE B AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411200	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1597m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Evaporative Cooling Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE B AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411200	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -
-	1597m SE	Status: Active Licence No: 4/29/10/*G/0024 Details: Non-Evaporative Cooling Direct Source: GROUND WATER SOURCE OF SUPPLY Point: BOREHOLE B AT PYEWIPE Data Type: Point Name: NOVARTIS GRIMSBY Easting: 524700 Northing: 411200	Annual Volume (m^3): 2223497 Max Daily Volume (m^3): 6092 Original Application No: - Original Start Date: 01/06/1966 Expiry Date: - Issue No: 100 Version Start Date: 01/03/1997 Version End Date: -

ID	Location	Details	
-	1599m W	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 11 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 521900 Northing: 412290	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1599m W	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 11 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 521900 Northing: 412290	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -
-	1622m SW	Status: Historical Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: TIOXIDE BOREHOLE 10 HEALING Data Type: Point Name: TIOXIDE EUROPE LTD Easting: 521970 Northing: 412110	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 13092.8 Original Application No: - Original Start Date: 01/07/1966 Expiry Date: - Issue No: 102 Version Start Date: 24/09/2010 Version End Date: -
-	1622m SW	Status: Active Licence No: 4/29/09/*G/0051 Details: Process Water Direct Source: GROUND WATER SOURCE OF SUPPLY Point: CHALK BOREHOLE 10 AT HEALING Data Type: Point Name: Tronox Pigment UK Limited Easting: 521970 Northing: 412110	Annual Volume (m^3): 3545958 Max Daily Volume (m^3): 11979 Original Application No: NPS/WR/032238 Original Start Date: 01/07/1966 Expiry Date: - Issue No: 107 Version Start Date: 19/08/2019 Version End Date: -

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

5.7 Surface water abstractions

Records within 2000m	**1**

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 65 >**

ID	Location	Details	
-	775m E	Status: Historical Licence No: AN/029/0009/016 Details: Transfer Between Sources (Post Water Act 2003) Direct Source: SURFACE WATER SOURCE OF SUPPLY Point: ABSTRACTION POINT ON MAWMBRIDGE DRAIN Data Type: Point Name: NORTH EAST LINCOLNSHIRE COUNCIL Easting: 524637 Northing: 412434	Annual Volume (m^3): 90000 Max Daily Volume (m^3): 3576 Original Application No: - Original Start Date: 27/02/2018 Expiry Date: 31/03/2030 Issue No: 1 Version Start Date: 27/02/2018 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	1

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

Features are displayed on the Abstractions and Source Protection Zones map on **page 65 >**

ID	Location	Type	Description
1	341m SE	3	Total catchment

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

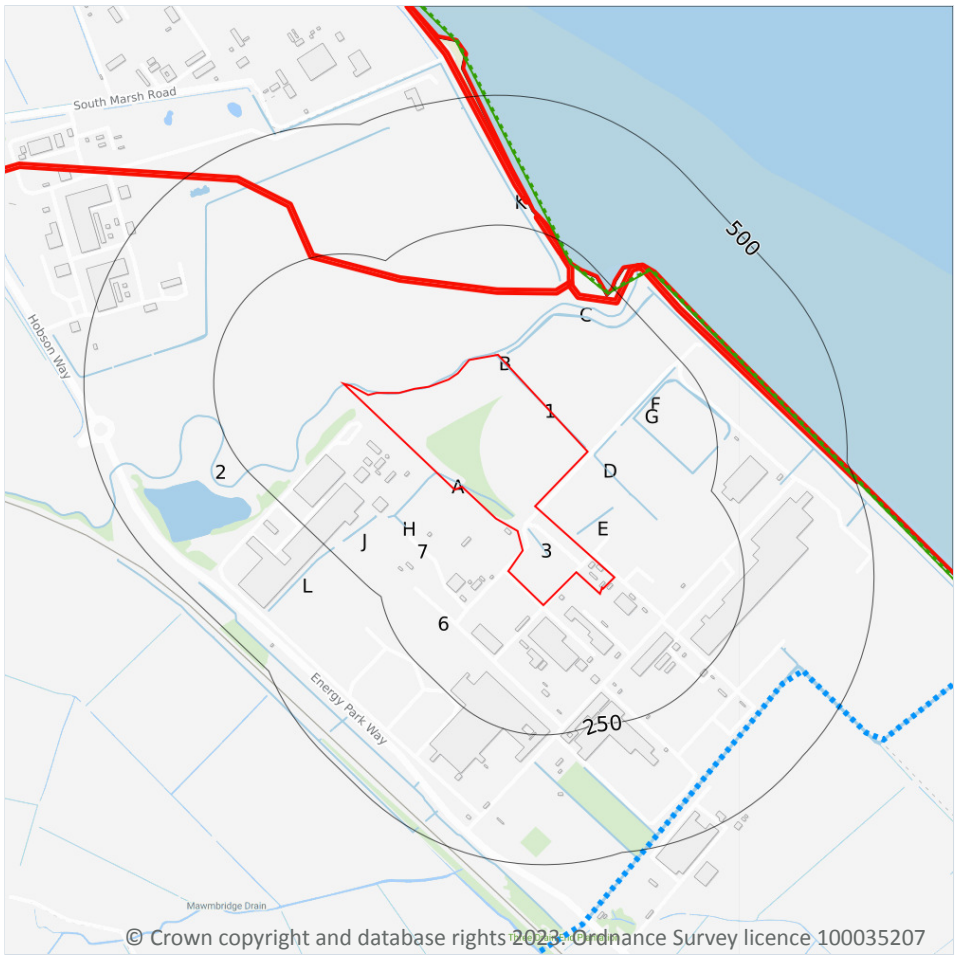
5.10 Source Protection Zones (confined aquifer)

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



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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	**18**

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 73 >**

ID	Location	Type of water feature	Ground level	Permanence	Name
1	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**

ID	Location	Type of water feature	Ground level	Permanence	Name
2	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**Oldfleet Drain**
3	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**
A	**On site**	**Inland river not influenced by normal tidal action.**	**On ground surface**	**Watercourse contains water year round (in normal circumstances)**	**-**
B	**On site**	**Inland river not influenced by normal tidal action.**	**Underground**	**Watercourse contains water year round (in normal circumstances)**	**-**
C	4m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	Oldfleet Drain
E	14m SE	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
C	14m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	15m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
F	81m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
G	109m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	115m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
D	115m E	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
H	115m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

ID	Location	Type of water feature	Ground level	Permanence	Name
H	115m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
J	140m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
K	185m N	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-
L	240m SW	Inland river not influenced by normal tidal action.	On ground surface	Watercourse contains water year round (in normal circumstances)	-

This data is sourced from the Ordnance Survey.

6.2 Surface water features

Records within 250m	**10**

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 73 >**

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 73 >**

ID	Location	Type	Water body catchment	Water body ID	Operational catchment	Management catchment
6	**On site**	**River**	**Mawnbridge Drain**	**GB104029067540**	**Becks Northern**	**Louth Grimsby and Ancholme**

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

6.4 WFD Surface water bodies

Records identified	2

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 73 >**

ID	Location	Type	Name	Water body ID	Overall rating	Chemical rating	Ecological rating	Year
11	222m N	Transi	HUMBER LOWER	GB530402609201 ↗	Moderate	Fail	Moderate	2019
S	380m SE	River	Mawnbridge Drain	GB104029067540 ↗	Moderate	Fail	Moderate	2019

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

6.5 WFD Groundwater bodies

Records on site	1

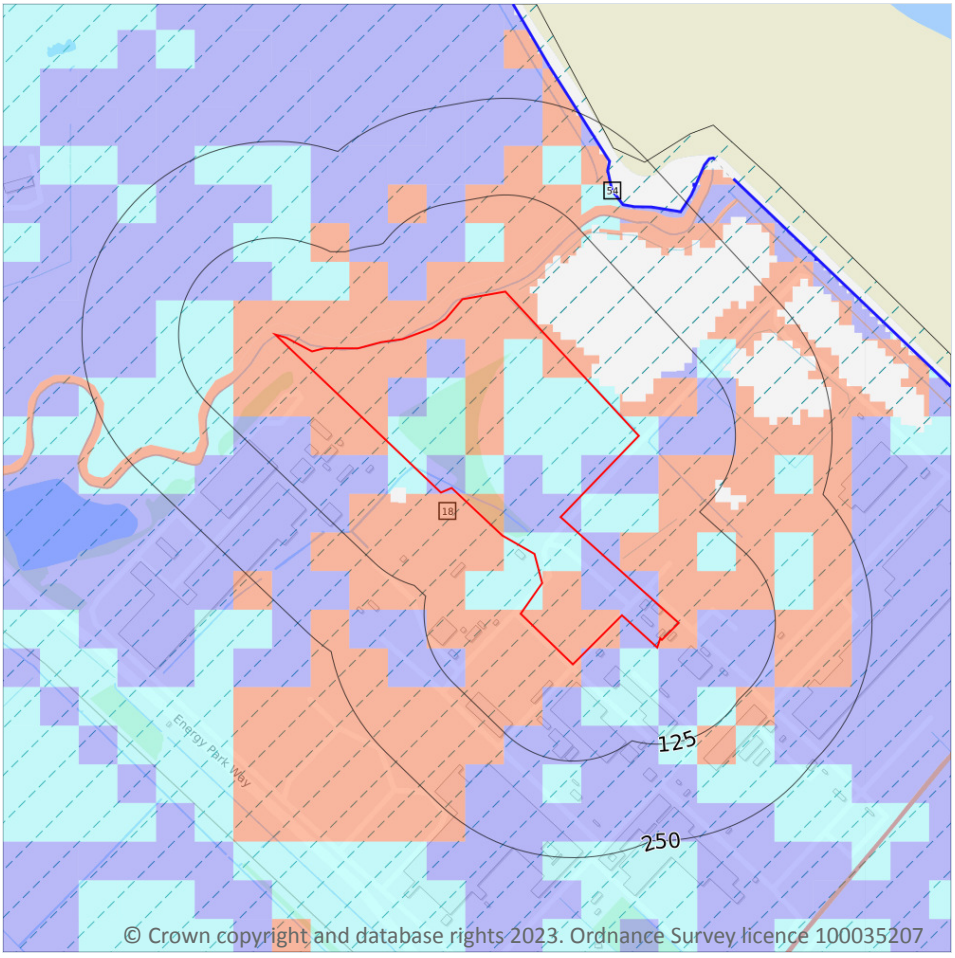
Groundwater bodies are also covered by the Directive and the same regime of objectives and reporting detailed in the previous section is in place. Click on the water body ID in the table to visit the EA Catchment Explorer to find out more about each groundwater body listed.

Features are displayed on the Hydrology map on **page 73 >**

ID	Location	Name	Water body ID	Overall rating	Chemical rating	Quantitative	Year
7	**On site**	**North Lincolnshire Chalk Unit**	**GB40401G401500 ↗**	**Poor**	**Poor**	**Poor**	**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	29

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 77 >**

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	**1**

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.

Features are displayed on the River and coastal flooding map on **page 77 >**

ID	Location	Event name	Date of flood	Flood source	Flood cause	Type of flood
18	**On site**	**1953-January_Lincolnshire Coastline**	**1953-01-31 1953-02-01**	**Other**	**Overtopping of defences**	**Tidal**

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

7.3 Flood Defences

Records within 250m	**1**

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.

Features are displayed on the River and coastal flooding map on **page 77 >**

ID	Location	Update
54	188m NE	08/11/2022

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.

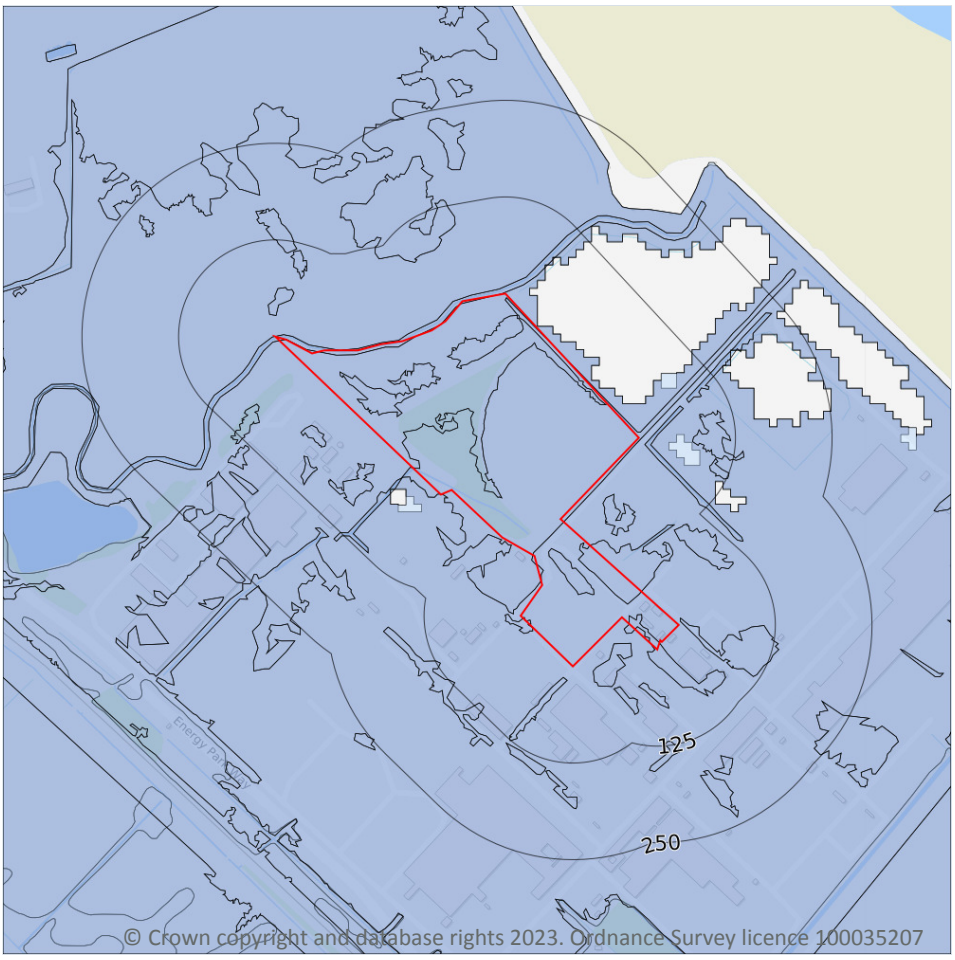
7.5 Flood Storage Areas

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 77 >**

Location	Type
On site	**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

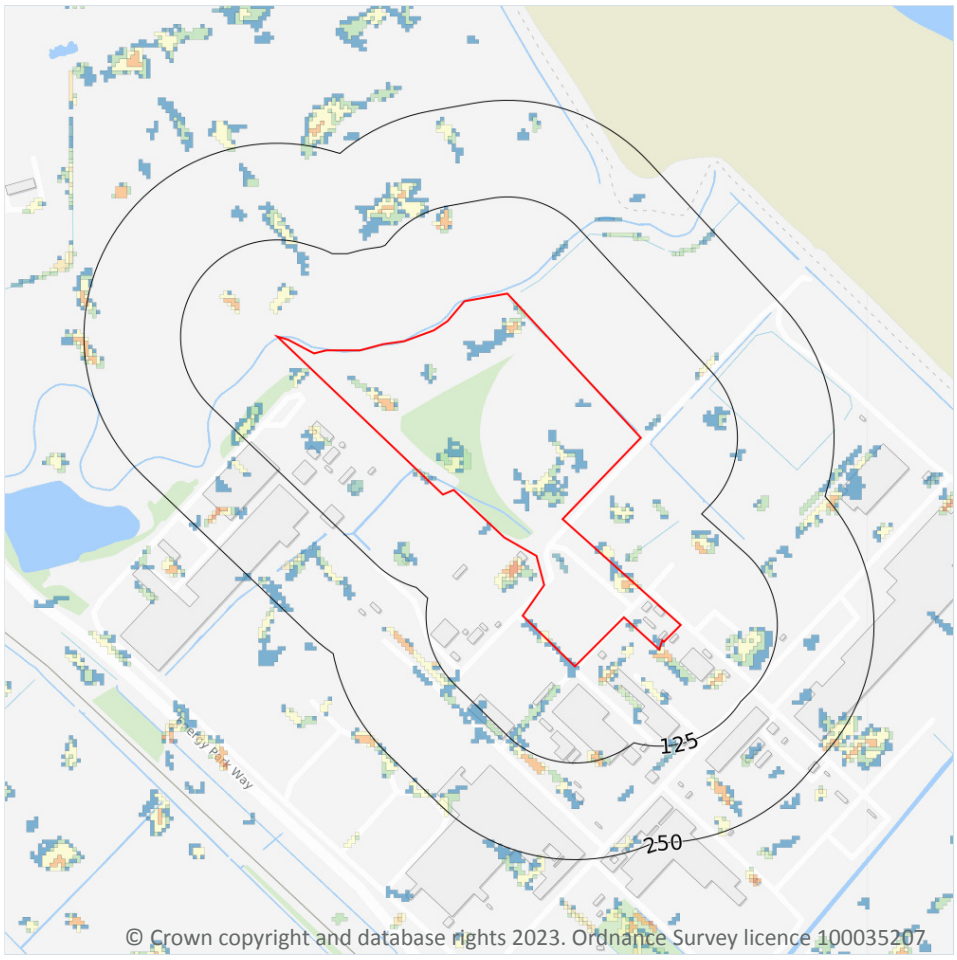
Areas of land at risk of flooding, when the presence of flood defences are ignored. Covering land with a 1 in 100 (1%) or greater chance of flooding each year from rivers or a 1 in 200 (0.5%) or greater chance of flooding each year from the sea.

Features are displayed on the River and coastal flooding map on **page 77 >**

Location	Type
On site	**Zone 3 - (Fluvial /Tidal 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 82 >**

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 0.1m and 0.3m
1 in 30 year	Between 0.1m and 0.3m

This data is sourced from Ambiental Risk Analytics.

9 Groundwater flooding

Site Outline

Search buffers in metres (m)

High

Moderate - High

Moderate

Low

Negligible

9.1 Groundwater flooding

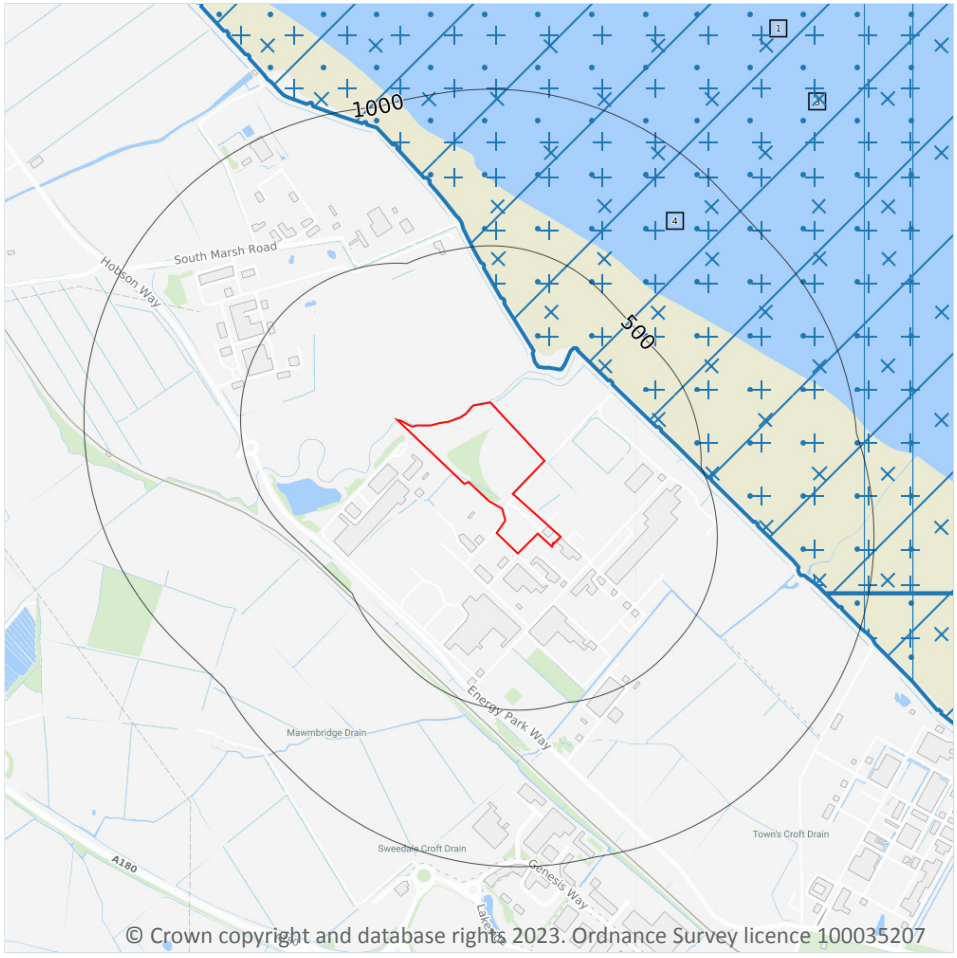
Highest risk on site	**Moderate-High**
Highest risk within 50m	**High**

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 84 >**

This data is sourced from Ambiental Risk Analytics.

10 Environmental designations



Site Outline

Search buffers in metres (m)

Sites of Special Scientific Interest (SSSI)

Conserved wetland sites (Ramsar sites)

Special Areas of Conservation (SAC)

Special Protection Areas (SPA)

10.1 Sites of Special Scientific Interest (SSSI)

Records within 2000m	**2**

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 85 >**

ID	Location	Name	Data source
1	189m NE	Humber Estuary	Natural England

ID	Location	Name	Data source
5	864m E	Humber Estuary	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	**2**

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.

Features are displayed on the Environmental designations map on **page 85 >**

ID	Location	Site	Details
2	189m NE	Name: Humber Estuary Site status: Listed Data source: Natural England	Overview: The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the estuary is exposed as mud or sand flats at low tide. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer. Ramsar criteria: Ramsar criterion 1 The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass Spartina anglica and annual glasswort Salicornia communities. Low to mid marsh communities are mostly represented by sea aster Aster tripolium, common saltmarsh grass Puccinellia maritima and sea purslane Atriplex portulacoides communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch Elytrigia atherica (Elymus pycnanthus) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed Phragmites australis fen and sea club rush Bolboschoenus maritimus swamp with the couch grass Elytrigia repens (Elymus repens) saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon. Ramsar criterion 3 The Humber Estuary Ramsar site supports a breeding colony of grey seals Halichoerus grypus at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad Bufo calamita. Ramsar criterion 5 Assemblages of international importance: 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001) Ramsar criterion 6 – species/populations occurring at levels of international

ID	Location	Site	Details
6	969m E	Name: Humber Estuary Site status: Listed Data source: Natural England	Overview: The Humber Estuary is the largest macro-tidal estuary on the British North Sea coast. It drains a catchment of some 24,240 square kilometres and is the site of the largest single input of freshwater from Britain into the North Sea. It has the second-highest tidal range in Britain (max 7.4 m) and approximately one-third of the estuary is exposed as mud or sand flats at low tide. The inner estuary supports extensive areas of reedbed with areas of mature and developing saltmarsh backed in places by limited areas of grazing marsh in the middle and outer estuary. On the north Lincolnshire coast the saltmarsh is backed by low sand dunes with marshy slacks and brackish pools. The Estuary regularly supports internationally important numbers of waterfowl in winter and nationally important breeding populations in summer. Ramsar criteria: Ramsar criterion 1 The site is a representative example of a near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons. It is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. Examples of both strandline, foredune, mobile, semi-fixed dunes, fixed dunes and dune grassland occur on both banks of the estuary and along the coast. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion on the tidal rivers of the Ouse and Trent. Wave exposed sandy shores are found in the outer/open coast areas of the estuary. These change to the more moderately exposed sandy shores and then to sheltered muddy shores within the main body of the estuary and up into the tidal rivers. The lower saltmarsh of the Humber is dominated by common cordgrass Spartina anglica and annual glasswort Salicornia communities. Low to mid marsh communities are mostly represented by sea aster Aster tripolium, common saltmarsh grass Puccinellia maritima and sea purslane Atriplex portulacoides communities. The upper portion of the saltmarsh community is atypical, dominated by sea couch Elytrigia atherica (Elymus pycnanthus) saltmarsh community. In the upper reaches of the estuary, the tidal marsh community is dominated by the common reed Phragmites australis fen and sea club rush Bolboschoenus maritimus swamp with the couch grass Elytrigia repens (Elymus repens) saltmarsh community. Within the Humber Estuary Ramsar site there are good examples of four of the five physiographic types of saline lagoon. Ramsar criterion 3 The Humber Estuary Ramsar site supports a breeding colony of grey seals Halichoerus grypus at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad Bufo calamita. Ramsar criterion 5 Assemblages of international importance: 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001) Ramsar criterion 6 – species/populations occurring at levels of international

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

10.3 Special Areas of Conservation (SAC)

Records within 2000m **1**

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.

Features are displayed on the Environmental designations map on **page 85 >**

ID	Location	Name	Features of interest	Habitat description	Data source
3	189m NE	Humber Estuary	Subtidal sandbanks; Estuaries; Intertidal mudflats and sandflats; Lagoons; Annual vegetation of drift lines; Glasswort and other annuals colonising mud and sand; Cord-grass swards; Atlantic salt meadows; Shifting dunes; Shifting dunes with marram; Dune grassland; Dunes with sea-buckthorn; Sea lamprey; River lamprey; Allis shad; Twaite shad; Grey seal; Common seal.	Bogs, Marshes, Water fringed vegetation, Fens; Salt marshes, Salt pastures, Salt steppes; Coastal sand dunes, Sand beaches, Machair; Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	Natural England

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

10.4 Special Protection Areas (SPA)

Records within 2000m **4**

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.

Features are displayed on the Environmental designations map on **page 85 >**

ID	Location	Name	Species of interest	Habitat description	Data source
4	189m NE	Humber Estuary	Great bittern; Great bittern; Common shelduck; Eurasian wigeon; Eurasian teal; Mallard; Common pochard; Greater scaup; Common goldeneye; Eurasian marsh harrier; Hen harrier; Eurasian oystercatcher; Pied avocet; Pied avocet; Ringed plover; Ringed plover; European golden plover; Grey plover; Grey plover; Northern lapwing; Red knot; Red knot; Sanderling; Sanderling; Ruff; Bar-tailed godwit; Whimbrel; Eurasian curlew; Common redshank; Common redshank; Common greenshank; Ruddy turnstone; Little tern; Black-tailed godwit; Black-tailed godwit; Dunlin; Dunlin; Dark-bellied brent goose	Salt marshes, Salt pastures, Salt steppes; Inland water bodies (Standing water, Running water); Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens	Natural England
7	1124m E	Humber Estuary	Great bittern; Great bittern; Common shelduck; Eurasian wigeon; Eurasian teal; Mallard; Common pochard; Greater scaup; Common goldeneye; Eurasian marsh harrier; Hen harrier; Eurasian oystercatcher; Pied avocet; Pied avocet; Ringed plover; Ringed plover; European golden plover; Grey plover; Grey plover; Northern lapwing; Red knot; Red knot; Sanderling; Sanderling; Ruff; Bar-tailed godwit; Whimbrel; Eurasian curlew; Common redshank; Common redshank; Common greenshank; Ruddy turnstone; Little tern; Black-tailed godwit; Black-tailed godwit; Dunlin; Dunlin; Dark-bellied brent goose	Salt marshes, Salt pastures, Salt steppes; Inland water bodies (Standing water, Running water); Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens	Natural England
-	1307m N	Humber Estuary	Great bittern; Great bittern; Common shelduck; Eurasian wigeon; Eurasian teal; Mallard; Common pochard; Greater scaup; Common goldeneye; Eurasian marsh harrier; Hen harrier; Eurasian oystercatcher; Pied avocet; Pied avocet; Ringed plover; Ringed plover; European golden plover; Grey plover; Grey plover; Northern lapwing; Red knot; Red knot; Sanderling; Sanderling; Ruff; Bar-tailed godwit; Whimbrel; Eurasian curlew; Common redshank; Common redshank; Common greenshank; Ruddy turnstone; Little tern; Black-tailed godwit; Black-tailed godwit; Dunlin; Dunlin; Dark-bellied brent goose	Salt marshes, Salt pastures, Salt steppes; Inland water bodies (Standing water, Running water); Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens	Natural England

ID	Location	Name	Species of interest	Habitat description	Data source
-	1878m NE	Humber Estuary	Great bittern; Great bittern; Common shelduck; Eurasian wigeon; Eurasian teal; Mallard; Common pochard; Greater scaup; Common goldeneye; Eurasian marsh harrier; Hen harrier; Eurasian oystercatcher; Pied avocet; Pied avocet; Ringed plover; Ringed plover; European golden plover; Grey plover; Grey plover; Northern lapwing; Red knot; Red knot; Sanderling; Sanderling; Ruff; Bar-tailed godwit; Whimbrel; Eurasian curlew; Common redshank; Common redshank; Common greenshank; Ruddy turnstone; Little tern; Black-tailed godwit; Black-tailed godwit; Dunlin; Dunlin; Dark-bellied brent goose	Salt marshes, Salt pastures, Salt steppes; Inland water bodies (Standing water, Running water); Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins); Coastal sand dunes, Sand beaches, Machair; Bogs, Marshes, Water fringed vegetation, Fens	Natural England

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	0

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

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	5

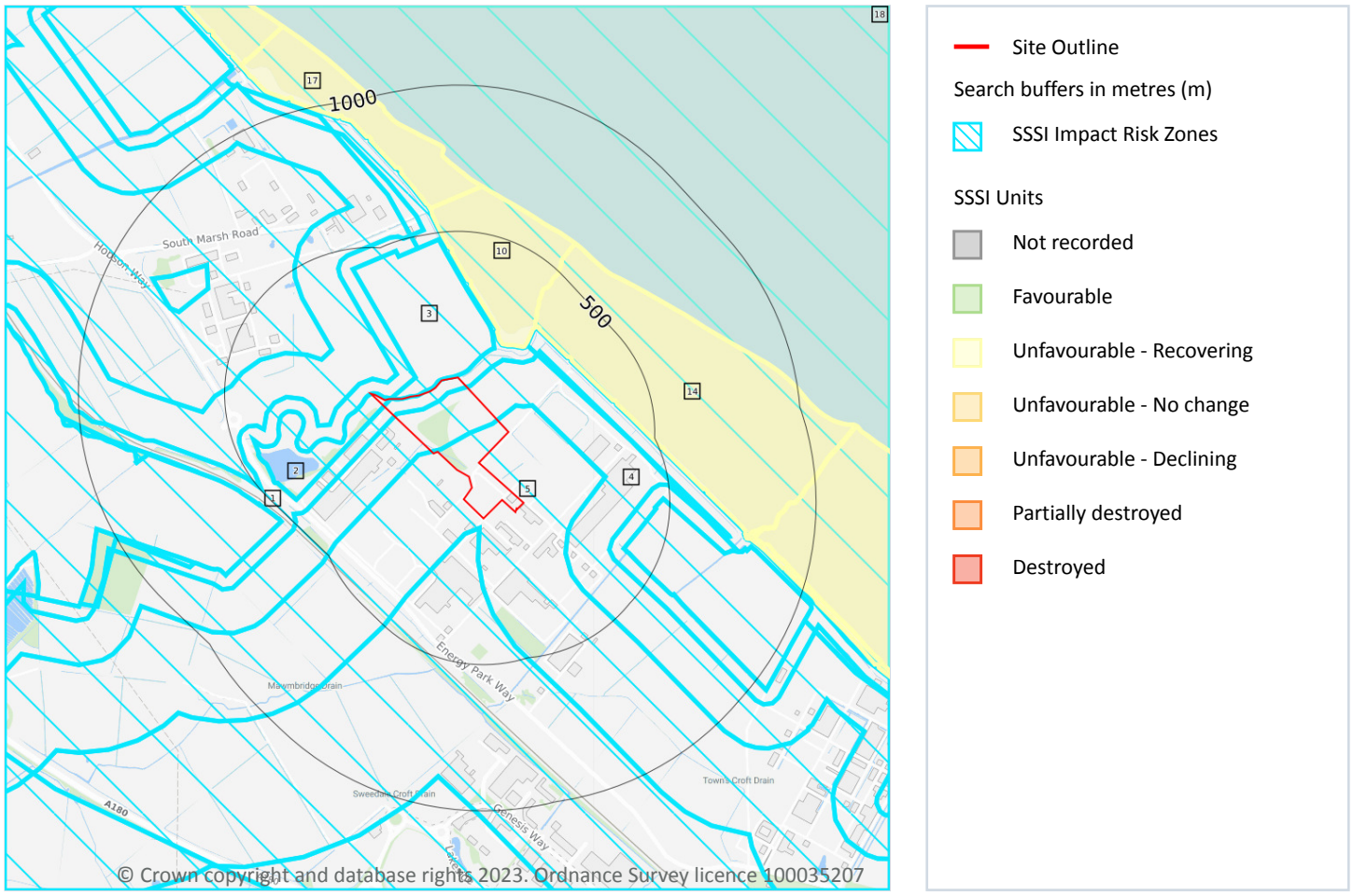
Areas at risk from agricultural nitrate pollution designated under the EC Nitrate Directive (91/676/EEC). These are areas of land that drain into waters polluted by nitrates. Farmers operating within these areas have to follow mandatory rules to tackle nitrate loss from agriculture.

Location	Name	Type	NVZ ID	Status
On site	**North Beck Drain NVZ**	**Surface Water**	**359**	**Existing**

Location	Name	Type	NVZ ID	Status
216m SE	North Beck Drain NVZ	Surface Water	359	Existing
1417m S	Lincolnshire Chalk	Groundwater	80	Existing
1574m SE	Lacby Beck / River Freshney Catchment (to N Sea) NVZ	Surface Water	357	Existing
1811m S	Lincolnshire Chalk	Groundwater	80	Existing

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

SSSI Impact Zones and Units



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10.17 SSSI Impact Risk Zones

Records on site	5

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 96 >**

ID	Location	Type of developments requiring consultation
1	**On site**	**All applications - ALL PLANNING APPLICATIONS - EXCEPT HOUSEHOLDER APPLICATIONS. Notes: A strategic approach has been developed for the loss of habitat used by SPA birds within the South Humber Bank mitigation zone (see local plan policy 9). You should liaise with the Council regarding how you should contribute to this strategic approach.**

ID	Location	Type of developments requiring consultation
2	**On site**	**All applications - ALL PLANNING APPLICATIONS.**
3	**On site**	**All applications - ALL PLANNING APPLICATIONS.**
4	**On site**	**All applications - All planning applications (except householder) outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures.** **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.** **Rural non-residential - Any non-residential development outside of existing urban areas where net additional gross internal floorspace following development is 30m² or more.** **Residential - Residential development of 10 units or more.** **Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units.** **Air pollution - Any development that could cause AIR POLLUTION or DUST either in its construction or operation (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores).** **Combustion - All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.** **Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management.** **Composting - Any composting proposal. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.** **Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream.** **Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply .** **Notes: A strategic approach has been developed for the loss of habitat used by SPA birds within the South Humber Bank mitigation zone (see local plan policy 9). You should liaise with the Council regarding how you should contribute to this strategic approach.**

ID	Location	Type of developments requiring consultation
5	On site	**All applications - All planning applications (except householder) outside or extending outside existing settlements/urban areas affecting greenspace, farmland, semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures. 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. Rural non-residential - Any non-residential development outside of existing urban areas where net additional gross internal floorspace following development is 30m² or more. Residential - Residential development of 10 units or more. Rural residential - Any residential developments outside of existing settlements/urban areas with a total net gain in residential units. Air pollution - Any development that could cause AIR POLLUTION (incl: industrial/commercial processes, livestock & poultry units, slurry lagoons & digestate stores, manure stores). Combustion - All general combustion processes. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion. Waste - Mechanical and biological waste treatment, inert landfill, non-hazardous landfill, hazardous landfill, household civic amenity recycling facilities construction, demolition and excavation waste, other waste management. Composting - Any composting proposal. Incl: open windrow composting, in-vessel composting, anaerobic digestion, other waste management. Discharges - Any discharge of water or liquid waste that is discharged to ground (ie to seep away) or to surface water, such as a beck or stream. Water supply - Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply . Notes: A strategic approach has been developed for the loss of habitat used by SPA birds within the South Humber Bank mitigation zone (see local plan policy 9). You should liaise with the Council regarding how you should contribute to this strategic approach.**

This data is sourced from Natural England.

10.18 SSSI Units

Records within 2000m	7

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 96 >**

ID: 10
Location: 189m NE
SSSI name: Humber Estuary
Unit name: Oldfleet Drain To South Marsh Road
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-

Feature name	Feature condition	Date of assessment
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1140 Mudflats and sandflats not covered by seawater at low tide	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Littoral sediment	Unfavourable - Recovering	30/03/2010
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
River lamprey, Lampetra fluviatilis - Passage	-	-
River lamprey, Lampetra fluviatilis	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022
S1095 Sea lamprey, Petromyzon marinus	-	-
S1099 River lamprey, Lampetra fluviatilis	-	-
Sea lamprey, Petromyzon marinus - Passage	-	-
Sea lamprey, Petromyzon marinus	-	-
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-

Feature name	Feature condition	Date of assessment
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

ID: 14
Location: 312m NE
SSSI name: Humber Estuary
Unit name: Mawmbridge Drain North
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1140 Mudflats and sandflats not covered by seawater at low tide	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Littoral sediment	Unfavourable - Recovering	30/03/2010
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
River lamprey, Lampetra fluviatilis - Passage	-	-
River lamprey, Lampetra fluviatilis	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022
S1095 Sea lamprey, Petromyzon marinus	-	-
S1099 River lamprey, Lampetra fluviatilis	-	-

Feature name	Feature condition	Date of assessment
Sea lamprey, Petromyzon marinus - Passage	-	-
Sea lamprey, Petromyzon marinus	-	-
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

ID: 17
Location: 586m N
SSSI name: Humber Estuary
Unit name: South Marsh Road To Middle Drain
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1140 Mudflats and sandflats not covered by seawater at low tide	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Littoral sediment	Unfavourable - Recovering	30/03/2010
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
River lamprey, Lampetra fluviatilis - Passage	-	-

Feature name	Feature condition	Date of assessment
River lamprey, Lampetra fluviatilis	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022
S1095 Sea lamprey, Petromyzon marinus	-	-
S1099 River lamprey, Lampetra fluviatilis	-	-
Sea lamprey, Petromyzon marinus - Passage	-	-
Sea lamprey, Petromyzon marinus	-	-
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

ID: 18
Location: 602m NE
SSSI name: Humber Estuary
Unit name: Humber Bridge To Grimsby Dock Subtidal
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Pochard, Aythya ferina	Unfavourable - Declining	29/03/2022
Estuaries	Unfavourable - Recovering	21/12/2010
Estuary	-	-
H1110 Sandbanks which are slightly covered by sea water all the time	-	-
H1130 Estuaries	-	-
River lamprey, Lampetra fluviatilis - Passage	-	-
River lamprey, Lampetra fluviatilis	Unfavourable - Recovering	21/12/2010
S1095 Sea lamprey, Petromyzon marinus	-	-
S1099 River lamprey, Lampetra fluviatilis	-	-
Sea lamprey, Petromyzon marinus - Passage	-	-
Sea lamprey, Petromyzon marinus	Unfavourable - Recovering	21/12/2010

Feature name	Feature condition	Date of assessment
Waterbird assemblage - Wintering	-	-

ID: 21
Location: 771m E
SSSI name: Humber Estuary
Unit name: Pyewipe Saltmarsh
Broad habitat: Fen, Marsh And Swamp - Lowland
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022
Aggregations of non-breeding birds - Turnstone, Arenaria interpres	Unfavourable - Declining	29/03/2022

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Aggregations of non-breeding birds - Wigeon, Anas penelope	Unfavourable - Declining	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1310 Salicornia and other annuals colonising mud and sand	-	-
H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	-	-
Invert. assemblage M3 saltmarsh, estuary and mudflat	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Marsh Harrier, Circus aeruginosus - A081, b	Favourable	21/04/2022
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022
SM4-28 - Saltmarsh	Unfavourable - Recovering	19/08/2010

Feature name	Feature condition	Date of assessment
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

ID: 22
Location: 799m E
SSSI name: Humber Estuary
Unit name: Pyewipe Mudflats
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1140 Mudflats and sandflats not covered by seawater at low tide	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Littoral sediment	Favourable	30/03/2010
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
River lamprey, Lampetra fluviatilis - Passage	-	-
River lamprey, Lampetra fluviatilis	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022

Feature name	Feature condition	Date of assessment
S1095 Sea lamprey, Petromyzon marinus	-	-
S1099 River lamprey, Lampetra fluviatilis	-	-
Sea lamprey, Petromyzon marinus - Passage	-	-
Sea lamprey, Petromyzon marinus	-	-
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-
Vascular plant assemblage	Favourable	30/03/2010
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

ID: 29
Location: 1206m NW
SSSI name: Humber Estuary
Unit name: Middle Drain North
Broad habitat: Littoral Sediment
Condition: Unfavourable - Recovering
Reportable features:

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Avocet, Recurvirostra avosetta	Favourable	29/03/2022
Aggregations of non-breeding birds - Bar-tailed godwit, Limosa lapponica	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Black-tailed godwit, Limosa limosa islandica	Favourable	29/03/2022
Aggregations of non-breeding birds - Brent goose (dark-bellied), Branta bernicla bernicla	Favourable	29/03/2022
Aggregations of non-breeding birds - Curlew, Numenius arquata	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Dunlin, Calidris alpina alpina	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Golden plover, Pluvialis apricaria	Favourable	29/03/2022
Aggregations of non-breeding birds - Greenshank, Tringa nebularia	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Grey plover, Pluvialis squatarola	Favourable	29/03/2022
Aggregations of non-breeding birds - Knot, Calidris canutus	Favourable	29/03/2022
Aggregations of non-breeding birds - Lapwing, Vanellus vanellus	Unfavourable - No change	29/03/2022

Feature name	Feature condition	Date of assessment
Aggregations of non-breeding birds - Oystercatcher, Haematopus ostralegus	Favourable	29/03/2022
Aggregations of non-breeding birds - Redshank, Tringa totanus	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ringed plover, Charadrius hiaticula	Unfavourable - Declining	29/03/2022
Aggregations of non-breeding birds - Ruff, Philomachus pugnax	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Sanderling, Calidris alba	Unfavourable - No change	29/03/2022
Aggregations of non-breeding birds - Shelduck, Tadorna tadorna	Favourable	29/03/2022
Aggregations of non-breeding birds - Teal, Anas crecca	Favourable	29/03/2022
Aggregations of non-breeding birds - Whimbrel, Numenius phaeopus	Favourable	29/03/2022
Avocet, Recurvirostra avosetta - A132-A, nb	Favourable	29/03/2022
Bar-tailed godwit, Limosa lapponica - A157, nb	Unfavourable - Declining	29/03/2022
Bar-tailed godwit, Limosa lapponica - Wintering	-	-
Black-tailed godwit, Limosa limosa - Wintering	-	-
Black-tailed godwit, Limosa limosa islandica - A616, nb	Favourable	29/03/2022
Dunlin, Calidris alpina - Passage	-	-
Dunlin, Calidris alpina - Wintering	-	-
Dunlin, Calidris alpina alpina - A672, nb	Unfavourable - No change	29/03/2022
Estuaries	-	-
Estuary	-	-
Golden plover, Pluvialis apricaria - A140, nb	Favourable	29/03/2022
Golden plover, Pluvialis apricaria - Passage	-	-
Golden plover, Pluvialis apricaria - Wintering	-	-
H1130 Estuaries	-	-
H1140 Mudflats and sandflats not covered by seawater at low tide	-	-
Knot, Calidris canutus - A143, nb	Favourable	29/03/2022
Knot, Calidris canutus - Passage	-	-
Knot, Calidris canutus - Wintering	-	-
Littoral sediment	Unfavourable - Recovering	30/03/2010
Redshank, Tringa totanus - A162, nb	Unfavourable - Declining	29/03/2022

Feature name	Feature condition	Date of assessment
Redshank, Tringa totanus - Passage	-	-
Redshank, Tringa totanus - Wintering	-	-
Ruff, Philomachus pugnax - A151, nb	Unfavourable - No change	29/03/2022
Shelduck, Tadorna tadorna - A048, nb	Favourable	29/03/2022
Shelduck, Tadorna tadorna - Wintering	-	-
Waterbird assemblage - Wintering	-	-
Waterbird assemblage	Favourable	29/03/2022

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

11 Visual and cultural designations

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	0

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.

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.

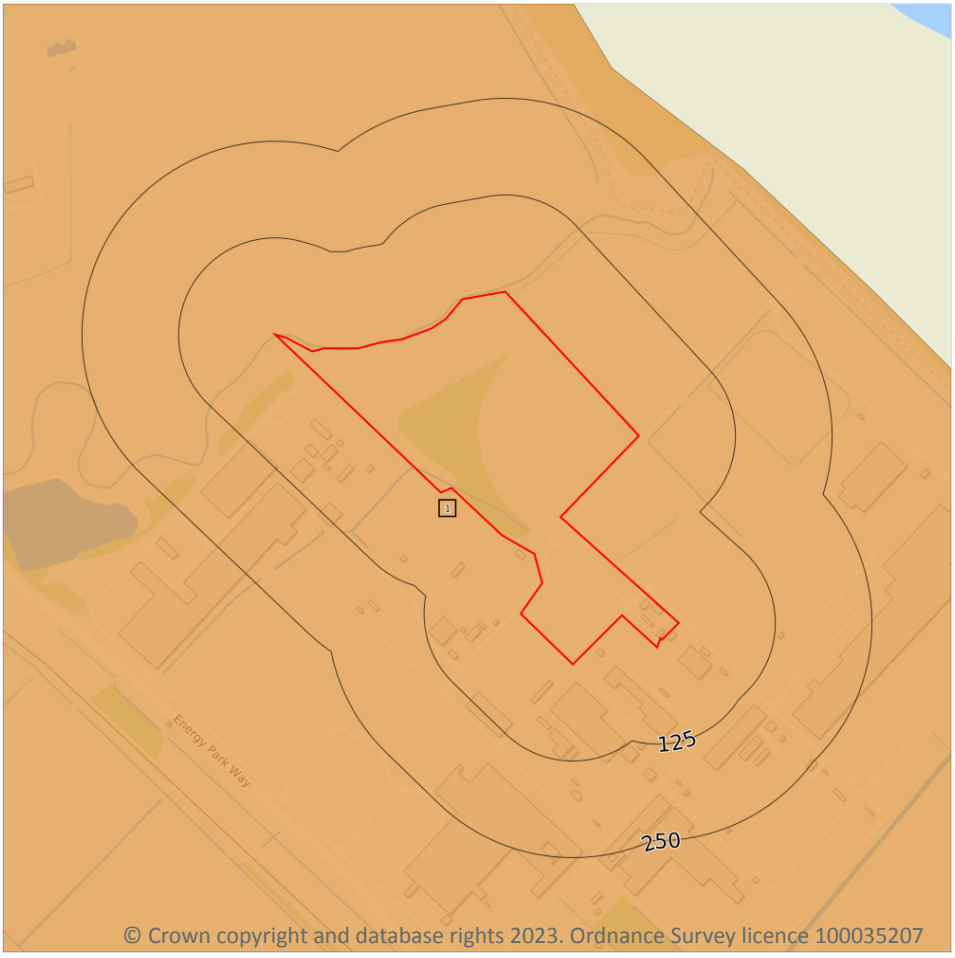
11.7 Registered Parks and Gardens

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 115 >**

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.

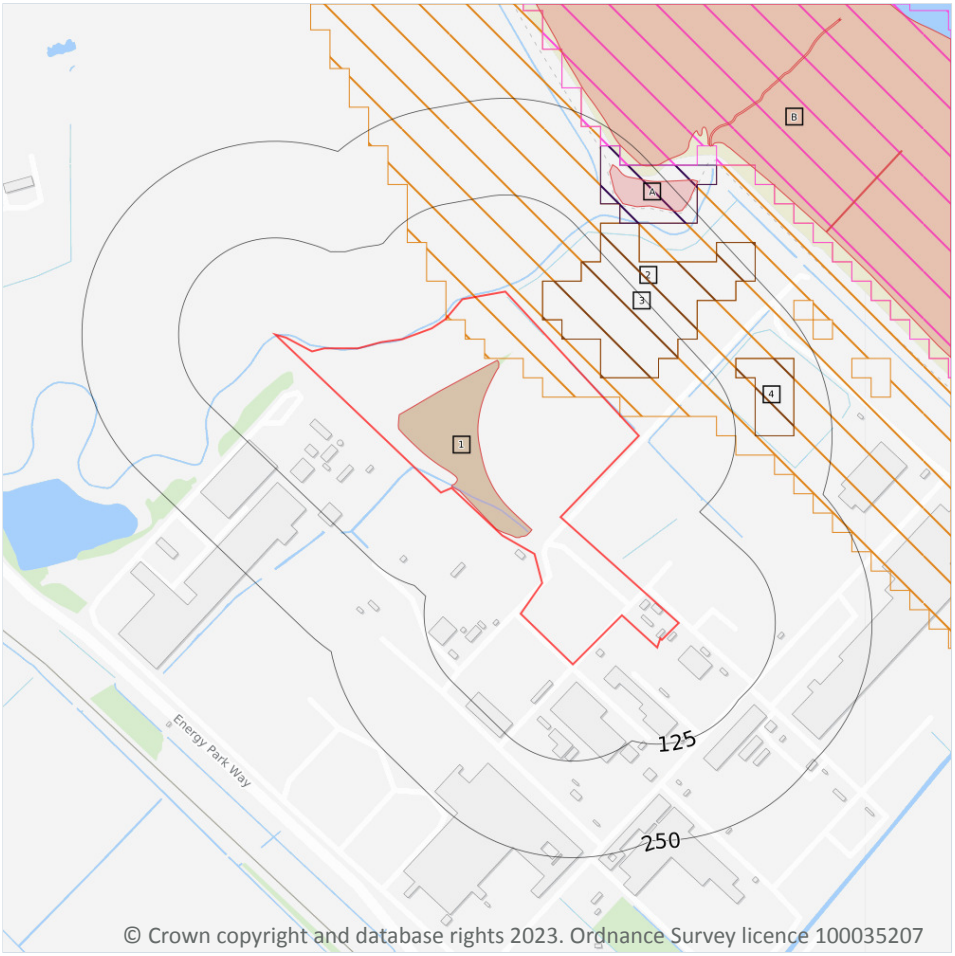
12.5 Countryside Stewardship Schemes

Records within 250m	0

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.

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 117 >**

ID	Location	Main Habitat	Other habitats
1	**On site**	**Deciduous woodland**	**Main habitat: DWOOD (INV > 50%)**
A	189m NE	Coastal saltmarsh	Main habitat: SALTM (INV > 50%)
B	239m NE	Mudflats	Main habitat: MUDFL (INV > 50%)

This data is sourced from Natural England.

13.2 Habitat Networks

Records within 250m	5

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.

Features are displayed on the Habitat designations map on **page 117 >**

ID	Location	Type	Habitat
2	**On site**	**Network Enhancement Zone 1**	**Not specified**
3	11m N	Network Enhancement Zone 2	Not specified
4	146m E	Network Enhancement Zone 2	Not specified
A	168m N	Primary Habitat	Saltmarsh
B	221m N	Associated Habitats	Other associated habitats

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

Site Outline

Search buffers in metres (m)

Full coverage

Partial coverage

No coverage

14.1 10k Availability

Records within 500m	1

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 119 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	On site	No coverage	No coverage	No coverage	No coverage	NoCov

This data is sourced from the British Geological Survey.

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

14.2 Artificial and made ground (10k)

Records within 500m	0

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.

This data is sourced from the British Geological Survey.

Geology 1:10,000 scale - Superficial

14.3 Superficial geology (10k)

Records within 500m	0

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.

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

14.5 Bedrock geology (10k)

Records within 500m	0

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.

This data is sourced from the British Geological Survey.

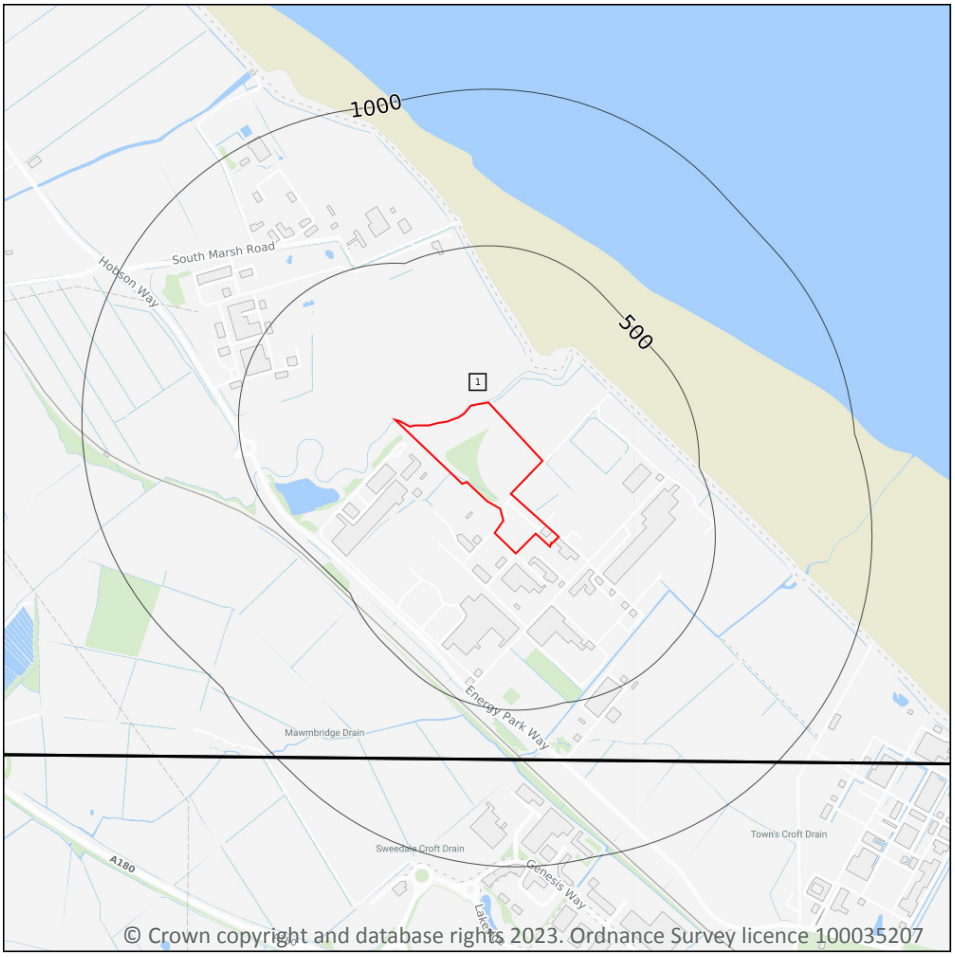
14.6 Bedrock faults and other linear features (10k)

Records within 500m	0

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.

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	1

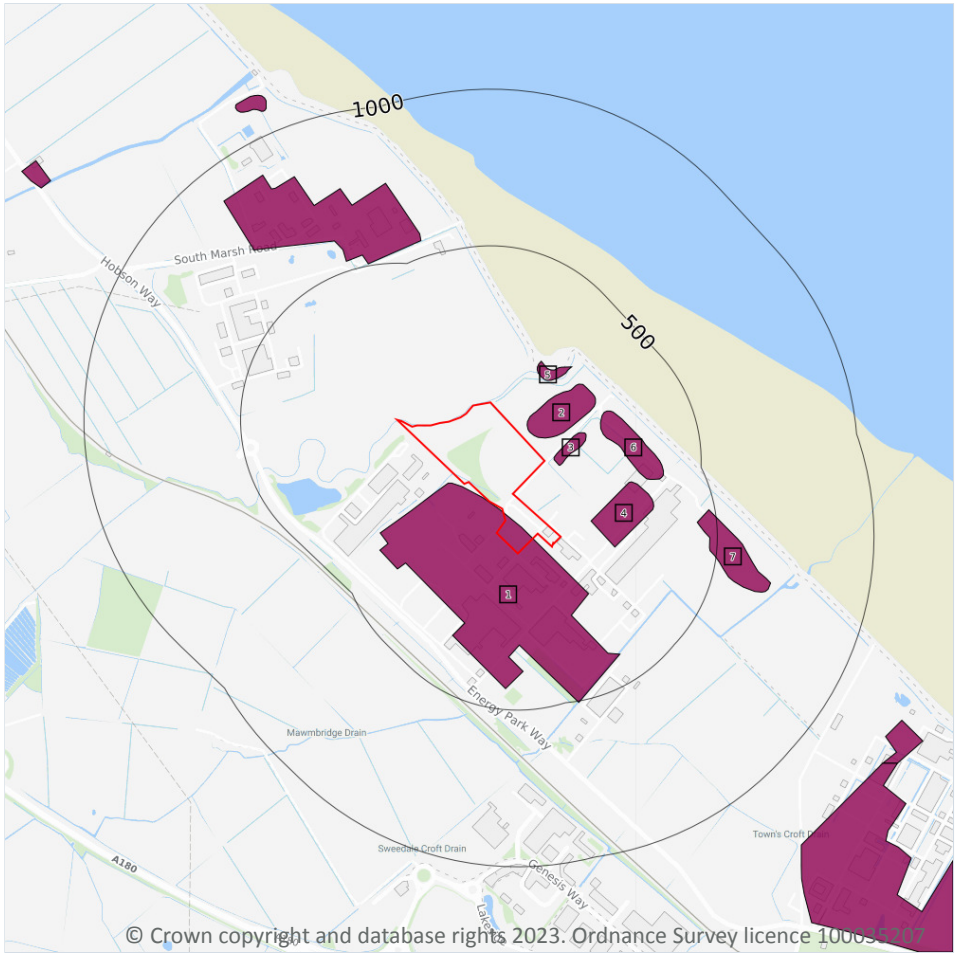
An indication on the coverage of 1:50,000 scale geology data for the site. Either 'Full' or 'No coverage' for each geological theme.

Features are displayed on the Geology 1:50,000 scale - Availability map on **page 123 >**

ID	Location	Artificial	Superficial	Bedrock	Mass movement	Sheet No.
1	**On site**	**Full**	**Full**	**Full**	**No coverage**	**EW081_082_patrington_and_spurn_v4**

This data is sourced from the British Geological Survey.

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



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 **7**

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 124 >**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**MGR-ARTDP**	**MADE GROUND (UNDIVIDED)**	**ARTIFICIAL DEPOSIT**
2	28m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
3	31m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
4	109m SE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

ID	Location	LEX Code	Description	Rock description
5	174m NE	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
6	206m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT
7	438m E	MGR-ARTDP	MADE GROUND (UNDIVIDED)	ARTIFICIAL DEPOSIT

This data is sourced from the British Geological Survey.

15.3 Artificial ground permeability (50k)

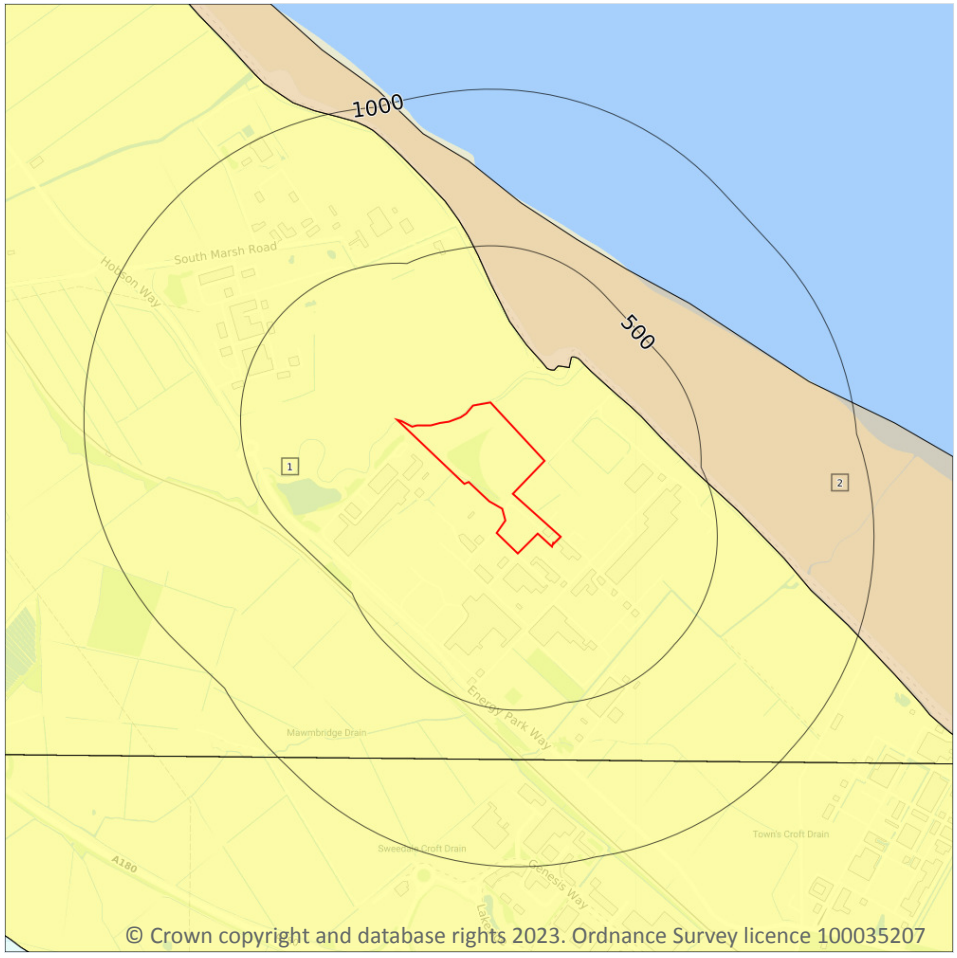
Records within 50m	**3**

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).

Location	Flow type	Maximum permeability	Minimum permeability
On site	**Mixed**	**Very High**	**Low**
28m NE	Mixed	Very High	Low
31m E	Mixed	Very High	Low

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 **2**

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 126 >**

ID	Location	LEX Code	Description	Rock description
1	**On site**	**TFD-XCZ**	**TIDAL FLAT DEPOSITS**	**CLAY AND SILT**
2	207m NE	BTFU-XCZS	BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED)	CLAY, SILT AND SAND

This data is sourced from the British Geological Survey.

15.5 Superficial permeability (50k)

Records within 50m	1

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**	**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.

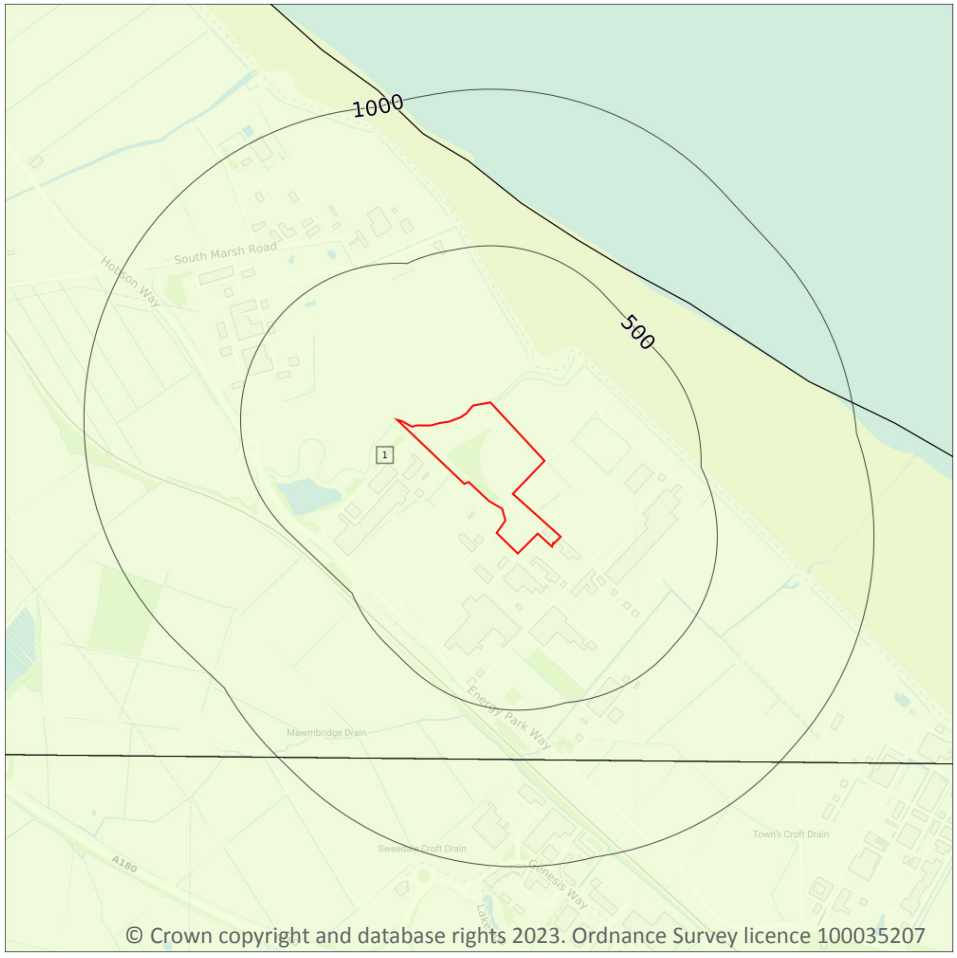
15.7 Landslip permeability (50k)

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	1

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 128 >**

ID	Location	LEX Code	Description	Rock age
1	**On site**	**FCK-CHLK**	**FLAMBOROUGH CHALK FORMATION - CHALK**	**SANTONIAN**

This data is sourced from the British Geological Survey.

15.9 Bedrock permeability (50k)

Records within 50m	1

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**	**Very High**

This data is sourced from the British Geological Survey.

15.10 Bedrock faults and other linear features (50k)

Records within 500m	0

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.

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	1

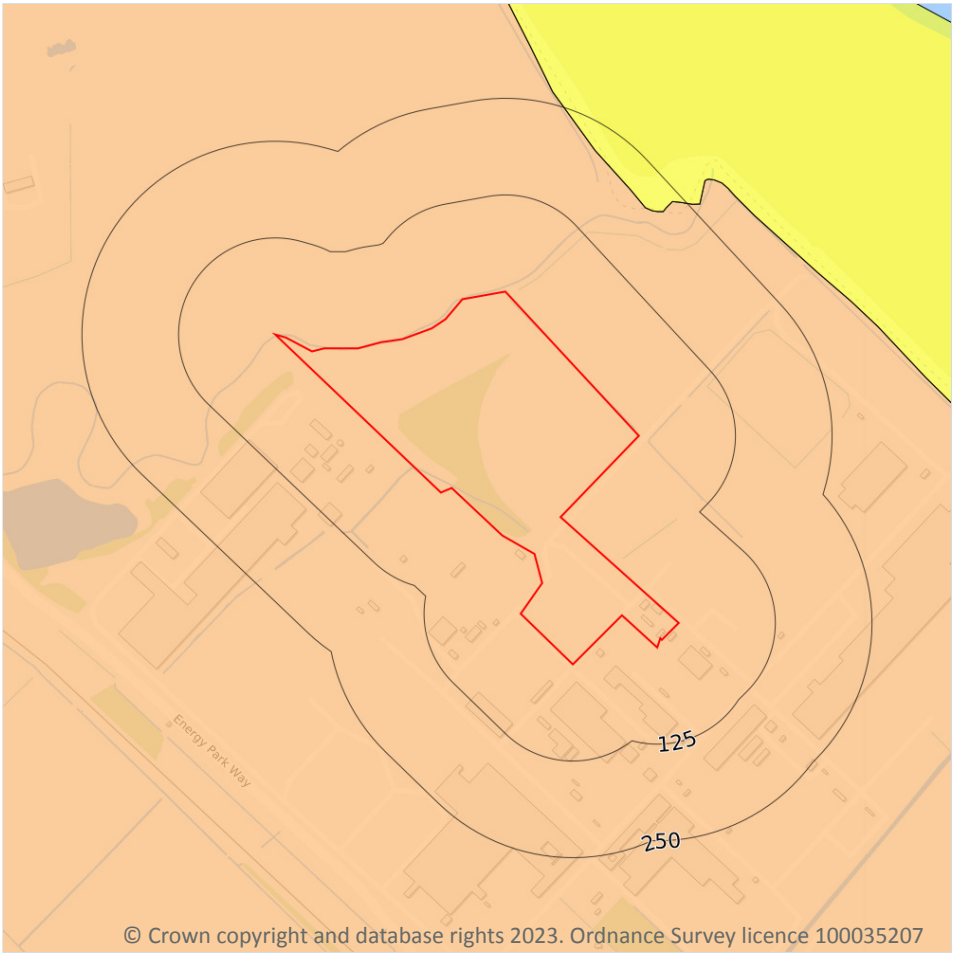
The Single Onshore Boreholes Index (SOBI); an index of over one million records of boreholes, shafts and wells from all forms of drilling and site investigation work held by the British Geological Survey. Covering onshore and nearshore boreholes dating back to at least 1790 and ranging from one to several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

Features are displayed on the Boreholes map on **page 130 >**

ID	Location	Grid reference	Name	Length	Confidential	Web link
1	186m NE	523794 413132	South Ferriby BH-01	20.0	N	20346386 ↗

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	1

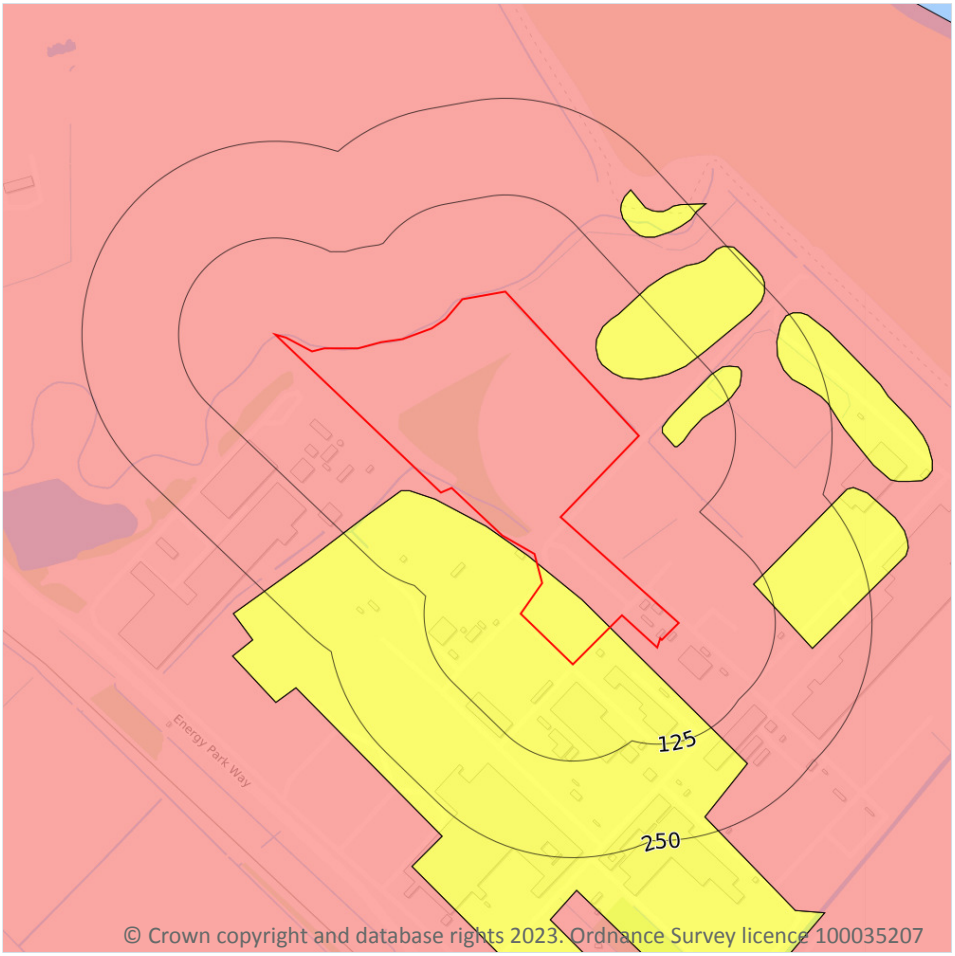
The potential hazard presented by soils that absorb water when wet (making them swell), and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and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

Features are displayed on the Natural ground subsidence - Shrink swell clays map on **page 131 >**

Location	Hazard rating	Details
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	4

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.

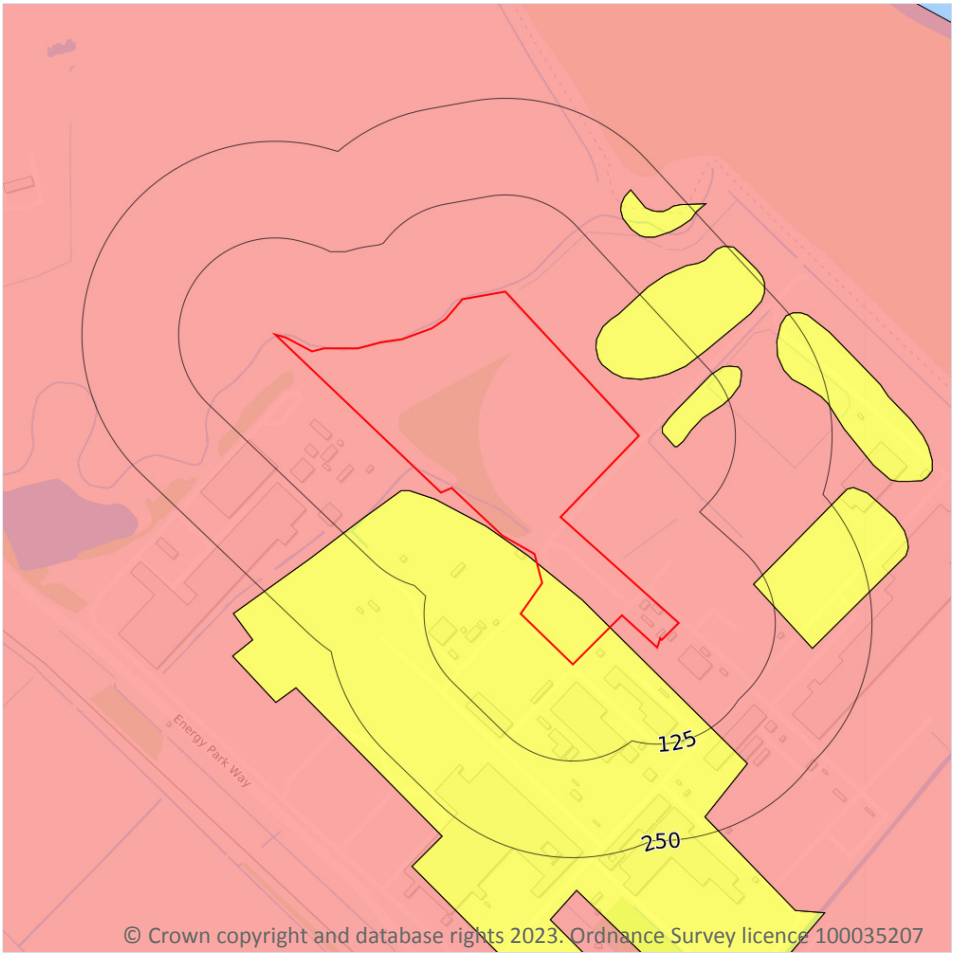
Features are displayed on the Natural ground subsidence - Running sands map on **page 132 >**

Location	Hazard rating	Details
On site	**Very low**	**Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.**

Location	Hazard rating	Details
On site	**Moderate**	**Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.**
28m NE	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.
31m E	Very low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly.

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	4

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 134 >**

Location	Hazard rating	Details
On site	**Very low**	**Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.**

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.**
28m NE	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.
31m E	Very low	Compressibility and uneven settlement problems are not likely to be significant on the site for most land uses.

This data is sourced from the British Geological Survey.

Natural ground subsidence - Collapsible deposits

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Site Outline

Search buffers in metres (m)

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

17.4 Collapsible deposits

Records within 50m	1

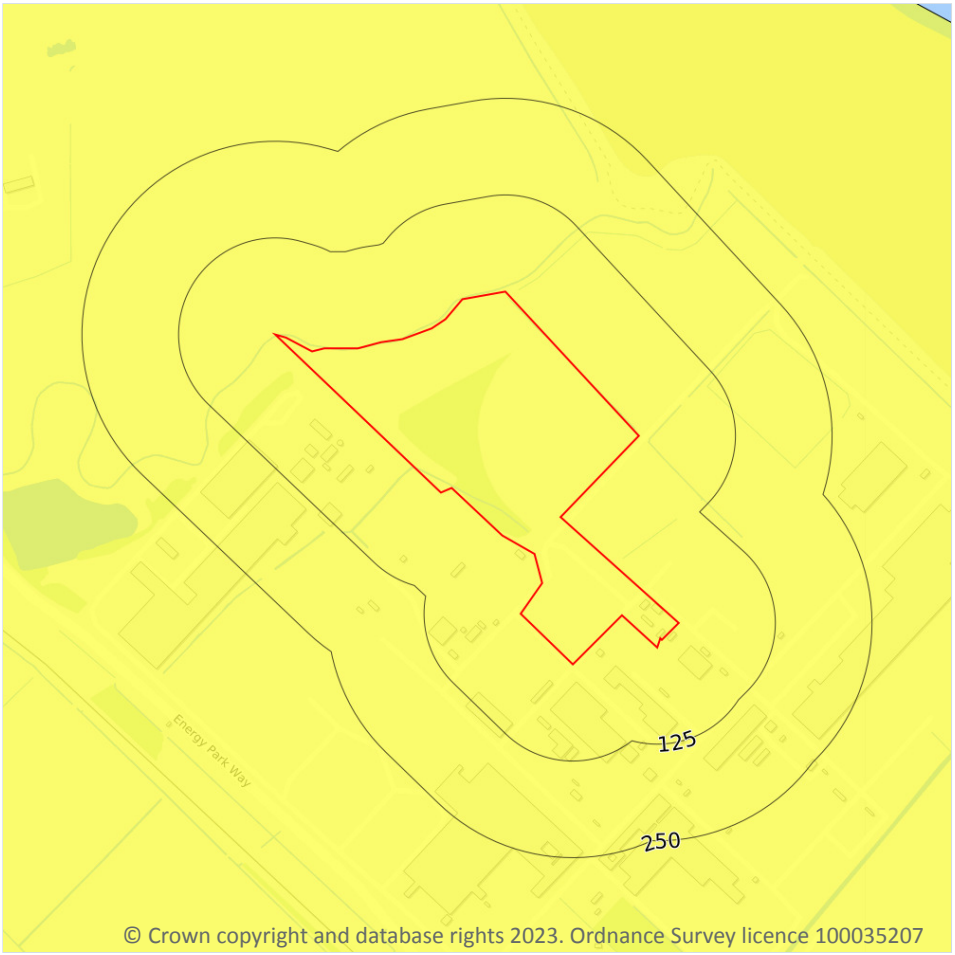
The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

Features are displayed on the Natural ground subsidence - Collapsible deposits map on **page 136 >**

Location	Hazard rating	Details
On site	**Negligible**	**Deposits with potential to collapse when loaded and saturated are believed not 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 137 >**

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 138 >**

Location	Hazard rating	Details
On site	**Negligible**	**Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.**

This data is sourced from the British Geological Survey.

18 Mining and ground workings

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	0

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.

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	0

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

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.

19.5 National karst database

Records within 500m	0

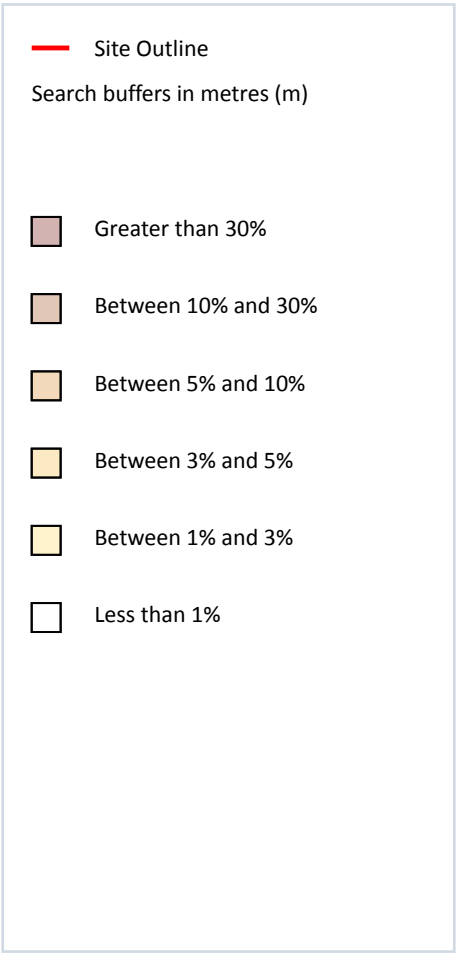
This is a comprehensive database of national karst information gathered from a wide range of sources. BGS have collected data on five main types of karst feature: Sinkholes, stream links, caves, springs, and incidences of associated damage to buildings, roads, bridges and other engineered works.

Since the database was set up in 2002 data covering most of the evaporite karst areas of the UK have now been added, along with data covering about 60% of the Chalk, and 35% of the Carboniferous Limestone outcrops. Many of the classic upland karst areas have yet to be included. Recorded so far are: Over 800 caves, 1300 stream sinks, 5600 springs, 10,000 sinkholes.

The database is not yet complete, and not all records have been verified. The absence of data does not mean that karst features are not present at a site. A reliability rating is included with each record.

This data is sourced from the British Geological Survey.

20 Radon



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 146 >**

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 **7**

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 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**30 - 45 mg/kg**
On site	**15 - 25 mg/kg**	**No data**	**100 mg/kg**	**60 mg/kg**	**1.8 mg/kg**	**90 - 120 mg/kg**	**30 - 45 mg/kg**
29m S	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
44m NW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 mg/kg
44m NW	15 - 25 mg/kg	No data	100 mg/kg	60 mg/kg	1.8 mg/kg	90 - 120 mg/kg	30 - 45 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.

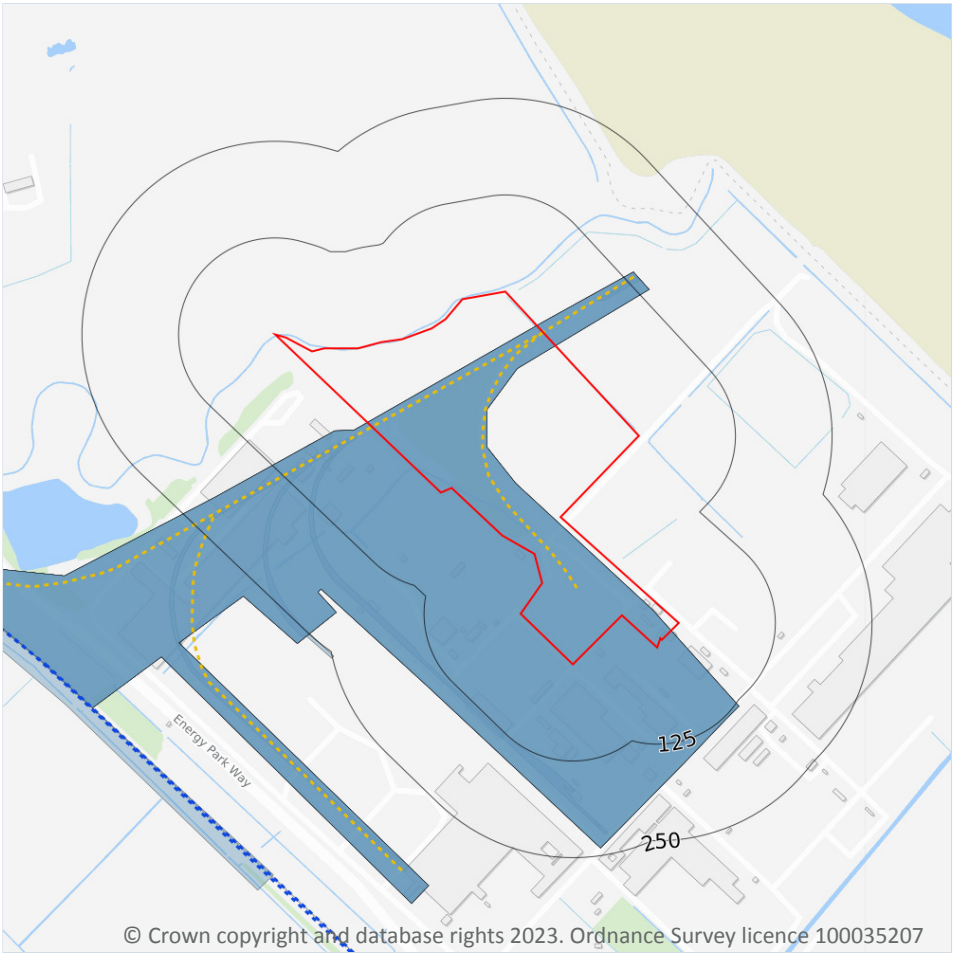
21.3 BGS Measured Urban Soil Chemistry

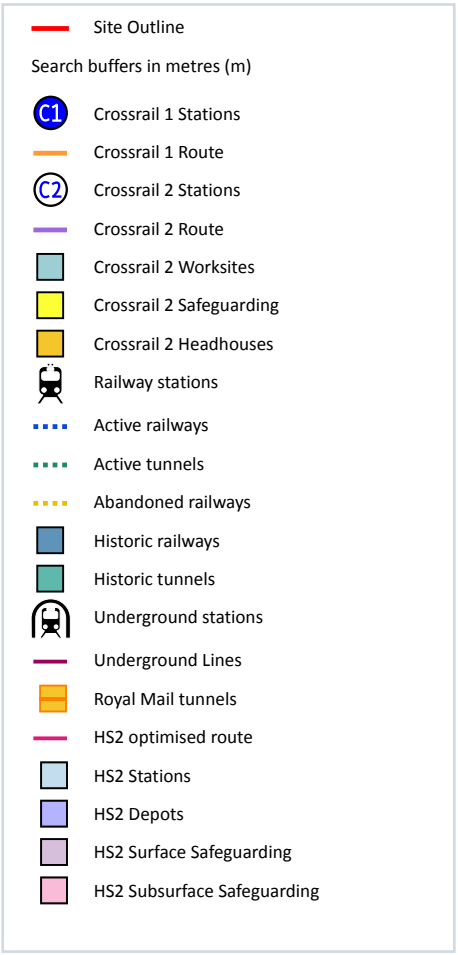
Records within 50m	0

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	6

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 150 >**

Location	Land Use	Year of mapping	Mapping scale
On site	**Railway Sidings**	**1988**	**10000**
On site	**Railway Sidings**	**1980**	**10000**
On site	**Railway Sidings**	**1968**	**10560**
On site	**Railway Sidings**	**1965**	**10560**
23m W	Railway Sidings	1964	2500
80m NE	Railway Sidings	1964	2500

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	3

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

Features are displayed on the Railway infrastructure and projects map on **page 150 >**

Location	Description
On site	**Abandoned**
On site	**Abandoned**
221m W	Abandoned

This data is sourced from OpenStreetMap.

22.7 Railways

Records within 250m	0

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

This data is sourced from Ordnance Survey and OpenStreetMap.

22.8 Crossrail 1

Records within 500m	0

The Crossrail railway project links 41 stations over 100 kilometres from Reading and Heathrow in the west, through underground sections in central London, to Shenfield and Abbey Wood in the east.

This data is sourced from publicly available information by Groundsure.

22.9 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.

22.10 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.

This data is sourced from HS2 ltd.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information. To find out who they are and their areas of expertise see https://www.groundsure.com/sources-reference ↗.

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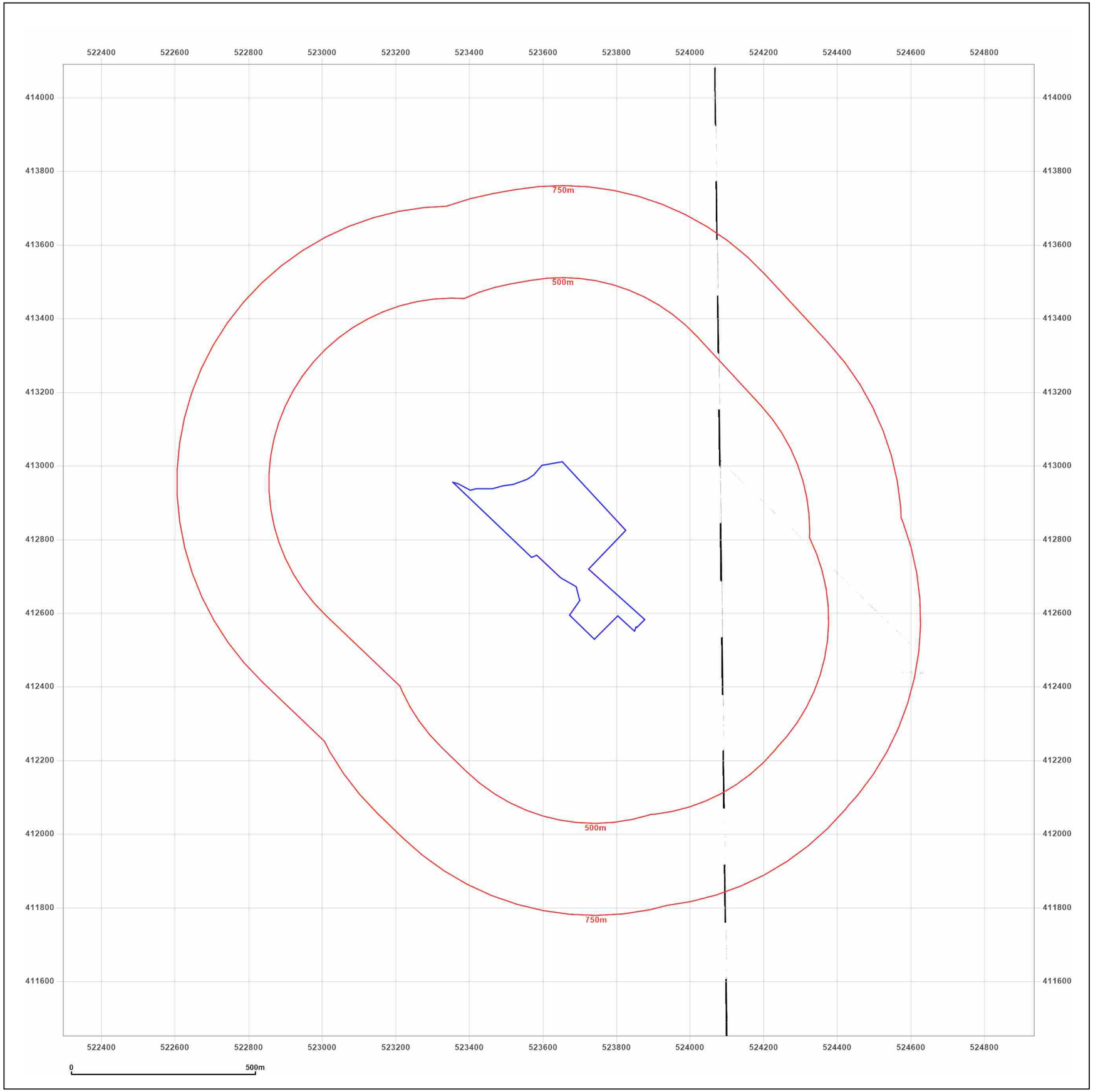

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1854**

Scale: 1:10,560

Printed at: 1:10,560

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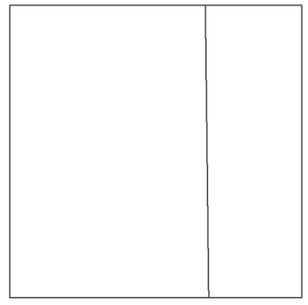

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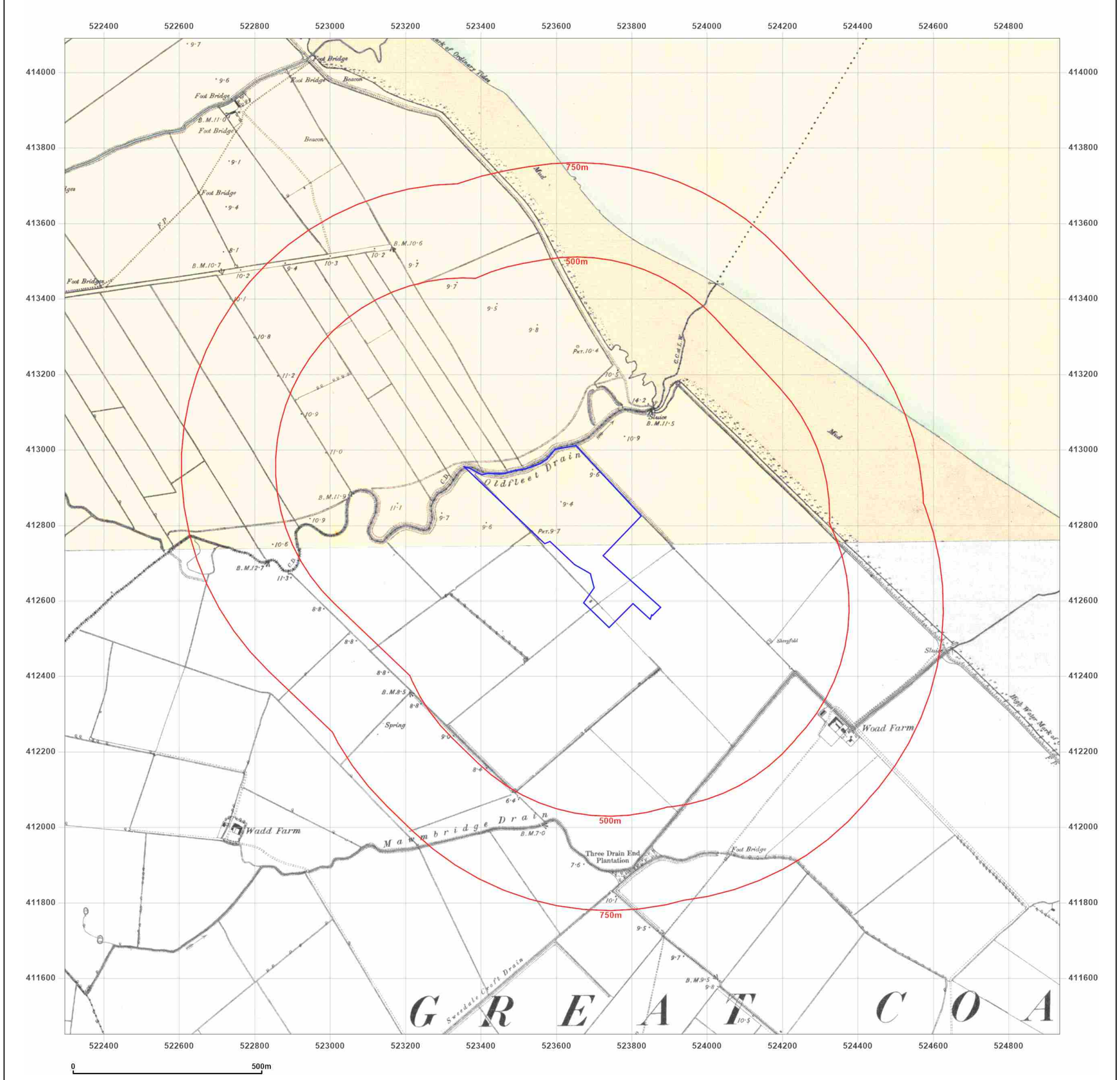

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Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1887**

Scale: 1:10,560

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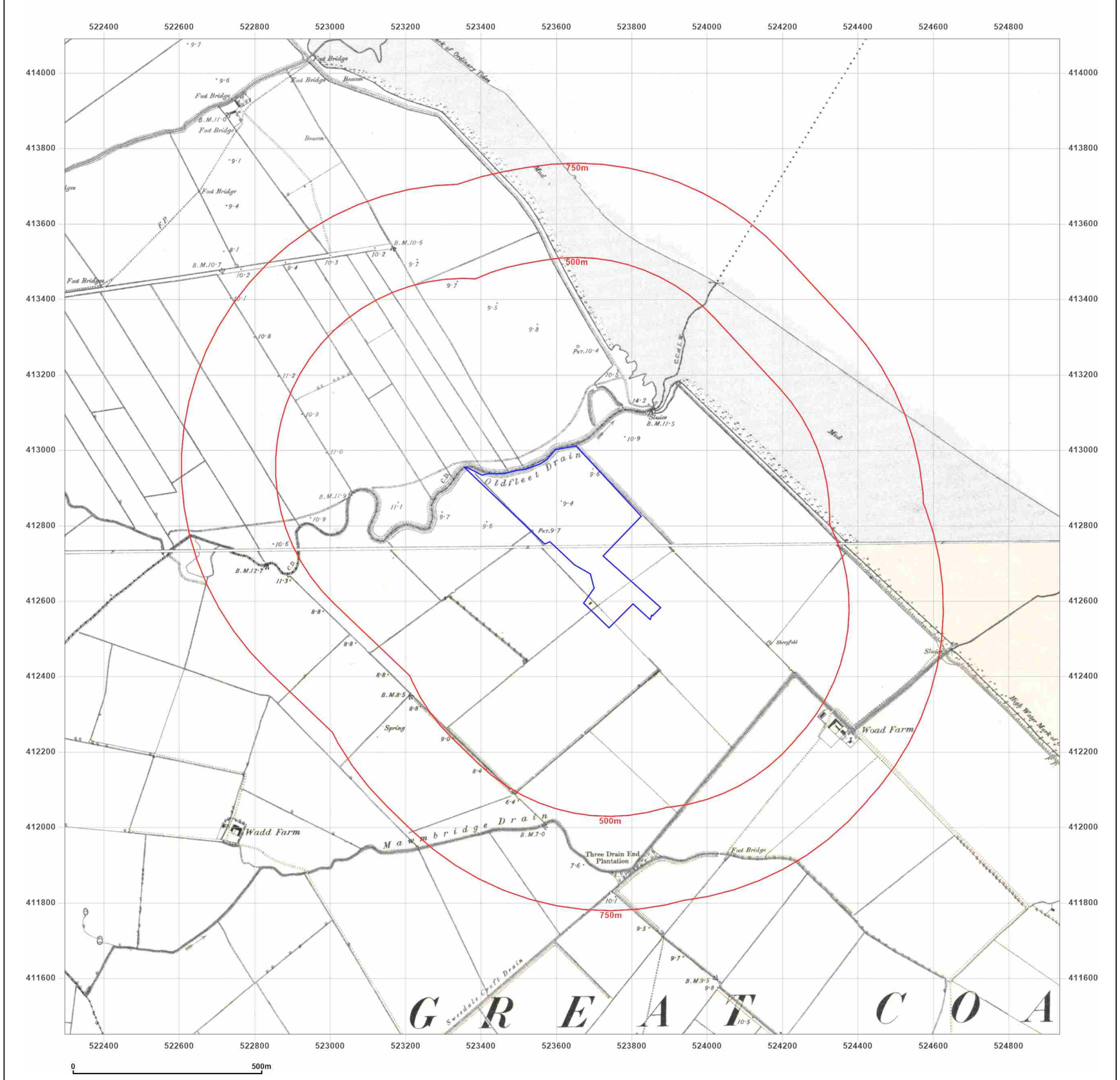

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1886-1888**

Scale: 1:10,560

Printed at: 1:10,560

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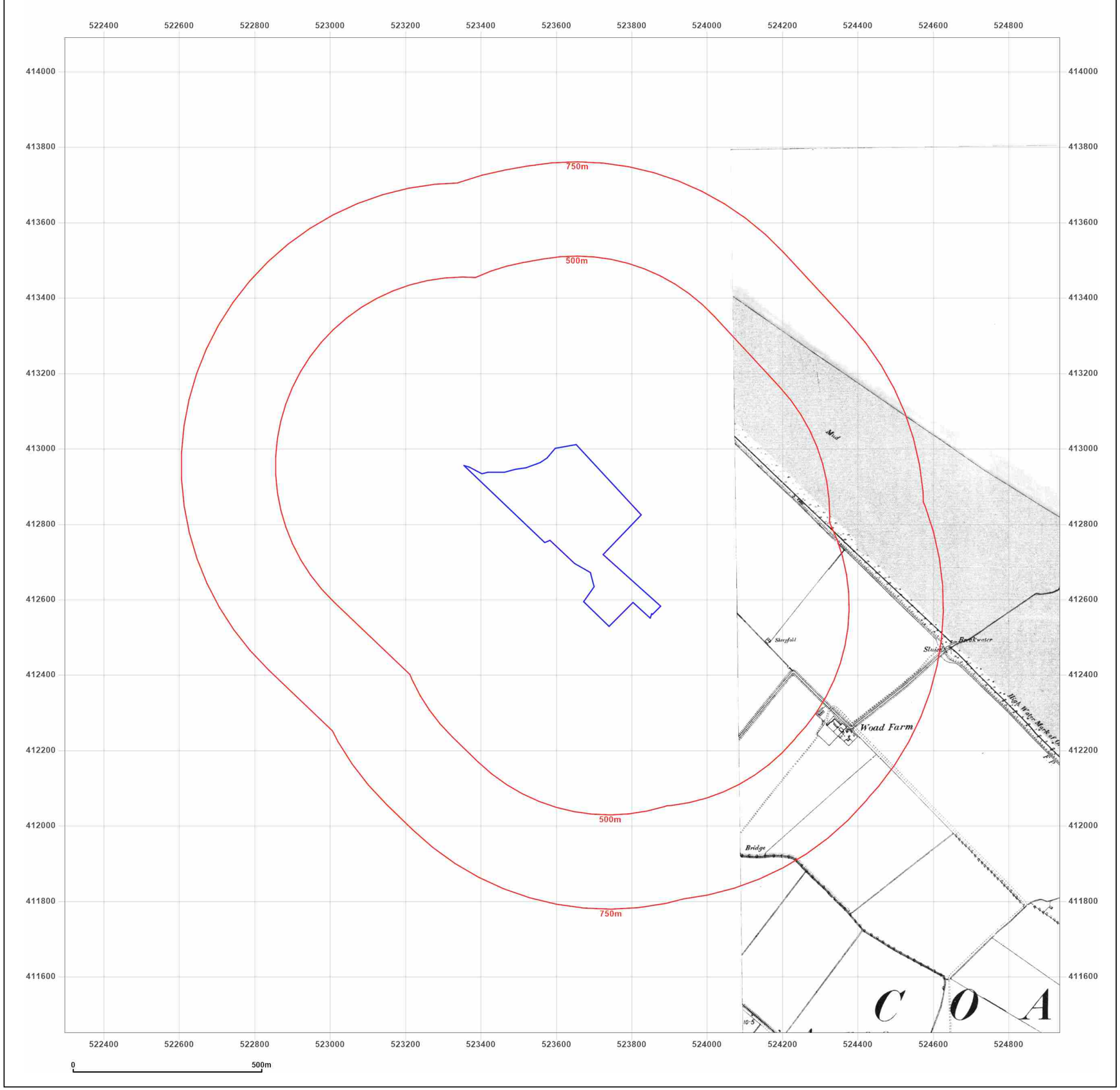

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1892**

Scale: 1:10,560

Printed at: 1:10,560

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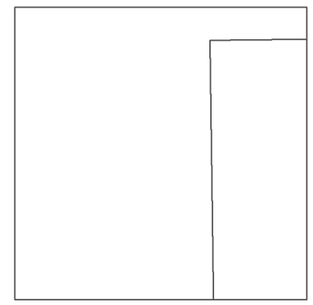

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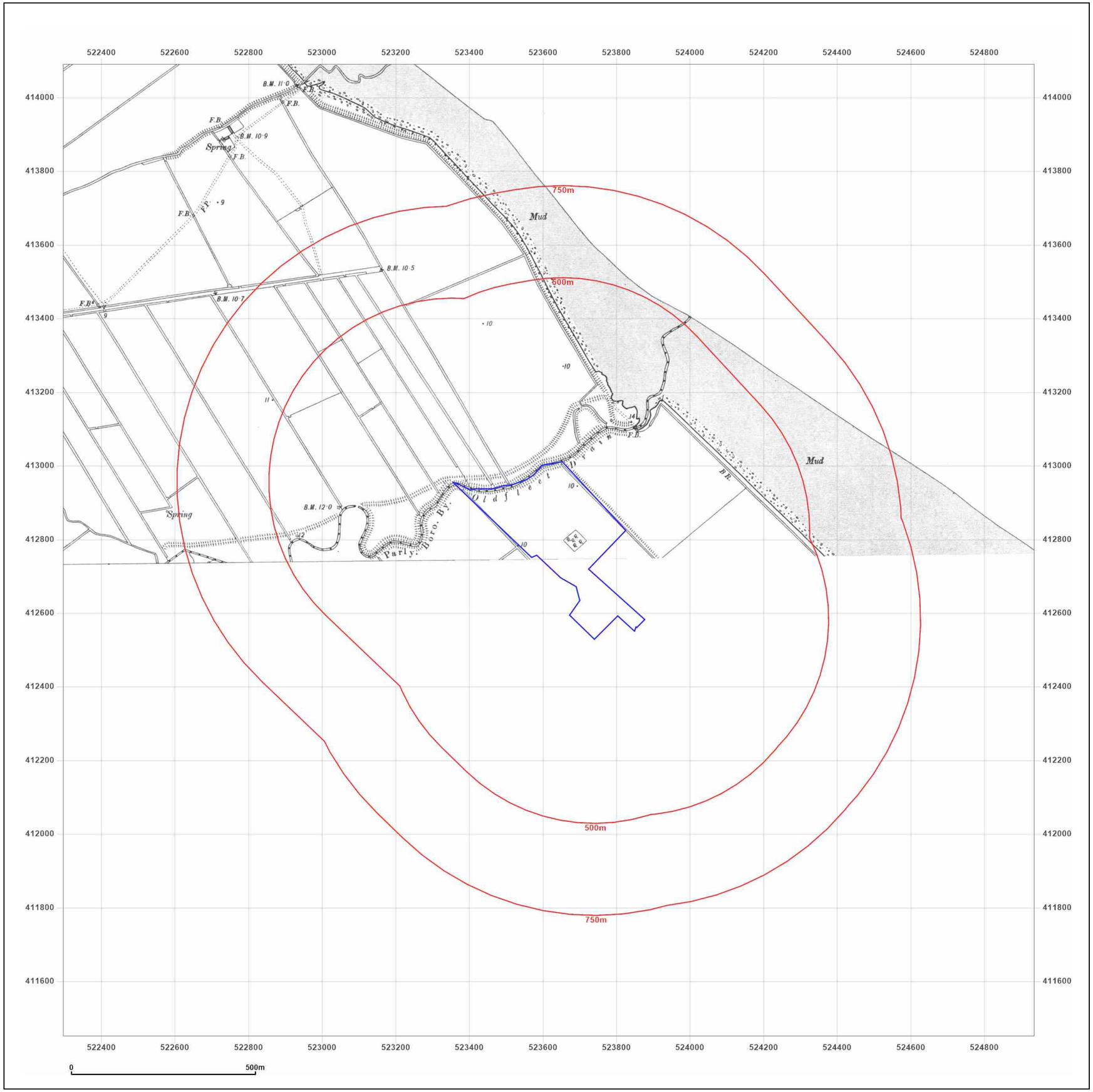

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1906**

Scale: 1:10,560

Printed at: 1:10,560

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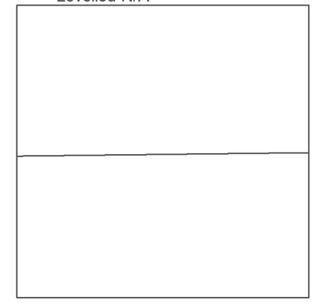

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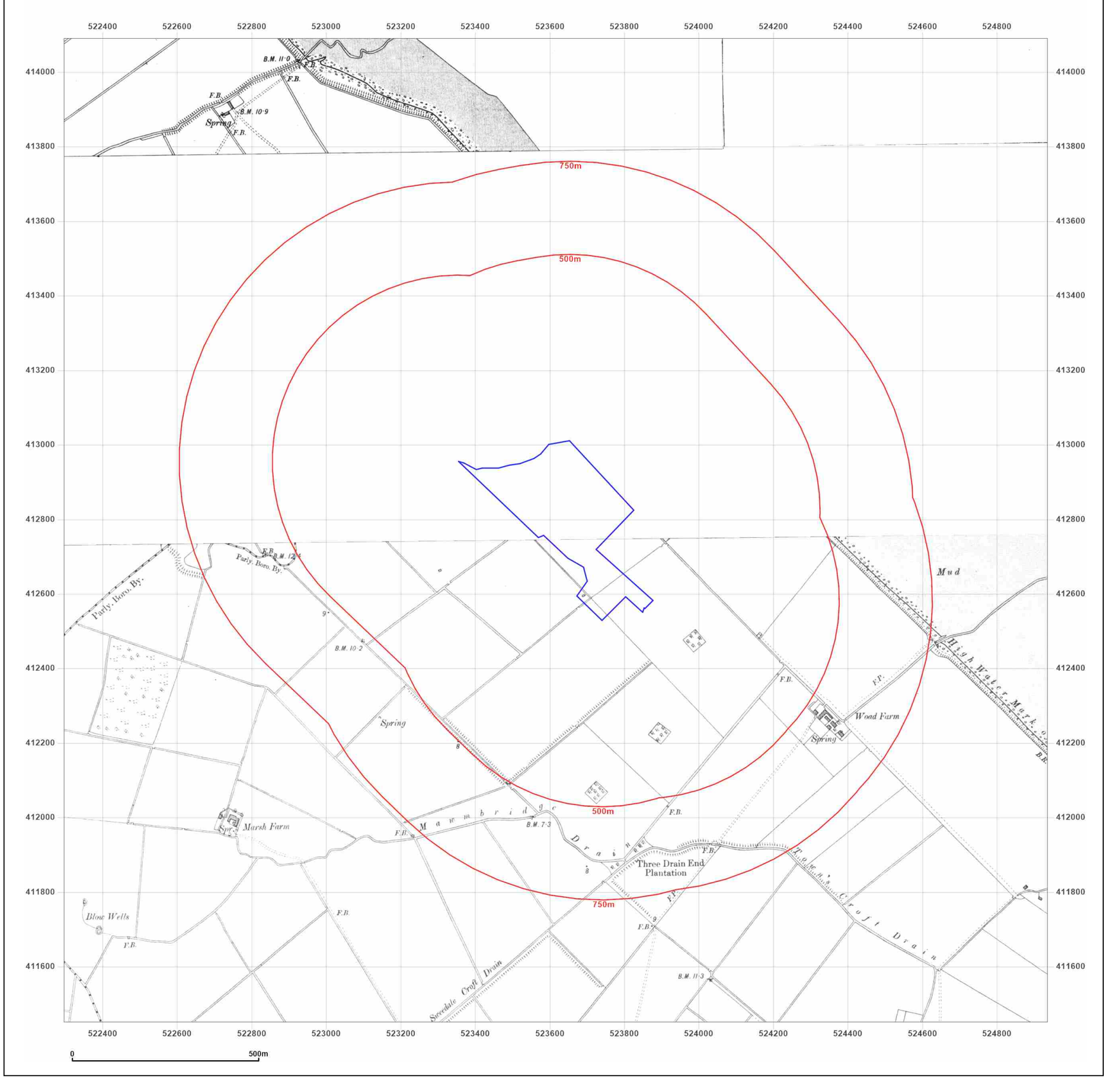

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series
Map date: **1906-1907**
Scale: 1:10,560
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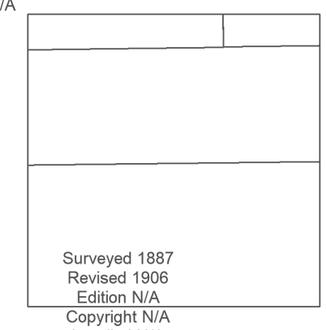

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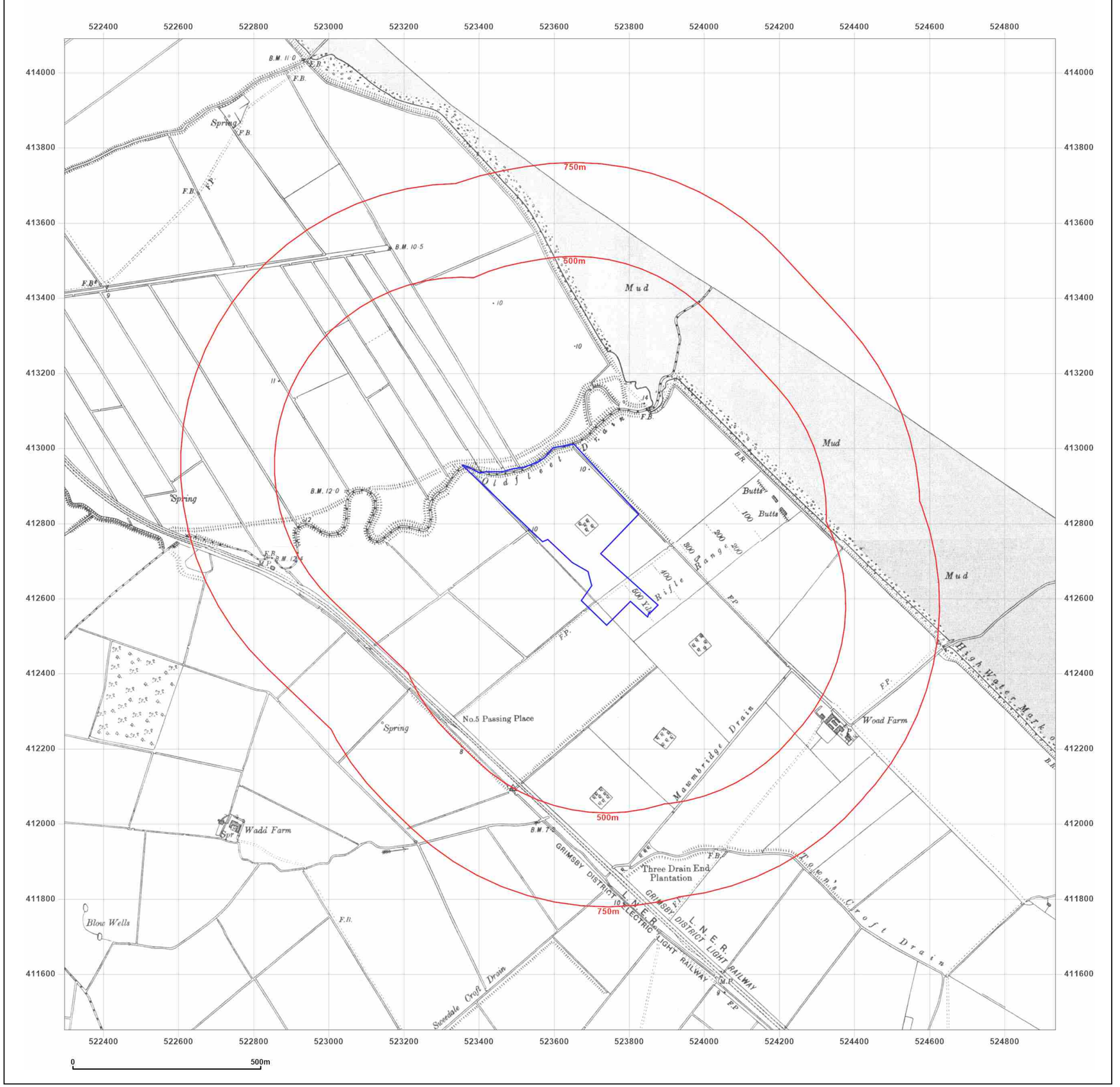

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1930-1931**

Scale: 1:10,560

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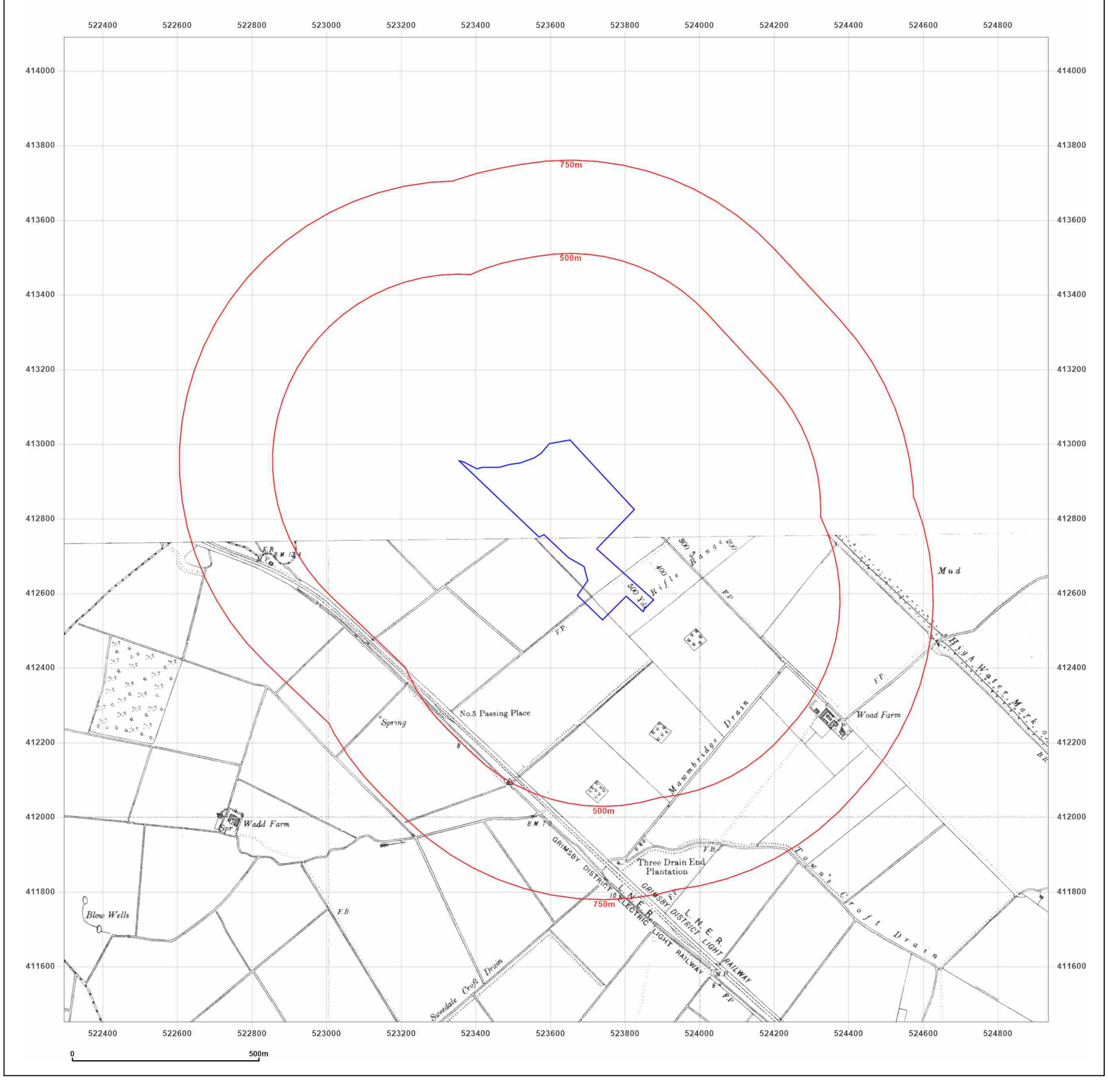

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1938**

Scale: 1:10,560

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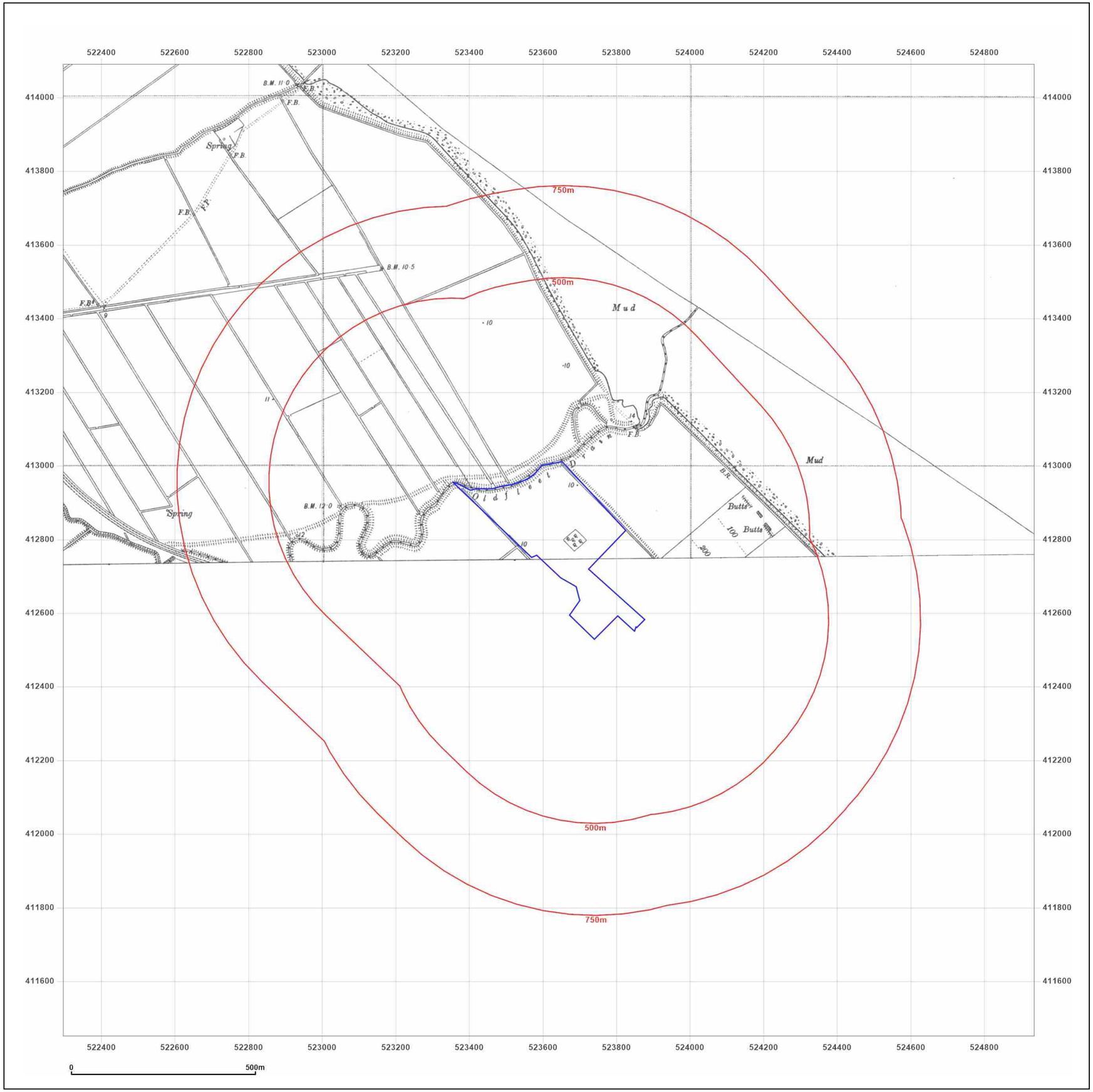

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1947**

Scale: 1:10,560

Printed at: 1:10,560

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Edition N/A
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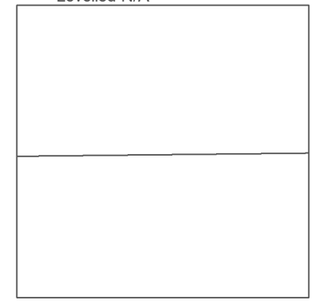

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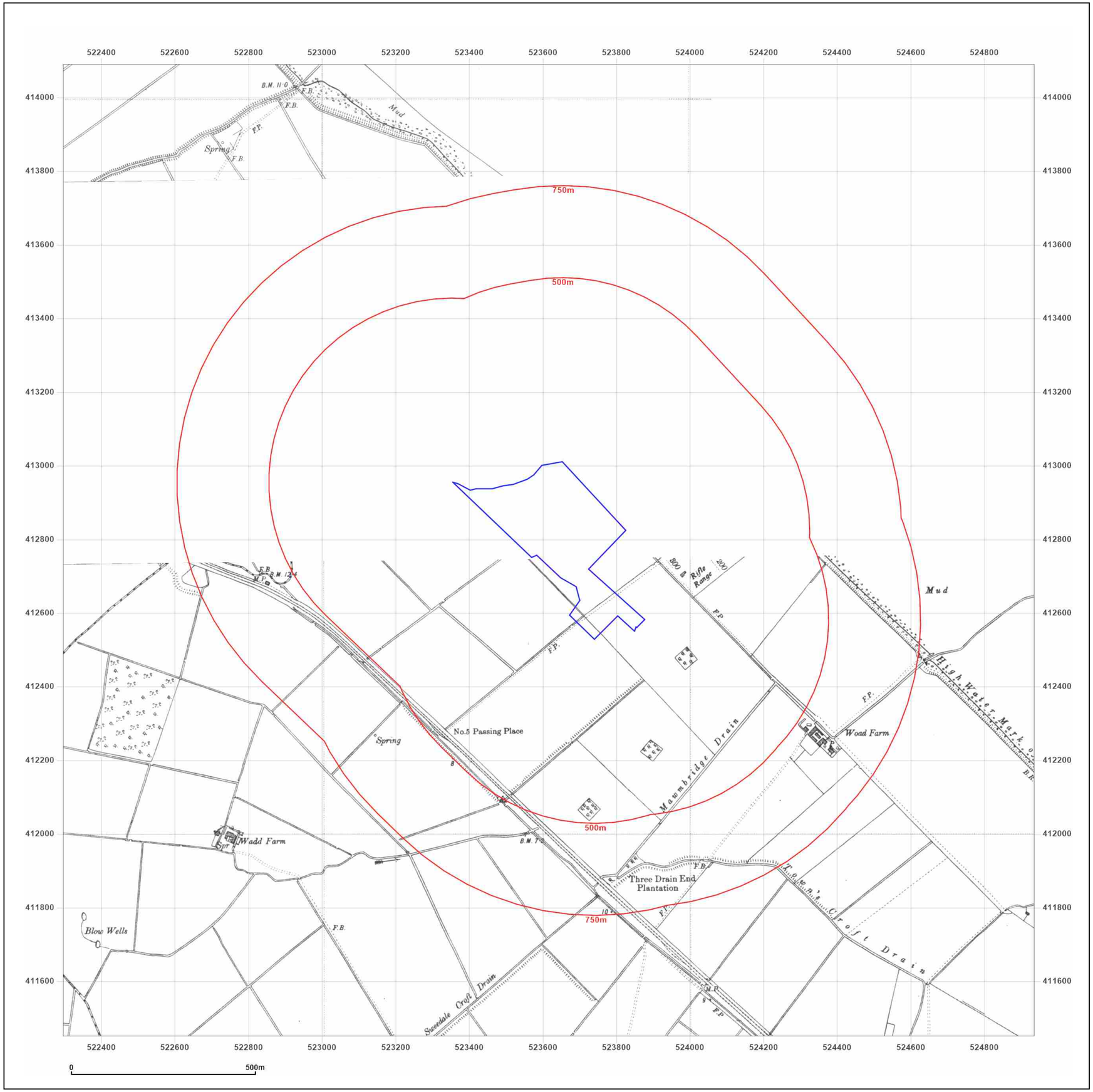

Groundsure INSIGHTS

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Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: County Series

Map date: **1946-1947**

Scale: 1:10,560

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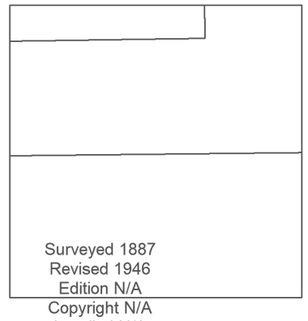

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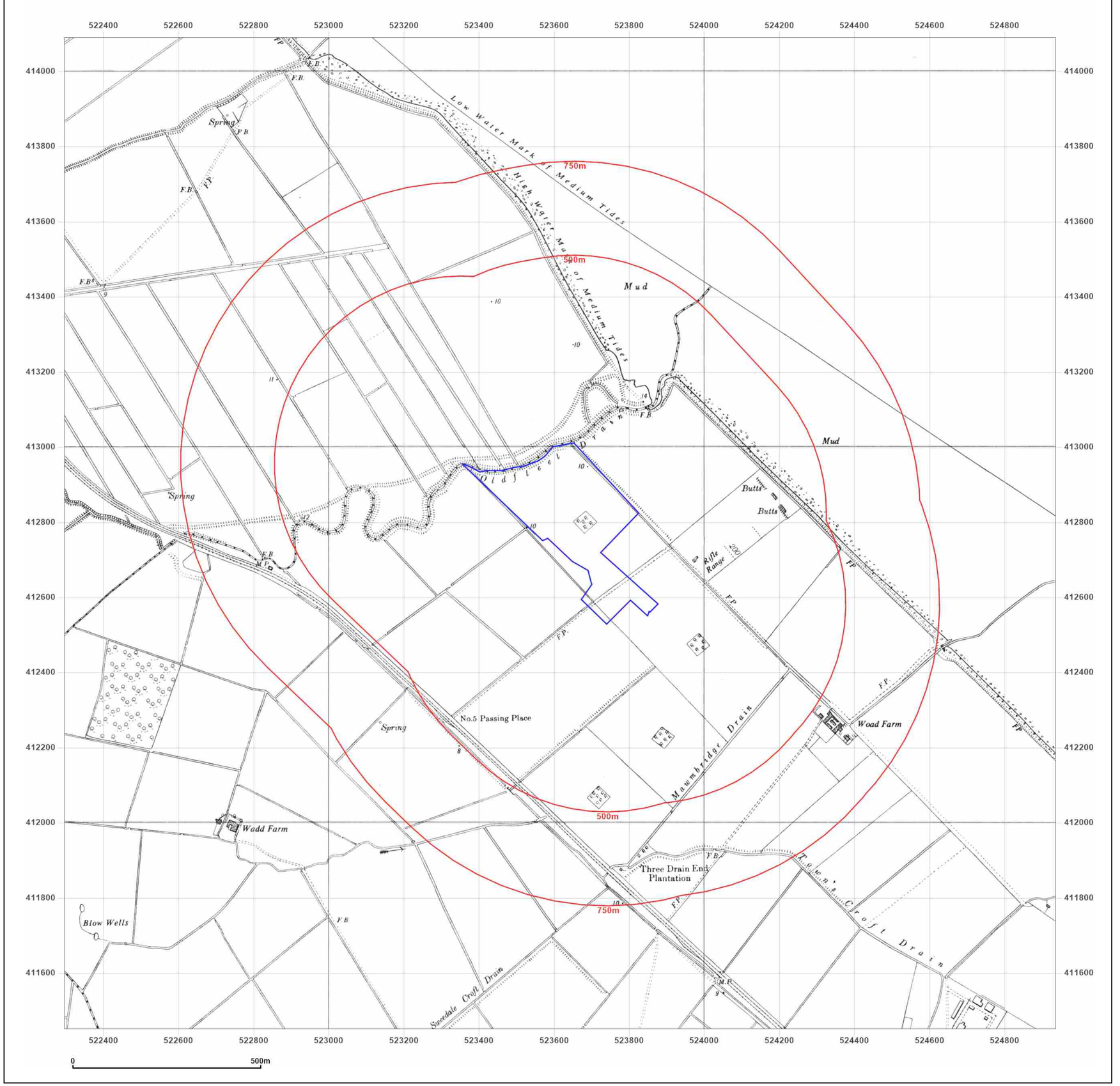

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: Provisional

Map date: **1956**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed N/A
Revised 1956
Edition 1956
Copyright N/A
Levelled N/A

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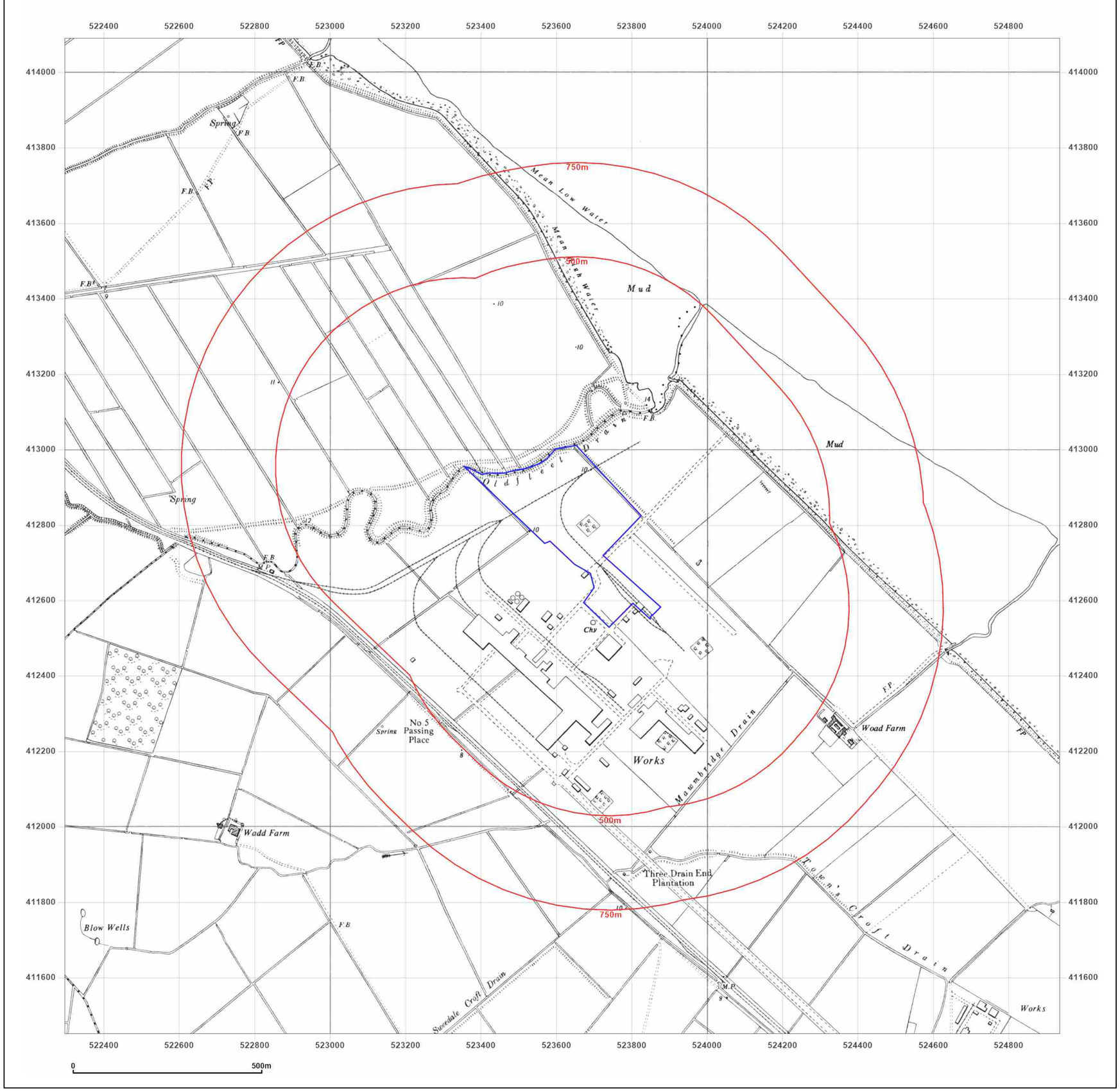

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: Provisional

Map date: **1965**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed N/A
Revised 1965
Edition N/A
Copyright N/A
Levelled N/A

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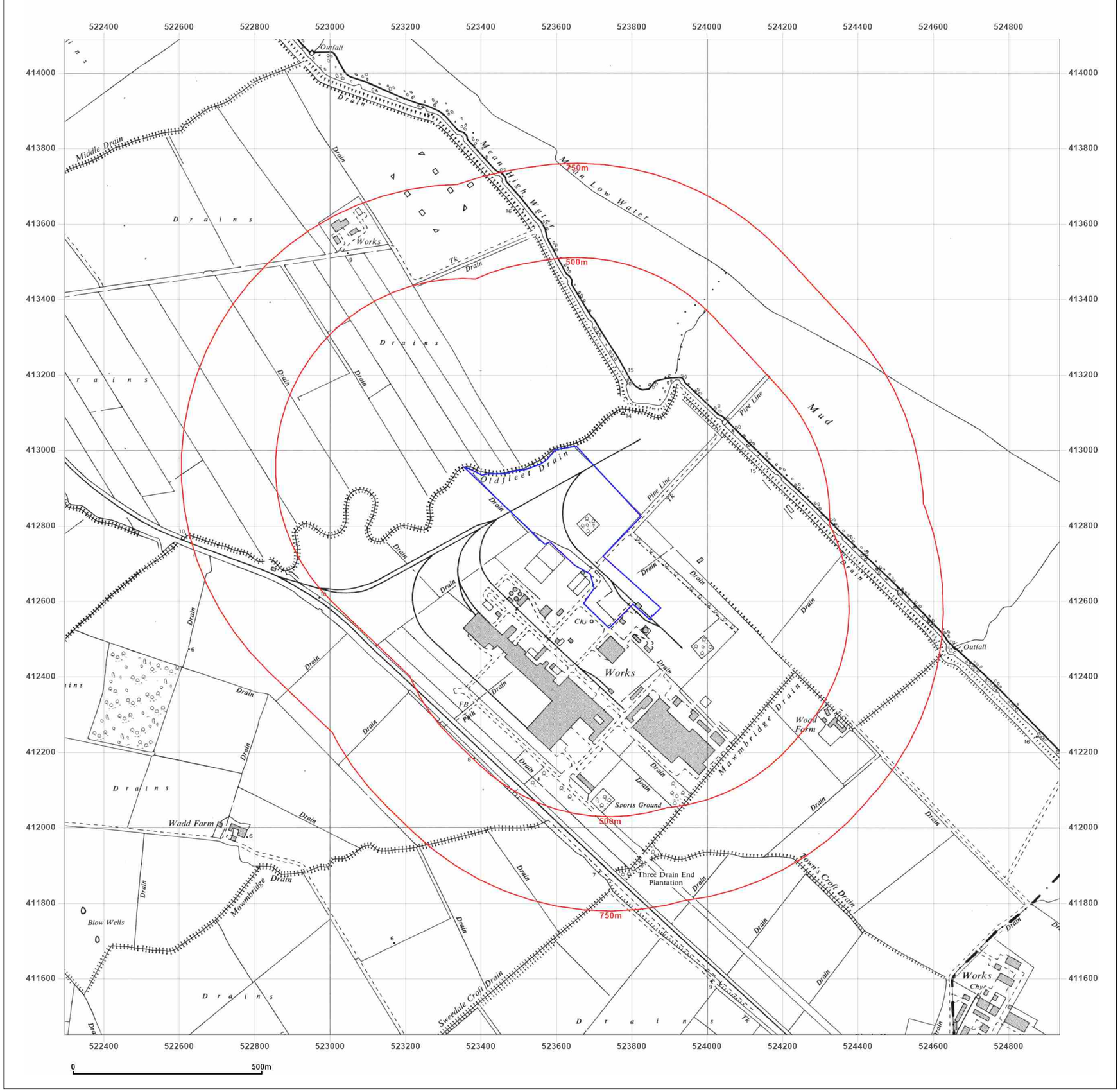

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: Provisional

Map date: **1968**

Scale: 1:10,560

Printed at: 1:10,560

N
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Surveyed 1968
Revised 1968
Edition N/A
Copyright N/A
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Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: National Grid

Map date: **1980**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1978
Revised 1980
Edition N/A
Copyright N/A
Levelled N/A

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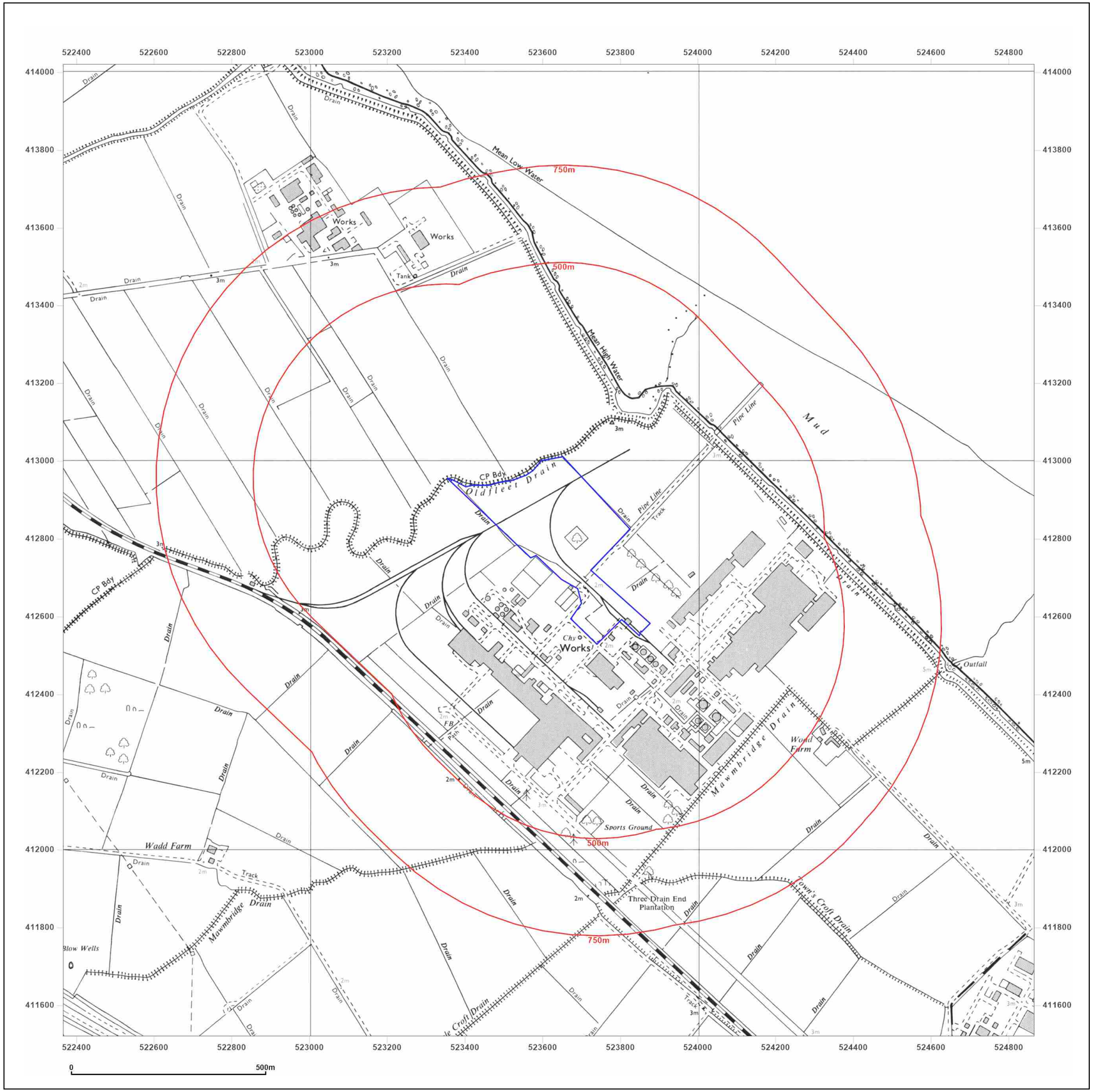

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: National Grid

Map date: **1988**

Scale: 1:10,000

Printed at: 1:10,000

N
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Surveyed 1986
Revised 1988
Edition N/A
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Levelled N/A

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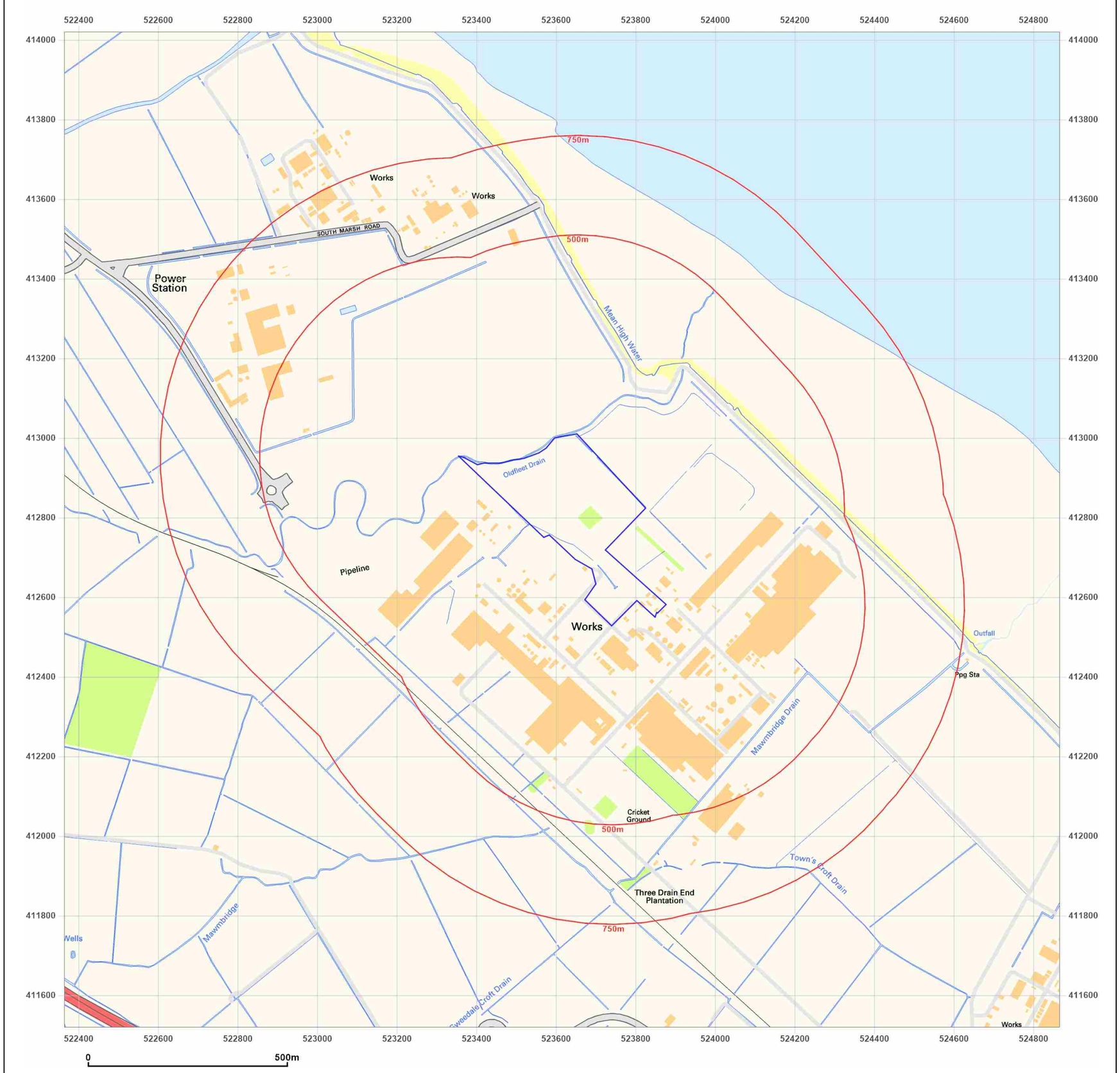

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: National Grid

Map date: **2001**

Scale: 1:10,000

Printed at: 1:10,000

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2001

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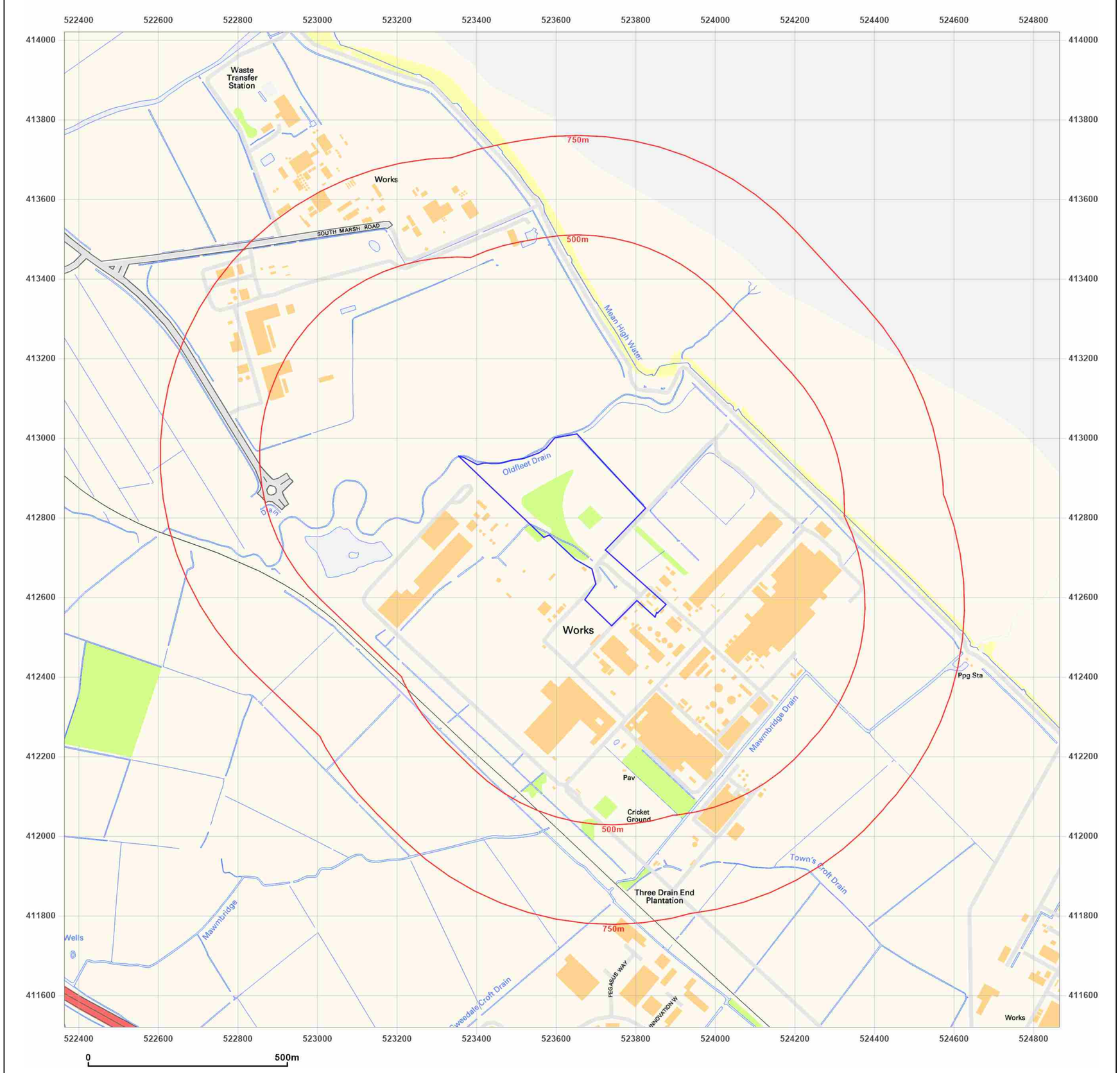

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: National Grid

Map date: **2010**

Scale: 1:10,000

Printed at: 1:10,000

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2010

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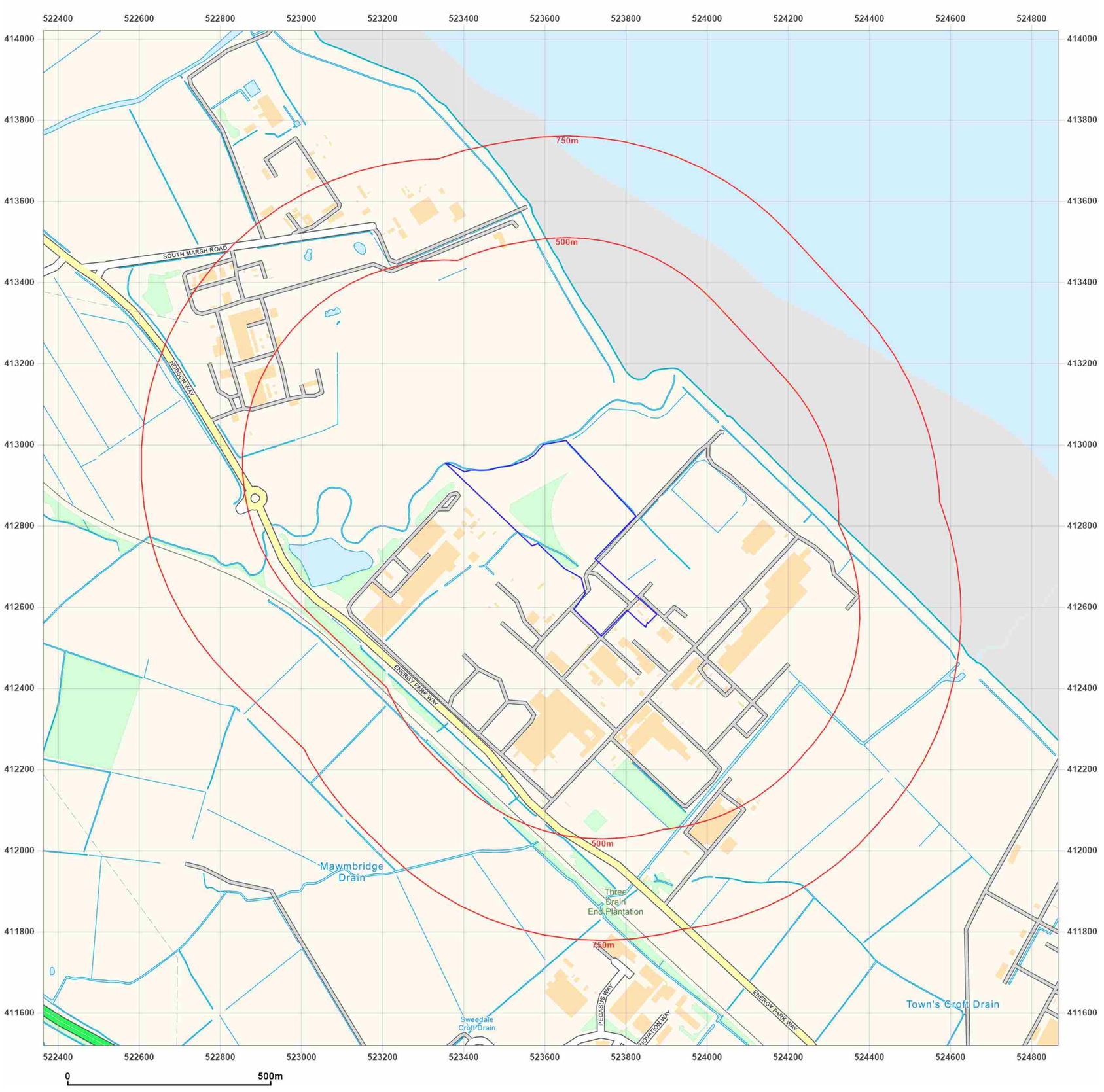

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL
Grid Ref: 523615, 412770

Map Name: National Grid

Map date: **2023**

Scale: 1:10,000

Printed at: 1:10,000

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2023

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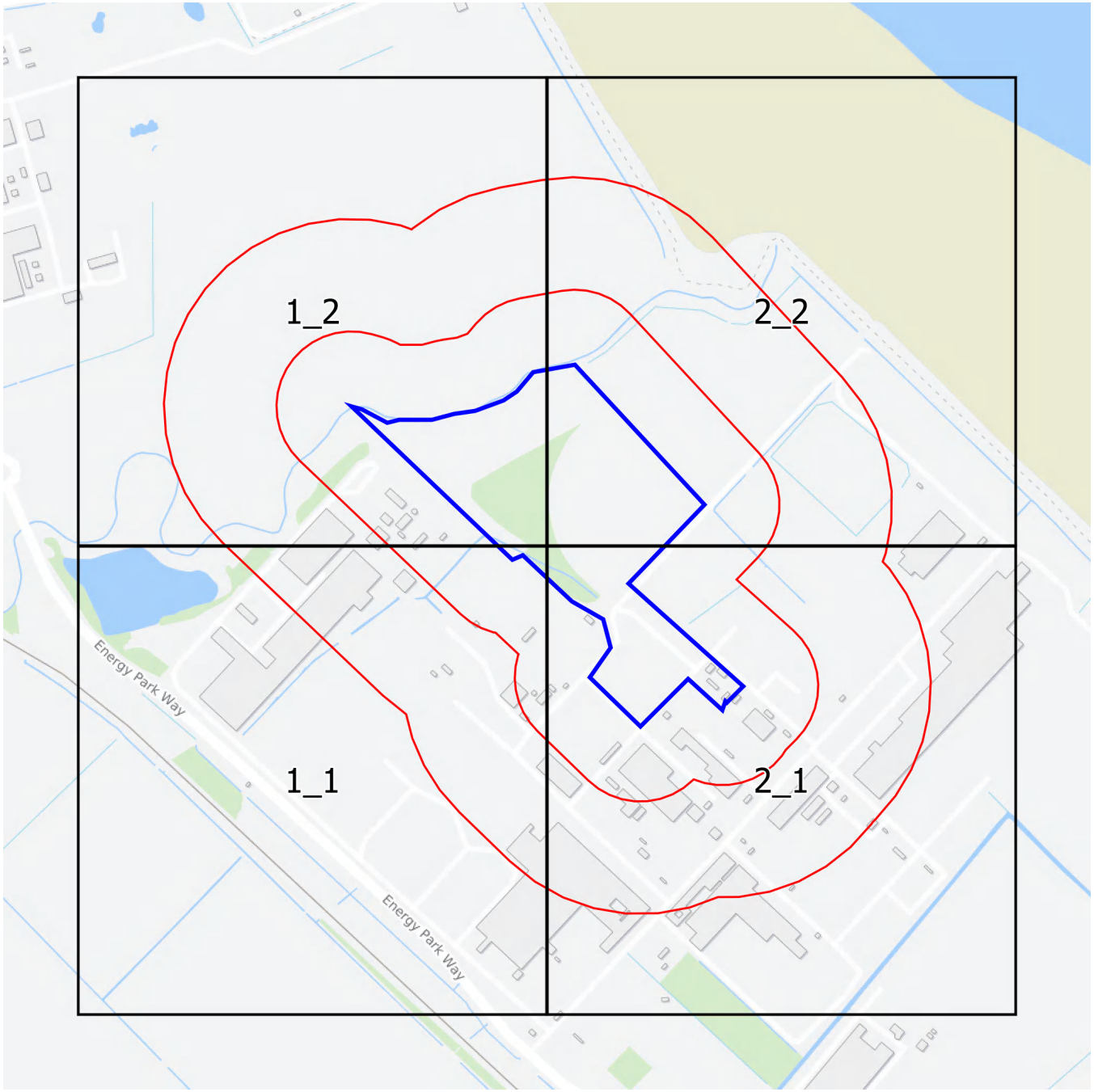

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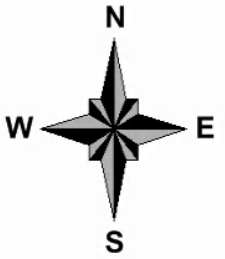
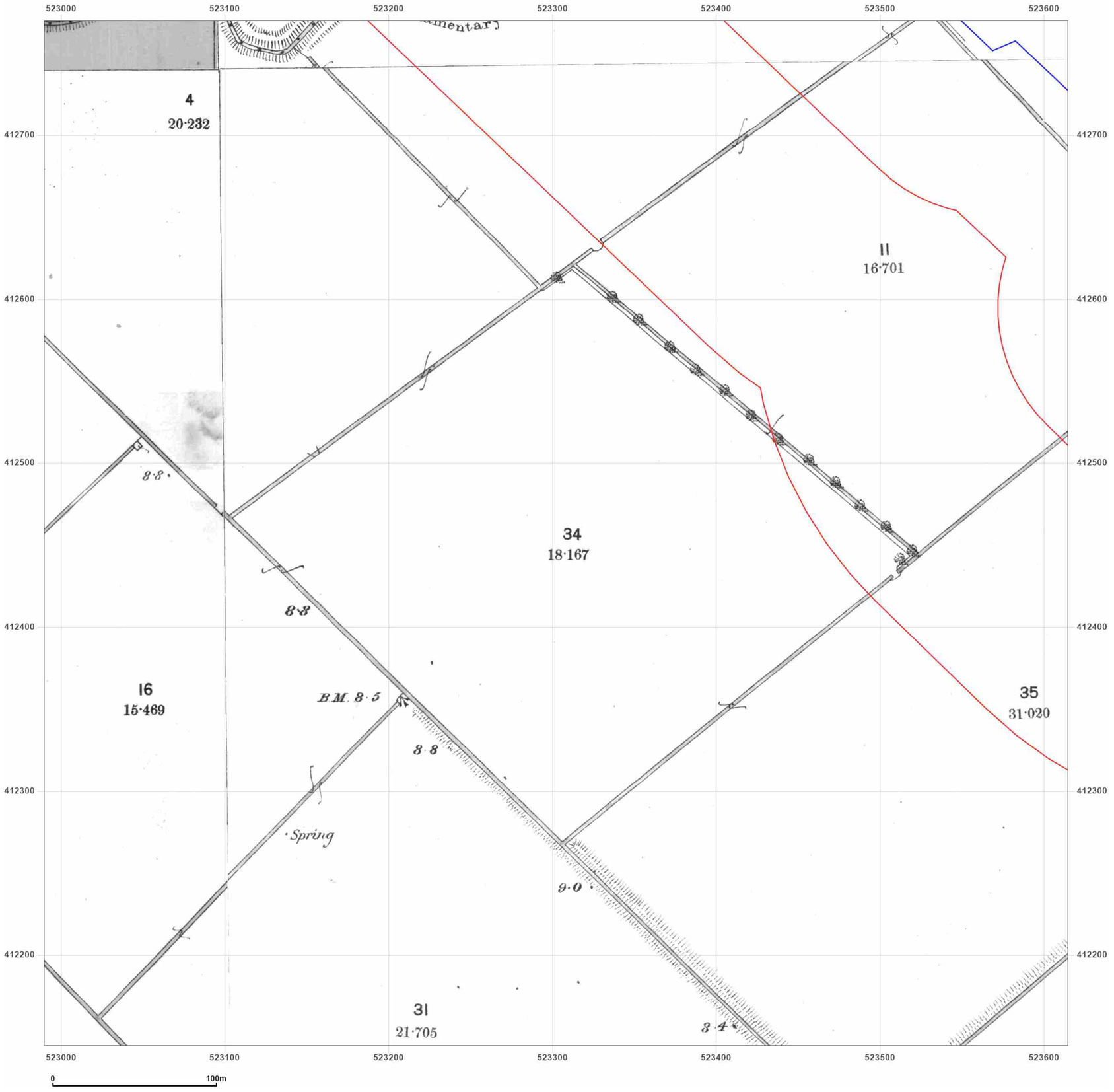
INSIGHTS

1:2,500 Scale Grid Index





Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_1
Grid Ref: 523302, 412457

Map Name: County Series

Map date: **1888-1889**

Scale: 1:2,500

Printed at: 1:2,500

N
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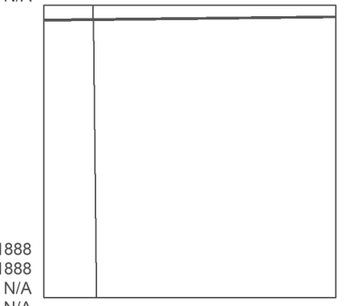
Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1889
Revised 1889
Edition N/A
Copyright N/A
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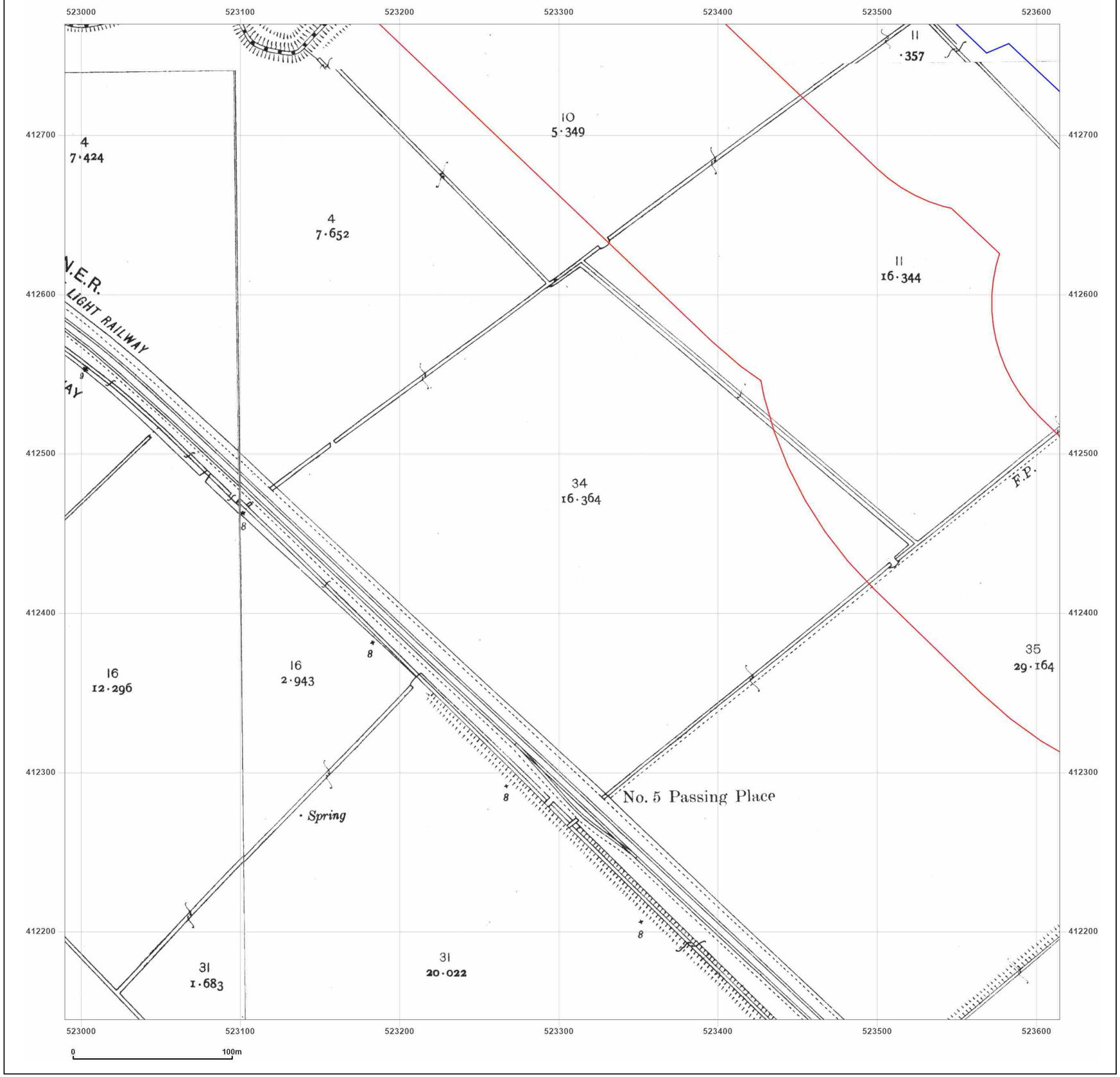

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_1
Grid Ref: 523302, 412457

Map Name: County Series

Map date: **1932**

Scale: 1:2,500

Printed at: 1:2,500

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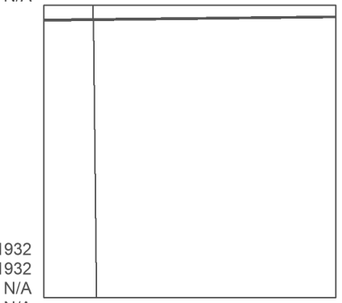
Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

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Revised 1932
Edition N/A
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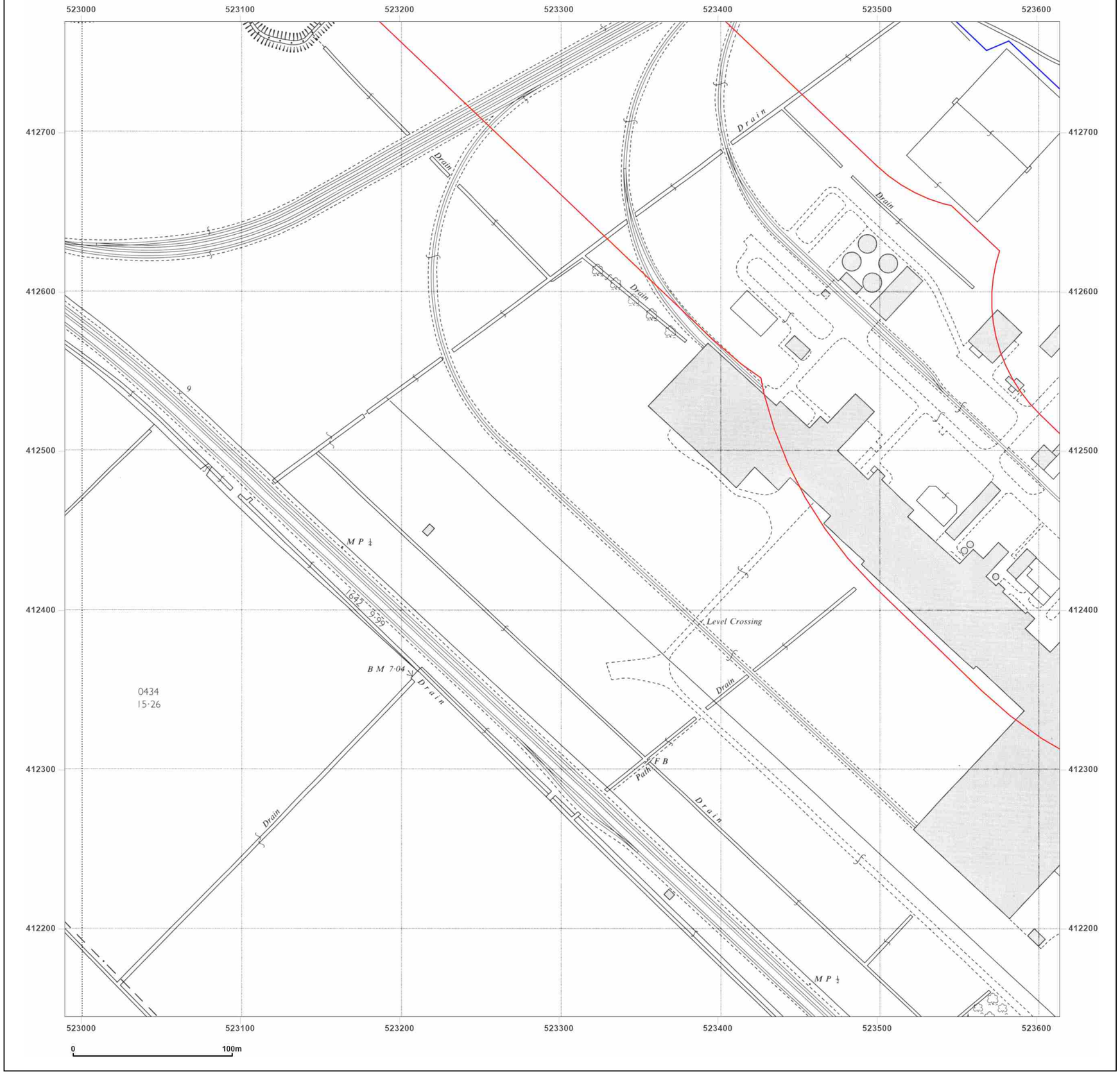

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_1
Grid Ref: 523302, 412457

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1964
Revised 1964
Edition N/A
Copyright 1965
Levelled 1951

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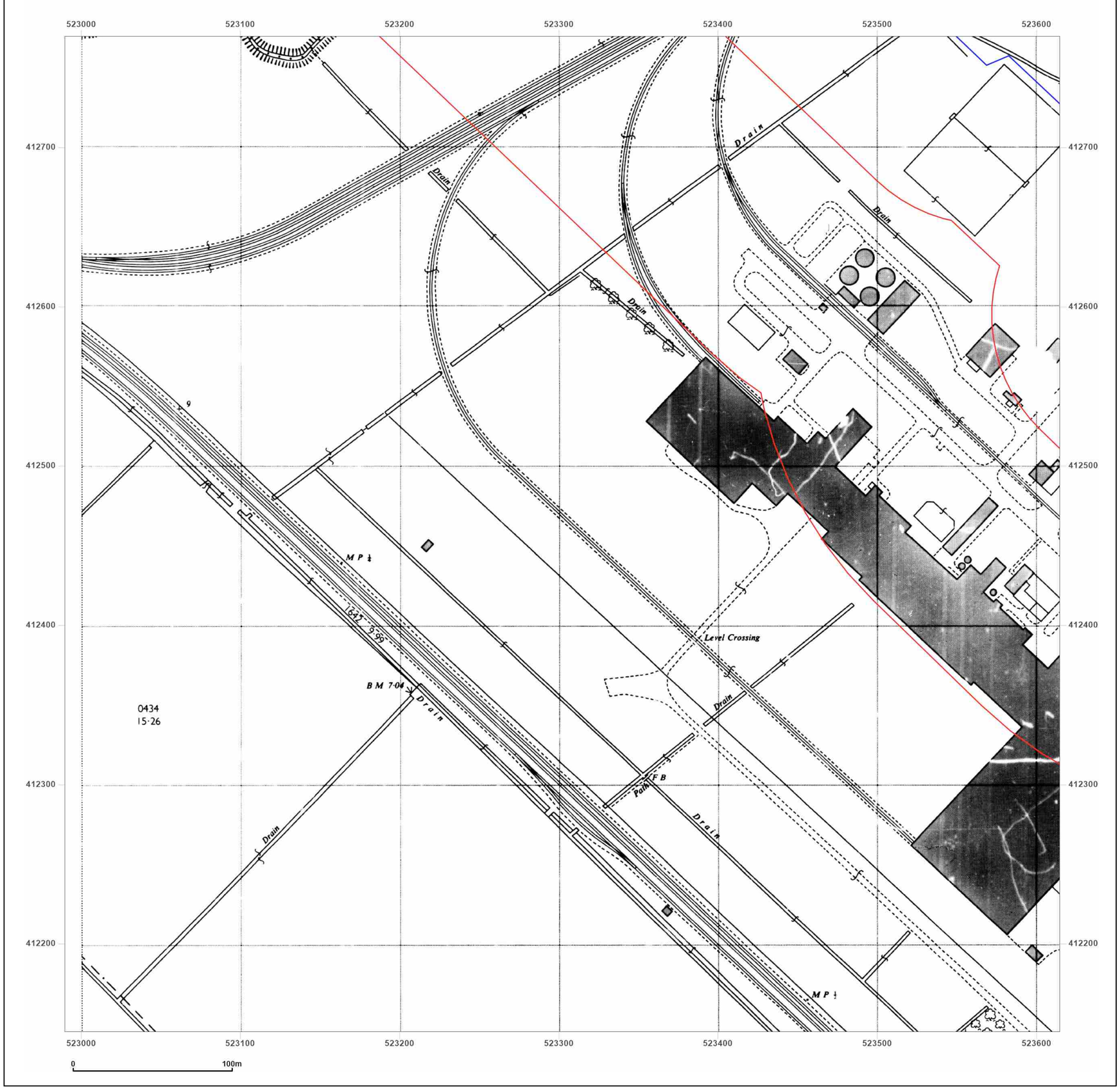

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_1
Grid Ref: 523302, 412457

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
W E
S

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A

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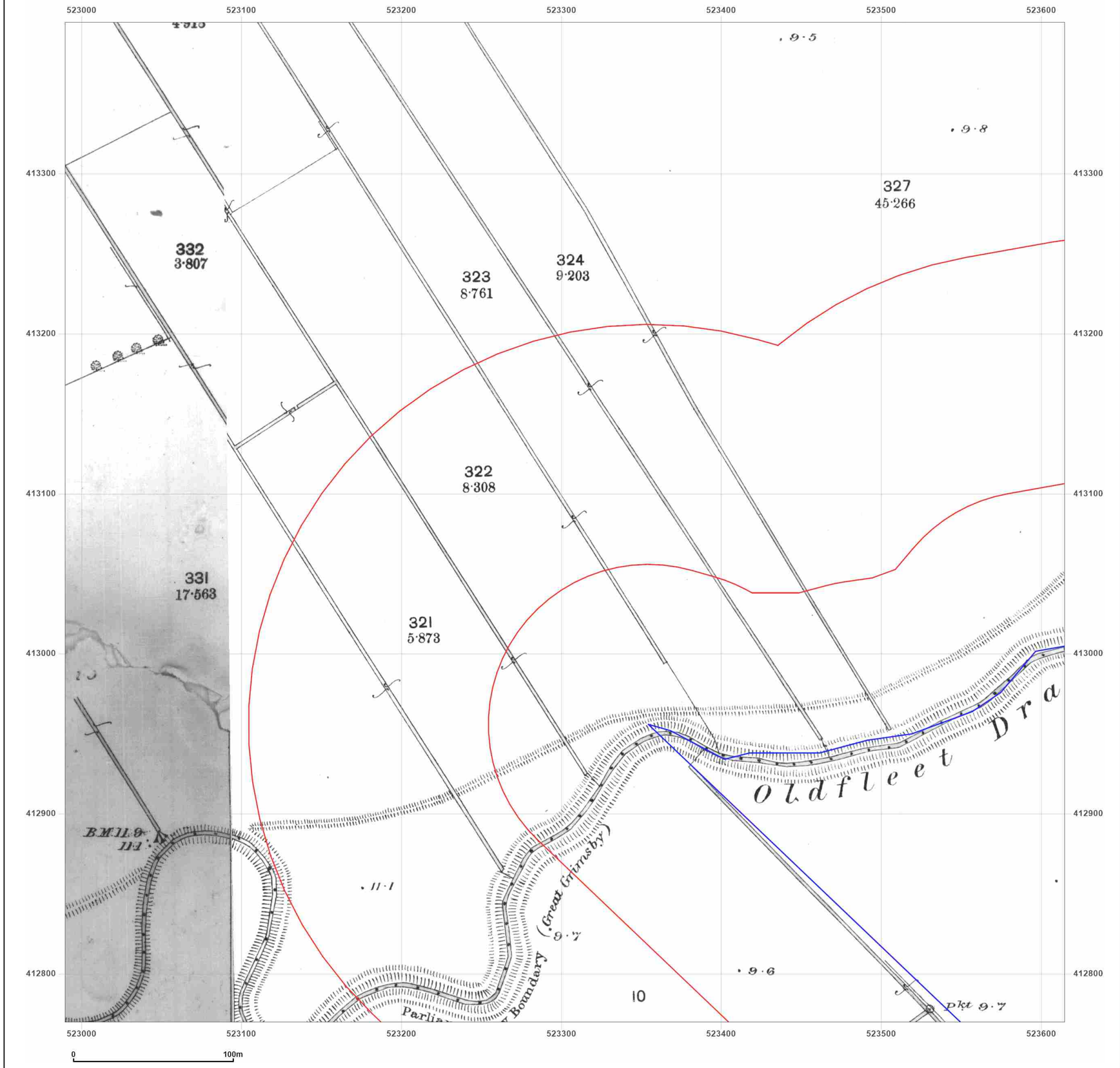

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_2
Grid Ref: 523302, 413082

Map Name: County Series

Map date: **1888**

Scale: 1:2,500

Printed at: 1:2,500

N
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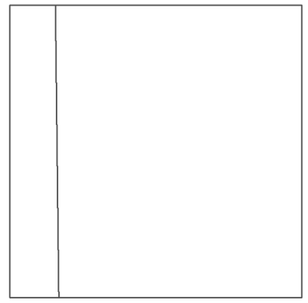
Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1888
Revised 1888
Edition N/A
Copyright N/A
Levelled N/A



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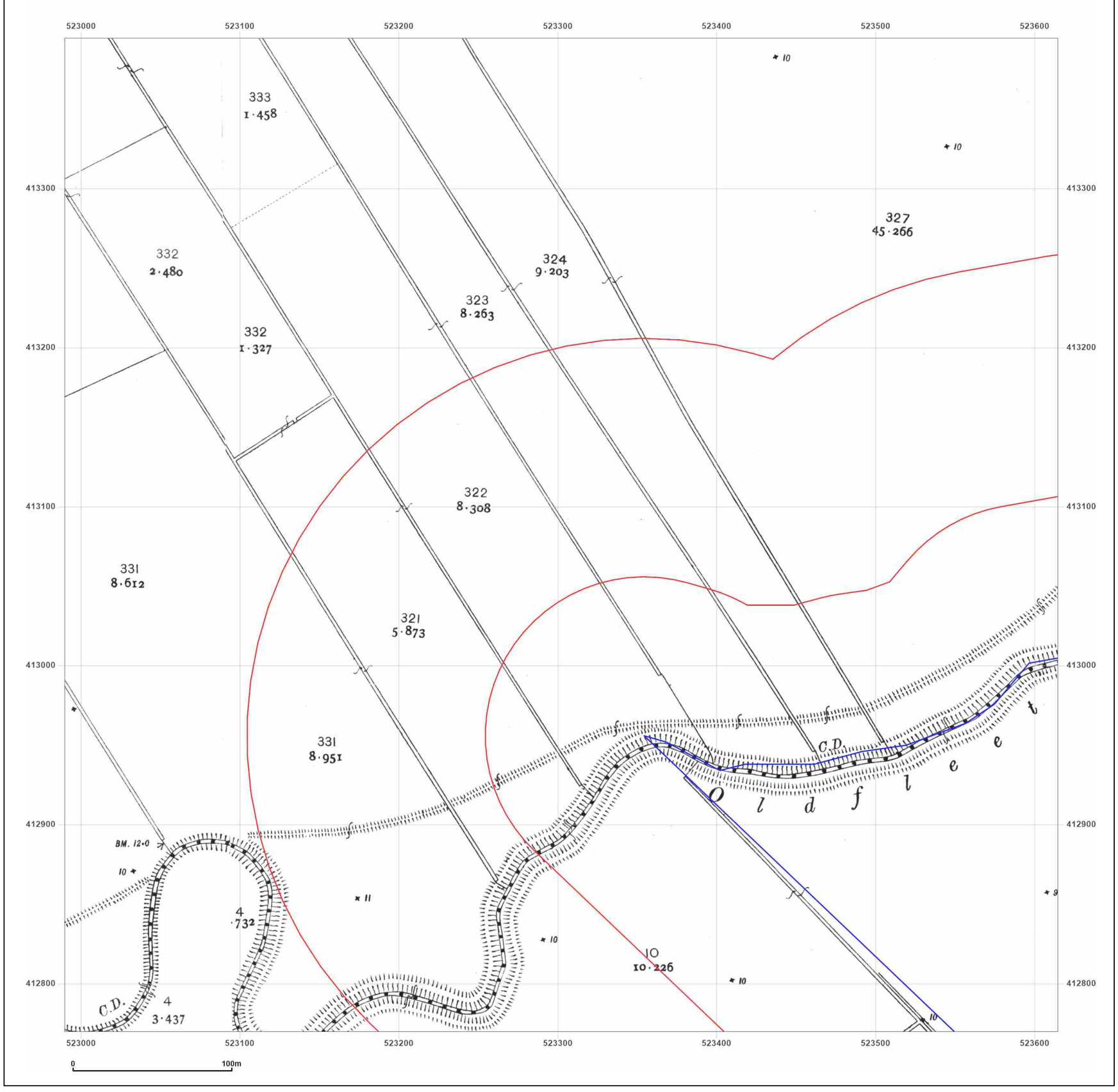

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_2
Grid Ref: 523302, 413082

Map Name: County Series

Map date: **1932**

Scale: 1:2,500

Printed at: 1:2,500

N
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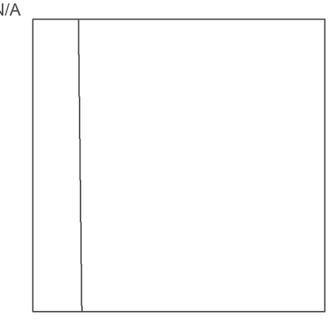
Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1932
Revised 1932
Edition N/A
Copyright N/A
Levelled N/A



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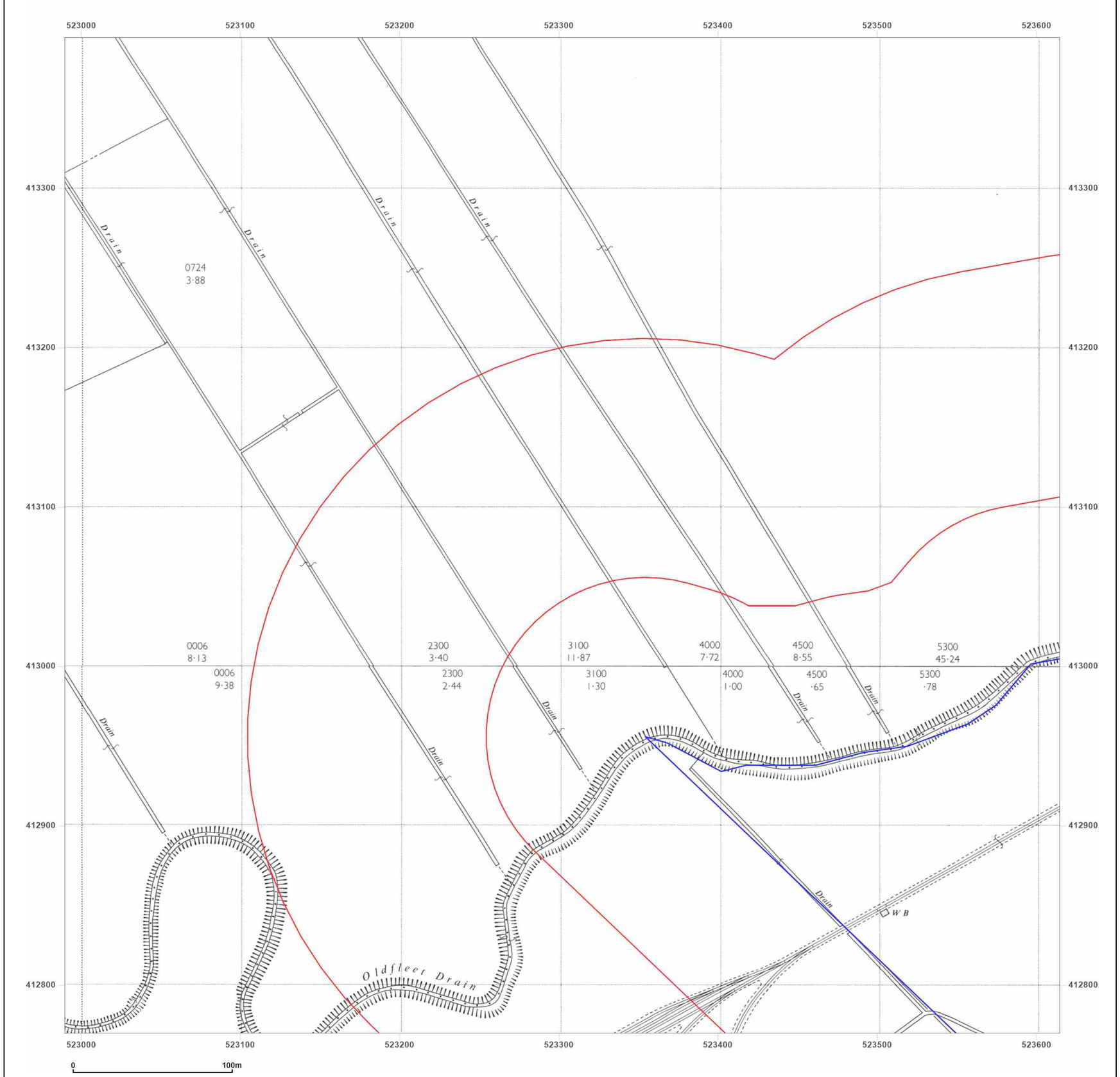

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_2
Grid Ref: 523302, 413082

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

N
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Surveyed 1964
Revised 1964
Edition N/A
Copyright 1965
Levelled 1951

Surveyed 1964
Revised 1964
Edition N/A
Copyright 1965
Levelled 1951

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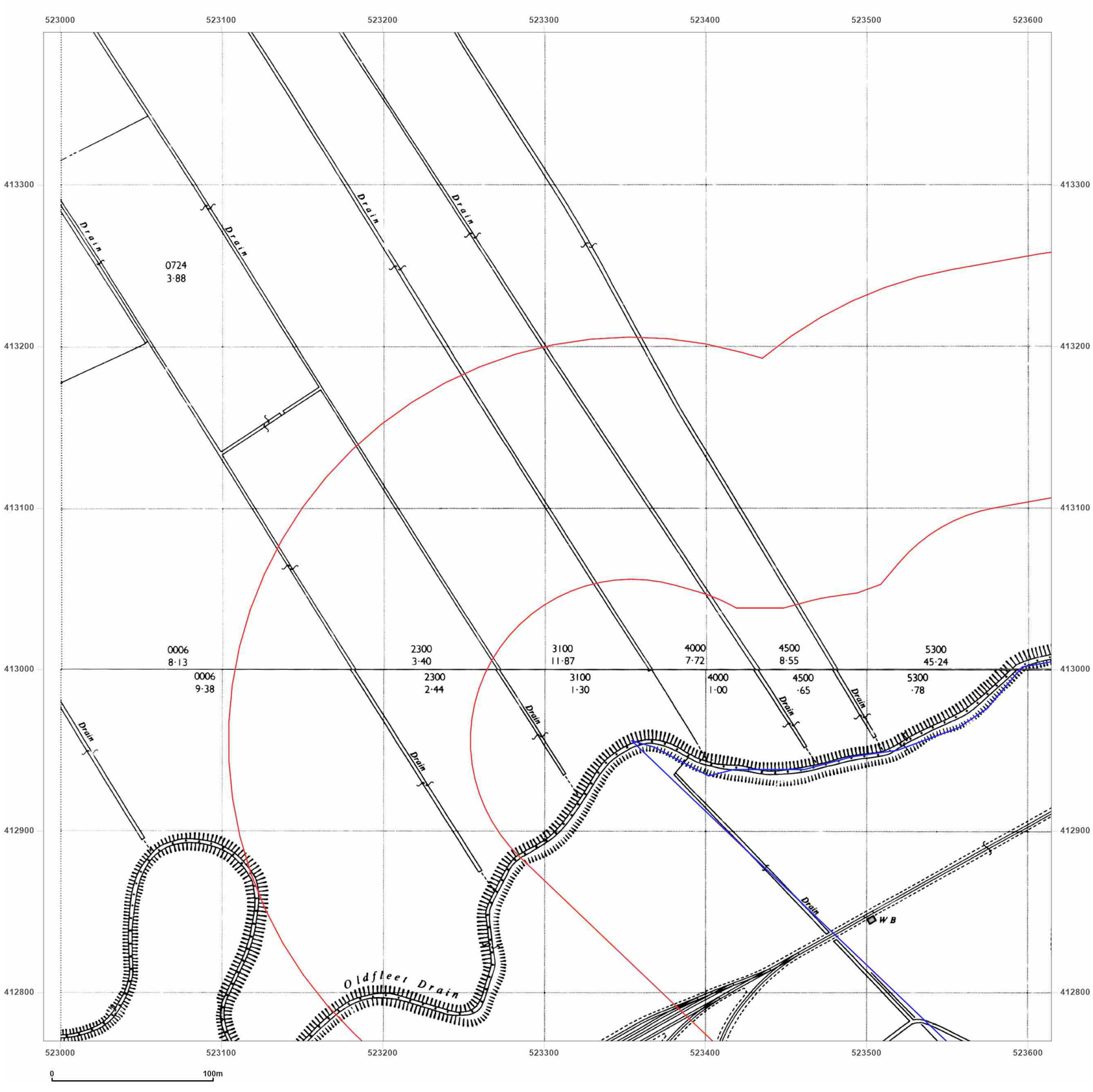

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_2
Grid Ref: 523302, 413082

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

Printed at: 1:2,500

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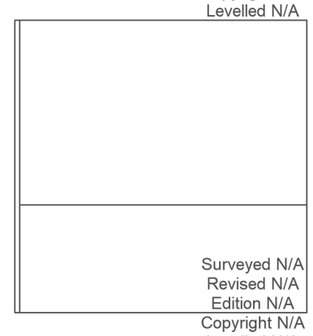
Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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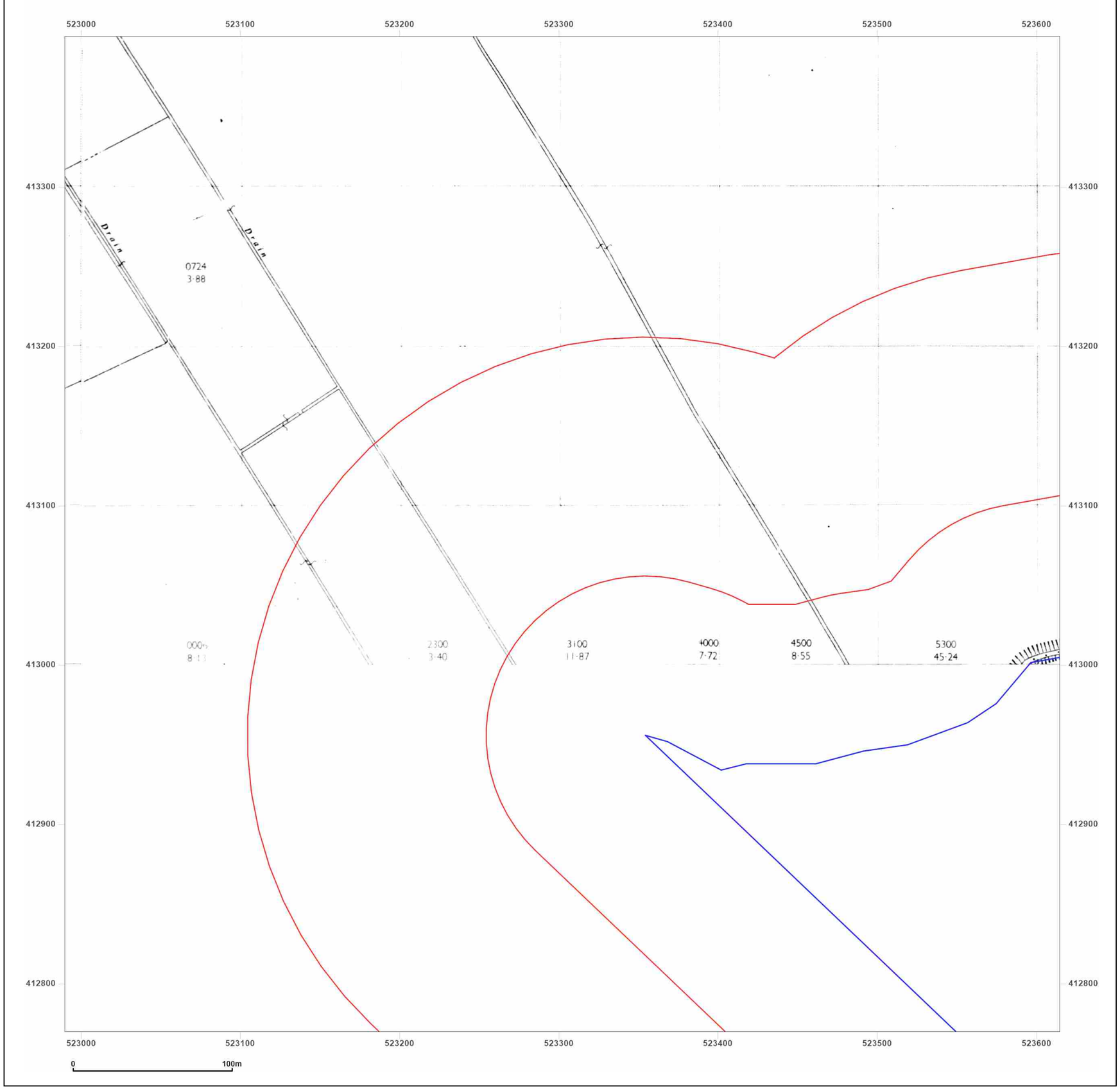

Groundsure INSIGHTS

Site Details:

Humber Gate, Grimsby Plots I & C, DN31 2TT

Client Ref: 129-002870__HTI_Grimsby_
Report Ref: GS-8SO-6VA-PTS-NOL_LS_1_2
Grid Ref: 523302, 413082

Map Name: National Grid
Map date: **1978**
Scale: 1:2,500
Printed at: 1:2,500

N
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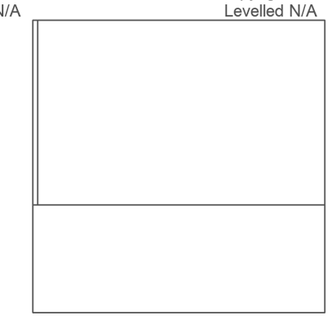
Surveyed N/A
Revised N/A
Edition N/A
Copyright 1978
Levelled N/A

Surveyed N/A
Revised N/A
Edition N/A
Copyright N/A
Levelled N/A



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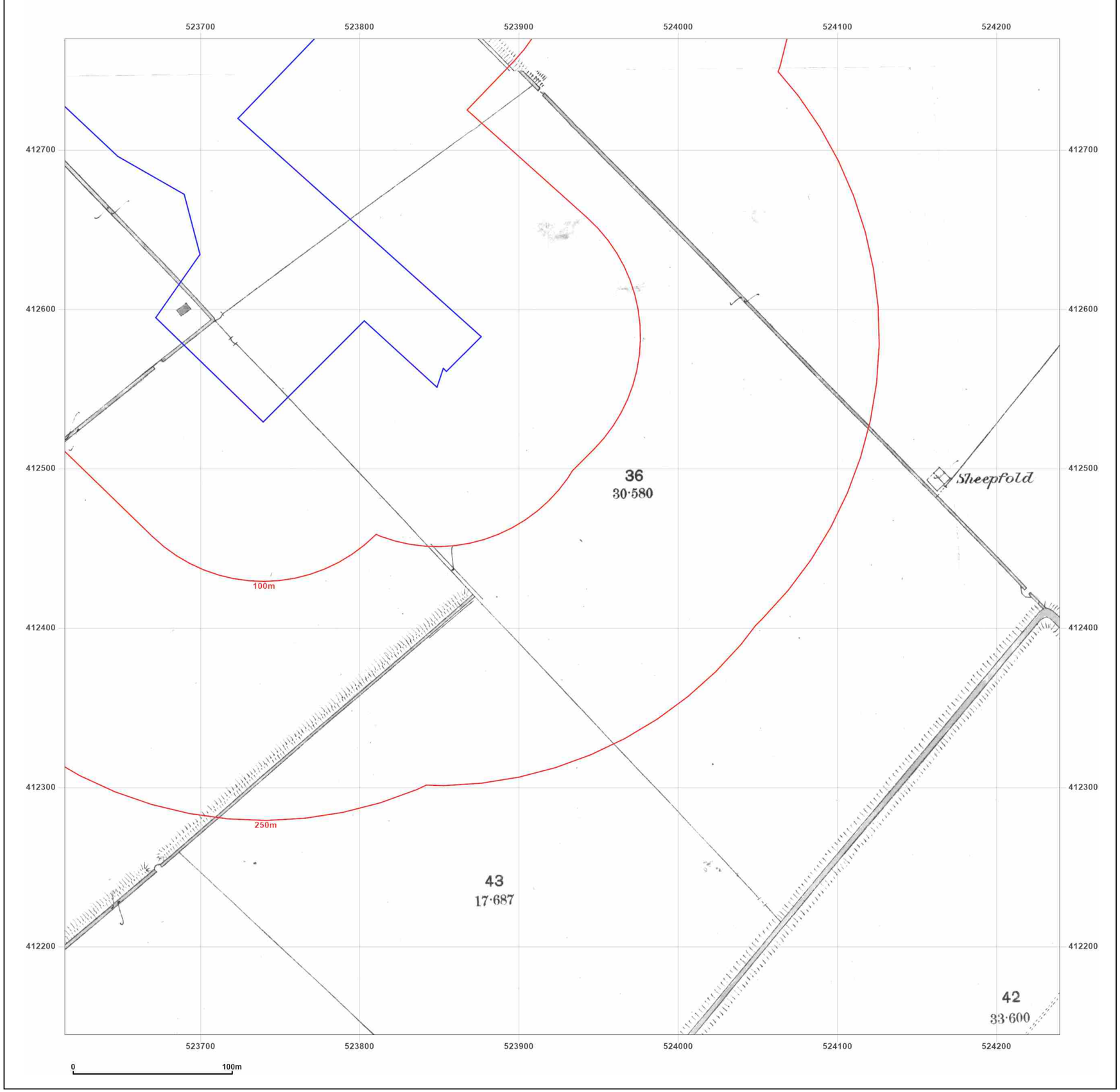

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Humber Gate, Grimsby Plots I & C, DN31 2TT

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Report Ref: GS-8SO-6VA-PTS-NOL_LS_2_1
Grid Ref: 523927, 412457

Map Name: County Series

Map date: **1888-1889**

Scale: 1:2,500

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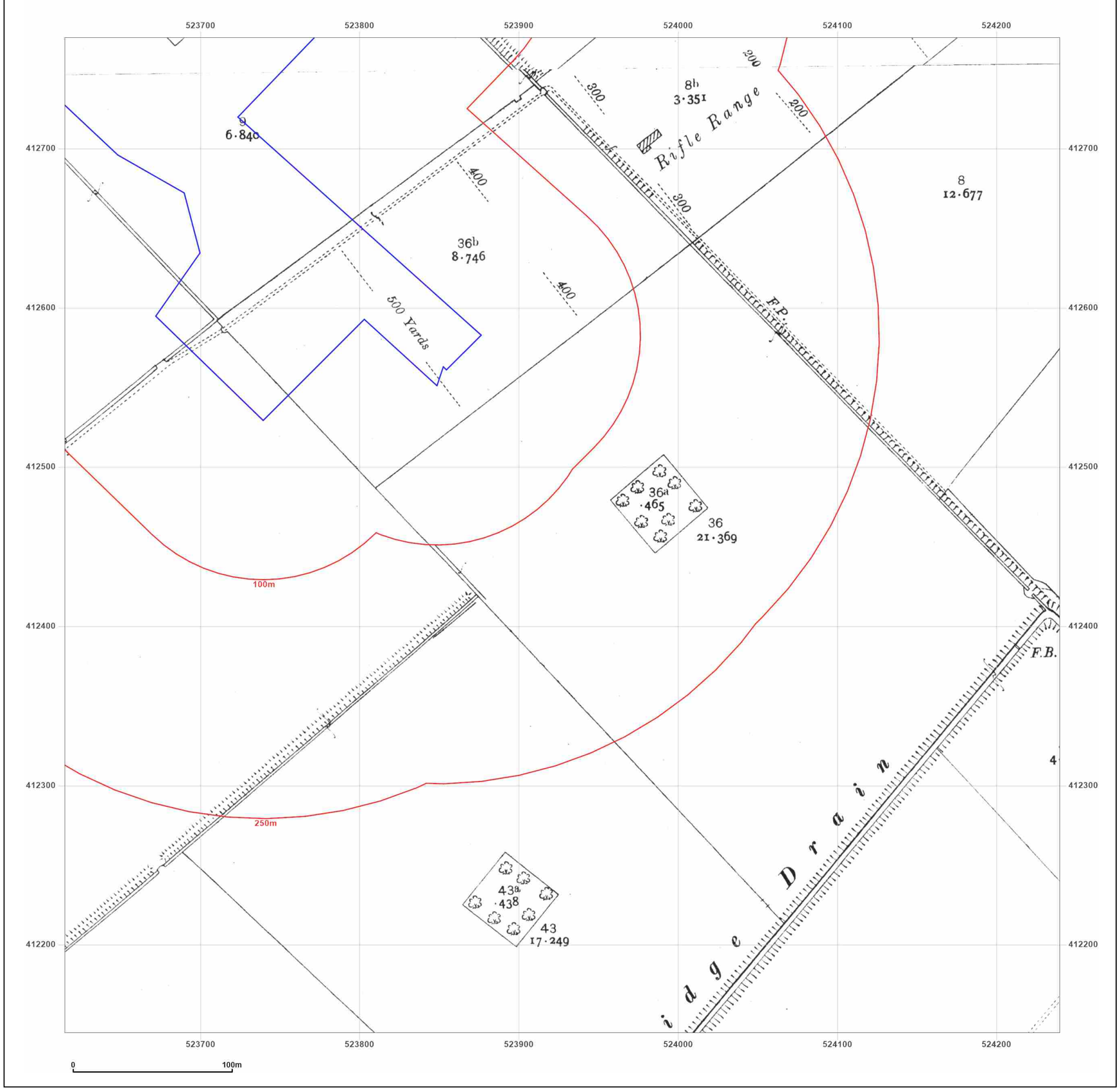

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Grid Ref: 523927, 412457

Map Name: County Series

Map date: **1932**

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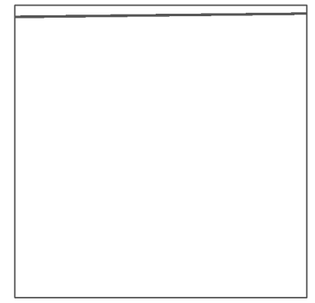

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Grid Ref: 523927, 412457

Map Name: National Grid

Map date: **1965**

Scale: 1:2,500

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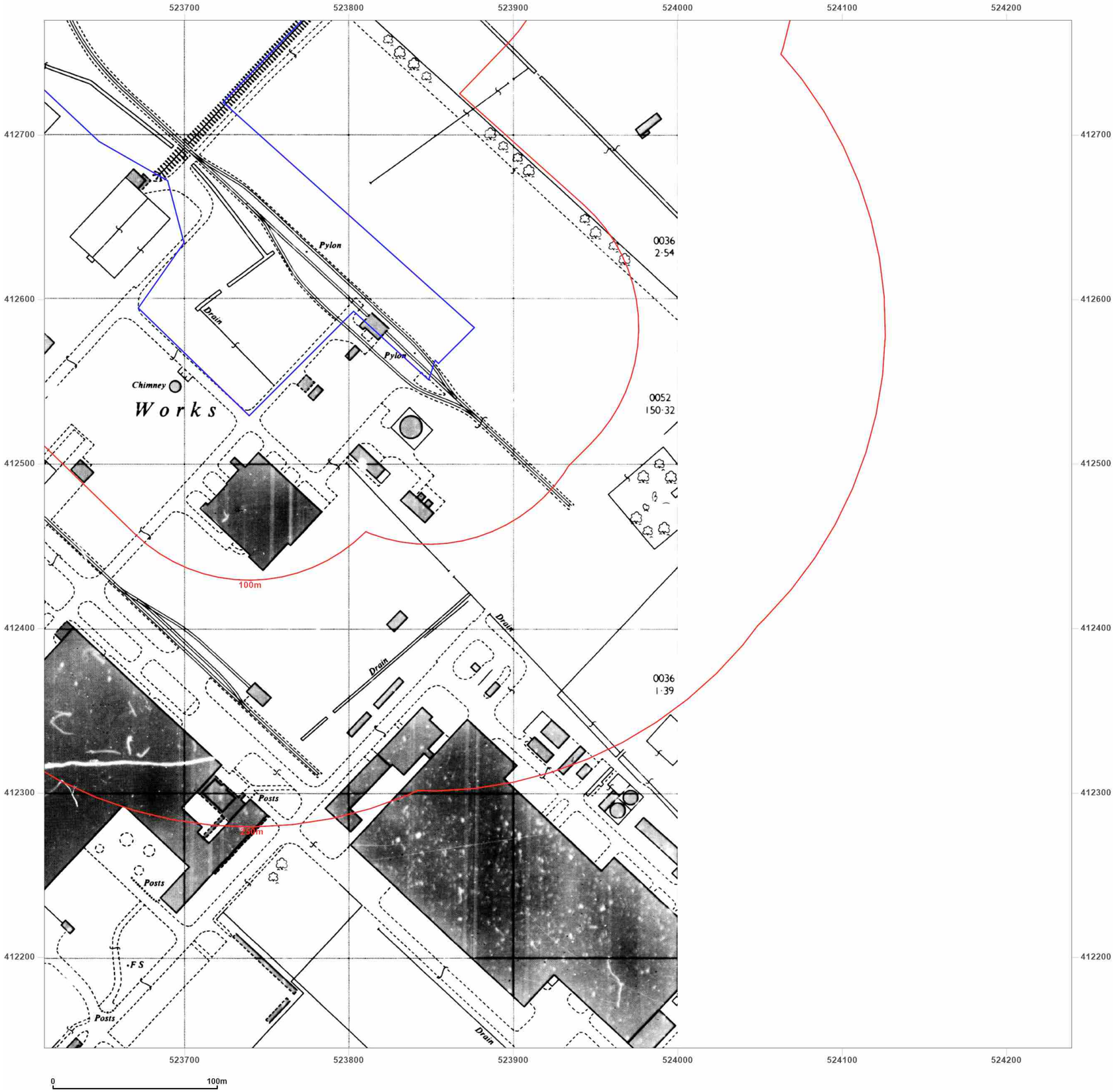

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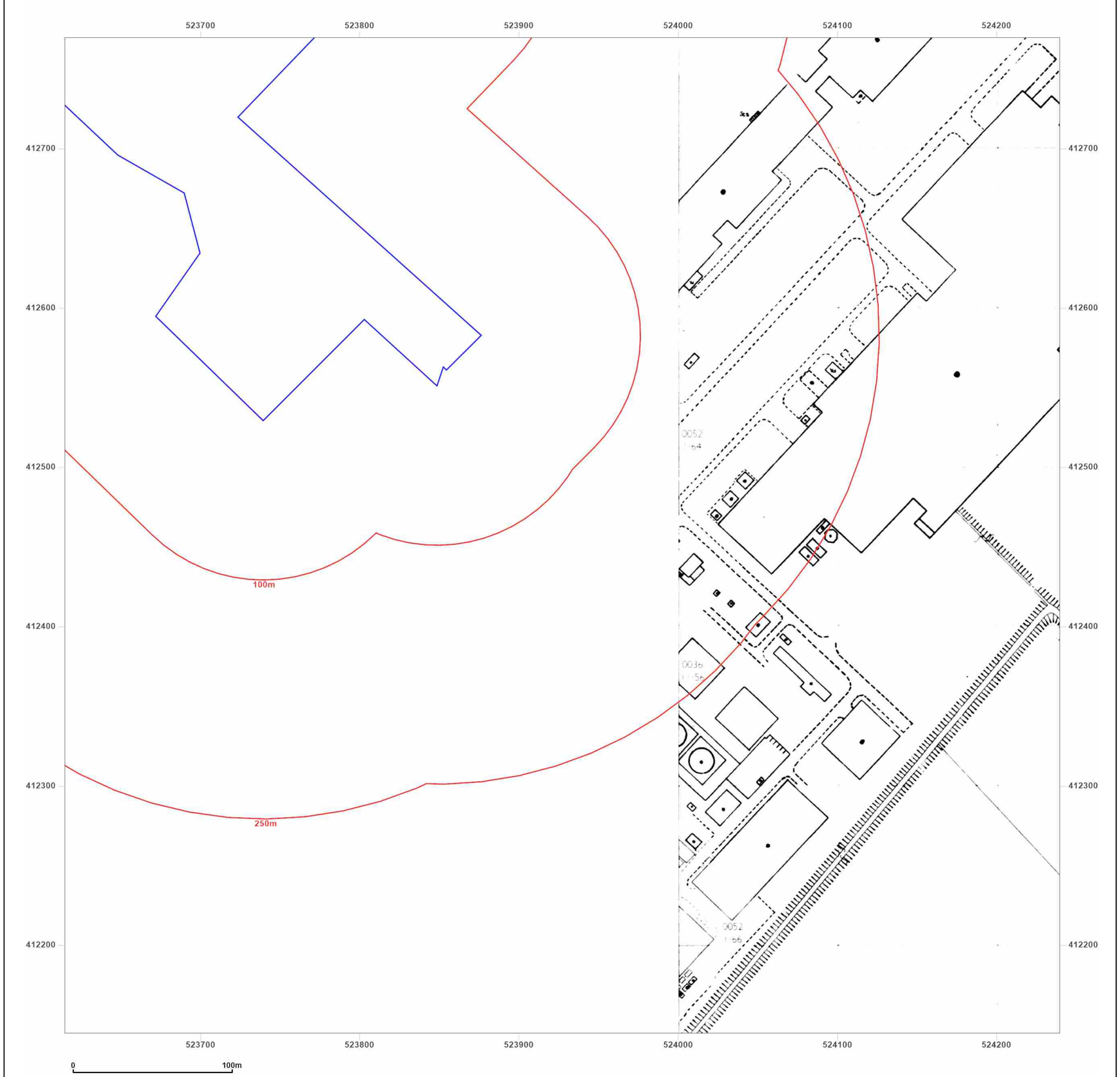

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Map Name: National Grid

Map date: **1977**

Scale: 1:2,500

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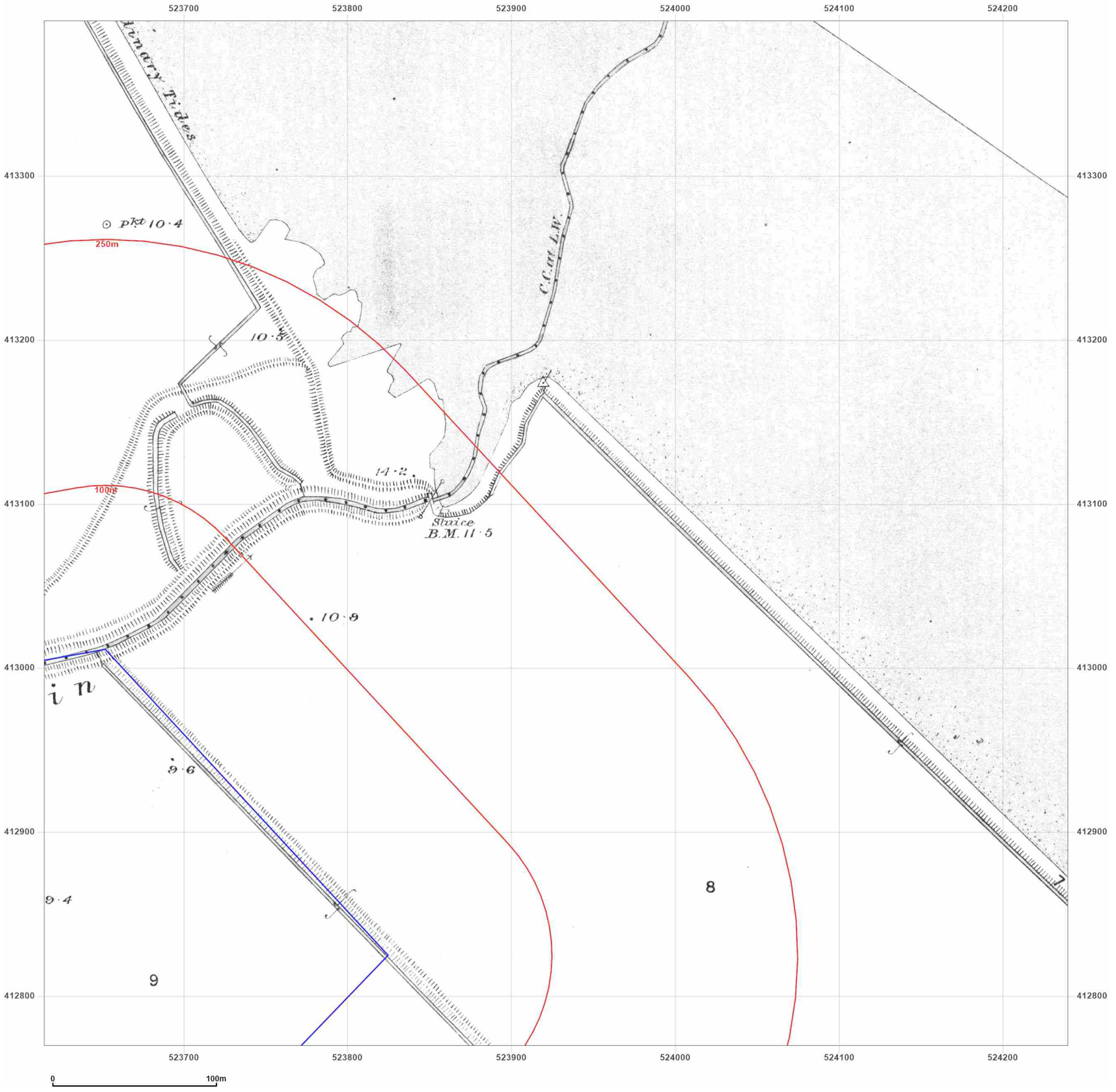

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Map Name: County Series

Map date: **1888**

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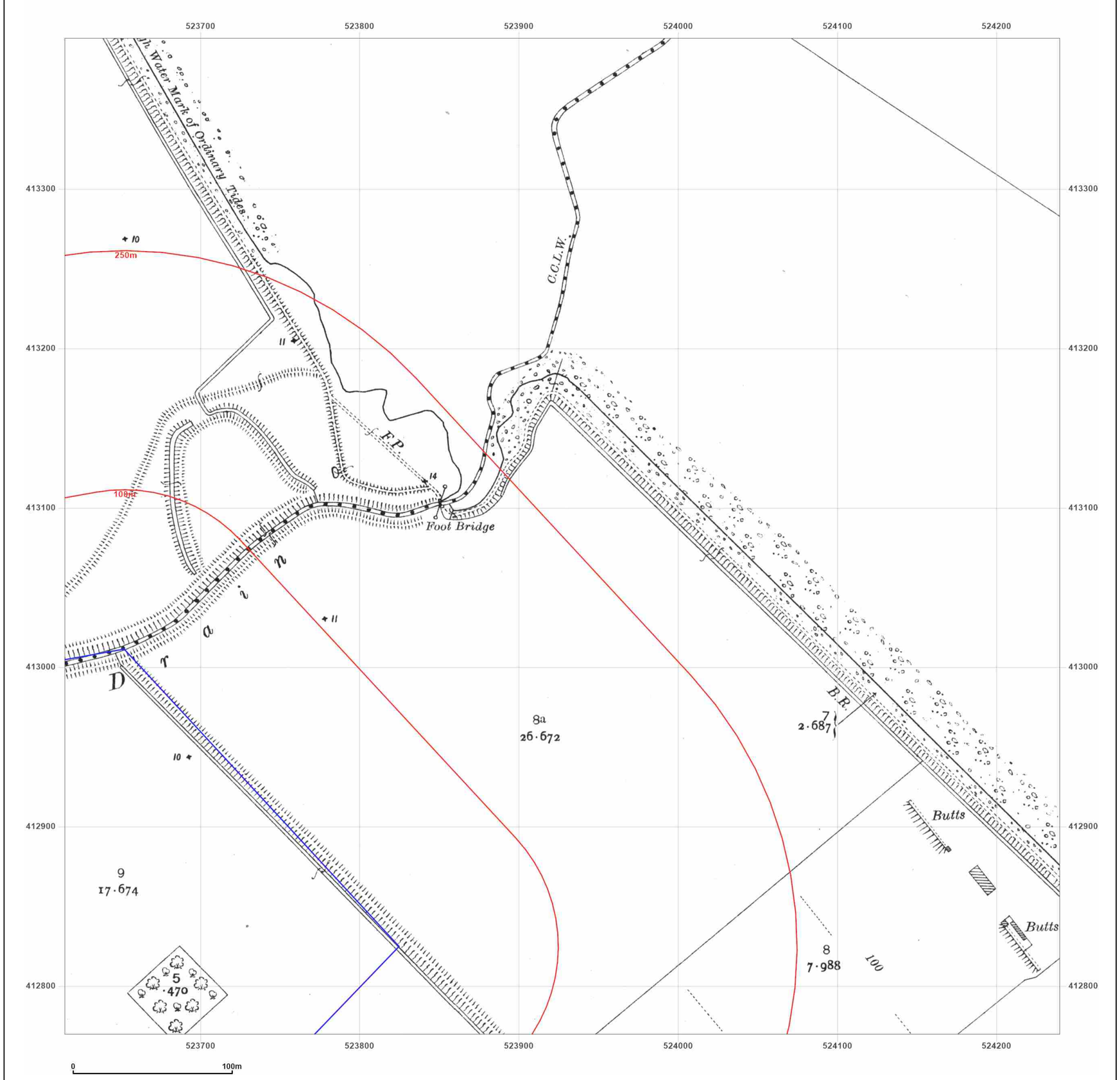

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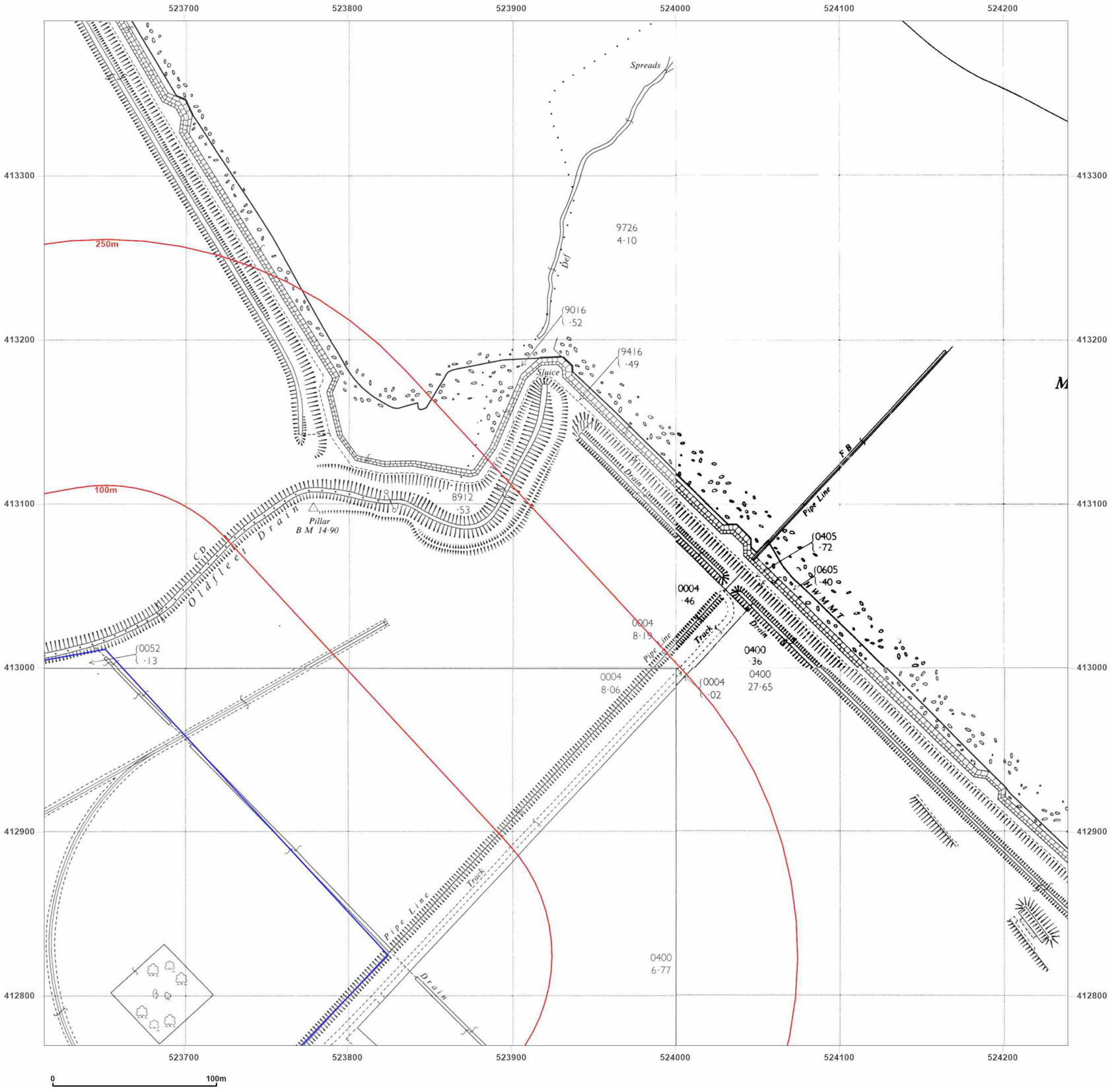

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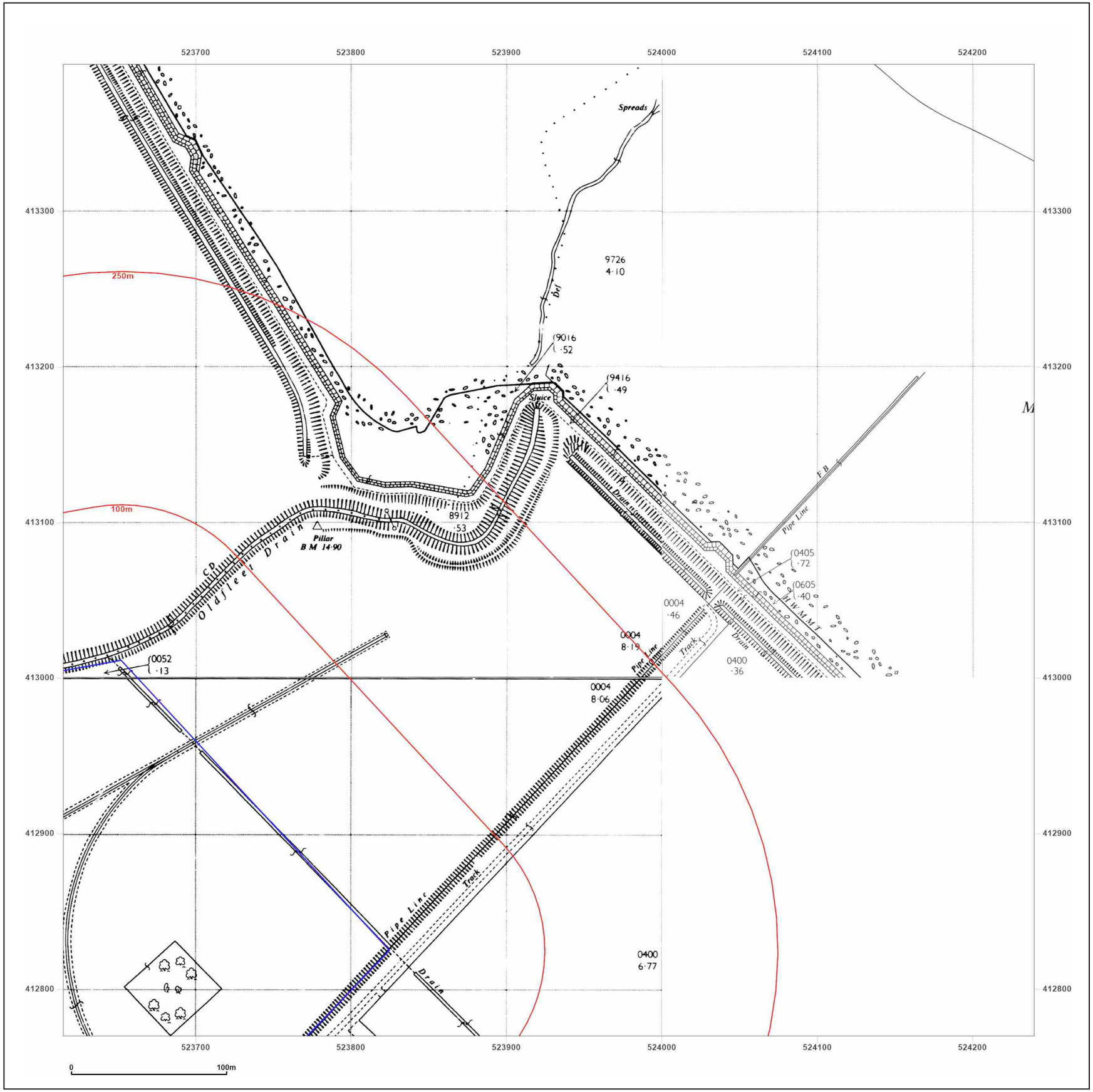

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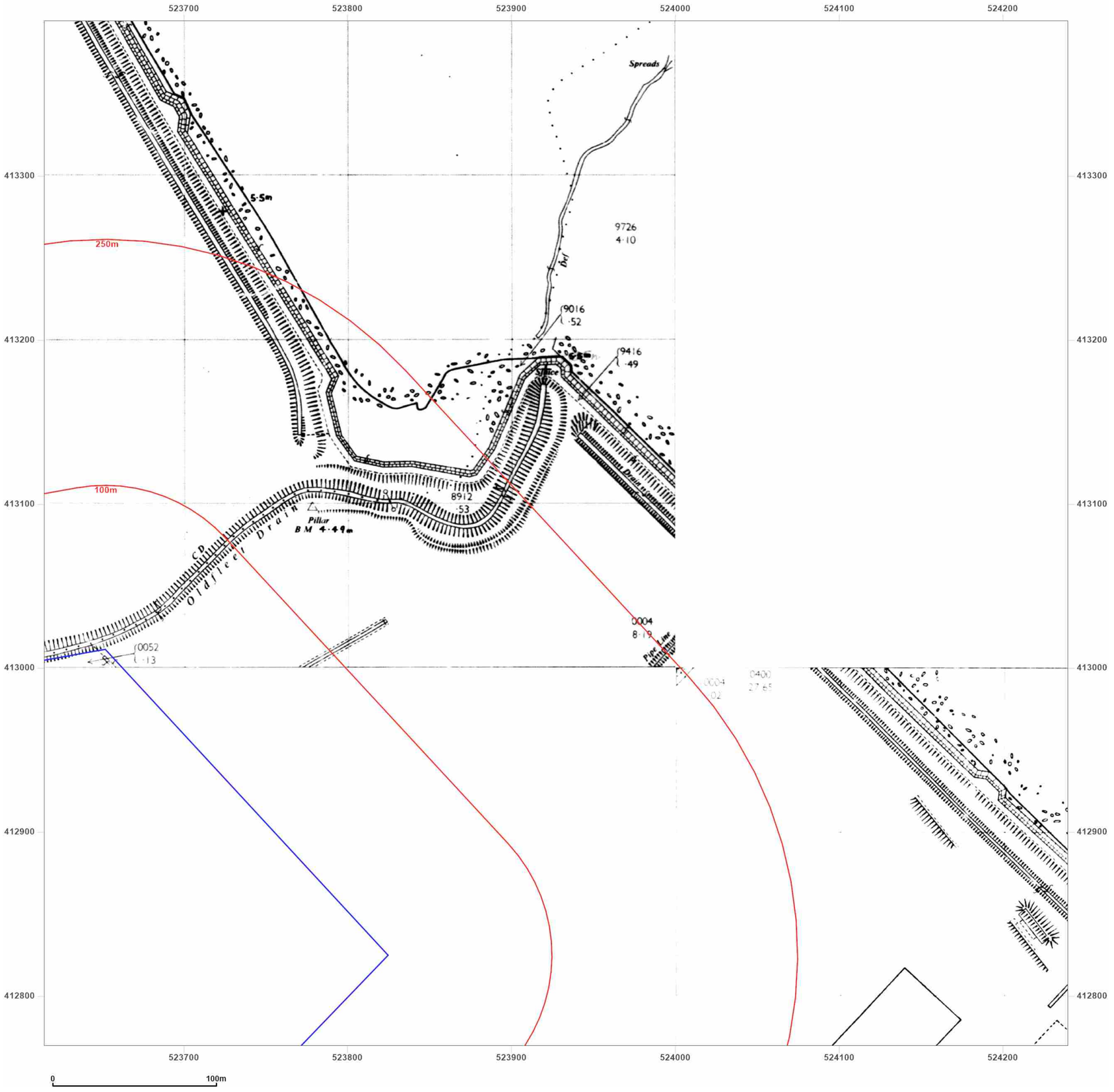

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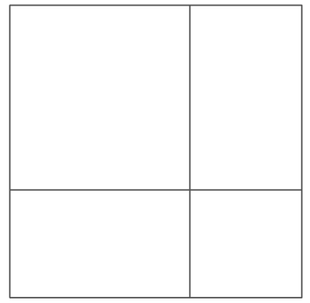

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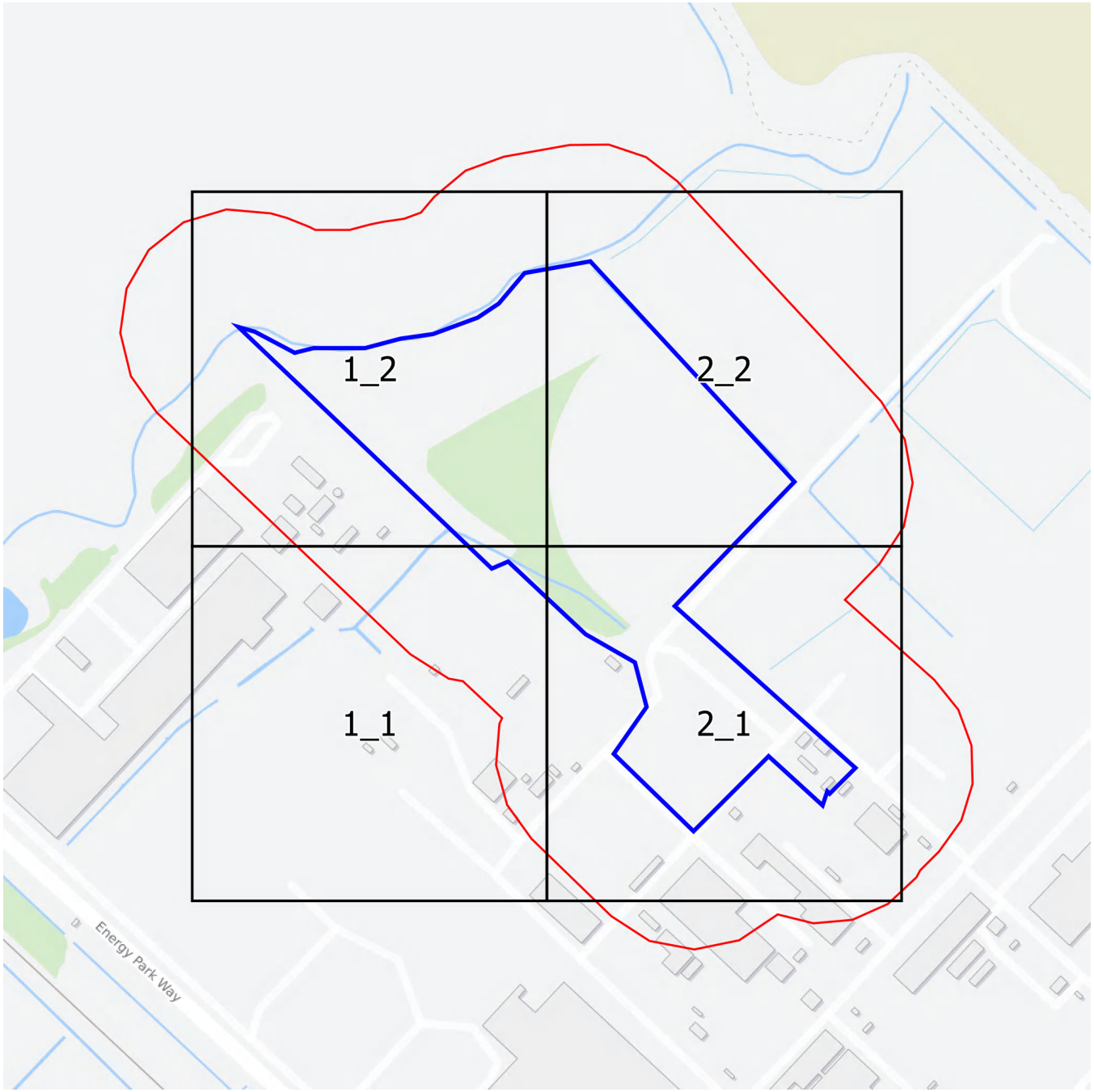

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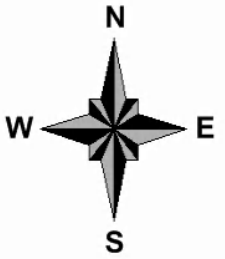
Landline Scale Grid Index



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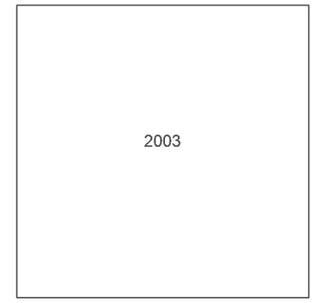

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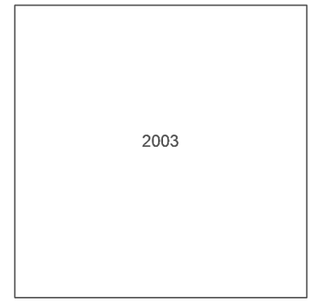

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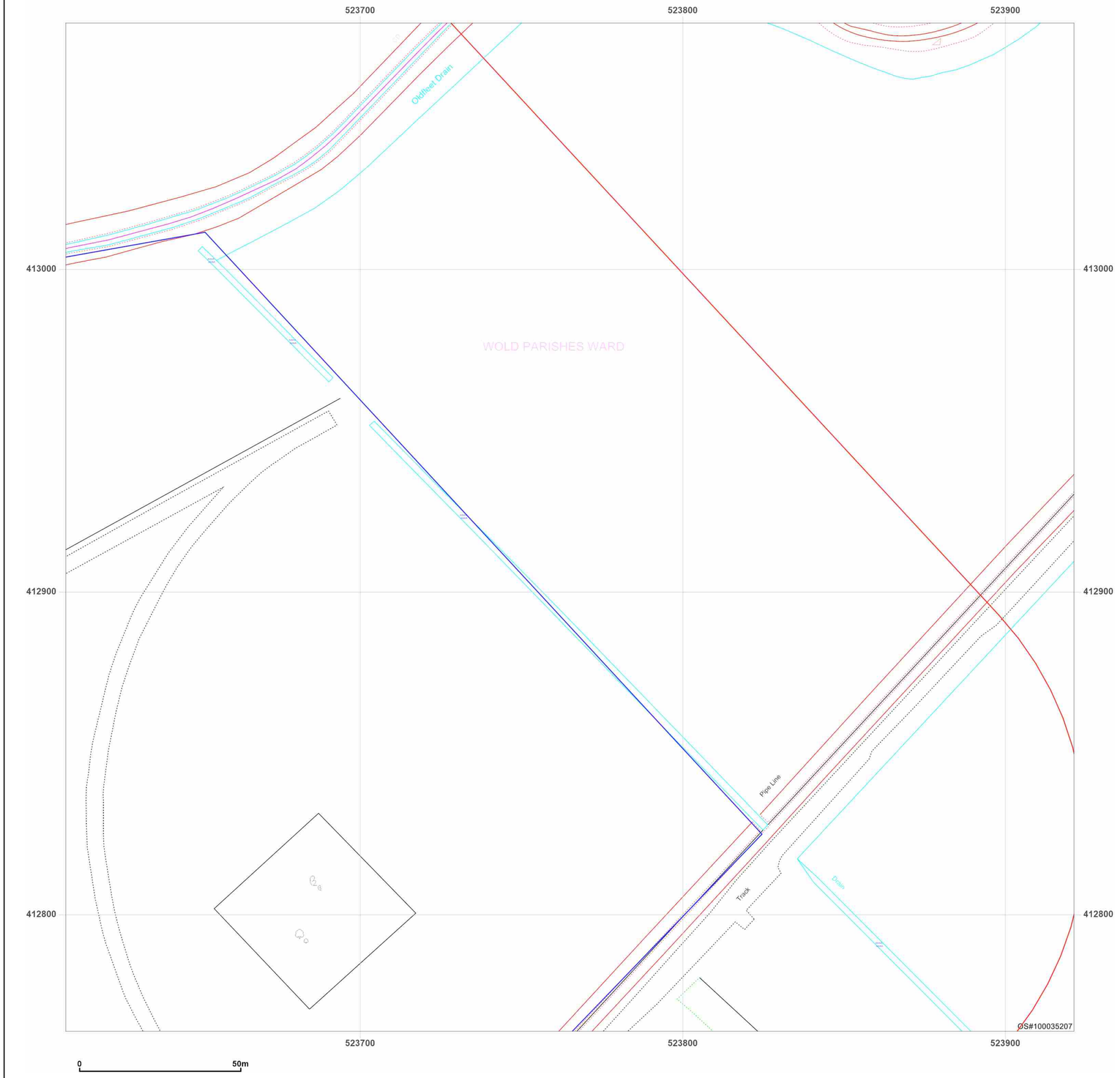

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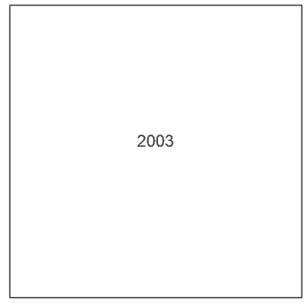

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Appendix D

Background to Water Sensitivity Assessment

ANNEX 2 OF R&D 66 (NHBC) – SITE SENSITIVITY ASSESSMENT FOR THE WATER ENVIRONMENT

1.0 GROUNDWATER

Sensitivity assessment	**Standard response**	**Implications/need for further work** *(subject to nature of source and pathway)*
H1 (Very high)	Highly vulnerable aquifer, actively used in vicinity of site with short travel times to sources of supply or sensitive watercourses. Likely to be within an inner or outer groundwater protection zone (Zones I or II under EA protection policy). All contaminant releases to the ground environment of concern.	Extensive groundwater and soil clean-up or removal is likely to be needed if a source and pathway exist. Potential for major on-site and off-site liabilities. Further, detailed risk assessment essential and is likely to be required by the Regulators. Could be long-term residual liabilities with major cost implications and potential high risk of prosecution.
H2 (High)	Major or minor vulnerable aquifer with probable use nearby (either direct abstraction or baseflow to sensitive watercourses and springs). Likely to be within Outer or Source Catchment protection zones (Zones II or III). Most contaminant releases to the ground environment of concern.	Significant groundwater remediation measures may be required, after detailed risk assessment, which is likely to be required by the Regulators. Soil decontamination or isolation probably necessary. Potential for significant on-site and off-site liabilities, including treatment and/or replacement of local potable water supplies. Substantial cost implications and potential moderate/high risk of prosecution.
M1 (Moderately high)	Recognised major or minor aquifer, moderately vulnerable, with probable use (either direct or via baseflow to a sensitive watercourse). Within formal protection zone or catchment of authorised abstractions for potable or other high quality uses. Minor, short-term releases of contaminants may be tolerable.	Following risk assessment, soil decontamination or isolation may be required. Localised groundwater clean-up may be needed but large scale clean-up unlikely unless source is substantial and toxic. Possible off-site liabilities such as replacement/treatment of local potable water supplies. Moderate cost implications and potential moderate risk of prosecution.
M2 (Moderate)	Minor aquifer, low to moderately vulnerable, but with possible uses in general area, particularly for domestic supplies. May provide pathway to surface water.	Risk assessment may indicate need for localised clean up/isolation of soil and groundwater only, but may be some off-site liabilities e.g. local potable water supplies. Moderate to low cost implications. Potential prosecution less

Sensitivity assessment	Standard response	Implications/need for further work *(subject to nature of source and pathway)*
		likely.
L1 (Low)	Permeable strata/minor aquifer near surface, but no apparent use and low vulnerability (may also be a significant aquifer but downgraded by longterm/permanent degradation of water quality). May provide pathway to surface watercourse at distance.	Localised clean-up/isolation of soil and groundwater only. Unlikely to be significant off-site liabilities or action by statutory authorities with respect to groundwater. Low cost implications.
L2 (Very low)	Not a recognised aquifer, but strata beneath site may retain a small amount of contaminated liquid but there is likely to be limited vertical penetration. High potential for surface runoff or ponding.	Clean-up/isolation of soil and contained groundwater only, in immediate vicinity of release. Unlikely to be off-site liabilities or action by statutory authorities with respect to groundwater. Low cost implications.

2.0 SURFACE WATER (EXCLUDING COASTAL WATERS)

Sensitivity assessment	Standard response	Implications/need for further work *(subject to nature of source and pathway and no short circuiting by artificial drainage systems)*
H1 (Very high)	High quality watercourse (GQA A or B) within close proximity (less than 250m) of site or with potential for rapid transmission of pollutants to that watercourse via a fissured aquifer. Or interconnected unclassified drain or stream.	Potential for major pollution incident with fish kills, risk to river users etc. Major cost implications for remediation measures and with respect to penalties on prosecution. Potential for major adverse publicity.
H2 (High)	Site within catchment and reasonable proximity (less than 500m) of high quality watercourse (GQA A/B) or with potential transmission of pollutants via baseflow from an aquifer with little subsurface attenuation or via an interconnected unclassified drain or stream.	Potential for significant pollution incident that requires remedial measures and likely to involve a prosecution and adverse publicity. Substantial cost implications.
M1 (Moderately high)	Site within catchment and reasonable proximity (less than 500m) of a moderate quality watercourse (GQA C/D) or 500-	Potential for significant pollution incident that requires remediation measures. Possible prosecution, particularly if contamination is likely to

Sensitivity assessment	Standard response	Implications/need for further work *(subject to nature of source and pathway and no short circuiting by artificial drainage systems)*
	1000m of a high quality watercourse (GQA A/B). Also where there is potential transmission of pollutants via baseflow with little subsurface attenuation or via an interconnected unclassified drain or stream.	be visible or result in public complaints.
M2 (Moderate)	Site within catchment of and relatively close (less than 1000m) to moderate or poor quality (GQA C to F) watercourse that may be subject to planned improvement by attainment of surface water quality objectives. May be potential for transmission of pollutants via baseflow from a highly permeable formation.	Minor incidents are unlikely to attract third party liabilities, but action by statutory authorities likely if contamination is visible or repeated.
L1 (Low)	Within catchment of and over 250m from generally poor quality watercourse (GQA E or F) that is unlikely to improve by current or foreseeable surface water quality objectives or at distance (over 1000m) from a good quality watercourse with no interconnecting drains or baseflow from fissured strata.	Unlikely to be third party liabilities or action from statutory authorities from surface water viewpoint.
L2 (Very low)	No surface water within general area of the site (at least 250m) or closed drainage within site. Little or no potential for significant transmission via baseflow and no interconnecting drains.	Liabilities restricted to site itself (localised soil contamination or ponding) or associated with groundwater.

3.0 COASTAL WATERS:

Sensitivity assessment	Standard response	Implications/need for further work *(subject to nature of source and pathway and no short circuiting by artificial drainage systems)*
H1 (Very high)	Within 100m of a sensitive coastal water, that is, a recognised bathing	Potential for major environmental health risks and ecological damage.

Sensitivity assessment	**Standard response**	**Implications/need for further work** *(subject to nature of source and pathway and no short circuiting by artificial drainage systems)*
	water, a "more sensitive area" (as defined under the Urban Wastewater Treatment Directive) or a marine SSSI or at a greater distance but with a direct connection via a stream or a highly fissured aquifer to such a coastal water with the potential for rapid flow to that water.	Probability of high remedial costs, prosecution and adverse publicity.
H2 (High)	As above, within 250m or with a relatively rapid route of transmission or within 100m of a "less sensitive area".	
M1 (Moderately high)	Within 500m of a bathing water or a defined sensitive area (see above); with possibility of diffuse flow via groundwater seepages at coastline or with connection via nearby watercourses.	LESS DATA AVAILABLE FOR COASTAL SITES TO GIVE GENERALISED ASSESSMENTS OF POTENTIAL LIABILITIES.
M2 (Moderate)	Within 500m of a coastal water (undefined), with possibility of diffuse flow via groundwater seepages at coastline or with connection via nearby watercourses.	
L1 (Low)	No coastline nearby (within 1km), but with possibility of diffuse groundwater seepages at coastline or connection via nearby watercourses.	Liabilities initially associated with watercourses or groundwaters.
L2 (Very low)	No coastline nearby (within 1km) and/or no direct connection via surface or ground water.	No liabilities likely.

Appendix E

Background to Qualitative Risk Assessment

ANNEX 4 OF R&D 66 (NHBC) – QUALITATIVE RISK ASSESSMENT

1.0 CLASSIFICATION OF CONSEQUENCE

Classification	Definition	Examples
Severe	Highly elevated concentrations **likely** to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs. Equivalent to EA **Category 1** pollution incident including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population. Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated concentrations of List I and II substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs. Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population. Significant damage to crops, buildings or property.	Significant harm to humans is defined in circular 01/2006 as death, disease*, serious injury, genetic mutation, birth defects or the impairment of reproductive functions. Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health **unlikely** to	Exposure could lead to slight short-

Classification	Definition	Examples
	lead to "significant harm". Equivalent to **EA Category 3** pollution incident including minimal or short lived effect on water quality; marginal effect on amenity value, agriculture or commerce. Minor or short lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population. Minor damage to crops, buildings or property.	term effects (e.g. mild skin rash). Surface spalling of concrete.
Minor	No measurable effect on humans. Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems. Repairable effects of damage to buildings, structures and services.	The loss of plants in a landscaping scheme. Discoloration of concrete.

* For these purposes, disease is to be taken to mean an unhealthy condition of the body or a part of it and can include, for example, cancer, liver dysfunction or extensive skin ailments. Mental dysfunction is included only insofar as it is attributable to the effects of a pollutant on the body of the person concerned.

2.0 CLASSIFICATION OF PROBABILITY

Category	Definition	Examples
High likelihood	There is a pollutant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	*a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden.* *b) Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.*
Likely	There is a pollutant linkage and all the elements are present and in the right place which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable,	*a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space.*

Category	Definition	Examples
	but possible in the short-term and likely over the long-term.	*b) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.*
Low likelihood	There is a pollutant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place, and is less likely in the shorter term.	*a) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space.* *b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.*
Unlikely	There is a pollutant linkage but circumstances are such that it is improbable that an event would occur even in the very long-term.	*a) Elevated concentrations of toxic contaminants are present below hardstanding.* *b) Light industrial unit <10 yrs old containing a doubleskinned UST with annual integrity testing results available.*

Note: A pollution linkage must first be established before probability is classified. If there is no pollution linkage then there is no potential risk. If there is no pollution linkage then there is no need to apply tests for probability and consequence.

For example if there is surface contamination and a major aquifer is present at depth, but this major aquifer is overlain by an aquiclude of significant thickness then there is no pollution linkage and the risks to the major aquifer are not assessed. The report should identify both the source and the receptor but state that because there is no linkage there are no potential risks.

3.0 THE CLASSIFICATION OF RISK

Probability (Likelihood)		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
	High likelihood	Very high risk	High risk	Moderate Risk	Low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk

	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

4.0 DESCRIPTION OF THE CLASSIFIED RISKS

Very high risk – There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.

High risk – Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.

Moderate risk – It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

Low risk – It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.

Very low risk – It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

No potential risk – There is no potential risk if no pollution linkage has been established.

Definitions	
Hazard	A property or situation which in certain circumstances could lead to harm. [The properties of different hazards must be assessed in relation to their potential to affect the various different receptors].
Risk	A combination of the probability or frequency of the occurrences of a defined hazard AND the magnitude of the consequences of that occurrence.
Probability	The mathematical expression of the chance of a particular event in a given period of time [e.g. probability of 0.2 is equivalent to 20% or a 1 in 5 chance].

Likelihood	Probability; the state or fact of being likely.
Consequences	The adverse effects (or harm) arising from a defined hazard which impairs the quality of the environment or human health in the short or longer term.
Pollution Linkage	An identified pathway is capable of exposing a receptor to a contaminant and that contaminant is capable of harming the receptor.

MEL GUIDELINES FOR THE ASSESSMENT OF SOIL QUALITY

1.0 APPLICATION OF TIER 1 SCREENING VALUES

A number of sets of Tier 1 Screening Values are currently in the public domain and the information below outlines each of these sets and their basis for derivation.

The Contaminated Land Exposure Assessment (CLEA) guidance provides Soil Guideline Values (SGVs), for the assessment of the significance of contamination testing results in soils.

SGVs are intended for use as 'Minimal Risk' levels for human health risk assessment and are based in the regulatory framework for assessment of risk to human health in relation to land use. SGVs have been developed on the basis of many critical assumptions about possible exposure to soil contamination. It is important that an assessor understands these assumptions and limitations before applying SGVs to an area of land.

Their derivation is based on the regulatory framework for assessment of risk to human health in relation to land use. SGVs for selected contaminants (arsenic, mercury, nickel, selenium, phenol, polychlorinated biphenyls (PCBs) and BTEX) were published by the Environment Agency in 2009. Note that due to new research the SGVs and related documents for mercury and nickel have now been withdrawn. There are no plans to publish new SGVs for these two substances as the Environment Agency (EA) no longer undertake this work.

A document published by a joint venture between CL:AIRE (Contaminated Land: Applications in the Real Environment) and the EIC provides additional Generic Assessment Criteria (GACs) for selected contaminants not included within the SGV project. These GACs have been produced based on the same framework and assumptions as the SGVs.

In relation to revised Part 2A Statutory Guidance (April 2012), Category 4 Screening Levels (C4SLs) were produced to aid in providing a simple test for deciding when land is suitable for use and definitely not contaminated land with regard to Part 2A. The derivation of the C4SLs is based on a low level of risk and Low Level of Toxicological Concern (LLTC) instead of Minimal Risk and Health Criteria Values (HCVs) in order to make them more pragmatic than SGVs. In addition, the exposure factors considered in each generic land use have been assessed and changes made to made them more applicable to the way we live today. Currently C4SLs exist for a select number of parameters (arsenic, benzene, benzo(a)pyrene, cadmium, hexavalent chromium and lead).

Subsequent to the C4SLs being published, Suitable 4 Use Levels (S4ULs) were published by Land Quality Management (LQM) to replace their existing GACs. The S4ULs have been developed by a collaborative effort between LQM and members of the UK contaminated land development and are based on updated toxicological information and updated exposure factors. The exposure factors considered are similar to those changed by the C4SL project, although it should be noted that not all changes were incorporated into the S4ULs.

The SGVs, GACs, S4ULs and C4SLs have all been calculated by considering the intended land use, standard soil parameters (pH, organic matter and particle size distribution), and depth from which the soils have been taken, which may not be appropriate for universal application or application to

these specific samples and interpretation is provided as an indicative guide only. Three generic land use scenarios are considered for SGVs, GACs, S4ULs and C4SLs; residential, allotments and commercial. In addition two types of public open space are also considered with regard to the C4SLs and S4ULs.

It should be noted that some of the contaminants included within the S4UL publication duplicate the contaminants where SGVs are available. Although the SGVs were published by the UK Government for use within the contaminated land industry, it may be seen that the SGVs are now out of date as they were published in 2009. The S4ULs are similar to the SGVs in the fact that they have been derived using HCVs but are non statutory due to their origin. However, it is considered that they should be utilised instead of the SGVs as the basis of the S4ULs are more up to date with regard to toxicological information and exposure factors.

It should be noted though that the GACs and S4ULs are non statutory by reason of their origin and should new SGVs be published these values will become redundant.

The GACs and S4ULs have been used as initial screening tools within this report. Where a contaminant has exceeded these values and a C4SL is available, a second assessment will be undertaken based on this value. The exception is for lead where only a C4SL is available and this will be used as the initial screening value.

The screening values for a **Commercial/Industrial** land use have been used where available. Below is a summary of this scenario.

Where SGVs have yet to be issued and GACs, C4SLs and S4ULs are unavailable and until formal guidance has been extended to other potential contaminants and land uses, other sources of guidance have been relied upon.

The information provided within this appendix is a brief summary of the current initial screening tools that are available for use and justification for utilising them. For full details please refer to the full documents referenced below.

Our contamination analytical package is suitable for assessing general contamination on brownfield sites. It was compiled in accordance with a general list of typical parameters.

COMMERCIAL/INDUSTRIAL LAND USE

There are may different kinds of workplace and work related activities. This lanf use assumes that work take place in a permanent single storey building, factory or warehouse where employees spend most of the time indoors involved in office based or relatively light physical work. This land use is not designated to consider those sites involving 100% hard cover (such as car parks) where the risk to the site user are from ingestion or skin contact because of the implausibility of such exposures arising while the constructed surface remains intact.

The S4ULs and C4SLs for a commercial (industrial) end use have been used as a n assessment tool within this report since this is appropriate *considering the development proposals for the site*.

2.0 PATHWAYS

Pathways used in the CLEA model include ingestion of dust, uptake by inhalation inside and outside a house (not considered for POS_{park}), direct contact with the skin, and for example the significance of consuming vegetables grown within the soils of interest (only considered in the residential scenario). Each of these pathways of exposure is considered and the significance of each weighted based upon the parameter of interest.

3.0 REFERENCES

Statutory Guidance

Final SC050021/SR3 Updated Technical Background to the CLEA Model

Final SC050021/SR2 Human Health Toxicological Assessment of Contaminants in Soil

Final SC050021/SR4 CLEA Software (Version 1.05) Handbook

Final SC050021/SR7 Compilation of Data for Priority Organic Pollutants for the Derivation of Soil Guideline Values

Soil Guideline Values (SGVs)

SC050021/ SGV Introduction

SC050021/ Inorganic Arsenic SGV

SC050021/ Mercury SGV *(withdrawn)*

SC050021/ Selenium SGV

SCO50021/ Nickel SGV *(withdrawn)*

SC050021/ Benzene SGV

SC050021/ Toluene SGV

SC050021/ Ethylbenzene SGV

SC050021/ Xylene SGV

SC050021/ Phenol SGV

SC050021/Cadmium SGV

SC050021/ Dioxins SGV

SC050021/TOX1 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Inorganic Arsenic

SC050021/TOX3 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Cadmium

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Mercury *(withdrawn)*

SC050021/TOX8 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Nickel *(withdrawn)*

SC050021/TOX9 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Phenol

SC050021/TOX12 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Dioxins, Furans and Dioxin-like PCBs

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Selenium

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Benzene

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Toluene

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Ethylbenzene

SC050021 Contaminants in Soil: Updated collation of toxicological data and intake values for humans. Xylene

SC050021 Supplementary information for the derivation of SGVs for Arsenic

SC050021 Supplementary information for the derivation of SGVs for Mercury *(withdrawn)*

SC050021 Supplementary information for the derivation of SGVs for Nickel *(withdrawn)*

SC050021 Supplementary information for the derivation of SGVs for Selenium

SC050021 Supplementary information for the derivation of SGVs for Benzene

SC050021 Supplementary information for the derivation of SGVs for Toluene

SC050021 Supplementary information for the derivation of SGVs for Ethylbenzene

SC050021 Supplementary information for the derivation of SGVs for Xylene

SC050021 Supplementary information for the derivation of SGVs for Cadmium

SC050021 Supplementary information for the derivation of SGVs for Phenol

SC050021 Supplementary information for the derivation of SGVs for Dioxins, Furans and Dioxin-like PCBs

Generic Assessment Criteria (GACs)

CLAIRE (2010). 'Soil Generic Assessment Criteria for Human Health Risk Assessment'. Contaminated Land: Applications in Real Environments (CLAIRE). January 2010.

Category 4 Screening Levels (C4SLs)

CL:AIRE. SP1010 Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination. Final Project Report. December 2013.

Appendix A Sensitivity Analysis Parameters

Appendix B Probability Modelling

Appendix C Arsenic

Appendix D Benzene

Appendix E Benzo(a)pyrene

Appendix F Cadmium

Appendix G Chromium VI

Appendix H Lead

Appendix I Statistics Review

DEFRA. SP1010 Development of Category 4 Screening Levels (C4SLs) for Assessment of Land Affected by Contamination – Policy Companion Document. March 2014

Suitable 4 Use Levels (S4ULs)

Land Quality Management (LQM). Nathanail, C.P, McCaffrey, C., Gillett, A.G., Ogden, R.C. and Nathanail, J.F. The LQM/CIEH S4ULs for Human Health Risk Assessment. Land Quality Press. 2015.

ORGANIC PARAMETERS

All information below is to be read in conjunction with Mayer Environmental Ltd guidance document on the use of assessment criteria and their limitations.

All values cited here assume a sandy loam soil as defined in SR3.

All criteria values given below assume that no free phase contamination is present.

It should be noted that the parameters listed below are not an exhaustive list – additional parameters have been included within the LQM S4ULs and CL:AIRE GACs. However, the parameters listed below are considered to be the most commonly encountered.

Key:
[a] S4ULs presented exceed the vapour saturation limit, which is presented in brackets
[b] S4ULs presented exceed the solubility saturation limit, which is presented in brackets
*CL:AIRE/EIC Publication
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BTEX & MTBE

Benzene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	0.33	0.087	0.17	0.37	0.87	-
Residential without home-grown produce	-	0.38	0.70	1.4	3.3	-
Allotment	0.07	0.017	0.034	0.075	0.18	-
Commercial	95	27	47	90	98	-
POS_{Resi}	-	72	72	73	140	-
POS_{Park}	-	90	100	110	230	-

Toluene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	610	130	290	660	-	-
Residential without home-grown produce	-	880[a] (869)	1,900	3,900	-	-
Allotment	120	22	51	120	-	-
Commercial	4,400	56,000[a] (869)	110,000[a] (1,920)	180,000[a] (4,360)	-	-
POS $_{Resi}$	-	56,000	56,000	56,000	-	-
POS $_{Park}$	-	87,000[a] (869)	95,000[a] (1,920)	100,000[a] (4,360)	-	-

Ethylbenzene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	350	47	110	260	-	-
Residential without home-grown produce	-	83	190	440	-	-
Allotment	90	16	39	91	-	-
Commercial	2,800	5,700 (518)	13,000 (1,220)	27,000 (2,840)	-	-
POS $_{Resi}$	-	24,000	24,000	25,000	-	-
POS $_{Park}$	-	17,000 (518)	22,000 (1,220)	27,000 (2,840)	-	-

Xylene

If the source is suspected to be a fresh spill then the total xylene concentration can be compared to the m-xylene value. If composition of the source is unknown or weathered the most conservative value should be used.

o-Xylene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	250	60	140	330	-	-
Residential without home-grown produce	-	88	210	480	-	-
Allotment	160	28	67	160	-	-
Commercial	2,600	6,600[b] (478)	15,000[b] (1,120)	33,000[b] (2,620)	-	-
POS $_{Resi}$	-	41,000	42,000	43,000	-	-
POS $_{Park}$	-	17,000[b] (478)	24,000[b] (1,120)	33,000[b] (2,620)	-	-

m-Xylene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	240	59	140	320	-	-
Residential without home-grown produce	-	82	190	450	-	-
Allotment	180	31	74	170	-	-
Commercial	3,500	6,200a (625)	14,000[a] (1,470)	31,000[b] (3,460)	-	-
POS $_{Resi}$	-	41,000	42,000	43,000	-	-
POS $_{Park}$	-	17,000[a] (625)	24,000[a] (1,470)	32,000[b] (3,460)	-	-

p-Xylene

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	
Residential with home-grown produce	230	56	130	310	-	-
Residential without home-grown produce	-	79	180	430	-	-
Allotment	160	29	69	160	-	-
Commercial	3,200	5,900[b] (576)	14,000[b] (1,350)	30,000[b] (3,170)	-	-
POS $_{Resi}$	-	41,000	42,000	43,000	-	-
POS $_{Park}$	-	17,000[b] (576)	23,000[b] (1,350)	31,000[b] (3,170)	-	-

Methyl tert-butyl ether (MTBE)

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)		
	6.0% SOM	-	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM
Residential with home-grown produce	-		-	49	84	160
Residential without home-grown produce	-		-	73	120	220
Allotment	-		-	23	44	90
Commercial	-		-	7,900	13,000	24,000
POS $_{Resi}$	-		-	-	-	-
POS $_{Park}$	-		-	-	-	-

PETROLEUM HYDROCARBONS

Residential With Home Grown Produce Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	42	78	160	-	-
Aliphatic EC>6-8	-	100	230	530	-	-
Aliphatic EC >8-10	-	27	65	150	-	-
Aliphatic EC >10-12	-	130[a] (48)	330[b] (118)	760[a] (283)	-	-
Aliphatic EC >12-16	-	1,100[b] (24)	2,400[b] (59)	4,300[b] (142)	-	-
Aliphatic EC >16-35	-	65,000[b] (8.48)	92,000[b] (21)	110,000	-	-
Aliphatic EC >35-44	-	65,000[b] (8.48)	92,000[b] (21)	110,000	-	-
Aromatic EC 5-7 (benzene)	-	70	140	300	-	-
Aromatic EC>7-8 (toluene)	-	130	290	660	-	-
Aromatic EC>8-10	-	34	83	190	-	-
Aromatic EC >10-12	-	74	180	380	-	-
Aromatic EC >12-16	-	140	330	660	-	-
Aromatic EC >16-21	-	260	540	930	-	-
Aromatic EC >21-35	-	1,100	1,500	1,700	-	-
Aromatic >35-44	-	1,100	1,500	1,700	-	-
Aliphatic + Aromatic EC >44-70	-	1,600	1,800	1,900	-	-

Residential Without Home Grown Produce Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	42	78	160	-	-
Aliphatic EC>6-8	-	100	230	530	-	-
Aliphatic EC >8-10	-	27	65	150	-	-
Aliphatic EC >10-12	-	130[a] (48)	330[b] (118)	770[a] (283)	-	-
Aliphatic EC >12-16	-	1,100[b] (24)	2,400[b] (59)	4,400[b] (142)	-	-
Aliphatic EC >16-35	-	65,000[b] (8.48)	92,000[b] (21)	110,000	-	-
Aliphatic EC >35-44	-	65,000[b] (8.48)	92,000[b] (21)	110,000	-	-
Aromatic EC 5-7 (benzene)	-	370	690	1,400	-	-
Aromatic EC>7-8 (toluene)	-	860	1,800	3,900	-	-
Aromatic EC>8-10	-	47	110	270	-	-
Aromatic EC >10-12	-	250	590	1,200	-	-
Aromatic EC >12-16	-	1,800	2,300[b] (419)	2,500	-	-
Aromatic EC >16-21	-	1,900	1,900	1,900	-	-
Aromatic EC >21-35	-	1,900	1,900	1,900	-	-
Aromatic >35-44	-	1,900	1,900	1,900	-	-
Aliphatic + Aromatic EC >44-70	-	1,900	1,900	1,900	-	-

Allotment Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	730	1,700	3,900	-	-
Aliphatic EC>6-8	-	2,300	5,600	13,000	-	-
Aliphatic EC >8-10	-	320	770	1,700	-	-
Aliphatic EC >10-12	-	2,200	4,400	7,300	-	-
Aliphatic EC >12-16	-	11,000	13,000	13,000	-	-
Aliphatic EC >16-35	-	260,000	270,000	270,000	-	-
Aliphatic EC >35-44	-	260,000	270,000	270,000	-	-
Aromatic EC 5-7 (benzene)	-	13	27	57	-	-
Aromatic EC>7-8 (toluene)	-	22	51	120	-	-
Aromatic EC>8-10	-	8.6	21	51	-	-
Aromatic EC >10-12	-	13	31	74	-	-
Aromatic EC >12-16	-	23	57	130	-	-
Aromatic EC >16-21	-	46	110	260	-	-
Aromatic EC >21-35	-	370	820	1,600	-	-
Aromatic >35-44	-	370	820	1,600	-	-
Aliphatic + Aromatic EC >44-70	-	1,200	2,100	3,000	-	-

Commercial Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	3,200[b] (304)	5,900[b] (558)	12,000[b] (1,150)	-	-
Aliphatic EC>6-8	-	7,800[b] (144)	17,000[b] (322)	40,000[b] (736)	-	-
Aliphatic EC >8-10	-	2,000[b] (78)	4,800[a] (190)	11,000[a] (451)	-	-
Aliphatic EC >10-12	-	9,700[b] (48)	23,000[a] (118)	47,000[a] (283)	-	-
Aliphatic EC >12-16	-	59,000[b] (24)	82,000[b] (59)	90,000[b] (142)	-	-
Aliphatic EC >16-35	-	1,600,000	1,700,000	1,800,000	-	-
Aliphatic EC >35-44	-	1,600,000	1,700,000	1,800,000	-	-
Aromatic EC 5-7 (benzene)	-	26,000[b] (1,220)	46,000[b] (2,260)	86,000[b] (4,710)	-	-
Aromatic EC>7-8 (toluene)	-	56,000[a] (869)	110,000[b] (1,920)	180,000[a] (4,360)	-	-
Aromatic EC>8-10	-	3,500[a] (613)	8,100[a] (1,500)	17,000[a] (3,580)	-	-
Aromatic EC >10-12	-	16,000[b] (364)	28,000[b] (899)	34,000[b] (2,150)	-	-
Aromatic EC >12-16	-	36,000[b] (169)	37,000	38,000	-	-
Aromatic EC >16-21	-	28,000	28,000	28,000	-	-
Aromatic EC >21-35	-	28,000	28,000	28,000	-	-
Aromatic >35-44	-	28,000	28,000	28,000	-	-
Aliphatic + Aromatic EC >44-70	-	28,000	28,000	28,000	-	-

Public Open Space – Residential (POS_{resi}) Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	570,000[b] (304)	590,000	600,000	-	-
Aliphatic EC>6-8	-	600,000	610,000	620,000	-	-
Aliphatic EC >8-10	-	13,000	13,000	13,000	-	-
Aliphatic EC >10-12	-	13,000	13,000	13,000	-	-
Aliphatic EC >12-16	-	13,000	13,000	13,000	-	-
Aliphatic EC >16-35	-	250,000	250,000	250,000	-	-
Aliphatic EC >35-44	-	250,000	250,000	250,000	-	-
Aromatic EC 5-7 (benzene)	-	56,000	56,000	56,000	-	-
Aromatic EC>7-8 (toluene)	-	56,000	56,000	56,000	-	-
Aromatic EC>8-10	-	5,000	5,000	5,000	-	-
Aromatic EC >10-12	-	5,000	5,000	5,000	-	-
Aromatic EC >12-16	-	5,100	5,100	5,000	-	-
Aromatic EC >16-21	-	3,800	3,800	3,800	-	-
Aromatic EC >21-35	-	3,800	3,800	3,800	-	-
Aromatic >35-44	-	3,800	3,800	3,800	-	-
Aliphatic + Aromatic EC >44-70	-	3,800	3,800	3,800	-	-

Public Open Space – Public Park (POS_{park}) Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Aliphatic EC 5-6	-	95,000[b] (304)	130,000[b] (558)	180,000[b] (1,150)	-	-
Aliphatic EC>6-8	-	150,000[b] (144)	220,000[b] (322)	320,000[b] (736)	-	-
Aliphatic EC >8-10	-	14,000[b] (78)	18,000[a] (190)	21,000[a] (451)	-	-
Aliphatic EC >10-12	-	21,000[b] (48)	23,000[a] (118)	24,000[a] (283)	-	-
Aliphatic EC >12-16	-	25,000[b] (24)	25,000[b] (59)	26,000[b] (142)	-	-
Aliphatic EC >16-35	-	450,000	480,000	490,000	-	-
Aliphatic EC >35-44	-	450,000	480,000	490,000	-	-
Aromatic EC 5-7 (benzene)	-	76,000[b] (1,220)	84,000[b] (2,260)	92,000[b] (4,710)	-	-
Aromatic EC>7-8 (toluene)	-	87,000[a] (869)	95,000[b] (1,920)	100,000[a] (4,360)	-	-
Aromatic EC>8-10	-	7,200[a] (613)	8,500[a] (1,500)	9,300[a] (3,580)	-	-
Aromatic EC >10-12	-	9,200[b] (364)	9,700[b] (899)	10,000	-	-
Aromatic EC >12-16	-	10,000	10,000	10,000	-	-
Aromatic EC >16-21	-	7,800	7,700	7,800	-	-
Aromatic EC >21-35	-	7,800	7,800	7,900	-	-
Aromatic >35-44	-	7,800	7,800	7,900	-	-
Aliphatic + Aromatic EC >44-70	-	7,800	7,800	7,900	-	-

POLYCYCLIC AROMATIC HYDROCARBONS

There are two principle approaches considered suitable for the risk assessment of PAHs; a suitable surrogate marker (usually benzo(a)pyrene (BaP)) or the use of relative potency factors (RPFs). In this case S4ULs have been produced for both approaches. The surrogate marker approach involves using BaP as a marker compound as long as the PAH profile being assessed is within an order of magnitude for the coal tar mixture studied by Culp et al. (see S4UL document for full details).

RPFs are used in assessing risks from complex mixtures of PAHs. In some cases it is assumed that all of the carcinogenic PAH compounds are as potent as BaP. However, this is a highly conservative approach and approaches based on relative potency have been developed to assess risks from mixtures of PAH congeners. BaP is the most thoroughly studied of the congeners and so is usually used as a benchmark for estimating the relative carcinogenic potency of other PAH congeners.

Residential With Home Grown Produce Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Acenaphthene	-	210	510	1,100	-	-
Acenaphthylene	-	170	420	920	-	-
Anthracene	-	2,400	5,400	11,000	-	-
Benzo(a)anthracene	-	7.2	11	13	-	-
Benzo(a)pyrene (only)	-	2.2	2.7	3.0	5	-
Benzo(b)fluoranthene	-	2.6	3.3	3.7	-	-
Benzo(ghi)perylene	-	320	340	350	-	-
Benzo(k)fluoranthene	-	77	93	100	-	-
Chrysene	-	15	22	27	-	-
Dibenz(ah)anthracene	-	0.24	0.28	0.3	-	-
Fluoranthene	-	280	560	890	-	-
Fluorene	-	170	400	860	-	-
Indeno(123-cd)pyrene	-	27	36	41	-	-
Naphthalene	-	2.3	5.6	13	-	-
Phenanthrene	-	95	2220	440	-	-
Pyrene	-	620	1,200	2,000	-	-
Coal Tar (BaP as surrogate marker)	-	0.79	0.98	1.1	-	-

Residential Without Home Grown Produce Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Acenaphthene	-	3,000[b] (57)	4,700[b] (141)	6,000[b] (336)	-	-
Acenaphthylene	-	2,900[b] (86.1)	4,600[b] (212)	6,000[b] (506)	-	-
Anthracene	-	31,000[a] (1.17)	35,000	37,000	-	-
Benzo(a)anthracene	-	11	14	15	-	-
Benzo(a)pyrene (only)	-	3.2	3.2	3.2	5.3	-
Benzo(b)fluoranthene	-	3.9	4.0	4.0	-	-
Benzo(ghi)perylene	-	360	360	360	-	-
Benzo(k)fluoranthene	-	110	110	110	-	-
Chrysene	-	30	31	32	-	-
Dibenz(ah)anthracene	-	0.31	0.32	0.32	-	-
Fluoranthene	-	1,500	1,600	1,600	-	-
Fluorene	-	2,800[b] (30.9)	3,800[b] (76.5)	4,500[b] (1835)	-	-
Indeno(123-cd)pyrene	-	45	46	46	-	-
Naphthalene	-	2.3	5.6	13	-	-
Phenanthrene	-	1,300[b] (36)	1,500	1,500	-	-
Pyrene	-	3,700	3,800	3,800	-	-
Coal Tar (BaP as surrogate marker)	-	1.2	1.2	1.2	-	-

Allotment Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6.0% SOM	1.0% SOM	2.5% SOM	6.0% SOM	6.0% SOM	1.0% SOM
Acenaphthene	-	34	85	200	-	-
Acenaphthylene	-	28	69	160	-	-
Anthracene	-	380	950	2,200	-	-
Benzo(a)anthracene	-	2.9	6.5	13	-	-
Benzo(a)pyrene (only)	-	0.97	2.0	3.5	5.7	-
Benzo(b)fluoranthene	-	0.99	2.1	3.9	-	-
Benzo(ghi)perylene	-	290	470	640	-	-
Benzo(k)fluoranthene	-	37	75	130	-	-
Chrysene	-	4.1	9.4	19	-	-
Dibenz(ah)anthracene	-	0.14	0.27	0.43	-	-
Fluoranthene	-	52	130	290	-	-
Fluorene	-	27	67	160	-	-
Indeno(123-cd)pyrene	-	9.5	21	39	-	-
Naphthalene	-	4.1	10	24	-	-
Phenanthrene	-	15	38	90	-	-
Pyrene	-	110	270	620	-	-
Coal Tar (BaP as surrogate marker)	-	0.32	0.67	1.2	-	-

Commercial Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM
Acenaphthene	-	84,000[b] (57)	97,000[b] (141)	100,000	-	-
Acenaphthylene	-	83,900[b] (86.1)	97,000[b] (212)	100,000	-	-
Anthracene	-	520,000	540,000	540,000	-	-
Benzo(a)anthracene	-	170	170	180	-	-
Benzo(a)pyrene (only)	-	35	35	36	77	-
Benzo(b)fluoranthene	-	44	44	45	-	-
Benzo(ghi)perylene	-	3,900	4,000	4,000	-	-
Benzo(k)fluoranthene	-	1,200	1,200	1,200	-	-
Chrysene	-	350	350	350	-	-
Dibenz(ah)anthracene	-	3.5	3.6	3.6	-	-
Fluoranthene	-	23,000	23,000	23,000	-	-
Fluorene	-	63,000[b] (30.9)	68,000	71,000	-	-
Indeno(123-cd)pyrene	-	22,000	510	510	-	-
Naphthalene	-	190[b] (76.4)	460[b] (183)	1,100[b] (432)	-	-
Phenanthrene	-	22,000	22,000	23,000	-	-
Pyrene	-	54,000	54,000	54,000	-	-
Coal Tar (BaP as surrogate marker)	-	15	15	15	-	-

Public Open Space – Residential (POS_{resi}) Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM
Acenaphthene	-	15,000	15,000	15,000	-	-
Acenaphthylene	-	15,000	15,000	15,000	-	-
Anthracene	-	74,000	74,000	74,000	-	-
Benzo(a)anthracene	-	29	29	29	-	-
Benzo(a)pyrene (only)	-	5.7	5.7	5.7	21	-
Benzo(b)fluoranthene	-	7.1	7.2	7.2	-	-
Benzo(ghi)perylene	-	640	640	640	-	-
Benzo(k)fluoranthene	-	190	190	190	-	-
Chrysene	-	57	57	57	-	-
Dibenz(ah)anthracene	-	0.57	0.57	0.58	-	-
Fluoranthene	-	3,100	3,100	3,100	-	-
Fluorene	-	9,900	9,900	9,900	-	-
Indeno(123-cd)pyrene	-	82	82	82	-	-
Naphthalene	-	4,900	4,900	4,900	-	-
Phenanthrene	-	3,100	3,100	3,100	-	-
Pyrene	-	7,400	7,400	7,400	-	-
Coal Tar (BaP as surrogate marker)	-	2.2	2.2	2.2	-	-

Public Open Space – Public Park (POS_{park}) Scenario

Fraction	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM
Acenaphthene	-	29,000	30,000	30,000	-	-
Acenaphthylene	-	29,000	30,000	30,000	-	-
Anthracene	-	150,000	150,000	150,000	-	-
Benzo(a)anthracene	-	49	56	62	-	-
Benzo(a)pyrene (only)	-	11	12	13	10	-
Benzo(b)fluoranthene	-	13	15	16	-	-
Benzo(ghi)perylene	-	1,400	1,500	1,600	-	-
Benzo(k)fluoranthene	-	370	410	440	-	-
Chrysene	-	93	110	120	-	-
Dibenz(ah)anthracene	-	1.1	1.3	1.4	-	-
Fluoranthene	-	6,300	6,300	6,400	-	-
Fluorene	-	20,000	20,000	20,000	-	-
Indeno(123-cd)pyrene	-	150	170	180	-	-
Naphthalene	-	120[b] (76.4)	1,900[b] (183)	3,000	-	-
Phenanthrene	-	6,200	6,200	6,300	-	-
Pyrene	-	15,000	15,000	15,000	-	-
Coal Tar (BaP as surrogate marker)	-	4.4	4.7	4.8	-	-

CHLORINATED SOLVENTS

Residential With Home Grown Produce Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	0.016	0.034	0.075	-	-	-	-
Tetrachloroethene (PCE)	-	0.18	0.39	0.9	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	0.11	0.19	0.37
Trans-1,2 Dichloroethene	-	-	-	-	-	0.19	0.34	0.7
Vinyl Chloride (aka chloroethene)	-	0.00064	0.00087	0.0014	-	-	-	-

Residential Without Home Grown Produce Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	0.017	0.036	0.08	-	-	-	-
Tetrachloroethene (PCE)	-	0.18	0.4	0.92	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	0.12	0.2	0.39
Trans-1,2 Dichloroethene	-	-	-	-	-	0.19	0.35	0.71
Vinyl Chloride (aka chloroethene)	-	0.00077	0.001	0.0015	-	-	-	-

Allotment Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	0.041	0.091	0.21	-	-	-	-
Tetrachloroethene (PCE)	-	0.65	1.5	3.6	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	0.26	0.5	1.0
Trans-1,2 Dichloroethene	-	-	-	-	-	0.93	1.9	4
Vinyl Chloride (aka chloroethene)	-	0.00055	0.001	0.0018	-	-	-	-

Commercial Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	1.2	2.6	5.7	-	-	-	-
Tetrachloroethene (PCE)	-	19	42	95	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	14	24	47
Trans-1,2 Dichloroethene	-	-	-	-	-	22	40	81
Vinyl Chloride (aka chloroethene)	-	0.059	0.077	0.12	-	-	-	-

Public Open Space – Residential (POS_{resi}) Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	120	120	120	-	-	-	-
Tetrachloroethene (PCE)	-	1,400	1,400	1,400	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	-	-	-
Trans-1,2 Dichloroethene	-	-	-	-	-	-	-	-
Vinyl Chloride (aka chloroethene)	-	3.5	3.5	3.5	-	-	-	-

Public Open Space – Park (POS_{park}) Scenario

Chlorinated Solvent	SGV (mg/kg)	S4UL^ (mg/kg)			C4SL (mg/kg)	GAC* (mg/kg)		
	6% SOM	1% SOM	2.5% SOM	6% SOM	6% SOM	1% SOM	2.5% SOM	6% SOM
Trichloroethene (TCE)	-	70	91	120	-	-	-	-
Tetrachloroethene (PCE)	-	810[b] (424)	1,100[b] (951)	1,500	-	-	-	-
Cis-1,2 Dichloroethene	-	-	-	-	-	-	-	-
Trans-1,2 Dichloroethene	-	-	-	-	-	-	-	-
Vinyl Chloride (aka chloroethene)	-	4.8	5	5.4	-	-	-	-

INORGANIC PARAMETERS

All information below is to be read in conjunction with Mayer Environmental Ltd guidance document on the use of assessment criteria and their limitations.

All values cited here assume a sandy loam soil as defined in SR3.

It should be noted that the parameters listed below are not an exhaustive list – additional parameters have been included within the LQM S4ULs and CL:AIRE GACs. However, the parameters listed below are considered to be the most commonly encountered.

Key:
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Inorganic Arsenic

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	32	37	37	-
Residential without home-grown produce	-	40	40	-
Allotment	43	43	49	-
Commercial	640	640	640	-
POS $_{Resi}$	-	79	79	-
POS $_{Park}$	-	170	170	-

Boron

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	290	-	-
Residential without home-grown produce	-	11,000	-	-
Allotment	-	45	-	-
Commercial	-	240,000	-	-
POS $_{Resi}$	-	21,000	-	-
POS $_{Park}$	-	46,000	-	-

Cadmium

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	10	11	22	-
Residential without home-grown produce	-	85	150	-
Allotment	1.8	1.9	3.9	-
Commercial	230	190	410	-
POS $_{Resi}$	-	120	220	-
POS $_{Park}$	-	560	880	-

Chromium III

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	910	-	-
Residential without home-grown produce	-	910	-	-
Allotment	-	18,000	-	-
Commercial	-	8,600	-	-
POS $_{Resi}$	-	1,500	-	-
POS $_{Park}$	-	33,000	-	-

Hexavalent Chromium (Chromium VI)

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	6	21	-
Residential without home-grown produce	-	6	21	-
Allotment	-	1.8	170	-
Commercial	-	33	49	-
POS $_{Resi}$	-	7.7	21	-
POS $_{Park}$	-	220	250	-

Copper

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	2,400	-	-
Residential without home-grown produce	-	7,100	-	-
Allotment	-	520	-	-
Commercial	-	68,000	-	-
POS $_{Resi}$	-	12,000	-	-
POS $_{Park}$	-	44,000	-	-

Lead

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	-	200	-
Residential without home-grown produce	-	-	310	-
Allotment	-	-	80	-
Commercial	-	-	2,330	-
POS $_{Resi}$	-	-	630	-
POS $_{Park}$	-	-	1,300	-

Mercury

The criteria values for inorganic mercury can normally be compared to total mercury as the equilibrium concentration of elemental and methyl mercury is likely to be low. However, consideration should be given to determine if elemental or methyl mercury are likely to be present.

Inorganic Mercury

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	40	-	-
Residential without home-grown produce	-	56	-	-
Allotment	-	19	-	-
Commercial	-	1,100	-	-
POS $_{Resi}$	-	120	-	-
POS $_{Park}$	-	240	-	-

Elemental Mercury

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	1.2	-	-
Residential without home-grown produce	-	1.2	-	-
Allotment	-	21	-	-
Commercial	-	58 (25.8)	-	-
POS $_{Resi}$	-	16	-	-
POS $_{Park}$	-	30 (25.8)	-	-

The S4ULs provided for commercial and POS resi exceed the vapour saturation limit which is shown in brackets.

Methyl Mercury

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	11	-	-
Residential without home-grown produce	-	15	-	-
Allotment	-	6	-	-
Commercial	-	320	-	-
POS $_{Resi}$	-	40	-	-
POS $_{Park}$	-	68	-	-

Nickel

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	130	-	-
Residential without home-grown produce	-	180	-	-
Allotment	-	53	-	-
Commercial	-	980	-	-
POS $_{Resi}$	-	230	-	-
POS $_{Park}$	-	800	-	-

Selenium

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	350	250	-	-
Residential without home-grown produce	-	430	-	-
Allotment	120	88	-	-
Commercial	13,000	12,000	-	-
POS_{Resi}	-	1,100	-	-
POS_{Park}	-	1,800	-	-

Zinc

Generic Scenario	SGV (mg/kg)	S4UL^ (mg/kg)	C4SL (mg/kg)	GAC* (mg/kg)
Residential with home-grown produce	-	3,700	-	-
Residential without home-grown produce	-	40,000	-	-
Allotment	-	620	-	-
Commercial	-	730,000	-	-
POS_{Resi}	-	81,000	-	-
POS_{Park}	-	170,000	-	-

Appendix F

Borehole & Trial Pit Logs

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023 - 13/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523711.78 N412750.49
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	CP	1.94m AoD	RB/CF	1:50	Sheet 1 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.30	1.64		Firm silty clay with occasional brick. MADE GROUND
								Soft to Firm mottled brown / grey silty CLAY
		1.00	ES					
		1.50	SPT					
		1.50	SPT	N=1 (1,0/0,1,0,0)				
		2.00	ES		2.10	-0.16		
								Very soft mottled grey / brown silty CLAY
		3.00	ES		3.00	-1.06		
		3.00	SPT					Very soft grey silty CLAY
		3.00	SPT	N=0 (0,0/0,0,0,0)				*Slight seepage*
		4.00	ES		4.20	-2.26		
								Very soft brown and grey silty CLAY with peat inclusions.
		4.50	SPT	N=0 (0,0/0,0,0,0)				
		5.00	ES					
		6.00	ES					
		6.00	SPT					
		6.00	SPT	N=0 (0,0/0,0,0,0)				
		7.00	D					
					7.20	-5.26		Greenish grey soft / firm silty peaty CLAY
					7.30	-5.36		Soft brown slightly silty PEAT. Occasional wood fragments noted.
		7.50	ES					
		7.50	SPT	N=18 (2,3/4,4,5,5)	7.70	-5.76		Firm brown silty CLAY with occasional gravels. Gravels are very fine to medium, angular to subrounded of chalk, sandstone and anthracite.
		8.00	ES					
		9.00	UT	Ublow=100				
		9.50	D					
		10.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		16.50 27.00	220 150	16.50	17.50	02:00					

Remarks

Artesian water encountered within the chalk and no further drilling undertaken in the chalk.

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023 - 13/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523711.78 N412750.49
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	CP	1.94m AoD	RB/CF	1:50	Sheet 2 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		10.50	SPT					Firm brown silty CLAY with occasional gravels. Gravels are very fine to medium, angular to subrounded of chalk, sandstone and anthracite.
		10.50	SPT	N=21 (3,5/4,5,5,7)				
		11.00	ES					
		12.00	SPT					
		12.50	UT	Ublow=67				
		13.00	D					
		13.50	SPT					
		13.50	SPT	N=17 (2,3/3,4,5,5)				
		14.00	D					
		15.00	UT	Ublow=70				
		15.50	D					
		16.00	D					
		16.50	SPT					
		16.50	SPT	N=50 (3,5/50 for 230mm)				
		17.00	D					
					17.50	-15.56		Yellowish brown slightly clayey sands and gravels.
		18.00	D		18.00	-16.06		Stiff brown CLAY.
		18.00	SPT					
		18.00	SPT	N=8 (2,1/2,2,2,2)				
		19.50	SPT		19.50	-17.56		Brown clayey matrix with chalk gravel.
		19.50	SPT	N=50 (13,12/50 for 260mm)				
		20.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		16.50 27.00	220 150	16.50	17.50	02:00					

Remarks

Artesian water encountered within the chalk and no further drilling undertaken in the chalk.

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023 - 13/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523711.78 N412750.49
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH01	CP	1.94m AoD	RB/CF	1:50	Sheet 3 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Brown clayey matrix with chalk gravel.
					20.50	-18.56		Very soft yellowish white slightly sandy, gravelly clayey CHALK. Gravel is dine to medium, angular to subangular of chalk. (Putty Chalk)
		21.00	D					*Chalk boulder*
		21.00	SPT					
	▼	21.00	SPT	N=50 (8,9/50 for 230mm)				
					21.50	-19.56		Soft white CHALK with chalk boulders.
		22.00	D					
		22.50	SPT					
		22.50	SPT	N=21 (3,3/4,5,6,6)				
		23.00	ES					
		24.00	SPT					
		24.00	SPT	N=26 (6,5/9,4,7,6)				
		25.00	D					
		25.50	SPT					
		25.50	SPT	N=50 (3,8/50 for 240mm)				
		26.00	D					
		27.00	SPT	N=21 (6,6/5,4,6,6)	27.00	-25.06		End of Borehole at 27.00m

21 22 23 24 25 26 27 28 29 30

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		16.50 27.00	220 150	16.50	17.50	02:00					

Remarks

Artesian water encountered within the chalk and no further drilling undertaken in the chalk.

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023 - 19/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523731.77 N412821.08
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH02	CP	2.11m AoD	CF	1:50	Sheet 1 of 3

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
								Firm brown slightly sandy, slightly gravelly CLAY. Gravel is angular to subangular of flint.
		1.00	ES		1.00	1.11		Soft brown slightly sandy CLAY.
		1.50	SPT					
		1.50	SPT	N=1 (1,0/0,1,0,0)				
		2.00	ES					
		3.00	ES		3.00	-0.89		
		3.00	SPT					Soft dark grey and occasional brown mottled sandy silty CLAY
		3.00	SPT	N=0 (0 for 450mm/0 for 0mm)				
		4.00	ES					
		4.00	SPT					
		4.00	SPT	N=0 (0 for 450mm/0 for 0mm)				
		5.00	ES					
		6.00	ES					
		6.00	SPT					
		6.00	SPT	N=0 (0 for 450mm/0 for 0mm)				
					6.80	-4.69		Soft brown, slightly sandy PEAT
		7.00	ES					
					7.30	-5.19		Soft grey very silty slightly peaty CLAY
		7.50	SPT					
		7.50	SPT	N=3 (1,1/0,1,1,1)				
					7.80	-5.69		Soft grey sandy, gravelly CLAY. Gravel is medium to coarse rounded to subangular of chalk and sandstone.
		8.00	ES					
					8.20	-6.09		*Slight seepage*
	▼							Firm greyish brown sandy gravelly CLAY. Gravel is rounded to subangular of chalk and sandstone
	▽							
		9.00	ES		9.00	-6.89		
		9.00	SPT		9.20	-7.09		Sand and gravels. Gravels are medium to coarse, rounded to subangular of chalk and sandstone.
		9.00	SPT	N=15 (2,3/3,4,4,4)				*Wet*
								Firm greyish brown SILT.
		10.00	ES		10.00	-7.89		

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		9.00	220								

Remarks

Installed for downhole seismic survey

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023 - 19/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523731.77 N412821.08
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH02	CP	2.11m AoD	CF	1:50	Sheet 2 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	UT	Ublow=83				Firm grey gravelly sandy CLAY. Gravel is coarse, subangular of chalk and mudstone.	
		11.00	D						11
		12.00	D						12
		12.00	SPT						
		12.00	SPT	N=29 (2,3/8,7,7,7)					
		13.00	ES		13.00	-10.89		Firm grey silty gravelly CLAY. Gravel is coarse, subangular of chalk and mudstone. *Seepage*	13
		14.00	ES						14
		15.00	D						15
		15.00	SPT						
		15.00	SPT	N=16 (2,3/4,4,3,5)					
					16.00	-13.89		Very dense yellow / brown fine to medium SAND.	16
		16.50	ES						
		16.50	SPT						
		16.50	SPT	N=36 (2,5/7,9,9,11)					
		17.00	D						17
		18.00	ES						18
		18.00	SPT						
		18.00	SPT	N=22 (2,3/5,6,6,5)					
					18.50	-16.39		Firm / Stiff grey / brown silty CLAY with chalk gravels. *Seepage*	
		19.00	D						19
		19.50	SPT						
		19.50	SPT	N=34 (3,2/9,10,8,7)					
		20.00	D						20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		9.00	220								

Remarks

Installed for downhole seismic survey

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023 - 19/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523731.77 N412821.08
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH02	CP	2.11m AoD	CF	1:50	Sheet 3 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		21.00 21.00 21.00	D SPT SPT	N=36 (2,3/5,9,11,11)	21.00	-18.89		Firm / Stiff grey / brown silty CLAY with chalk gravels.
					23.00	-20.89		White / yellow silty clayey CHALK.
								End of Borehole at 25.00m

21 22 23 24 25 26 27 28 29 30

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		9.00	220								

Remarks

Installed for downhole seismic survey

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 20/09/2023 - 22/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523708.11 N412850.11
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH03	CP	2.01m AoD	CF	1:50	Sheet 1 of 3

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		1.00	ES					Firm dark brown slightly sandy CLAY with occasional rounded to subangular gravels of flint and sandstone.
		1.50	SPT					
		1.50	SPT	N=4 (1,1/1,1,1,1)				
		2.00	ES		2.00	0.01		Very soft grey slightly clayey SILT.
								Seepage
		3.00	ES					
		3.00	SPT					
		3.00	SPT	N=0 (0,0/0,0,0,0)				
		4.00	ES					
		4.50	SPT					
		4.50	SPT	N=0 (0,0/0,0,0,0)				
		5.00	ES					
		6.00	ES		6.00	-3.99		Soft greenish grey very silty CLAY with peat inclusions.
		6.00	SPT					
		6.00	SPT	N=0 (0,0/0,0,0,0)				
		7.00	ES					
					7.20	-5.19		Very soft dark brown PEAT.
		7.50	SPT		7.50	-5.49		
		7.50	SPT	N=21 (2,2/5,5,6,5)				Firm slightly sandy, gravelly CLAY. Gravel is medium to coarse, rounded to subangular of chalk and sandstone.
		8.00	ES					
		9.00	ES					
		9.00	UT	Ublow=110				
		10.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00 22.50	220 150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 20/09/2023 - 22/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523708.11 N412850.11
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH03	CP	2.01m AoD	CF	1:50	Sheet 2 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		10.50	SPT					Firm slightly sandy, gravelly CLAY. Gravel is medium to coarse, rounded to subangular of chalk and sandstone.	
		10.50	SPT						
		10.50	SPT	N=21 (2,3/4,5,6,6)					
		11.00	ES						11
		12.00	D						12
		12.00	SPT						
		13.00	ES						13
		13.50	SPT						
		13.50	SPT	N=23 (2,4/5,6,6,6)					
		14.00	ES		14.00	-11.99		Yellow / brown fine to medium SAND.	14
					14.20	-12.19		Soft grey sandy, gravelly CLAY. Gravel is medium to coarse, rounded to subangular of chalk.	
		15.00	D						15
		15.00	SPT						
		15.00	SPT	N=5 (1,1/1,2,1,1)					
		16.00	ES		16.00	-13.99		Dense grey very silty SAND.	16
		16.50	SPT						
		16.50	SPT	N=42 (2,1/7,9,12,14)					
		17.00	D						17
					17.80	-15.79		Firm to stiff grey silty, gravelly, sandy CLAY.	
		18.00	D						18
		18.00	SPT						
		18.00	SPT	N=39 (2,3/5,9,12,13)					
		19.00	D						19
		19.50	SPT						
		19.50	SPT	N=46 (2,3/9,11,12,14)					
									20

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00	220								
		22.50	150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 20/09/2023 - 22/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523708.11 N412850.11
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH03	CP	2.01m AoD	CF	1:50	Sheet 3 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
		21.00 21.00	SPT SPT	N=45 (3,5/10,11,12,12)	21.00	-18.99		Firm to stiff grey silty, gravelly, sandy CLAY. Firm greenish grey silty CLAY.
	▼				22.10	-20.09		Slightly clayey CHALK. *Artesian water encountered within the chalk.*
		22.50 22.50	SPT SPT	N=44 (6,11/10,10,12,12)	22.50	-20.49		End of Borehole at 22.50m

21 22 23 24 25 26 27 28 29 30

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00 22.50	220 150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 25/09/2023 - 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523680.79 N412899.39
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH04	CP	2.21m AoD	CF	1:50	Sheet 1 of 3

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		1.00	ES					Grass over firm brown slightly silty CLAY with some some fine rounded to subangular gravels.
		1.50	SPT					
		1.50	SPT	N=8 (1,2/2,2,2,2)	1.60	0.61		
		2.00	ES					Soft brown silty clay with occasional medium, rounded to subangular gravels.
		3.00	ES		3.00	-0.79		
		3.00	SPT					Very soft dark brown and grey very silty CLAY.
		3.00	SPT	1 (1,0/0,0,1,)				*Slight seepage*
	▼	4.00	ES					
		4.50	SPT					
		5.00	ES					
		6.00	ES					
		6.00	SPT					
					6.40	-4.19		Soft brown silty PEAT.
		7.00	ES		7.00	-4.79		Firm brown sandy gravelly CLAY. Gravel is fine, rounded to subangular of chalk.
		7.50	SPT					
		7.50	SPT	N=4 (1,1/1,1,1,1)				
		8.00	ES					
		9.00	UT	Ublow=100				
		10.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.50 21.00	220 150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 25/09/2023 - 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523680.79 N412899.39
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH04	CP	2.21m AoD	CF	1:50	Sheet 2 of 3

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.50	SPT	N=26 (2,4/6,5,7,8)				Firm brown sandy gravelly CLAY. Gravel is fine, rounded to subangular of chalk.
		11.00	ES					
		12.00	ES					
		12.00	UT	Ublow=100				
		13.00	ES					
		13.50	SPT					
		13.50	SPT	N=30 (2,4/5,7,9,9)				
		14.00	ES					
		15.00	UT	Ublow=100				
		16.00	ES		16.00	-13.79		
		16.50	SPT					Coarse SAND and fine chalk gravel. *Material very wet*
		16.50	SPT	N=48 (2,5/10,12,12,14)				
		17.00	ES					
		18.00	ES					
		18.00	SPT					
		18.00	SPT	N=28 (3,5/6,7,7,8)				
		19.00	ES					
		19.45	SPT					
		19.45	SPT	N=48 (3,5/9,11,13,15)				
		20.00	ES		20.00	-17.79		

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.50 21.00	220 150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 25/09/2023 - 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523680.79 N412899.39
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH04	CP	2.21m AoD	CF	1:50	Sheet 3 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	21.00 21.00	D SPT	N=50 (12,14/50 for 245mm)	20.80 21.00	-18.59 -18.79		Soft to firm greyish brown silty CLAY. White / Yellow gravelly clayey CHALK. *Artesian water encountered* End of Borehole at 21.00m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.50 21.00	220 150								

Remarks

Artesian water encountered at base of well

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523651.02 N412976.57
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH05	CP	2.50m AoD	CF	1:50	Sheet 1 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Firm brown slightly silty gravelly CLAY.
		1.00	ES					
		1.50	SPT					
		1.50	SPT	N=7 (1,2/2,3,2,0)				
					1.90	0.60		Very soft dark brown silty CLAY
		3.00	ES					
		3.00	SPT					
		4.00	ES					
		4.50	SPT					
		5.00	ES		5.00	-2.50		Very soft dark grey silty CLAY.
		6.00	ES					
		6.00	SPT					
		7.00	ES		7.00	-4.50		Very soft grey clayey, silty PEAT.
		7.50	SPT					
		7.50	SPT	N=1 (1,0/0,1,0,0)				
		8.00	ES					
		9.00	ES		8.90	-6.40		Firm brown slightly sandy, gravelly CLAY. Gravel is fine, rounded to subrounded of chalk.
		9.00	SPT					
		9.00	SPT	N=4 (1,1/1,1,1,1)				
		10.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00 21.00	220 150								

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523651.02 N412976.57
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH05	CP	2.50m AoD	CF	1:50	Sheet 2 of 3

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m)	Legend	Stratum Description
		10.50	UT	Ublow=100				Firm brown slightly sandy, gravelly CLAY. Gravel is fine, rounded to subrounded of chalk.
		11.00	ES					
		12.00	ES					
		12.00	SPT					
	▼	12.00	SPT	N=14 (2,3/3,4,3,4)				
		13.00	ES					*Wet*
		13.50	UT	Ublow=60	13.50	-11.00		Greyish brown medium to coarse SAND.
					13.80	-11.30		Firm brown sandy gravelly CLAY. Gravel is fine, rounded to subangular of chalk.
		14.00	ES					
		15.00	ES					
		15.00	SPT					
		15.00	SPT	N=28 (3,4/5,6,8,9)				
		16.00	ES					
		16.50	SPT					
	▽	17.00	ES		17.00	-14.50		Orange brown SAND and GRAVELS.
		18.00	ES		18.00	-15.50		Firm brown / grey sandy CLAY.
		18.00	SPT					
		18.00	SPT	N=50 (5,9/50 for 240mm)				
		19.00	ES					
		19.45	SPT					
		19.45	SPT	N=17 (4,5/4,4,5,4)				
		20.00	ES					

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00 21.00	220 150								

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 26/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523651.02 N412976.57
Project No. : 129-002870	Crew Name: SEP Geotech	Drilling Equipment: Dando 2000

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
BH05	CP	2.50m AoD	CF	1:50	Sheet 3 of 3

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	21.00 21.00	SPT SPT	N=20 (5,6/6,5,4,5)				Firm brown / grey sandy CLAY.
					22.10	-19.60		White clayey CHALK.
		22.50 22.50	SPT SPT	50 (25 for 100mm/50 for 100mm)				
					23.00	-20.50		End of Borehole at 23.00m

21 22 23 24 25 26 27 28 29 30

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
		10.00 21.00	220 150								

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 13/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523787.67 N412811.93
Project No. : 129-002870	Crew Name: LG / HW	Drilling Equipment: Archway Heavyweight

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS01	WLS	2.21m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark brown TOPSOIL with occasional root fragments.
	0.40	ES		0.40	1.81		Firm light brown CLAY.
	1.00	ES		1.00	1.21		Soft light brown and dark grey mottled CLAY.
	1.00	SPT	N=4 (1,0/1,1,1,1)				
	2.00	ES		2.00	0.21		Very soft dark brown and black mottled CLAY with peat deposits.
	2.00	SPT	N=3 (1,0/0,1,1,1)				
	3.00	ES					
	3.00	SPT	N=3 (1,0/0,1,1,1)				
	4.00	SPT	N=4 (1,1/1,1,1,1)	4.00	-1.79		
	5.00	SPT	N=1 (1,1/1,0,0,0)				End of Borehole at 5.00m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	101							0.00	5.00	90	
2.00	86										
3.00	76										
4.00	66										
5.00	66										

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 13/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523750.84 N412889.71
Project No. : 129-002870	Crew Name: LG / HW	Drilling Equipment: Archway Heavyweight

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS02	WLS	2.19m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark brown TOPSOIL with organic / root fragments.
	0.40	ES		0.40	1.79		Firm light brown CLAY.
	1.00	ES		1.00	1.19		Soft light brown and dark brown mottled CLAY.
	1.00	SPT	N=4 (1,2/1,1,1,1)				
	2.00	ES		2.00	0.19		Very soft dark brown CLAY with peat deposits.
	2.00	SPT	N=5 (1,2/2,1,1,1)				
	3.00	ES					
	3.00	SPT	N=4 (1,1/1,1,1,1)				
	4.00	SPT	N=3 (2,1/1,1,0,1)				
	5.00	SPT	N=4 (1,1/1,1,1,1)	5.00	-2.81		End of Borehole at 5.00m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	101							0.00	5.00	90	
2.00	86										
3.00	76										
4.00	76										
5.00	76										

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523677.66 N412966.92
Project No. : 129-002870	Crew Name: LG / HW	Drilling Equipment: Archway Heavyweight

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS03	WLS	2.39m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark brown TOPSOIL with occasional root fragments.
	0.40	ES		0.40	1.99		Firm light brown and light grey mottled CLAY.
	1.00	ES		1.00	1.39		Soft light brown CLAY.
	1.00	SPT	N=4 (2,2/1,1,1,1)				
	2.00	ES		2.00	0.39		Very soft dark brown CLAY with peat deposits.
	2.00	SPT	N=4 (1,1/1,1,1,1)				
	3.00	ES		3.00	-0.61		Very soft black CLAY with peat deposits. Poor recovery
	3.00	SPT	N=4 (1,1/1,1,1,1)				
	4.00	SPT	N=1 (1,1/0,1,0,0)				
	5.00	SPT	N=1 (1,0/1,0,0,0)	5.00	-2.61		End of Borehole at 5.00m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	101							0.00	5.00	90	
2.00	86										
3.00	76										
4.00	76										
5.00	66										

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523721.41 N412771.42
Project No. : 129-002870	Crew Name: LG / HW	Drilling Equipment: Archway Heavyweight

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS04	WLS	1.99m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark brown TOPSOIL with occasional root fragments.
	0.40	ES		0.40	1.59		Firm light brown and light grey mottled CLAY.
	1.00	ES		1.00	0.99		Soft light brown CLAY.
	1.00	SPT	N=5 (2,2/1,2,1,1)				
	2.00	ES		2.00	-0.01		Very soft dark brown CLAY with peat deposits.
	2.00	SPT	N=4 (1,1/1,1,1,1)				
	3.00	ES		3.00	-1.01		Very soft black CLAY with peat pockets. One shell noted. Poor recovery.
	3.00	SPT	N=3 (1,1/1,0,1,1)				
	4.00	SPT	N=4 (1,1/1,1,1,1)	4.00	-2.01		End of Borehole at 4.00m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	101							0.00	4.00	90	
2.00	86										
3.00	76										
4.00	76										

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523738.44 N412706.00
Project No. : 129-002870	Crew Name: LG / HW	Drilling Equipment: Archway Heavyweight

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS05	WLS	2.69m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark brown clayey TOPSOIL with occasional ceramic and anthracite fragments.
	0.20	ES		0.20	2.49		
	0.40	ES		0.40	2.29		White chalk and concrete layer with occasional subrounded to angular gravels of flint. MADE GROUND.
							Very firm light brown CLAY.
	1.00	ES		1.00	1.69		
	1.00	SPT	N=17 (5,3/5,4,4,4)				Firm light brown and light grey mottled CLAY.
	2.00	ES		2.00	0.69		
	2.00	SPT	N=18 (3,3/4,6,4,4)				Soft dark brown and dark grey mottled CLAY.
	3.00	ES		3.00	-0.31		
	3.00	SPT	N=4 (1,1/1,1,1,1)				Very soft dark grey CLAY with peat deposits.
	4.00	SPT	N=1 (1,1/1,0,0,0)	4.00	-1.31		End of Borehole at 4.00m

1 2 3 4 5 6 7 8 9 10

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation
1.00	101							0.00	4.00	90	
2.00	86										
3.00	76										
4.00	76										

Remarks

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523794.78 N412612.31
Project No. : 129-002870	Crew Name:	Drilling Equipment:

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
WS06/WS06A	WLS	2.36m AoD	BP	1:50	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.50	ES		0.50	1.86		Dark brown ashy topsoil with occasional brick fragments. MADE GROUND
	1.00	ES		1.00	1.36		Ashy MADE GROUND with angular boulders of chalk and brick. Refused at 1m.
							End of Borehole at 1.00m

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Refused at 1m. WS06 refused at 6".

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523767.28 N412588.39
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP01	TP	2.55m AoD	RB / CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Scrub vegetation over black / dark brown sandy, gravelly, ashy MADE GROUND. Gravel is fine to coarse, angular to subrounded of flint, brick, concrete and slate. Frequent large brick cobbles present including some whole bricks. Rots and rootlets present in top 0.2m.
				0.30	2.25		Black / brown sand, gravelly ashy MADE GROUND. Gravel is fine to coarse, subangular of brick, concrete and potentially anthracite. Concrete and brick cobbles present. Rare fragments of tyre rubber and fabric noted.
	0.80	ES		0.85	1.70		Firm brown and grey mottled CLAY. Occasional fine gravel of anthracite. Occasional small pockets of black organic rotting matter. Slight organic odour noted.
	1.00	ES					
				1.50	1.05		Firm light grey and orange mottled CLAY. Occasional small wet pockets of clay and small pockets of black rotting organic matter noted.
							Slight seepage at base of pit
				2.00	0.55		End of Borehole at 2.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Plot C

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523748.74 N412651.69
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP02	TP	2.83m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Dark grey sandy gravelly MADE GROUND including cobbles of brick and concrete. Roots present to 0.1m. Whole bricks present.
	0.40	ES		0.40	2.43		Firm dark grey and mottled red/brown silty CLAY.
	0.75	ES		0.75	2.08		End of Borehole at 1.70m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Plot C

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523737.13 N412773.56
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP03	TP	2.09m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Very firm dark brown CLAY. Vegetation and roots noted to 0.1m. Rare rootlets to 0.4m.
				0.40	1.69		Very firm dark brown CLAY.
							Red brick noted through pit. Possible drainage pipe.
	1.20	ES		1.20	0.89		Firm dark brown and dark grey mottled CLAY.
	1.50	ES		1.50	0.59		End of Borehole at 1.50m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
1.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523784.03 N412845.57
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP04	TP	2.10m AoD	BP/CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	1.70		Dark brown silty TOPSOIL with occasional root fragments.
	1.00	ES		1.00	1.10		Firm dark brown CLAY with dark grey streaks.
	2.20	ES		1.50	0.60		Firm dark brown CLAY with grey streaks.
				2.40	-0.30		Soft dark brown and grey / black mottled CLAY.
				3.40	-1.30		Very soft dark grey SILT with dark mottling.
							End of Borehole at 3.40m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stble					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523715.97 N412874.86
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP05	TP	2.27m AoD	CF/BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	1.87		Stiff dark brown CLAY. Evidence of vegetation (roots) present until 0.3m.
	1.20	ES		1.20	1.07		Stiff dark brown and mottled grey CLAY.
	2.00	ES		2.00	0.27		Firm dark brown and mottled black CLAY. Black mottling comprises peat.
	2.90	ES		2.90	-0.63		Soft dark grey CLAY.
	4.00	ES		4.00	-1.73		Soft dark grey CLAY with peat deposits.
							End of Borehole at 4.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523747.62 N412805.11
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP06	TP	2.11m AoD	CF/BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	1.71		Very firm dark brown CLAY.
							Very firm dark brown and light grey mottled CLAY.
				1.10	1.01		Soft dark grey CLAY with peat deposits
	1.96	ES					
	3.45	ES		3.45	-1.34		End of Borehole at 3.45m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523679.01 N412945.14
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP07	TP	2.61m AoD	CF/BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	2.21		Dark brown clayey TOPSOIL. Fragments of wood (potentially remnants of sidings). One metal 6 inch bolt noted.
	1.30	ES		1.30	1.31		Stiff dark brown CLAY. Fragments of red ceramic tile noted - assumed to be a former field irrigation pipe.
	2.00	ES		2.00	0.61		Firm dark and grey mottled CLAY with rare black peat deposits.
	3.20	ES					Soft black CLAY with peat deposits.
	4.00	ES		4.00	-1.39		End of Borehole at 4.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	STable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523679.01 N412945.14
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP07	TP	2.61m AoD	CF/BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	2.21		Dark brown clayey TOPSOIL. Fragments of wood (potentially remnants of sidings). One metal 6 inch bolt noted.
	1.30	ES		1.30	1.31		Stiff dark brown CLAY. Fragments of red ceramic tile noted - assumed to be a former field irrigation pipe.
	2.00	ES		2.00	0.61		Firm dark and grey mottled CLAY with rare black peat deposits.
	3.20	ES					Soft black CLAY with peat deposits.
	4.00	ES		4.00	-1.39		End of Borehole at 4.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	STable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 15/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523728.45 N412843.83
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP08	TP	2.19m AoD	CF/BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.50	ES		0.50	1.69		Black sandy, gravelly MADE GROUND. Gravel is course, sugbangular of brick and concrete. Brick and concrete cobbles preset and occasional plastic fragments noted.
							MADE GROUND comprising boulders of chalk with suspected concrete as well. Occasional brick fragments noted.
	0.80	ES		0.80	1.39		Firm dark brown CLAY. *Water ingress noted at 0.8m.*
	2.00	ES		2.00	0.19		*Water flow noted at base of pit.* End of Borehole at 2.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 15/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523863.31 N412589.34
Project No. : 129-002870	Crew Name:	Equipment:

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP09	TP	2.52m AoD		1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
							Black sandy gravelly MADE GROUND.
				0.40	2.12		MADE GROUND. Boulders of chalk.
				1.00	1.52		Firm dark brown CLAY
				2.00	0.52		Stiff dark brown and grey mottled CLAY.
				3.00	-0.48		End of Borehole at 3.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks

Remarks

Plot C

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 15/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523722.30 N412617.62
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JC B3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP10	TP	2.88m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.30	2.58		Dark brown clayey TOPSOIL. Evidence of vegetation present to 0.25m.
	1.10	ES		1.10	1.78		Firm dark brown CLAY.
	2.00	ES		2.00	0.88		Soft dark brown CLAY.
	3.00	ES		3.00	-0.12		Soft black / grey CLAY.
							End of Borehole at 3.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Plot C

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 27/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523713.00 N412698.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP11	TP	2.52m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.05	2.47		Brown clayey TOPSOIL.
							Black gravelly sandy MADE GROUND.
				0.30	2.22		*Solid red brick layer*
	0.35	ES					Black gravelly sandy MADE GROUND with cobbles of brick and stone.
							Hard limestone layer
				0.90	1.62		Firm dark brown and dark grey mottled CLAY with occasional thin black layers of sandy peat material.
	1.10	ES					
	1.60	ES					
				2.70	-0.18		Soft dark grey brown and back mottled CLAY>
	3.10	ES		3.10	-0.58		End of Borehole at 3.10m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Potential access road

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 27/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523752.00 N412663.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP12	TP	2.52m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	2.32		Dark brown gravelly sandy TOPSOIL. Sand is coarse o fine. Gravel is fine to coarse with occasional cobbles of brick.
	0.40	ES					Black sandy gravelly MADE GOUND with gravel of clinker, anthracite and slag. *Red brick layer*
	0.60	ES		0.60	1.92		Concrete layer with coarse gravel of stone and clinker. MADE GROUND.
				0.65	1.87		Dark brown sandy gravelly MADE GROUND.
				0.75	1.77		Firm dark grey CLAY.
				0.80	1.72		Firm dark brown and grey mottled CLAY.
	1.60	ES					
	3.00	ES		3.00	-0.48		End of Borehole at 3.00m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	STable					

Remarks

Potential access road

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 27/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523798.37 N412621.98
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
TP13	TP	2.52m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.20	2.32		Dark brown gravelly TOPSOIL.
	0.30	ES		0.30	2.22		Black gravelly sandy MADE GROUND with black clay deposits.
							Concrete layer
	0.50	ES					Dark grey CLAY.
	0.60	ES		0.60	1.92		Firm dark brown and grey black mottled CLAY.
				0.70	1.82		Soft grey light brown and black mottled CLAY.
	3.20	ES		3.20	-0.68		End of Borehole at 3.20m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	stable					

Remarks

Potential access road

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523700.00 N412754.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR01	TP	1.93m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	1.53		Dark brown CLAY.
	0.75	ES		0.75	1.18		Stiff dark brown and grey mottled CLAY.
							End of Borehole at 0.75m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523684.84 N412766.52
Project No. : 129-002870	Crew Name: BrianPlant ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR02	TP	1.94m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES					Stiff dark brown CLAY
	0.85	ES		0.85	1.09		End of Borehole at 0.85m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523730.00 N412790.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR03	TP	2.05m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES					Stiff dark brown CLAY.
	0.85	ES		0.85	1.20		End of Borehole at 0.85m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for cbr location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523758.87 N412877.66
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR04	TP	2.07m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES					Stiff dark brown CLAY
	0.75	ES		0.75	1.32		End of Borehole at 0.75m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523684.10 N412854.38
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR05	TP	1.96m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Firm dark brown CLAY
	0.40	ES		0.40	1.56		Firm dark brown and grey mottled CLAY.
				0.90	1.06		End of Borehole at 0.90m

1 2 3 4 5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523698.00 N412921.04
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR06	TP	2.09m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Firm dark brown CLAY
	0.40	ES		0.40	1.69		Firm dark brown and grey mottled CLAY.
				0.85	1.24		End of Borehole at 0.85m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR location

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523650.84 N412996.78
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR07	TP	2.57m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Firm dark brown CLAY
	0.40	ES		0.40	2.17		Firm dark brown and grey mottled CLAY.
				0.70	1.87		End of Borehole at 0.70m

1 2 3 4 5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523652.62 N412945.81
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR08	TP	2.44m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Firm dark brown CLAY
	0.40	ES		0.40	2.04		Firm dark brown and grey mottled CLAY.
				0.85	1.59		End of Borehole at 0.85m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR

Percussion Drilling Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 14/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523771.00 N412843.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Drilling Equipment: JCB 3CX

Borehole Number	Hole Type	Level	Logged By	Scale	Page Number
CBR09	TP	1.12m AoD	CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Firm dark brown CLAY.
	0.40	ES		0.40	0.72		Firm dark brown and grey mottled CLAY.
				0.80	0.32		End of Borehole at 0.80m

1
2
3
4
5

Hole Diameter		Casing Diameter		Chiselling				Inclination and Orientation			
Depth Base	Diameter	Depth Base	Diameter	Depth Top	Depth Base	Duration	Tool	Depth Top	Depth Base	Inclination	Orientation

Remarks

Excavated for CBR locatio

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 11/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523767.30 N412793.73
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT1-1	TP	2.10m AoD	BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.00	ES					Brown Clayey TOPSOIL
				0.40	1.70		Firm light brown mottled CLAY.
	1.00	ES		1.00	1.10		Firm brown with occasional orange mottling CLAY.
				1.20	0.90		End of Borehole at 1.20m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Excavated for utility clearance for CPT Rig

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523799.33 N412855.73
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT2-2	TP		CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40			Very stiff dark brown CLAY
				1.20			Very stiff dark brown and light grey mottled CLAY
							End of Borehole at 1.20m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Excavated for utility clearance for CPT Rig

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523770.67 N412864.90
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT3-3	TP	2.17m AoD	CF / BP	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40	1.77		Dark brown clayey TOPSOIL. Evidence of vegetation present to 0.3m.
							Firm dark brown and light grey mottled CLAY.
				1.30	0.87		End of Borehole at 1.30m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523716.41 N412794.01
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT4-6	TP		CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.40	ES		0.40			Very firm dark brown CLAY with occasional light grey mottling. Vegetation present to 0.3m.
							Firm dark brown and light grey mottled CLAY.
				1.20			End of Borehole at 1.20m

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523621.18 N412985.00
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT5-5	TP		CF	1:25	Sheet 1 of 1

Well	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.36	ES		0.40			Firm dark brown CLAY. Vegetation present to 0.3m.
				1.30			Firm dark brown and dark grey mottled CLAY.
							End of Borehole at 1.30m

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Trial Pit Log

Project Name: Humber Gate, Grimsby	Client: Mayer Environmental Ltd	Date: 12/09/2023
Location: Humber Gate, Energy Park Way, DN31 2TT	Contractor: Jackson Drilling	Co-ords: E523631.78 N412959.77
Project No. : 129-002870	Crew Name: BrianPlant Ltd	Equipment: JCB 3CX

Location Number	Location Type	Level	Logged By	Scale	Page Number
CPT6-6	TP		CF	1:25	Sheet 1 of 1

Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.40			Very firm dark brown CLAY. Vegetation present to 0.3m.
0.40	ES					
			1.20			Very firm dark brown and grey mottled CLAY.
						End of Borehole at 1.20m

0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

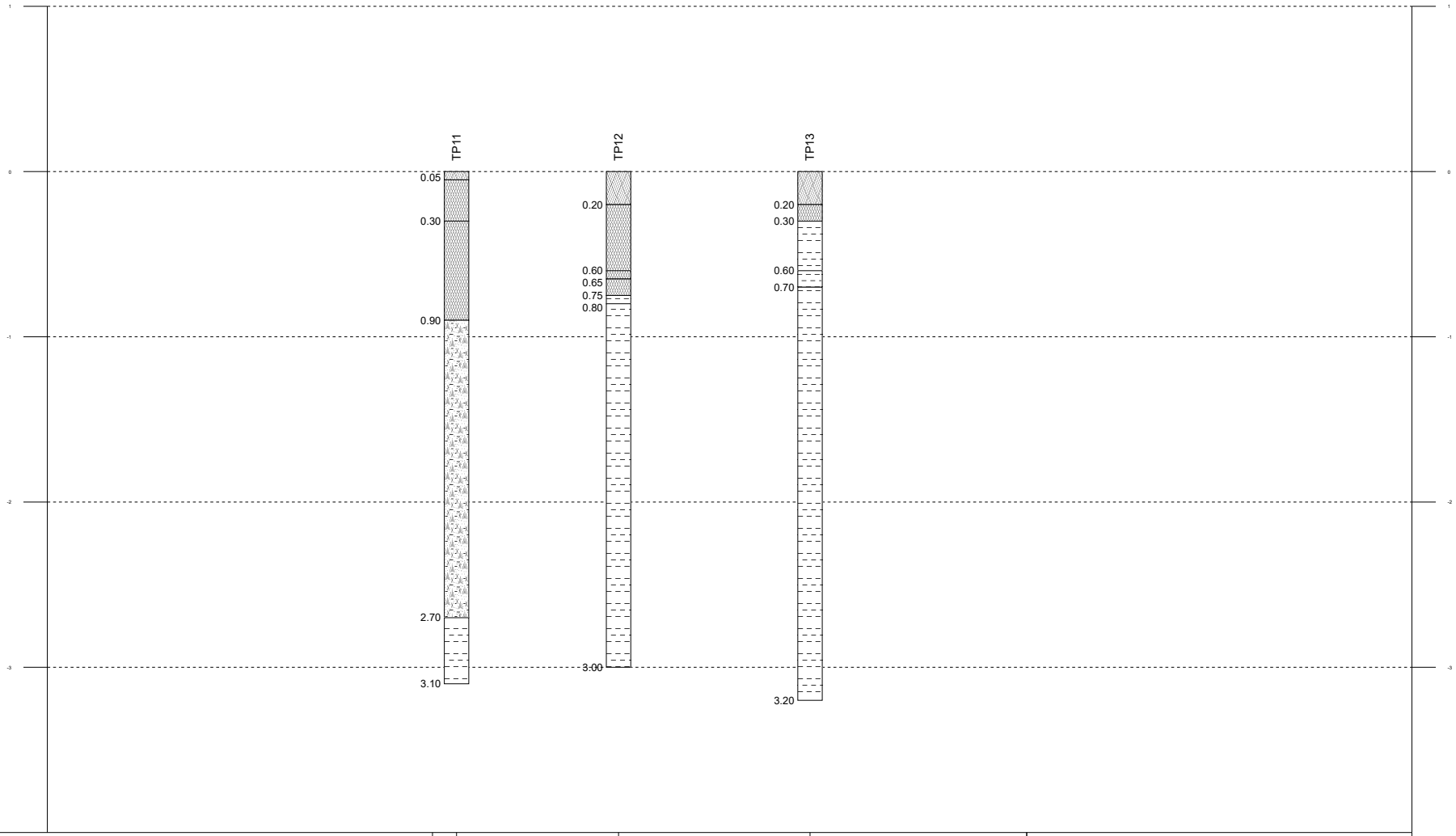
Dimensions		Trench Support and Comment			Pumping Data		
Pit Length	Pit Width	Pit Stability	Shoring Used	Remarks	Date	Rate	Remarks
2.00	1.00	Stable					

Remarks

Appendix G

Cross Sections

Project Id: 129-002870	Title: Section Line
Project Title: Humber Gate, Grimsby	Vertical Scale: 1:37
Location: Humber Gate, Energy Park Way, DN31 2TT	Horizontal Scale: 1:1974
Client: Mayer Environmental Ltd	Engineer: Rebecca Beddard



Legend Key

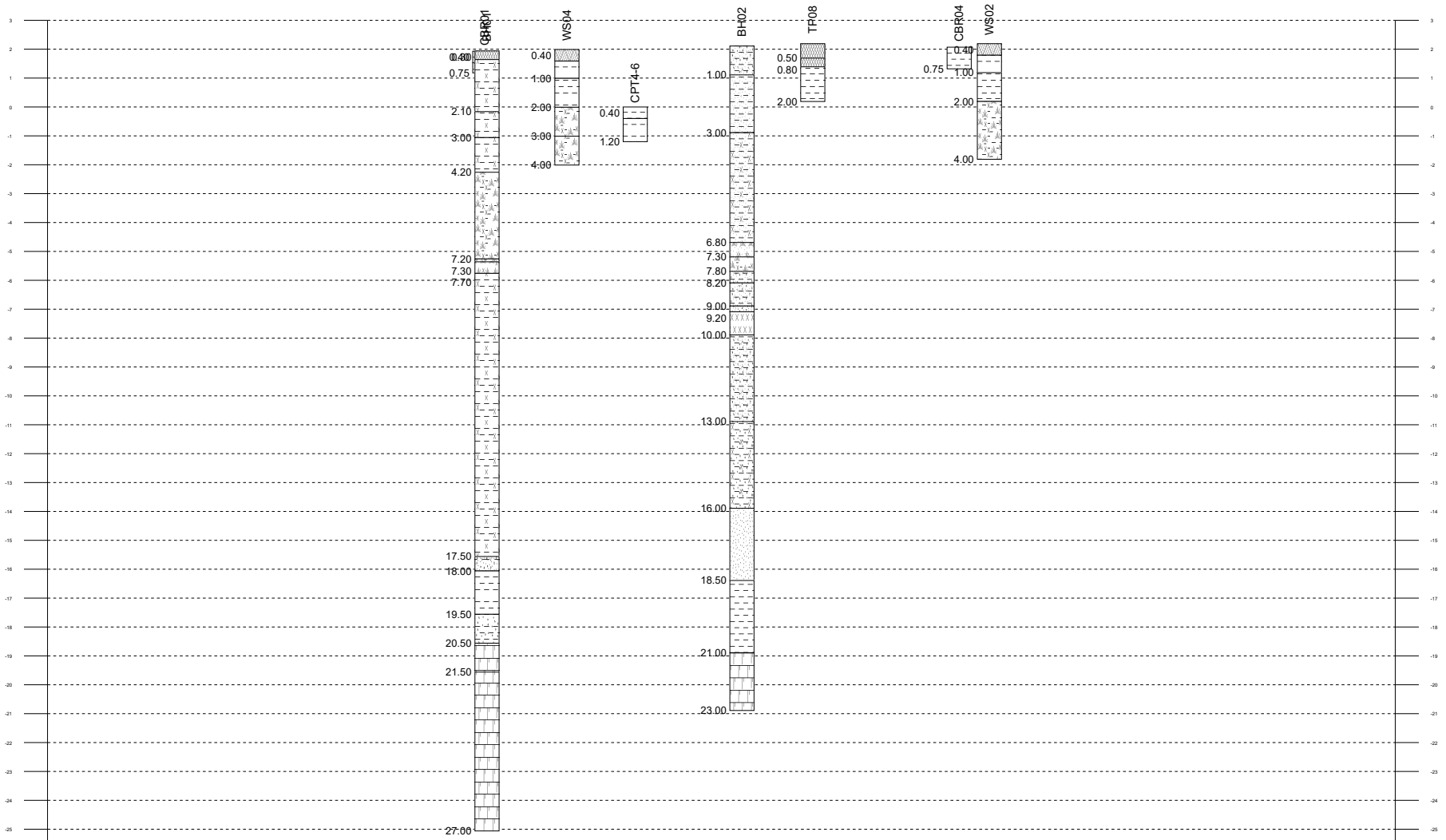
- TOPSOIL
- MADE GROUND
- CLAY
- Sandy peaty SILT/CLAY

Chainage (m)	0.00	7.77	60.08	121.90	191.87
Elevation (m)					
Offset (m)	2.51		0.63	3.89	

Project Id: 129-002870	Title: Section Line
Project Title: Humber Gate, Grimsby	Vertical Scale: 1:209
Location: Humber Gate, Energy Park Way, DN31 2TT	Horizontal Scale: 1:1734
Client: Mayer Environmental Ltd	Engineer: Rebecca Beddard

Legend Key

- MADE GROUND
- TOPSOIL
- Sandy gravelly CLAY
- CLAY
- Silty CLAY
- Sandy CLAY
- Peaty SILT/ CLAY
- Silty sandy CLAY
- Sandy PEAT
- Silty PEAT
- SAND and GRAVEL
- SILT
- Silty gravelly CLAY
- SAND
- Clayey gravelly SAND
- Gravelly CLAY
- CHALK

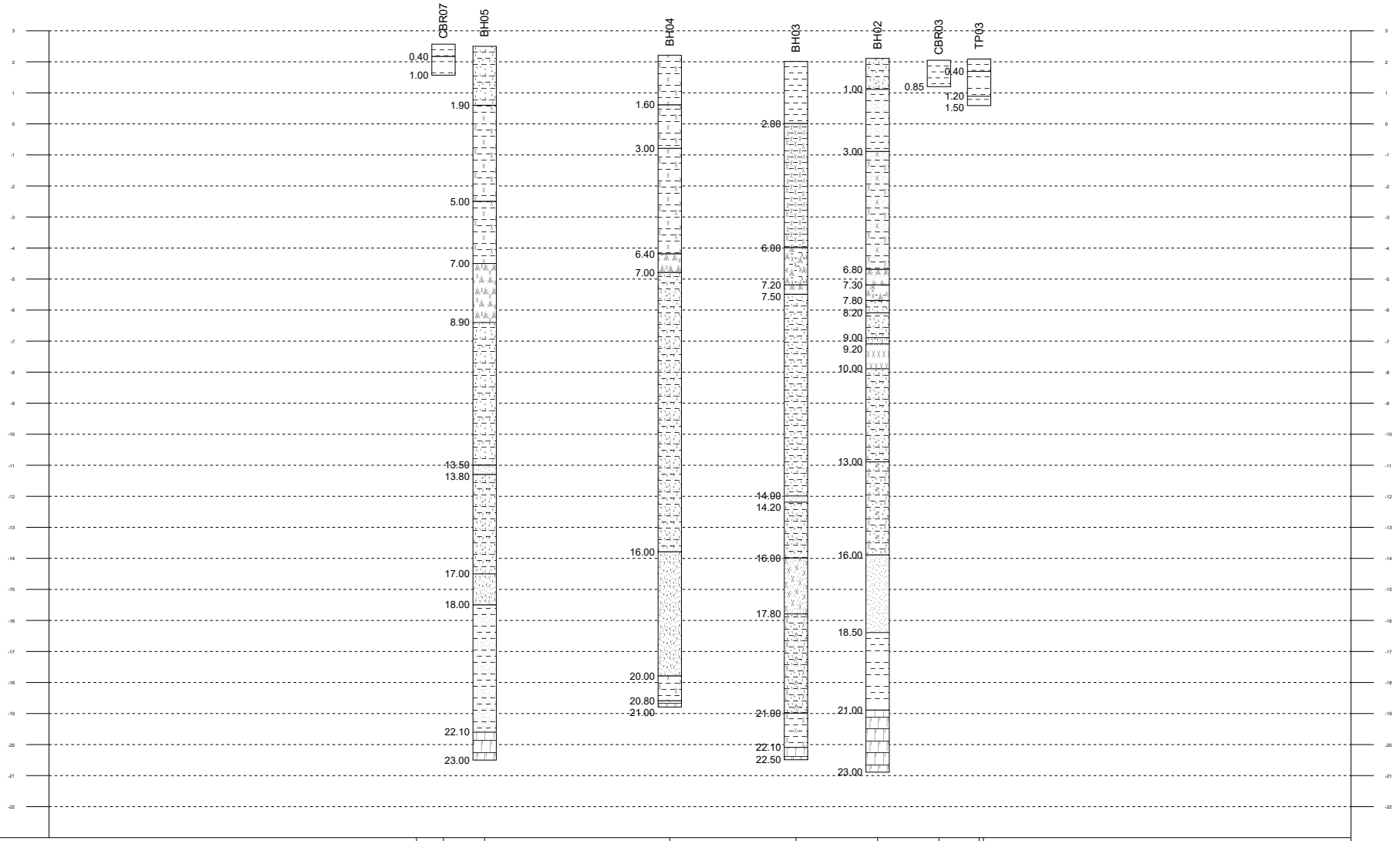


Chainage (m)	0.00	16.94	39.90	59.53	90.18	110.51	152.56	161.24	168.48
Elevation (m)		1.93	1.99		2.11	2.19	2.07	2.19	
Offset (m)		5.09	9.18	3.07	2.38	8.34	9.04	2.55	

Project Id: 129-002870	Title: Section Line
Project Title: Humber Gate, Grimsby	Vertical Scale: 1:188
Location: Humber Gate, Energy Park Way, DN31 2TT	Horizontal Scale: 1:2599
Client: Mayer Environmental Ltd	Engineer: Rebecca Beddard

Legend Key

- CLAY
- Gravelly CLAY
- Silty CLAY
- Sandy gravelly CLAY
- Sandy CLAY
- SILT/CLAY
- Silty sandy CLAY
- Peaty CLAY/ SILT
- Silty PEAT
- Sandy PEAT
- PEAT
- Peaty SILT/ CLAY
- SAND and GRAVEL
- SILT
- Silty gravelly CLAY
- SAND
- Gravelly SAND



Chainage (m)	0.00	12.02	30.35	112.84	169.08	205.45	232.77	252.88
Elevation (m)	2.57	2.50	2.21	2.01	2.11	2.05	2.09	
Offset (m)	8.81	0.31	5.89	2.33	6.60	8.32	8.93	

Appendix H

Analytical Data Certificates – Soils

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-31071-1
Initial Date of Issue:	20-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Brendan Pittman Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	15-Sep-2023
Order No.:	129005384	**Date Instructed:**	15-Sep-2023
No. of Samples:	21		
Turnaround (Wkdays):	5	**Results Due:**	21-Sep-2023
Date Approved:	20-Oct-2023	**Subcon Results Due:**	06-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703188	1703189	1703190	1703191	1703192	1703193	1703194	1703195
			Sample Location:		TP01	TP01	TP01	TP02	TP02	TP03	TP03	TP03
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.80	1.00	0.40	0.75	0.00	1.20	1.50
			Bottom Depth (m):		0.30			0.75	1.70	0.40		
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY			COVENTRY	COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type	U	2192		N/A	-	-			-	-		-
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected			No Asbestos Detected	No Asbestos Detected		No Asbestos Detected
Asbestos by Gravimetry	U	2192	%	0.001					-			-
Total Asbestos	U	2192	%	0.001					-			-
Moisture	N	2030	%	0.020	19	14			26	24		32
Soil Colour	N	2040		N/A	Brown	Black	Brown	Black	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots	Stones	Stones	Stones	Stones and Roots	Stones	None
Soil Texture	N	2040		N/A	Sand	Sand	Sand	Sand	Clay	Sand	Sand	Clay
pH at 20C	M	2010		4.0	8.5	8.2			7.6	7.9		8.4
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	1300	1400			1500	330		300
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	1.7			4.9	1.9		0.57
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.53			0.37	0.012		0.021
Total Sulphur	U	2175	%	0.010	1.0	1.1			0.15	0.042		0.021
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50			< 0.50	< 0.50		< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	23	21			13	16		3.1
Arsenic	M	2455	mg/kg	0.5	5.3	12			9.0	19		14
Cadmium	M	2455	mg/kg	0.10	0.16	0.18			< 0.10	0.16		< 0.10
Chromium	M	2455	mg/kg	0.5	7.8	13			23	38		31
Copper	M	2455	mg/kg	0.50	14	24			9.2	18		13
Mercury	M	2455	mg/kg	0.05	< 0.05	0.09			< 0.05	0.09		< 0.05
Nickel	M	2455	mg/kg	0.50	7.3	15			18	32		29
Lead	M	2455	mg/kg	0.50	16	52			17	32		17
Selenium	M	2455	mg/kg	0.25	0.33	0.78			1.0	0.96		1.2
Zinc	M	2455	mg/kg	0.50	110	120			48	96		66
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50			< 0.50	< 0.50		< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10			< 0.10	< 0.10		< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25			< 0.25	< 0.25		< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	22	3.2			< 2.0	< 2.0		< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	21	6.8			< 1.0	< 1.0		< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	16	7.5			< 2.0	< 2.0		< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	11	13			8.0	< 3.0		< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10			< 10	< 10		< 10

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703188	1703189	1703190	1703191	1703192	1703193	1703194	1703195
			Sample Location:		TP01	TP01	TP01	TP02	TP02	TP03	TP03	TP03
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.80	1.00	0.40	0.75	0.00	1.20	1.50
			Bottom Depth (m):		0.30			0.75	1.70	0.40		
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY			COVENTRY	COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	70	31			9.8	< 5.0		< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	70	31			< 10	< 10		< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05			< 0.05	< 0.05		< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25			< 0.25	< 0.25		< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	27	4.4			< 1.0	< 1.0		< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	96	18			< 1.0	< 1.0		< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	83	14			< 2.0	< 2.0		< 2.0
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	180	27			29	6.7		< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	7.1	1.5			< 1.0	< 1.0		< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	390	63			31	7.3		< 5.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	390	65			31	< 10		< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50			< 0.50	< 0.50		< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	460	94			40	11		< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	460	96			40	11		< 10
Organic Matter	M	2625	%	0.40	46	54			3.8	3.4		1.3
Naphthalene	M	2700	mg/kg	0.10	< 0.10	7.8			< 0.10	< 0.10		< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	1.2			< 0.10	< 0.10		< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	0.95			< 0.10	< 0.10		< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	2.5			< 0.10	< 0.10		< 0.10
Phenanthrene	M	2700	mg/kg	0.10	0.76	2.7			< 0.10	< 0.10		< 0.10
Anthracene	M	2700	mg/kg	0.10	0.34	0.33			< 0.10	< 0.10		< 0.10
Fluoranthene	M	2700	mg/kg	0.10	2.9	1.7			< 0.10	< 0.10		< 0.10
Pyrene	M	2700	mg/kg	0.10	3.2	1.8			< 0.10	< 0.10		< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	1.6	0.86			< 0.10	< 0.10		< 0.10
Chrysene	M	2700	mg/kg	0.10	1.9	1.2			< 0.10	< 0.10		< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	2.1	0.95			< 0.10	< 0.10		< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	0.87	0.32			< 0.10	< 0.10		< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	1.7	0.83			< 0.10	< 0.10		< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	1.2	0.43			< 0.10	< 0.10		< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	1.4	0.27			< 0.10	< 0.10		< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	1.5	0.89			< 0.10	< 0.10		< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	20	25			< 2.0	< 2.0		< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	< 1.0						
Chloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Bromomethane	M	2760	µg/kg	20	< 20	< 20						

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:		**Chemtest Sample ID.:**			1703188	1703189	1703190	1703191	1703192	1703193	1703194	1703195
		Sample Location:			TP01	TP01	TP01	TP02	TP02	TP03	TP03	TP03
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.00	0.80	1.00	0.40	0.75	0.00	1.20	1.50
		Bottom Depth (m):			0.30			0.75	1.70	0.40		
		Date Sampled:			11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
		Asbestos Lab:			COVENTRY	COVENTRY			COVENTRY	COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
Chloroethane	U	2760	µg/kg	2.0	< 2.0	< 2.0						
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Dichloromethane	N	2760	µg/kg	50	< 50	< 50						
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	< 5.0						
Trichloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
Benzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0	< 2.0						
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Dibromomethane	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0	< 5.0						
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10						
Toluene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	< 10						
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10	< 10						
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	< 2.0						
Dibromochloromethane	U	2760	µg/kg	10	< 10	< 10						
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0	< 5.0						
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0	< 2.0						
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
o-Xylene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Styrene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	< 1.0						
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Bromobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	< 50						
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0	< 1.0						

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703188	1703189	1703190	1703191	1703192	1703193	1703194	1703195
			Sample Location:		TP01	TP01	TP01	TP02	TP02	TP03	TP03	TP03
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.80	1.00	0.40	0.75	0.00	1.20	1.50
			Bottom Depth (m):		0.30			0.75	1.70	0.40		
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY			COVENTRY	COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	< 50						
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0	< 1.0						
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0	< 1.0						
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	< 2.0						
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	< 1.0						
PCB 28	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 52	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 118	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 153	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 138	U	2815	mg/kg	0.010	< 0.010	< 0.010						
PCB 180	U	2815	mg/kg	0.010	< 0.010	< 0.010						
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	< 0.10						
Total Phenols	M	2920	mg/kg	0.10	< 0.10	0.14			< 0.10	< 0.10		< 0.10
N-Nitrosodimethylamine	SN		mg/kg	0.10	<0.1	<0.1						
Phenol	SN		mg/kg	0.10	<0.1	<0.1						
Bis(2-chloroethyl)ether	SN		mg/kg	0.10	<0.1	<0.1						
2-Chlorophenol	SN		mg/kg	0.10	<0.1	<0.1						
1,3-Dichlorobenzene	SN		mg/kg	0.10	<0.1	<0.1						
1,4-Dichlorobenzene	SN		mg/kg	0.10	<0.1	<0.1						
2-Methylphenol	SN		mg/kg	0.10	<0.1	<0.1						
1,2-Dichlorobenzene	SN		mg/kg	0.10	<0.1	<0.1						
Bis(2-chloroisopropyl)ether	SN		mg/kg	0.10	<0.1	<0.1						
3&4-Methylphenol	SN		mg/kg	0.10	<0.1	<0.1						
N-Nitrosodi-n-propylamine	SN		mg/kg	0.10	<0.1	<0.1						
Hexachloroethane	SN		mg/kg	0.10	<0.1	<0.1						
Nitrobenzene	SN		mg/kg	0.10	<0.1	<0.1						
Isophorone	SN		mg/kg	0.10	<0.1	<0.1						

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703188	1703189	1703190	1703191	1703192	1703193	1703194	1703195
			Sample Location:		TP01	TP01	TP01	TP02	TP02	TP03	TP03	TP03
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.80	1.00	0.40	0.75	0.00	1.20	1.50
			Bottom Depth (m):		0.30			0.75	1.70	0.40		
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY			COVENTRY	COVENTRY		COVENTRY
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
2,4-Dimethylphenol	SN		mg/kg	0.10	<0.1	<0.1						
2-Nitrophenol	SN		mg/kg	0.10	<0.1	<0.1						
Bis(2-chloroethoxy)methane	SN		mg/kg	0.10	<0.1	<0.1						
2,4-Dichlorophenol	SN		mg/kg	0.10	<0.1	<0.1						
1,2,4-Trichlorobenzene	SN		mg/kg	0.10	<0.1	<0.1						
4-Chloroaniline	SN		mg/kg	0.10	<0.1	<0.1						
Hexachlorobutadiene	SN		mg/kg	0.10	<0.1	<0.1						
4-Chloro-3-methylphenol	SN		mg/kg	0.10	<0.1	<0.1						
2-Methylnaphthalene	SN		mg/kg	0.10	<0.1	<0.1						
1-Methylnaphthalene	SN		mg/kg	0.10	3.2	6.2						
Hexachlorocyclopentadiene	SN		mg/kg	0.10	<0.1	<0.1						
2,4,6-Trichlorophenol	SN		mg/kg	0.10	<0.1	<0.1						
2,4,5-Trichlorophenol	SN		mg/kg	0.10	<0.1	<0.1						
2-Chloronaphthalene	SN		mg/kg	0.10	<0.1	<0.1						
2-Nitroaniline	SN		mg/kg	0.10	<0.1	<0.1						
Dimethyl phthalate	SN		mg/kg	0.10	<0.1	<0.1						
2,6-Dinitrotoluene	SN		mg/kg	0.10	<0.1	<0.1						
3-Nitroaniline	SN		mg/kg	0.10	<0.1	<0.1						
2,4-Dinitrophenol	SN		mg/kg	0.10	<0.1	<0.1						
4-Nitrophenol	SN		mg/kg	0.10	2.0	<0.1						
2,4-Dinitrotoluene	SN		mg/kg	0.10	<0.1	<0.1						
Dibenzofuran	SN		mg/kg	0.10	0.62	1.1						
Diethyl phthalate	SN		mg/kg	0.10	<0.1	<0.1						
4-Chlorophenylphenyl ether	SN		mg/kg	0.10	<0.1	<0.1						
4-Nitroaniline	SN		mg/kg	0.10	<0.1	<0.1						
2-Methyl-4,6-dinitrophenol	SN		mg/kg	0.10	<0.1	<0.1						
Azobenzene	SN		mg/kg	0.10	<0.1	<0.1						
4-Bromophenylphenyl ether	SN		mg/kg	0.10	<0.1	<0.1						
Hexachlorobenzene	SN		mg/kg	0.10	<0.1	<0.1						
Pentachlorophenol	SN		mg/kg	0.10	<0.1	<0.1						
Carbazole	SN		mg/kg	0.10	<0.1	<0.1						
Di-n-butyl phthalate	SN		mg/kg	0.10	<0.1	<0.1						
Butylbenzyl phthalate	SN		mg/kg	0.10	<0.1	<0.1						
Bis(2-ethylhexyl)phthalate	SN		mg/kg	0.10	<0.1	<0.1						
Di-n-octyl phthalate	SN		mg/kg	0.10	<0.1	<0.1						

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703196	1703197	1703198	1703199	1703200	1703201	1703202	1703203	1703204
			Sample Location:		CPT01	CPT01	BH01	TP02	BH01	BH01	BH01	CPT01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	7.00	1.7	2.00	8.00	6.00	0.4	3.00
			Bottom Depth (m):		1.00	1.20							
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-	-							
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected							
Asbestos by Gravimetry	U	2192	%	0.001									
Total Asbestos	U	2192	%	0.001									
Moisture	N	2030	%	0.020		21							
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Roots and Stones	Stones	Stones	Stones	Stones and Roots	Stones	Stones and Roots	Stones
Soil Texture	N	2040		N/A	Clay	Sand	Clay	Clay	Clay	Clay	Clay	Sand	Clay
pH at 20C	M	2010		4.0		8.3							
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0		220							
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40		0.49							
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010		0.018							
Total Sulphur	U	2175	%	0.010		0.024							
Cyanide (Total)	M	2300	mg/kg	0.50		< 0.50							
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		2.9							
Arsenic	M	2455	mg/kg	0.5		12							
Cadmium	M	2455	mg/kg	0.10		< 0.10							
Chromium	M	2455	mg/kg	0.5		31							
Copper	M	2455	mg/kg	0.50		13							
Mercury	M	2455	mg/kg	0.05		< 0.05							
Nickel	M	2455	mg/kg	0.50		25							
Lead	M	2455	mg/kg	0.50		17							
Selenium	M	2455	mg/kg	0.25		0.94							
Zinc	M	2455	mg/kg	0.50		63							
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50							
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10							
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25							
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0							
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0							
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0							
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0							
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10							

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			Chemtest Job No.:		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			Chemtest Sample ID.:		1703196	1703197	1703198	1703199	1703200	1703201	1703202	1703203	1703204
			Sample Location:		CPT01	CPT01	BH01	TP02	BH01	BH01	BH01	CPT01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	7.00	1.7	2.00	8.00	6.00	0.4	3.00
			Bottom Depth (m):		1.00	1.20							
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0							
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10							
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05							
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25							
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0							
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0							
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	< 2.0	< 2.0							
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0	< 2.0							
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0							
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	< 5.0	< 5.0							
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10							
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50							
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10							
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10							
Organic Matter	M	2625	%	0.40		1.3							
Naphthalene	M	2700	mg/kg	0.10		< 0.10							
Acenaphthylene	M	2700	mg/kg	0.10		< 0.10							
Acenaphthene	M	2700	mg/kg	0.10		< 0.10							
Fluorene	M	2700	mg/kg	0.10		< 0.10							
Phenanthrene	M	2700	mg/kg	0.10		< 0.10							
Anthracene	M	2700	mg/kg	0.10		< 0.10							
Fluoranthene	M	2700	mg/kg	0.10		< 0.10							
Pyrene	M	2700	mg/kg	0.10		< 0.10							
Benzo[a]anthracene	M	2700	mg/kg	0.10		< 0.10							
Chrysene	M	2700	mg/kg	0.10		< 0.10							
Benzo[b]fluoranthene	M	2700	mg/kg	0.10		< 0.10							
Benzo[k]fluoranthene	M	2700	mg/kg	0.10		< 0.10							
Benzo[a]pyrene	M	2700	mg/kg	0.10		< 0.10							
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10		< 0.10							
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10		< 0.10							
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10		< 0.10							
Total Of 16 PAH's	M	2700	mg/kg	2.0		< 2.0							
Dichlorodifluoromethane	U	2760	µg/kg	1.0									
Chloromethane	M	2760	µg/kg	1.0									
Vinyl Chloride	M	2760	µg/kg	1.0									
Bromomethane	M	2760	µg/kg	20									

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703196	1703197	1703198	1703199	1703200	1703201	1703202	1703203	1703204
			Sample Location:		CPT01	CPT01	BH01	TP02	BH01	BH01	BH01	CPT01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	7.00	1.7	2.00	8.00	6.00	0.4	3.00
			Bottom Depth (m):		1.00	1.20							
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Chloroethane	U	2760	µg/kg	2.0									
Trichlorofluoromethane	M	2760	µg/kg	1.0									
1,1-Dichloroethene	M	2760	µg/kg	1.0									
Dichloromethane	N	2760	µg/kg	50									
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0									
1,1-Dichloroethane	M	2760	µg/kg	1.0									
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0									
Bromochloromethane	U	2760	µg/kg	5.0									
Trichloromethane	M	2760	µg/kg	1.0									
1,1,1-Trichloroethane	M	2760	µg/kg	1.0									
Tetrachloromethane	M	2760	µg/kg	1.0									
1,1-Dichloropropene	U	2760	µg/kg	1.0									
Benzene	M	2760	µg/kg	1.0									
1,2-Dichloroethane	M	2760	µg/kg	2.0									
Trichloroethene	N	2760	µg/kg	1.0									
1,2-Dichloropropane	M	2760	µg/kg	1.0									
Dibromomethane	M	2760	µg/kg	1.0									
Bromodichloromethane	M	2760	µg/kg	5.0									
cis-1,3-Dichloropropene	N	2760	µg/kg	10									
Toluene	M	2760	µg/kg	1.0									
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									
1,1,2-Trichloroethane	M	2760	µg/kg	10									
Tetrachloroethene	M	2760	µg/kg	1.0									
1,3-Dichloropropane	U	2760	µg/kg	2.0									
Dibromochloromethane	U	2760	µg/kg	10									
1,2-Dibromoethane	M	2760	µg/kg	5.0									
Chlorobenzene	M	2760	µg/kg	1.0									
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0									
Ethylbenzene	M	2760	µg/kg	1.0									
m & p-Xylene	M	2760	µg/kg	1.0									
o-Xylene	M	2760	µg/kg	1.0									
Styrene	M	2760	µg/kg	1.0									
Tribromomethane	U	2760	µg/kg	1.0									
Isopropylbenzene	M	2760	µg/kg	1.0									
Bromobenzene	M	2760	µg/kg	1.0									
1,2,3-Trichloropropane	N	2760	µg/kg	50									
N-Propylbenzene	U	2760	µg/kg	1.0									
2-Chlorotoluene	M	2760	µg/kg	1.0									

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703196	1703197	1703198	1703199	1703200	1703201	1703202	1703203	1703204
			Sample Location:		CPT01	CPT01	BH01	TP02	BH01	BH01	BH01	CPT01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	7.00	1.7	2.00	8.00	6.00	0.4	3.00
			Bottom Depth (m):		1.00	1.20							
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0									
4-Chlorotoluene	U	2760	µg/kg	1.0									
Tert-Butylbenzene	U	2760	µg/kg	1.0									
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0									
Sec-Butylbenzene	U	2760	µg/kg	1.0									
1,3-Dichlorobenzene	M	2760	µg/kg	1.0									
4-Isopropyltoluene	U	2760	µg/kg	1.0									
1,4-Dichlorobenzene	M	2760	µg/kg	1.0									
N-Butylbenzene	U	2760	µg/kg	1.0									
1,2-Dichlorobenzene	M	2760	µg/kg	1.0									
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50									
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0									
Hexachlorobutadiene	N	2760	µg/kg	1.0									
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0									
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0									
PCB 28	U	2815	mg/kg	0.010									
PCB 52	U	2815	mg/kg	0.010									
PCB 90+101	U	2815	mg/kg	0.010									
PCB 118	U	2815	mg/kg	0.010									
PCB 153	U	2815	mg/kg	0.010									
PCB 138	U	2815	mg/kg	0.010									
PCB 180	U	2815	mg/kg	0.010									
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10									
Total Phenols	M	2920	mg/kg	0.10		< 0.10							
N-Nitrosodimethylamine	SN		mg/kg	0.10									
Phenol	SN		mg/kg	0.10									
Bis(2-chloroethyl)ether	SN		mg/kg	0.10									
2-Chlorophenol	SN		mg/kg	0.10									
1,3-Dichlorobenzene	SN		mg/kg	0.10									
1,4-Dichlorobenzene	SN		mg/kg	0.10									
2-Methylphenol	SN		mg/kg	0.10									
1,2-Dichlorobenzene	SN		mg/kg	0.10									
Bis(2-chloroisopropyl)ether	SN		mg/kg	0.10									
3&4-Methylphenol	SN		mg/kg	0.10									
N-Nitrosodi-n-propylamine	SN		mg/kg	0.10									
Hexachloroethane	SN		mg/kg	0.10									
Nitrobenzene	SN		mg/kg	0.10									
Isophorone	SN		mg/kg	0.10									

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703196	1703197	1703198	1703199	1703200	1703201	1703202	1703203	1703204
			Sample Location:		CPT01	CPT01	BH01	TP02	BH01	BH01	BH01	CPT01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	7.00	1.7	2.00	8.00	6.00	0.4	3.00
			Bottom Depth (m):		1.00	1.20							
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:		COVENTRY	COVENTRY							
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
2,4-Dimethylphenol	SN		mg/kg	0.10									
2-Nitrophenol	SN		mg/kg	0.10									
Bis(2-chloroethoxy)methane	SN		mg/kg	0.10									
2,4-Dichlorophenol	SN		mg/kg	0.10									
1,2,4-Trichlorobenzene	SN		mg/kg	0.10									
4-Chloroaniline	SN		mg/kg	0.10									
Hexachlorobutadiene	SN		mg/kg	0.10									
4-Chloro-3-methylphenol	SN		mg/kg	0.10									
2-Methylnaphthalene	SN		mg/kg	0.10									
1-Methylnaphthalene	SN		mg/kg	0.10									
Hexachlorocyclopentadiene	SN		mg/kg	0.10									
2,4,6-Trichlorophenol	SN		mg/kg	0.10									
2,4,5-Trichlorophenol	SN		mg/kg	0.10									
2-Chloronaphthalene	SN		mg/kg	0.10									
2-Nitroaniline	SN		mg/kg	0.10									
Dimethyl phthalate	SN		mg/kg	0.10									
2,6-Dinitrotoluene	SN		mg/kg	0.10									
3-Nitroaniline	SN		mg/kg	0.10									
2,4-Dinitrophenol	SN		mg/kg	0.10									
4-Nitrophenol	SN		mg/kg	0.10									
2,4-Dinitrotoluene	SN		mg/kg	0.10									
Dibenzofuran	SN		mg/kg	0.10									
Diethyl phthalate	SN		mg/kg	0.10									
4-Chlorophenylphenyl ether	SN		mg/kg	0.10									
4-Nitroaniline	SN		mg/kg	0.10									
2-Methyl-4,6-dinitrophenol	SN		mg/kg	0.10									
Azobenzene	SN		mg/kg	0.10									
4-Bromophenylphenyl ether	SN		mg/kg	0.10									
Hexachlorobenzene	SN		mg/kg	0.10									
Pentachlorophenol	SN		mg/kg	0.10									
Carbazole	SN		mg/kg	0.10									
Di-n-butyl phthalate	SN		mg/kg	0.10									
Butylbenzyl phthalate	SN		mg/kg	0.10									
Bis(2-ethylhexyl)phthalate	SN		mg/kg	0.10									
Di-n-octyl phthalate	SN		mg/kg	0.10									

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703205	1703206	1703207	1703208
			Sample Location:		TP01	BH01	BH01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.50	5.0	4.0	1.0
			Bottom Depth (m):		2.00			
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
ACM Type	U	2192		N/A				
Asbestos Identification	U	2192		N/A				
Asbestos by Gravimetry	U	2192	%	0.001				
Total Asbestos	U	2192	%	0.001				
Moisture	N	2030	%	0.020				
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	Stones	Stones
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay
pH at 20C	M	2010		4.0				
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0				
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40				
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010				
Total Sulphur	U	2175	%	0.010				
Cyanide (Total)	M	2300	mg/kg	0.50				
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50				
Arsenic	M	2455	mg/kg	0.5				
Cadmium	M	2455	mg/kg	0.10				
Chromium	M	2455	mg/kg	0.5				
Copper	M	2455	mg/kg	0.50				
Mercury	M	2455	mg/kg	0.05				
Nickel	M	2455	mg/kg	0.50				
Lead	M	2455	mg/kg	0.50				
Selenium	M	2455	mg/kg	0.25				
Zinc	M	2455	mg/kg	0.50				
Chromium (Hexavalent)	N	2490	mg/kg	0.50				
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05				
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05				
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05				
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10				
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05				
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25				
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00				
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00				
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00				
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00				
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00				

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			Chemtest Job No.:		23-31071	23-31071	23-31071	23-31071
Quotation No.:			Chemtest Sample ID.:		1703205	1703206	1703207	1703208
			Sample Location:		TP01	BH01	BH01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.50	5.0	4.0	1.0
			Bottom Depth (m):		2.00			
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00				
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00				
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05				
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05				
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05				
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25				
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00				
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00				
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00				
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00				
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00				
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00				
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00				
Total VPH >C5-C10	U	2780	mg/kg	0.50				
Total EPH >C10-C35	U	2690	mg/kg	10.00				
Total EPH >C10-C40	N	2690	mg/kg	10.00				
Organic Matter	M	2625	%	0.40				
Naphthalene	M	2700	mg/kg	0.10				
Acenaphthylene	M	2700	mg/kg	0.10				
Acenaphthene	M	2700	mg/kg	0.10				
Fluorene	M	2700	mg/kg	0.10				
Phenanthrene	M	2700	mg/kg	0.10				
Anthracene	M	2700	mg/kg	0.10				
Fluoranthene	M	2700	mg/kg	0.10				
Pyrene	M	2700	mg/kg	0.10				
Benzo[a]anthracene	M	2700	mg/kg	0.10				
Chrysene	M	2700	mg/kg	0.10				
Benzo[b]fluoranthene	M	2700	mg/kg	0.10				
Benzo[k]fluoranthene	M	2700	mg/kg	0.10				
Benzo[a]pyrene	M	2700	mg/kg	0.10				
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10				
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10				
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10				
Total Of 16 PAH's	M	2700	mg/kg	2.0				
Dichlorodifluoromethane	U	2760	µg/kg	1.0				
Chloromethane	M	2760	µg/kg	1.0				
Vinyl Chloride	M	2760	µg/kg	1.0				
Bromomethane	M	2760	µg/kg	20				

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703205	1703206	1703207	1703208
			Sample Location:		TP01	BH01	BH01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.50	5.0	4.0	1.0
			Bottom Depth (m):		2.00			
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
Chloroethane	U	2760	µg/kg	2.0				
Trichlorofluoromethane	M	2760	µg/kg	1.0				
1,1-Dichloroethene	M	2760	µg/kg	1.0				
Dichloromethane	N	2760	µg/kg	50				
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0				
1,1-Dichloroethane	M	2760	µg/kg	1.0				
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0				
Bromochloromethane	U	2760	µg/kg	5.0				
Trichloromethane	M	2760	µg/kg	1.0				
1,1,1-Trichloroethane	M	2760	µg/kg	1.0				
Tetrachloromethane	M	2760	µg/kg	1.0				
1,1-Dichloropropene	U	2760	µg/kg	1.0				
Benzene	M	2760	µg/kg	1.0				
1,2-Dichloroethane	M	2760	µg/kg	2.0				
Trichloroethene	N	2760	µg/kg	1.0				
1,2-Dichloropropane	M	2760	µg/kg	1.0				
Dibromomethane	M	2760	µg/kg	1.0				
Bromodichloromethane	M	2760	µg/kg	5.0				
cis-1,3-Dichloropropene	N	2760	µg/kg	10				
Toluene	M	2760	µg/kg	1.0				
Trans-1,3-Dichloropropene	N	2760	µg/kg	10				
1,1,2-Trichloroethane	M	2760	µg/kg	10				
Tetrachloroethene	M	2760	µg/kg	1.0				
1,3-Dichloropropane	U	2760	µg/kg	2.0				
Dibromochloromethane	U	2760	µg/kg	10				
1,2-Dibromoethane	M	2760	µg/kg	5.0				
Chlorobenzene	M	2760	µg/kg	1.0				
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0				
Ethylbenzene	M	2760	µg/kg	1.0				
m & p-Xylene	M	2760	µg/kg	1.0				
o-Xylene	M	2760	µg/kg	1.0				
Styrene	M	2760	µg/kg	1.0				
Tribromomethane	U	2760	µg/kg	1.0				
Isopropylbenzene	M	2760	µg/kg	1.0				
Bromobenzene	M	2760	µg/kg	1.0				
1,2,3-Trichloropropane	N	2760	µg/kg	50				
N-Propylbenzene	U	2760	µg/kg	1.0				
2-Chlorotoluene	M	2760	µg/kg	1.0				

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703205	1703206	1703207	1703208
			Sample Location:		TP01	BH01	BH01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.50	5.0	4.0	1.0
			Bottom Depth (m):		2.00			
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0				
4-Chlorotoluene	U	2760	µg/kg	1.0				
Tert-Butylbenzene	U	2760	µg/kg	1.0				
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0				
Sec-Butylbenzene	U	2760	µg/kg	1.0				
1,3-Dichlorobenzene	M	2760	µg/kg	1.0				
4-Isopropyltoluene	U	2760	µg/kg	1.0				
1,4-Dichlorobenzene	M	2760	µg/kg	1.0				
N-Butylbenzene	U	2760	µg/kg	1.0				
1,2-Dichlorobenzene	M	2760	µg/kg	1.0				
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50				
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0				
Hexachlorobutadiene	N	2760	µg/kg	1.0				
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0				
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				
PCB 28	U	2815	mg/kg	0.010				
PCB 52	U	2815	mg/kg	0.010				
PCB 90+101	U	2815	mg/kg	0.010				
PCB 118	U	2815	mg/kg	0.010				
PCB 153	U	2815	mg/kg	0.010				
PCB 138	U	2815	mg/kg	0.010				
PCB 180	U	2815	mg/kg	0.010				
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10				
Total Phenols	M	2920	mg/kg	0.10				
N-Nitrosodimethylamine	SN		mg/kg	0.10				
Phenol	SN		mg/kg	0.10				
Bis(2-chloroethyl)ether	SN		mg/kg	0.10				
2-Chlorophenol	SN		mg/kg	0.10				
1,3-Dichlorobenzene	SN		mg/kg	0.10				
1,4-Dichlorobenzene	SN		mg/kg	0.10				
2-Methylphenol	SN		mg/kg	0.10				
1,2-Dichlorobenzene	SN		mg/kg	0.10				
Bis(2-chloroisopropyl)ether	SN		mg/kg	0.10				
3&4-Methylphenol	SN		mg/kg	0.10				
N-Nitrosodi-n-propylamine	SN		mg/kg	0.10				
Hexachloroethane	SN		mg/kg	0.10				
Nitrobenzene	SN		mg/kg	0.10				
Isophorone	SN		mg/kg	0.10				

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31071	23-31071	23-31071	23-31071
Quotation No.:			**Chemtest Sample ID.:**		1703205	1703206	1703207	1703208
			Sample Location:		TP01	BH01	BH01	BH01
			Sample Type:		SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.50	5.0	4.0	1.0
			Bottom Depth (m):		2.00			
			Date Sampled:		11-Sep-2023	11-Sep-2023	11-Sep-2023	11-Sep-2023
			Asbestos Lab:					
Determinand	**Accred.**	**SOP**	**Units**	**LOD**				
2,4-Dimethylphenol	SN		mg/kg	0.10				
2-Nitrophenol	SN		mg/kg	0.10				
Bis(2-chloroethoxy)methane	SN		mg/kg	0.10				
2,4-Dichlorophenol	SN		mg/kg	0.10				
1,2,4-Trichlorobenzene	SN		mg/kg	0.10				
4-Chloroaniline	SN		mg/kg	0.10				
Hexachlorobutadiene	SN		mg/kg	0.10				
4-Chloro-3-methylphenol	SN		mg/kg	0.10				
2-Methylnaphthalene	SN		mg/kg	0.10				
1-Methylnaphthalene	SN		mg/kg	0.10				
Hexachlorocyclopentadiene	SN		mg/kg	0.10				
2,4,6-Trichlorophenol	SN		mg/kg	0.10				
2,4,5-Trichlorophenol	SN		mg/kg	0.10				
2-Chloronaphthalene	SN		mg/kg	0.10				
2-Nitroaniline	SN		mg/kg	0.10				
Dimethyl phthalate	SN		mg/kg	0.10				
2,6-Dinitrotoluene	SN		mg/kg	0.10				
3-Nitroaniline	SN		mg/kg	0.10				
2,4-Dinitrophenol	SN		mg/kg	0.10				
4-Nitrophenol	SN		mg/kg	0.10				
2,4-Dinitrotoluene	SN		mg/kg	0.10				
Dibenzofuran	SN		mg/kg	0.10				
Diethyl phthalate	SN		mg/kg	0.10				
4-Chlorophenylphenyl ether	SN		mg/kg	0.10				
4-Nitroaniline	SN		mg/kg	0.10				
2-Methyl-4,6-dinitrophenol	SN		mg/kg	0.10				
Azobenzene	SN		mg/kg	0.10				
4-Bromophenylphenyl ether	SN		mg/kg	0.10				
Hexachlorobenzene	SN		mg/kg	0.10				
Pentachlorophenol	SN		mg/kg	0.10				
Carbazole	SN		mg/kg	0.10				
Di-n-butyl phthalate	SN		mg/kg	0.10				
Butylbenzyl phthalate	SN		mg/kg	0.10				
Bis(2-ethylhexyl)phthalate	SN		mg/kg	0.10				
Di-n-octyl phthalate	SN		mg/kg	0.10				

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-31573-1
Initial Date of Issue:	20-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Monitoring
Project	129-002870 Grimsby

Quotation No.:		**Date Received:**	21-Sep-2023
Order No.:		**Date Instructed:**	21-Sep-2023
No. of Samples:	49		
Turnaround (Wkdays):	9	**Results Due:**	03-Oct-2023
Date Approved:	20-Oct-2023	**Subcon Results Due:**	12-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Leachate

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd				**Chemtest Job No.:**		23-31573	23-31573
Quotation No.:				**Chemtest Sample ID.:**		1705201	1705207
				Sample Location:		WS02	WS04
				Sample Type:		SOIL	SOIL
				Top Depth (m):		2.00	0.00
				Bottom Depth (m):		3.00	0.40
				Date Sampled:		13-Sep-2023	13-Sep-2023
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**		
Calcium	U	1455	10:1	mg/l	2.00	3.2	4.0
Potassium	U	1455	10:1	mg/l	0.50	1.9	0.55

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705181	1705182	1705183	1705184	1705185	1705186	1705187	1705188	1705189
			Sample Location:		CPT04	CPT05	CPT06	TP05	TP05	TP05	TP05	TP05	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.40	0.40	0.40	1.20	2.00	2.90	4.00	0.40
			Bottom Depth (m):		1.20	1.30	1.20						
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB						NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A			-						-
Asbestos Identification	U	2192		N/A			No Asbestos Detected						No Asbestos Detected
Moisture	N	2030	%	0.020	18	19	16		19		29		18
Stones and Removed Materials	N	2030	%	0.020									
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones and Roots	Stones and Roots	Roots and Stones	Roots and Stones	Roots	None	None	Stones and Roots
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
pH at 20C	M	2010		4.0	8.1	8.5	8.4		8.4		8.4		7.6
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	290	290	280		400		360		500
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.4	2.6	1.2		< 0.40		1.8		1.1
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.069	< 0.010		< 0.010		0.17		0.012
Total Sulphur	U	2175	%	0.010	0.043	0.028	0.045		0.025		0.70		0.038
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50		< 0.50		< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.7	3.2	2.8		3.0		3.7		2.4
Aluminium (Total)	N	2430	mg/kg	100									
Iron (Total)	N	2430	mg/kg	100									
Magnesium (Total)	N	2430	mg/kg	10									
Arsenic	M	2455	mg/kg	0.5	17	25	12		15		0.8		14
Barium	M	2455	mg/kg	0									
Beryllium	U	2455	mg/kg	0.5									
Cadmium	M	2455	mg/kg	0.10	0.12	< 0.10	0.11		< 0.10		< 0.10		< 0.10
Cobalt	M	2455	mg/kg	0.5									
Chromium	M	2455	mg/kg	0.5	31	44	29		36		2.4		35
Manganese	M	2455	mg/kg	1.0									
Molybdenum	M	2455	mg/kg	0.5									
Antimony	N	2455	mg/kg	2.0									
Tin	N	2455	mg/kg	2.0									
Strontium	N	2455	mg/kg	0.5									
Tellurium	N	2450	mg/kg	5.0									
Thallium	N	2455	mg/kg	0.10									
Copper	M	2455	mg/kg	0.50	17	21	14		14		0.97		14
Mercury	M	2455	mg/kg	0.05	0.07	< 0.05	0.05		< 0.05		< 0.05		< 0.05
Nickel	M	2455	mg/kg	0.50	29	45	28		34		2.3		30
Lead	M	2455	mg/kg	0.50	26	30	28		22		1.1		22
Selenium	M	2455	mg/kg	0.25	0.79	1.0	0.64		0.64		< 0.25		0.74
Vanadium	U	2455	mg/kg	0.5									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705181	1705182	1705183	1705184	1705185	1705186	1705187	1705188	1705189
			Sample Location:		CPT04	CPT05	CPT06	TP05	TP05	TP05	TP05	TP05	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.40	0.40	0.40	1.20	2.00	2.90	4.00	0.40
			Bottom Depth (m):		1.20	1.30	1.20						
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB						NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Zinc	M	2455	mg/kg	0.50	81	100	73		81		5.0		75
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50		< 0.50		< 0.50		< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10		[C] < 0.10		< 0.10		< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25		[C] < 0.25		< 0.25		< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0		[C] < 2.0		< 2.0		< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0		[C] < 1.0		< 1.0		< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0		[C] < 2.0		7.7		< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	3.4		[C] < 3.0		6.8		11
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10		[C] < 10		< 10		< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0		[C] < 5.0		14		11
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10		[C] < 10		14		11
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05		[C] < 0.05		< 0.05		< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25		[C] < 0.25		< 0.25		< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0		[C] < 1.0		< 1.0		< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	3.2	< 1.0		[C] 1.9		< 1.0		< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	5.0	5.8	5.9		[C] 6.0		9.5		5.3
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	4.4	< 2.0	5.1		[C] < 2.0		25		44
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	4.8	2.4	4.6		[C] 1.9		4.0		10
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	9.7	10	12		[C] 8.8		35		50
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	14	13	16		[C] 11		39		60
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50		[C] < 0.50		< 0.50		< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	11	11	16		[C] < 10		49		60
Total EPH >C10-C40	N	2690	mg/kg	10.00	16	13	21		[C] < 10		53		71
Organic Matter	M	2625	%	0.40	3.9	0.72	3.1		1.2		2.2		1.9
TPH >C6-C10	N	2670	mg/kg	1.0									
TPH >C10-C25	N	2670	mg/kg	1.0									
TPH >C25-C40	N	2670	mg/kg	1.0									
Total TPH >C6-C40	M	2670	mg/kg	10									
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705181	1705182	1705183	1705184	1705185	1705186	1705187	1705188	1705189
			Sample Location:		CPT04	CPT05	CPT06	TP05	TP05	TP05	TP05	TP05	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.40	0.40	0.40	1.20	2.00	2.90	4.00	0.40
			Bottom Depth (m):		1.20	1.30	1.20						
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB						NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Coronene	N	2700	mg/kg	0.10									
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0		< 2.0		< 2.0		< 2.0
Total Of 17 PAH's	N	2700	mg/kg	2.0									
Dichlorodifluoromethane	U	2760	µg/kg	1.0									< 1.0
Chloromethane	M	2760	µg/kg	1.0									< 1.0
Vinyl Chloride	M	2760	µg/kg	1.0									< 1.0
Bromomethane	M	2760	µg/kg	20									< 20
Chloroethane	U	2760	µg/kg	2.0									< 2.0
Trichlorofluoromethane	M	2760	µg/kg	1.0									< 1.0
1,1-Dichloroethene	M	2760	µg/kg	1.0									< 1.0
Dichloromethane	N	2760	µg/kg	50									< 50
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0									< 1.0
1,1-Dichloroethane	M	2760	µg/kg	1.0									< 1.0
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0									< 1.0
Bromochloromethane	U	2760	µg/kg	5.0									< 5.0
Trichloromethane	M	2760	µg/kg	1.0									< 1.0
1,1,1-Trichloroethane	M	2760	µg/kg	1.0									< 1.0
Tetrachloromethane	M	2760	µg/kg	1.0									< 1.0
1,1-Dichloropropene	U	2760	µg/kg	1.0									< 1.0
Benzene	M	2760	µg/kg	1.0									< 1.0
1,2-Dichloroethane	M	2760	µg/kg	2.0									< 2.0
Trichloroethene	N	2760	µg/kg	1.0									< 1.0
1,2-Dichloropropane	M	2760	µg/kg	1.0									< 1.0
Dibromomethane	M	2760	µg/kg	1.0									< 1.0
Bromodichloromethane	M	2760	µg/kg	5.0									< 5.0
cis-1,3-Dichloropropene	N	2760	µg/kg	10									< 10

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:		**Chemtest Sample ID.:**			1705181	1705182	1705183	1705184	1705185	1705186	1705187	1705188	1705189
		Sample Location:			CPT04	CPT05	CPT06	TP05	TP05	TP05	TP05	TP05	TP07
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			0.40	0.40	0.40	0.40	1.20	2.00	2.90	4.00	0.40
		Bottom Depth (m):			1.20	1.30	1.20						
		Date Sampled:			13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
		Asbestos Lab:			NEW-ASB	NEW-ASB	NEW-ASB						NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0									< 1.0
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									< 10
1,1,2-Trichloroethane	M	2760	µg/kg	10									< 10
Tetrachloroethene	M	2760	µg/kg	1.0									< 1.0
1,3-Dichloropropane	U	2760	µg/kg	2.0									< 2.0
Dibromochloromethane	U	2760	µg/kg	10									< 10
1,2-Dibromoethane	M	2760	µg/kg	5.0									< 5.0
Chlorobenzene	M	2760	µg/kg	1.0									< 1.0
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0									< 2.0
Ethylbenzene	M	2760	µg/kg	1.0									< 1.0
m & p-Xylene	M	2760	µg/kg	1.0									< 1.0
o-Xylene	M	2760	µg/kg	1.0									< 1.0
Styrene	M	2760	µg/kg	1.0									< 1.0
Tribromomethane	U	2760	µg/kg	1.0									< 1.0
Isopropylbenzene	M	2760	µg/kg	1.0									< 1.0
Bromobenzene	M	2760	µg/kg	1.0									< 1.0
1,2,3-Trichloropropane	N	2760	µg/kg	50									< 50
N-Propylbenzene	U	2760	µg/kg	1.0									< 1.0
2-Chlorotoluene	M	2760	µg/kg	1.0									< 1.0
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0									< 1.0
4-Chlorotoluene	U	2760	µg/kg	1.0									< 1.0
Tert-Butylbenzene	U	2760	µg/kg	1.0									< 1.0
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0									< 1.0
Sec-Butylbenzene	U	2760	µg/kg	1.0									< 1.0
1,3-Dichlorobenzene	M	2760	µg/kg	1.0									< 1.0
4-Isopropyltoluene	U	2760	µg/kg	1.0									< 1.0
1,4-Dichlorobenzene	M	2760	µg/kg	1.0									< 1.0
N-Butylbenzene	U	2760	µg/kg	1.0									< 1.0
1,2-Dichlorobenzene	M	2760	µg/kg	1.0									< 1.0
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50									< 50
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0									< 1.0
Hexachlorobutadiene	N	2760	µg/kg	1.0									< 1.0
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0									< 2.0
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0									< 1.0
PCB 28	U	2815	mg/kg	0.010									< 0.010
PCB 52	U	2815	mg/kg	0.010									< 0.010
PCB 90+101	U	2815	mg/kg	0.010									< 0.010
PCB 118	U	2815	mg/kg	0.010									< 0.010

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705181	1705182	1705183	1705184	1705185	1705186	1705187	1705188	1705189
			Sample Location:		CPT04	CPT05	CPT06	TP05	TP05	TP05	TP05	TP05	TP07
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.40	0.40	0.40	0.40	1.20	2.00	2.90	4.00	0.40
			Bottom Depth (m):		1.20	1.30	1.20						
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB	NEW-ASB	NEW-ASB						NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 153	U	2815	mg/kg	0.010									< 0.010
PCB 138	U	2815	mg/kg	0.010									< 0.010
PCB 180	U	2815	mg/kg	0.010									< 0.010
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10									< 0.10
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10		< 0.10		< 0.10		< 0.10
Total Stones >2mm	N		%	0.1									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:		**Chemtest Sample ID.:**			1705190	1705191	1705193	1705194	1705195	1705196	1705197	1705198	1705199
		Sample Location:			TP07	TP07	TP07	WS01	WS01	WS01	WS01	WS02	WS02
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			1.30	2.00	4.00	0.00	1.00	2.00	3.00	0.00	0.40
		Bottom Depth (m):						0.40	2.00	3.00	4.00	0.40	1.00
		Date Sampled:			13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
		Asbestos Lab:						NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A				-				-	
Asbestos Identification	U	2192		N/A				No Asbestos Detected				No Asbestos Detected	
Moisture	N	2030	%	0.020	18			18		30		26	21
Stones and Removed Materials	N	2030	%	0.020									
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Roots	None	Stones and Roots	Stones and Roots	Roots	Stones and Roots	Roots	Roots
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Clay
pH at 20C	M	2010		4.0	8.1			7.8		8.6		6.8	8.3
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	570			340		1900		230	630
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	2.2			< 0.40		2.8		0.48	0.41
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.037			< 0.010		0.25		< 0.010	0.010
Total Sulphur	U	2175	%	0.010	0.030			0.036		0.82		0.042	0.024
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50			< 0.50		< 0.50		< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	3.9			5.7		< 0.50		18	6.4
Aluminium (Total)	N	2430	mg/kg	100									
Iron (Total)	N	2430	mg/kg	100									
Magnesium (Total)	N	2430	mg/kg	10									
Arsenic	M	2455	mg/kg	0.5	19			22		21		19	13
Barium	M	2455	mg/kg	0									
Beryllium	U	2455	mg/kg	0.5									
Cadmium	M	2455	mg/kg	0.10	< 0.10			0.20		0.20		0.14	< 0.10
Cobalt	M	2455	mg/kg	0.5									
Chromium	M	2455	mg/kg	0.5	39			44		42		39	29
Manganese	M	2455	mg/kg	1.0									
Molybdenum	M	2455	mg/kg	0.5									
Antimony	N	2455	mg/kg	2.0									
Tin	N	2455	mg/kg	2.0									
Strontium	N	2455	mg/kg	0.5									
Tellurium	N	2450	mg/kg	5.0									
Thallium	N	2455	mg/kg	0.10									
Copper	M	2455	mg/kg	0.50	17			22		21		18	12
Mercury	M	2455	mg/kg	0.05	< 0.05			0.09		0.10		0.06	< 0.05
Nickel	M	2455	mg/kg	0.50	40			40		38		34	28
Lead	M	2455	mg/kg	0.50	21			37		36		33	16
Selenium	M	2455	mg/kg	0.25	0.86			1.1		1.1		0.95	0.60
Vanadium	U	2455	mg/kg	0.5									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705190	1705191	1705193	1705194	1705195	1705196	1705197	1705198	1705199
			Sample Location:		TP07	TP07	TP07	WS01	WS01	WS01	WS01	WS02	WS02
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.30	2.00	4.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):					0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:					NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Zinc	M	2455	mg/kg	0.50	83			110		110		95	61
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50			< 0.50		< 0.50		< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10			[C] < 0.10		[C] < 0.10		< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05			[C] 0.13		[C] < 0.05		< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25			[C] < 0.25		[C] < 0.25		< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0			[C] < 2.0		[C] < 2.0		< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0			[C] < 1.0		[C] < 1.0		< 1.0	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0			[C] < 2.0		[C] < 2.0		< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0			[C] < 3.0		[C] 5.6		< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10			[C] < 10		[C] < 10		< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0			[C] < 5.0		[C] 5.6		< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10			[C] < 10		[C] < 10		< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05			[C] < 0.05		[C] < 0.05		< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25			[C] < 0.25		[C] < 0.25		< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0			[C] < 1.0		[C] < 1.0		< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0			[C] < 1.0		[C] < 1.0		< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	5.8			[C] 6.5		[C] 6.5		6.5	8.3
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0			[C] 5.0		[C] 10		10	2.8
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	2.3			[C] 3.4		[C] 1.3		5.6	1.4
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	7.6			[C] 11		[C] 17		16	12
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10			[C] 15		[C] 18		22	14
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50			[C] < 0.50		[C] < 0.50		< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10			[C] 12		[C] 22		20	15
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10			[C] 16		[C] 23		25	17
Organic Matter	M	2625	%	0.40	1.2			4.5		3.1		4.9	1.6
TPH >C6-C10	N	2670	mg/kg	1.0									
TPH >C10-C25	N	2670	mg/kg	1.0									
TPH >C25-C40	N	2670	mg/kg	1.0									
Total TPH >C6-C40	M	2670	mg/kg	10									
Naphthalene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705190	1705191	1705193	1705194	1705195	1705196	1705197	1705198	1705199
			Sample Location:		TP07	TP07	TP07	WS01	WS01	WS01	WS01	WS02	WS02
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.30	2.00	4.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):					0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:					NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	M	2700	mg/kg	0.10	< 0.10			< 0.10		0.14		< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10			< 0.10		0.26		< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10			< 0.10		0.31		< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Coronene	N	2700	mg/kg	0.10									
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0			< 2.0		< 2.0		< 2.0	< 2.0
Total Of 17 PAH's	N	2700	mg/kg	2.0									
Dichlorodifluoromethane	U	2760	µg/kg	1.0				[C] < 1.0					
Chloromethane	M	2760	µg/kg	1.0				[C] < 1.0					
Vinyl Chloride	M	2760	µg/kg	1.0				[C] < 1.0					
Bromomethane	M	2760	µg/kg	20				[C] < 20					
Chloroethane	U	2760	µg/kg	2.0				[C] < 2.0					
Trichlorofluoromethane	M	2760	µg/kg	1.0				[C] < 1.0					
1,1-Dichloroethene	M	2760	µg/kg	1.0				[C] < 1.0					
Dichloromethane	N	2760	µg/kg	50				[C] < 50					
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0				[C] < 1.0					
1,1-Dichloroethane	M	2760	µg/kg	1.0				[C] < 1.0					
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0				[C] < 1.0					
Bromochloromethane	U	2760	µg/kg	5.0				[C] < 5.0					
Trichloromethane	M	2760	µg/kg	1.0				[C] < 1.0					
1,1,1-Trichloroethane	M	2760	µg/kg	1.0				[C] < 1.0					
Tetrachloromethane	M	2760	µg/kg	1.0				[C] < 1.0					
1,1-Dichloropropene	U	2760	µg/kg	1.0				[C] < 1.0					
Benzene	M	2760	µg/kg	1.0				[C] < 1.0					
1,2-Dichloroethane	M	2760	µg/kg	2.0				[C] < 2.0					
Trichloroethene	N	2760	µg/kg	1.0				[C] < 1.0					
1,2-Dichloropropane	M	2760	µg/kg	1.0				[C] < 1.0					
Dibromomethane	M	2760	µg/kg	1.0				[C] < 1.0					
Bromodichloromethane	M	2760	µg/kg	5.0				[C] < 5.0					
cis-1,3-Dichloropropene	N	2760	µg/kg	10				[C] < 10					

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705190	1705191	1705193	1705194	1705195	1705196	1705197	1705198	1705199
			Sample Location:		TP07	TP07	TP07	WS01	WS01	WS01	WS01	WS02	WS02
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.30	2.00	4.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):					0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:					NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0				[C] < 1.0					
Trans-1,3-Dichloropropene	N	2760	µg/kg	10				[C] < 10					
1,1,2-Trichloroethane	M	2760	µg/kg	10				[C] < 10					
Tetrachloroethene	M	2760	µg/kg	1.0				[C] < 1.0					
1,3-Dichloropropane	U	2760	µg/kg	2.0				[C] < 2.0					
Dibromochloromethane	U	2760	µg/kg	10				[C] < 10					
1,2-Dibromoethane	M	2760	µg/kg	5.0				[C] < 5.0					
Chlorobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0				[C] < 2.0					
Ethylbenzene	M	2760	µg/kg	1.0				[C] < 1.0					
m & p-Xylene	M	2760	µg/kg	1.0				[C] < 1.0					
o-Xylene	M	2760	µg/kg	1.0				[C] < 1.0					
Styrene	M	2760	µg/kg	1.0				[C] < 1.0					
Tribromomethane	U	2760	µg/kg	1.0				[C] < 1.0					
Isopropylbenzene	M	2760	µg/kg	1.0				[C] < 1.0					
Bromobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
1,2,3-Trichloropropane	N	2760	µg/kg	50				[C] < 50					
N-Propylbenzene	U	2760	µg/kg	1.0				[C] < 1.0					
2-Chlorotoluene	M	2760	µg/kg	1.0				[C] < 1.0					
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0				[C] < 1.0					
4-Chlorotoluene	U	2760	µg/kg	1.0				[C] < 1.0					
Tert-Butylbenzene	U	2760	µg/kg	1.0				[C] < 1.0					
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0				[C] < 1.0					
Sec-Butylbenzene	U	2760	µg/kg	1.0				[C] < 1.0					
1,3-Dichlorobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
4-Isopropyltoluene	U	2760	µg/kg	1.0				[C] < 1.0					
1,4-Dichlorobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
N-Butylbenzene	U	2760	µg/kg	1.0				[C] < 1.0					
1,2-Dichlorobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50				[C] < 50					
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0				[C] < 1.0					
Hexachlorobutadiene	N	2760	µg/kg	1.0				[C] < 1.0					
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0				[C] < 2.0					
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				[C] < 1.0					
PCB 28	U	2815	mg/kg	0.010				[C] < 0.010					
PCB 52	U	2815	mg/kg	0.010				[C] < 0.010					
PCB 90+101	U	2815	mg/kg	0.010				[C] < 0.010					
PCB 118	U	2815	mg/kg	0.010				[C] < 0.010					

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705190	1705191	1705193	1705194	1705195	1705196	1705197	1705198	1705199
			Sample Location:		TP07	TP07	TP07	WS01	WS01	WS01	WS01	WS02	WS02
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.30	2.00	4.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):					0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:					NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 153	U	2815	mg/kg	0.010				[C] < 0.010					
PCB 138	U	2815	mg/kg	0.010				[C] < 0.010					
PCB 180	U	2815	mg/kg	0.010				[C] < 0.010					
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10				[C] < 0.10					
Total Phenols	M	2920	mg/kg	0.10	< 0.10			< 0.10		< 0.10		< 0.10	< 0.10
Total Stones >2mm	N		%	0.1									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705200	1705201	1705202	1705203	1705204	1705205	1705206	1705207	1705208
			Sample Location:		WS02	WS02	WS02	WS03	WS03	WS03	WS03	WS04	WS04
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	3.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):		2.00	3.00	4.00	0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Feb-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:			NEW-ASB		NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A		-		-				-	
Asbestos Identification	U	2192		N/A		No Asbestos Detected		No Asbestos Detected				No Asbestos Detected	
Moisture	N	2030	%	0.020		23		16				12	
Stones and Removed Materials	N	2030	%	0.020		< 0.020						< 0.020	
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Brown	Brown	Brown	Brown	Black	Brown
Other Material	N	2040		N/A	Roots	Roots	Roots	Roots	None	Roots	Roots	Stones and Roots	Stones and Roots
Soil Texture	N	2040		N/A	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Loam	Clay
pH at 20C	M	2010		4.0				[B] 8.2					
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0		1800		[B] 360				300	
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40		2.8		[B] 0.63				0.51	
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010		0.25		[B] < 0.010				0.015	
Total Sulphur	U	2175	%	0.010		0.19		[B] 0.031				0.89	
Cyanide (Total)	M	2300	mg/kg	0.50		< 0.50		[B] < 0.50				< 0.50	
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50		6.4		[B] 3.2				2.1	
Aluminium (Total)	N	2430	mg/kg	100		15000						14000	
Iron (Total)	N	2430	mg/kg	100		20000						20000	
Magnesium (Total)	N	2430	mg/kg	10		7200						6900	
Arsenic	M	2455	mg/kg	0.5		21		12				21	
Barium	M	2455	mg/kg	0		79						66	
Beryllium	U	2455	mg/kg	0.5		1.4						1.1	
Cadmium	M	2455	mg/kg	0.10		0.28		< 0.10				0.15	
Cobalt	M	2455	mg/kg	0.5		14						8.9	
Chromium	M	2455	mg/kg	0.5		42		33				15	
Manganese	M	2455	mg/kg	1.0		700						200	
Molybdenum	M	2455	mg/kg	0.5		1.7						3.0	
Antimony	N	2455	mg/kg	2.0		< 2.0						< 2.0	
Tin	N	2455	mg/kg	2.0		< 2.0						< 2.0	
Strontium	N	2455	mg/kg	0.5		26						36	
Tellurium	N	2450	mg/kg	5.0		6.3						5.9	
Thallium	N	2455	mg/kg	0.10		0.35						0.19	
Copper	M	2455	mg/kg	0.50		21		14				52	
Mercury	M	2455	mg/kg	0.05		0.09		< 0.05				0.08	
Nickel	M	2455	mg/kg	0.50		38		31				21	
Lead	M	2455	mg/kg	0.50		35		21				24	
Selenium	M	2455	mg/kg	0.25		1.0		0.74				1.4	
Vanadium	U	2455	mg/kg	0.5		64						21	

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705200	1705201	1705202	1705203	1705204	1705205	1705206	1705207	1705208
			Sample Location:		WS02	WS02	WS02	WS03	WS03	WS03	WS03	WS04	WS04
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	3.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):		2.00	3.00	4.00	0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Feb-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:			NEW-ASB		NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Zinc	M	2455	mg/kg	0.50		110		69				150	
Chromium (Hexavalent)	N	2490	mg/kg	0.50		< 0.50		< 0.50				< 0.50	
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05				[B] < 0.05					
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05				[B] < 0.05					
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05				[B] < 0.05					
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10				[B] < 0.10					
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05				[B] < 0.05					
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25				[B] < 0.25					
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00				[B] < 2.0					
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00				[B] < 1.0					
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00				[B] < 2.0					
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00				[B] < 3.0					
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00				[B] < 10					
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00				[B] < 5.0					
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00				[B] < 10					
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05				[B] < 0.05					
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05				[B] < 0.05					
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05				[B] < 0.05					
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25				[B] < 0.25					
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00				[B] < 1.0					
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00				[B] < 1.0					
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00				[B] 8.6					
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00				[B] < 2.0					
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00				[B] 4.3					
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00				[B] 11					
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00				[B] 15					
Total VPH >C5-C10	U	2780	mg/kg	0.50				[B] < 0.50					
Total EPH >C10-C35	U	2690	mg/kg	10.00				[B] 13					
Total EPH >C10-C40	N	2690	mg/kg	10.00				[B] 17					
Organic Matter	M	2625	%	0.40				[B] 2.2					
TPH >C6-C10	N	2670	mg/kg	1.0		< 1.0						[C] 87	
TPH >C10-C25	N	2670	mg/kg	1.0		< 1.0						[C] 370	
TPH >C25-C40	N	2670	mg/kg	1.0		< 1.0						[C] 130	
Total TPH >C6-C40	M	2670	mg/kg	10		< 10						[C] 590	
Naphthalene	M	2700	mg/kg	0.10		< 0.10		[B] < 0.10				12	
Acenaphthylene	M	2700	mg/kg	0.10		< 0.10		[B] < 0.10				1.8	
Acenaphthene	M	2700	mg/kg	0.10		< 0.10		[B] < 0.10				1.6	
Fluorene	M	2700	mg/kg	0.10		< 0.10		[B] < 0.10				3.8	

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd					**Chemtest Job No.:**	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:					**Chemtest Sample ID.:**	1705200	1705201	1705202	1705203	1705204	1705205	1705206	1705207	1705208
					Sample Location:	WS02	WS02	WS02	WS03	WS03	WS03	WS03	WS04	WS04
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	1.00	2.00	3.00	0.00	1.00	2.00	3.00	0.00	0.40
					Bottom Depth (m):	2.00	3.00	4.00	0.40	2.00	3.00	4.00	0.40	1.00
					Date Sampled:	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Feb-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
					Asbestos Lab:		NEW-ASB		NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Phenanthrene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				4.7	
Anthracene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				0.51	
Fluoranthene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				2.4	
Pyrene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				2.7	
Benzo[a]anthracene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				1.2	
Chrysene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				1.3	
Benzo[b]fluoranthene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				1.5	
Benzo[k]fluoranthene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				0.51	
Benzo[a]pyrene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				1.1	
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				0.65	
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				0.40	
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10			< 0.10		[B] < 0.10				1.4	
Coronene	N	2700	mg/kg	0.10			< 0.10						< 0.10	
Total Of 16 PAH's	M	2700	mg/kg	2.0					[B] < 2.0					
Total Of 17 PAH's	N	2700	mg/kg	2.0			< 2.0						38	
Dichlorodifluoromethane	U	2760	µg/kg	1.0										
Chloromethane	M	2760	µg/kg	1.0										
Vinyl Chloride	M	2760	µg/kg	1.0										
Bromomethane	M	2760	µg/kg	20										
Chloroethane	U	2760	µg/kg	2.0										
Trichlorofluoromethane	M	2760	µg/kg	1.0										
1,1-Dichloroethene	M	2760	µg/kg	1.0										
Dichloromethane	N	2760	µg/kg	50										
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0										
1,1-Dichloroethane	M	2760	µg/kg	1.0										
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0										
Bromochloromethane	U	2760	µg/kg	5.0										
Trichloromethane	M	2760	µg/kg	1.0										
1,1,1-Trichloroethane	M	2760	µg/kg	1.0										
Tetrachloromethane	M	2760	µg/kg	1.0										
1,1-Dichloropropene	U	2760	µg/kg	1.0										
Benzene	M	2760	µg/kg	1.0			< 1.0						[C] < 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0										
Trichloroethene	N	2760	µg/kg	1.0										
1,2-Dichloropropane	M	2760	µg/kg	1.0										
Dibromomethane	M	2760	µg/kg	1.0										
Bromodichloromethane	M	2760	µg/kg	5.0										
cis-1,3-Dichloropropene	N	2760	µg/kg	10										

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:		**Chemtest Sample ID.:**			1705200	1705201	1705202	1705203	1705204	1705205	1705206	1705207	1705208
		Sample Location:			WS02	WS02	WS02	WS03	WS03	WS03	WS03	WS04	WS04
		Sample Type:			SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):			1.00	2.00	3.00	0.00	1.00	2.00	3.00	0.00	0.40
		Bottom Depth (m):			2.00	3.00	4.00	0.40	2.00	3.00	4.00	0.40	1.00
		Date Sampled:			13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Feb-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
		Asbestos Lab:				NEW-ASB		NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0		< 1.0						[C] 2.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									
1,1,2-Trichloroethane	M	2760	µg/kg	10									
Tetrachloroethene	M	2760	µg/kg	1.0									
1,3-Dichloropropane	U	2760	µg/kg	2.0									
Dibromochloromethane	U	2760	µg/kg	10									
1,2-Dibromoethane	M	2760	µg/kg	5.0									
Chlorobenzene	M	2760	µg/kg	1.0									
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0									
Ethylbenzene	M	2760	µg/kg	1.0		< 1.0						[C] < 1.0	
m & p-Xylene	M	2760	µg/kg	1.0		< 1.0						[C] < 1.0	
o-Xylene	M	2760	µg/kg	1.0		< 1.0						[C] < 1.0	
Styrene	M	2760	µg/kg	1.0									
Tribromomethane	U	2760	µg/kg	1.0									
Isopropylbenzene	M	2760	µg/kg	1.0									
Bromobenzene	M	2760	µg/kg	1.0									
1,2,3-Trichloropropane	N	2760	µg/kg	50									
N-Propylbenzene	U	2760	µg/kg	1.0									
2-Chlorotoluene	M	2760	µg/kg	1.0									
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0									
4-Chlorotoluene	U	2760	µg/kg	1.0									
Tert-Butylbenzene	U	2760	µg/kg	1.0									
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0									
Sec-Butylbenzene	U	2760	µg/kg	1.0									
1,3-Dichlorobenzene	M	2760	µg/kg	1.0									
4-Isopropyltoluene	U	2760	µg/kg	1.0									
1,4-Dichlorobenzene	M	2760	µg/kg	1.0									
N-Butylbenzene	U	2760	µg/kg	1.0									
1,2-Dichlorobenzene	M	2760	µg/kg	1.0									
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50									
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0									
Hexachlorobutadiene	N	2760	µg/kg	1.0									
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0									
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0									
PCB 28	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
PCB 52	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
PCB 90+101	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
PCB 118	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705200	1705201	1705202	1705203	1705204	1705205	1705206	1705207	1705208
			Sample Location:		WS02	WS02	WS02	WS03	WS03	WS03	WS03	WS04	WS04
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	3.00	0.00	1.00	2.00	3.00	0.00	0.40
			Bottom Depth (m):		2.00	3.00	4.00	0.40	2.00	3.00	4.00	0.40	1.00
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Feb-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:			NEW-ASB		NEW-ASB				NEW-ASB	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 153	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
PCB 138	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
PCB 180	U	2815	mg/kg	0.010		< 0.010						[C] < 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10		< 0.10						[C] < 0.10	
Total Phenols	M	2920	mg/kg	0.10		< 0.10		< 0.10				< 0.10	
Total Stones >2mm	N		%	0.1		47						30	

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705209	1705210	1705211	1705212	1705213	1705214	1705215	1705216	1705217
			Sample Location:		WS04	WS04	BH01	BH01	CPT06	CPT05	CPT04	W504	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	20	23	1.20	0.36	1.20	3.00	2.45
			Bottom Depth (m):		2.00	3.00						4.00	
			Date Sampled:		13-Sep-2023	13-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-								
Asbestos Identification	U	2192		N/A	No Asbestos Detected								
Moisture	N	2030	%	0.020	26		15	18					
Stones and Removed Materials	N	2030	%	0.020									
Soil Colour	N	2040		N/A	Brown	Brown	Brown	Beige	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Roots	Roots	Stones	Stones	Roots	Roots	Roots	Roots	None
Soil Texture	N	2040		N/A	Clay	Clay	Loam	Clay	Clay	Clay	Clay	Clay	Clay
pH at 20C	M	2010		4.0	8.6		8.8	9.1					
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	1800		120	140					
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.4		0.41	< 0.40					
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.22		< 0.010	< 0.010					
Total Sulphur	U	2175	%	0.010	0.34		0.050	< 0.010					
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50		< 0.50	< 0.50					
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	7.1		0.91	12					
Aluminium (Total)	N	2430	mg/kg	100									
Iron (Total)	N	2430	mg/kg	100									
Magnesium (Total)	N	2430	mg/kg	10									
Arsenic	M	2455	mg/kg	0.5	20		3.4	0.8					
Barium	M	2455	mg/kg	0									
Beryllium	U	2455	mg/kg	0.5									
Cadmium	M	2455	mg/kg	0.10	0.22		< 0.10	0.14					
Cobalt	M	2455	mg/kg	0.5									
Chromium	M	2455	mg/kg	0.5	42		7.8	1.9					
Manganese	M	2455	mg/kg	1.0									
Molybdenum	M	2455	mg/kg	0.5									
Antimony	N	2455	mg/kg	2.0									
Tin	N	2455	mg/kg	2.0									
Strontium	N	2455	mg/kg	0.5									
Tellurium	N	2450	mg/kg	5.0									
Thallium	N	2455	mg/kg	0.10									
Copper	M	2455	mg/kg	0.50	21		4.2	2.9					
Mercury	M	2455	mg/kg	0.05	0.10		< 0.05	< 0.05					
Nickel	M	2455	mg/kg	0.50	38		7.5	3.8					
Lead	M	2455	mg/kg	0.50	35		4.5	3.7					
Selenium	M	2455	mg/kg	0.25	1.0		< 0.25	< 0.25					
Vanadium	U	2455	mg/kg	0.5									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705209	1705210	1705211	1705212	1705213	1705214	1705215	1705216	1705217
			Sample Location:		WS04	WS04	BH01	BH01	CPT06	CPT05	CPT04	W504	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	20	23	1.20	0.36	1.20	3.00	2.45
			Bottom Depth (m):		2.00	3.00						4.00	
			Date Sampled:		13-Sep-2023	13-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Zinc	M	2455	mg/kg	0.50	110		23	14					
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50	< 0.50					
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25		< 0.25	< 0.25					
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0			< 2.0					
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0			< 1.0					
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0			< 2.0					
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0			< 3.0					
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10			< 10					
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0			< 5.0					
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10			< 10					
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05		< 0.05	< 0.05					
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25		< 0.25	< 0.25					
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0			1.7					
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0			< 1.0					
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	5.9			5.9					
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	3.4			< 2.0					
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0			< 1.0					
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	9.3			9.0					
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10			< 10					
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50		< 0.50	< 0.50					
Total EPH >C10-C35	U	2690	mg/kg	10.00	12			11					
Total EPH >C10-C40	N	2690	mg/kg	10.00	12			11					
Organic Matter	M	2625	%	0.40	2.1		< 0.40	4.4					
TPH >C6-C10	N	2670	mg/kg	1.0									
TPH >C10-C25	N	2670	mg/kg	1.0									
TPH >C25-C40	N	2670	mg/kg	1.0									
Total TPH >C6-C40	M	2670	mg/kg	10									
Naphthalene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Acenaphthene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Fluorene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705209	1705210	1705211	1705212	1705213	1705214	1705215	1705216	1705217
			Sample Location:		WS04	WS04	BH01	BH01	CPT06	CPT05	CPT04	W504	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	20	23	1.20	0.36	1.20	3.00	2.45
			Bottom Depth (m):		2.00	3.00						4.00	
			Date Sampled:		13-Sep-2023	13-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	M	2700	mg/kg	0.10	0.25		< 0.10	< 0.10					
Anthracene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Fluoranthene	M	2700	mg/kg	0.10	0.18		< 0.10	< 0.10					
Pyrene	M	2700	mg/kg	0.10	0.24		< 0.10	< 0.10					
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Chrysene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Coronene	N	2700	mg/kg	0.10									
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0		< 2.0	< 2.0					
Total Of 17 PAH's	N	2700	mg/kg	2.0									
Dichlorodifluoromethane	U	2760	µg/kg	1.0									
Chloromethane	M	2760	µg/kg	1.0									
Vinyl Chloride	M	2760	µg/kg	1.0									
Bromomethane	M	2760	µg/kg	20									
Chloroethane	U	2760	µg/kg	2.0									
Trichlorofluoromethane	M	2760	µg/kg	1.0									
1,1-Dichloroethene	M	2760	µg/kg	1.0									
Dichloromethane	N	2760	µg/kg	50									
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0									
1,1-Dichloroethane	M	2760	µg/kg	1.0									
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0									
Bromochloromethane	U	2760	µg/kg	5.0									
Trichloromethane	M	2760	µg/kg	1.0									
1,1,1-Trichloroethane	M	2760	µg/kg	1.0									
Tetrachloromethane	M	2760	µg/kg	1.0									
1,1-Dichloropropene	U	2760	µg/kg	1.0									
Benzene	M	2760	µg/kg	1.0									
1,2-Dichloroethane	M	2760	µg/kg	2.0									
Trichloroethene	N	2760	µg/kg	1.0									
1,2-Dichloropropane	M	2760	µg/kg	1.0									
Dibromomethane	M	2760	µg/kg	1.0									
Bromodichloromethane	M	2760	µg/kg	5.0									
cis-1,3-Dichloropropene	N	2760	µg/kg	10									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705209	1705210	1705211	1705212	1705213	1705214	1705215	1705216	1705217
			Sample Location:		WS04	WS04	BH01	BH01	CPT06	CPT05	CPT04	W504	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	20	23	1.20	0.36	1.20	3.00	2.45
			Bottom Depth (m):		2.00	3.00						4.00	
			Date Sampled:		13-Sep-2023	13-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0									
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									
1,1,2-Trichloroethane	M	2760	µg/kg	10									
Tetrachloroethene	M	2760	µg/kg	1.0									
1,3-Dichloropropane	U	2760	µg/kg	2.0									
Dibromochloromethane	U	2760	µg/kg	10									
1,2-Dibromoethane	M	2760	µg/kg	5.0									
Chlorobenzene	M	2760	µg/kg	1.0									
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0									
Ethylbenzene	M	2760	µg/kg	1.0									
m & p-Xylene	M	2760	µg/kg	1.0									
o-Xylene	M	2760	µg/kg	1.0									
Styrene	M	2760	µg/kg	1.0									
Tribromomethane	U	2760	µg/kg	1.0									
Isopropylbenzene	M	2760	µg/kg	1.0									
Bromobenzene	M	2760	µg/kg	1.0									
1,2,3-Trichloropropane	N	2760	µg/kg	50									
N-Propylbenzene	U	2760	µg/kg	1.0									
2-Chlorotoluene	M	2760	µg/kg	1.0									
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0									
4-Chlorotoluene	U	2760	µg/kg	1.0									
Tert-Butylbenzene	U	2760	µg/kg	1.0									
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0									
Sec-Butylbenzene	U	2760	µg/kg	1.0									
1,3-Dichlorobenzene	M	2760	µg/kg	1.0									
4-Isopropyltoluene	U	2760	µg/kg	1.0									
1,4-Dichlorobenzene	M	2760	µg/kg	1.0									
N-Butylbenzene	U	2760	µg/kg	1.0									
1,2-Dichlorobenzene	M	2760	µg/kg	1.0									
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50									
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0									
Hexachlorobutadiene	N	2760	µg/kg	1.0									
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0									
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0									
PCB 28	U	2815	mg/kg	0.010									
PCB 52	U	2815	mg/kg	0.010									
PCB 90+101	U	2815	mg/kg	0.010									
PCB 118	U	2815	mg/kg	0.010									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705209	1705210	1705211	1705212	1705213	1705214	1705215	1705216	1705217
			Sample Location:		WS04	WS04	BH01	BH01	CPT06	CPT05	CPT04	W504	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		1.00	2.00	20	23	1.20	0.36	1.20	3.00	2.45
			Bottom Depth (m):		2.00	3.00						4.00	
			Date Sampled:		13-Sep-2023	13-Sep-2023	11-Sep-2023	11-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:		NEW-ASB								
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 153	U	2815	mg/kg	0.010									
PCB 138	U	2815	mg/kg	0.010									
PCB 180	U	2815	mg/kg	0.010									
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10									
Total Phenols	M	2920	mg/kg	0.10	< 0.10		< 0.10	< 0.10					
Total Stones >2mm	N		%	0.1									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705218	1705219	1705220	1705221	1705222	1705223	1705224	1705225	1705226
			Sample Location:		BH01	W506A	W505	W505	W505	W505	W505	CPT06	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):			0.40	1.00	0.40	2.00	3.00	0.00	1.20	1.00
			Bottom Depth (m):			1.00	2.00	1.00	3.00	4.00	0.20		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:										
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A									
Asbestos Identification	U	2192		N/A									
Moisture	N	2030	%	0.020									
Stones and Removed Materials	N	2030	%	0.020									
Soil Colour	N	2040		N/A	Brown	Black	Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones and Roots	Stones and Roots	Stones	Roots	Roots	Stones and Roots	Roots	Roots
Soil Texture	N	2040		N/A	Loam	Loam	Clay	Clay	Clay	Clay	Clay	Clay	Clay
pH at 20C	M	2010		4.0									
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0									
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40									
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010									
Total Sulphur	U	2175	%	0.010									
Cyanide (Total)	M	2300	mg/kg	0.50									
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50									
Aluminium (Total)	N	2430	mg/kg	100									
Iron (Total)	N	2430	mg/kg	100									
Magnesium (Total)	N	2430	mg/kg	10									
Arsenic	M	2455	mg/kg	0.5									
Barium	M	2455	mg/kg	0									
Beryllium	U	2455	mg/kg	0.5									
Cadmium	M	2455	mg/kg	0.10									
Cobalt	M	2455	mg/kg	0.5									
Chromium	M	2455	mg/kg	0.5									
Manganese	M	2455	mg/kg	1.0									
Molybdenum	M	2455	mg/kg	0.5									
Antimony	N	2455	mg/kg	2.0									
Tin	N	2455	mg/kg	2.0									
Strontium	N	2455	mg/kg	0.5									
Tellurium	N	2450	mg/kg	5.0									
Thallium	N	2455	mg/kg	0.10									
Copper	M	2455	mg/kg	0.50									
Mercury	M	2455	mg/kg	0.05									
Nickel	M	2455	mg/kg	0.50									
Lead	M	2455	mg/kg	0.50									
Selenium	M	2455	mg/kg	0.25									
Vanadium	U	2455	mg/kg	0.5									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705218	1705219	1705220	1705221	1705222	1705223	1705224	1705225	1705226
			Sample Location:		BH01	W506A	W505	W505	W505	W505	W505	CPT06	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):			0.40	1.00	0.40	2.00	3.00	0.00	1.20	1.00
			Bottom Depth (m):			1.00	2.00	1.00	3.00	4.00	0.20		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:										
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Zinc	M	2455	mg/kg	0.50									
Chromium (Hexavalent)	N	2490	mg/kg	0.50									
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05									
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05									
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05									
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10									
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05									
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25									
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00									
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00									
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00									
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00									
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00									
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00									
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00									
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05									
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05									
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05									
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25									
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00									
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00									
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00									
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00									
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00									
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00									
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00									
Total VPH >C5-C10	U	2780	mg/kg	0.50									
Total EPH >C10-C35	U	2690	mg/kg	10.00									
Total EPH >C10-C40	N	2690	mg/kg	10.00									
Organic Matter	M	2625	%	0.40									
TPH >C6-C10	N	2670	mg/kg	1.0									
TPH >C10-C25	N	2670	mg/kg	1.0									
TPH >C25-C40	N	2670	mg/kg	1.0									
Total TPH >C6-C40	M	2670	mg/kg	10									
Naphthalene	M	2700	mg/kg	0.10									
Acenaphthylene	M	2700	mg/kg	0.10									
Acenaphthene	M	2700	mg/kg	0.10									
Fluorene	M	2700	mg/kg	0.10									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705218	1705219	1705220	1705221	1705222	1705223	1705224	1705225	1705226
			Sample Location:		BH01	W506A	W505	W505	W505	W505	W505	CPT06	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):			0.40	1.00	0.40	2.00	3.00	0.00	1.20	1.00
			Bottom Depth (m):			1.00	2.00	1.00	3.00	4.00	0.20		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:										
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Phenanthrene	M	2700	mg/kg	0.10									
Anthracene	M	2700	mg/kg	0.10									
Fluoranthene	M	2700	mg/kg	0.10									
Pyrene	M	2700	mg/kg	0.10									
Benzo[a]anthracene	M	2700	mg/kg	0.10									
Chrysene	M	2700	mg/kg	0.10									
Benzo[b]fluoranthene	M	2700	mg/kg	0.10									
Benzo[k]fluoranthene	M	2700	mg/kg	0.10									
Benzo[a]pyrene	M	2700	mg/kg	0.10									
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10									
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10									
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10									
Coronene	N	2700	mg/kg	0.10									
Total Of 16 PAH's	M	2700	mg/kg	2.0									
Total Of 17 PAH's	N	2700	mg/kg	2.0									
Dichlorodifluoromethane	U	2760	µg/kg	1.0									
Chloromethane	M	2760	µg/kg	1.0									
Vinyl Chloride	M	2760	µg/kg	1.0									
Bromomethane	M	2760	µg/kg	20									
Chloroethane	U	2760	µg/kg	2.0									
Trichlorofluoromethane	M	2760	µg/kg	1.0									
1,1-Dichloroethene	M	2760	µg/kg	1.0									
Dichloromethane	N	2760	µg/kg	50									
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0									
1,1-Dichloroethane	M	2760	µg/kg	1.0									
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0									
Bromochloromethane	U	2760	µg/kg	5.0									
Trichloromethane	M	2760	µg/kg	1.0									
1,1,1-Trichloroethane	M	2760	µg/kg	1.0									
Tetrachloromethane	M	2760	µg/kg	1.0									
1,1-Dichloropropene	U	2760	µg/kg	1.0									
Benzene	M	2760	µg/kg	1.0									
1,2-Dichloroethane	M	2760	µg/kg	2.0									
Trichloroethene	N	2760	µg/kg	1.0									
1,2-Dichloropropane	M	2760	µg/kg	1.0									
Dibromomethane	M	2760	µg/kg	1.0									
Bromodichloromethane	M	2760	µg/kg	5.0									
cis-1,3-Dichloropropene	N	2760	µg/kg	10									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705218	1705219	1705220	1705221	1705222	1705223	1705224	1705225	1705226
			Sample Location:		BH01	W506A	W505	W505	W505	W505	W505	CPT06	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):			0.40	1.00	0.40	2.00	3.00	0.00	1.20	1.00
			Bottom Depth (m):			1.00	2.00	1.00	3.00	4.00	0.20		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:										
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Toluene	M	2760	µg/kg	1.0									
Trans-1,3-Dichloropropene	N	2760	µg/kg	10									
1,1,2-Trichloroethane	M	2760	µg/kg	10									
Tetrachloroethene	M	2760	µg/kg	1.0									
1,3-Dichloropropane	U	2760	µg/kg	2.0									
Dibromochloromethane	U	2760	µg/kg	10									
1,2-Dibromoethane	M	2760	µg/kg	5.0									
Chlorobenzene	M	2760	µg/kg	1.0									
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0									
Ethylbenzene	M	2760	µg/kg	1.0									
m & p-Xylene	M	2760	µg/kg	1.0									
o-Xylene	M	2760	µg/kg	1.0									
Styrene	M	2760	µg/kg	1.0									
Tribromomethane	U	2760	µg/kg	1.0									
Isopropylbenzene	M	2760	µg/kg	1.0									
Bromobenzene	M	2760	µg/kg	1.0									
1,2,3-Trichloropropane	N	2760	µg/kg	50									
N-Propylbenzene	U	2760	µg/kg	1.0									
2-Chlorotoluene	M	2760	µg/kg	1.0									
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0									
4-Chlorotoluene	U	2760	µg/kg	1.0									
Tert-Butylbenzene	U	2760	µg/kg	1.0									
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0									
Sec-Butylbenzene	U	2760	µg/kg	1.0									
1,3-Dichlorobenzene	M	2760	µg/kg	1.0									
4-Isopropyltoluene	U	2760	µg/kg	1.0									
1,4-Dichlorobenzene	M	2760	µg/kg	1.0									
N-Butylbenzene	U	2760	µg/kg	1.0									
1,2-Dichlorobenzene	M	2760	µg/kg	1.0									
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50									
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0									
Hexachlorobutadiene	N	2760	µg/kg	1.0									
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0									
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0									
PCB 28	U	2815	mg/kg	0.010									
PCB 52	U	2815	mg/kg	0.010									
PCB 90+101	U	2815	mg/kg	0.010									
PCB 118	U	2815	mg/kg	0.010									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705218	1705219	1705220	1705221	1705222	1705223	1705224	1705225	1705226
			Sample Location:		BH01	W506A	W505	W505	W505	W505	W505	CPT06	TP05
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):			0.40	1.00	0.40	2.00	3.00	0.00	1.20	1.00
			Bottom Depth (m):			1.00	2.00	1.00	3.00	4.00	0.20		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:										
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 153	U	2815	mg/kg	0.010									
PCB 138	U	2815	mg/kg	0.010									
PCB 180	U	2815	mg/kg	0.010									
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10									
Total Phenols	M	2920	mg/kg	0.10									
Total Stones >2mm	N		%	0.1									

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705227	1705228	1705229
			Sample Location:		WS06A	CPT05	TP05
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.30	2.40
			Bottom Depth (m):		0.40		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A			
Asbestos Identification	U	2192		N/A			
Moisture	N	2030	%	0.020			
Stones and Removed Materials	N	2030	%	0.020			
Soil Colour	N	2040		N/A	Black	Brown	Brown
Other Material	N	2040		N/A	Roots and Stones	Roots	None
Soil Texture	N	2040		N/A	Loam	Clay	Clay
pH at 20C	M	2010		4.0			
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0			
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40			
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010			
Total Sulphur	U	2175	%	0.010			
Cyanide (Total)	M	2300	mg/kg	0.50			
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50			
Aluminium (Total)	N	2430	mg/kg	100			
Iron (Total)	N	2430	mg/kg	100			
Magnesium (Total)	N	2430	mg/kg	10			
Arsenic	M	2455	mg/kg	0.5			
Barium	M	2455	mg/kg	0			
Beryllium	U	2455	mg/kg	0.5			
Cadmium	M	2455	mg/kg	0.10			
Cobalt	M	2455	mg/kg	0.5			
Chromium	M	2455	mg/kg	0.5			
Manganese	M	2455	mg/kg	1.0			
Molybdenum	M	2455	mg/kg	0.5			
Antimony	N	2455	mg/kg	2.0			
Tin	N	2455	mg/kg	2.0			
Strontium	N	2455	mg/kg	0.5			
Tellurium	N	2450	mg/kg	5.0			
Thallium	N	2455	mg/kg	0.10			
Copper	M	2455	mg/kg	0.50			
Mercury	M	2455	mg/kg	0.05			
Nickel	M	2455	mg/kg	0.50			
Lead	M	2455	mg/kg	0.50			
Selenium	M	2455	mg/kg	0.25			
Vanadium	U	2455	mg/kg	0.5			

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705227	1705228	1705229
			Sample Location:		WS06A	CPT05	TP05
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.30	2.40
			Bottom Depth (m):		0.40		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Zinc	M	2455	mg/kg	0.50			
Chromium (Hexavalent)	N	2490	mg/kg	0.50			
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05			
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05			
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05			
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10			
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05			
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25			
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00			
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00			
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00			
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00			
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00			
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00			
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00			
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05			
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05			
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05			
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25			
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00			
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00			
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00			
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00			
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00			
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00			
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00			
Total VPH >C5-C10	U	2780	mg/kg	0.50			
Total EPH >C10-C35	U	2690	mg/kg	10.00			
Total EPH >C10-C40	N	2690	mg/kg	10.00			
Organic Matter	M	2625	%	0.40			
TPH >C6-C10	N	2670	mg/kg	1.0			
TPH >C10-C25	N	2670	mg/kg	1.0			
TPH >C25-C40	N	2670	mg/kg	1.0			
Total TPH >C6-C40	M	2670	mg/kg	10			
Naphthalene	M	2700	mg/kg	0.10			
Acenaphthylene	M	2700	mg/kg	0.10			
Acenaphthene	M	2700	mg/kg	0.10			
Fluorene	M	2700	mg/kg	0.10			

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705227	1705228	1705229
			Sample Location:		WS06A	CPT05	TP05
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.30	2.40
			Bottom Depth (m):		0.40		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Phenanthrene	M	2700	mg/kg	0.10			
Anthracene	M	2700	mg/kg	0.10			
Fluoranthene	M	2700	mg/kg	0.10			
Pyrene	M	2700	mg/kg	0.10			
Benzo[a]anthracene	M	2700	mg/kg	0.10			
Chrysene	M	2700	mg/kg	0.10			
Benzo[b]fluoranthene	M	2700	mg/kg	0.10			
Benzo[k]fluoranthene	M	2700	mg/kg	0.10			
Benzo[a]pyrene	M	2700	mg/kg	0.10			
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10			
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10			
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10			
Coronene	N	2700	mg/kg	0.10			
Total Of 16 PAH's	M	2700	mg/kg	2.0			
Total Of 17 PAH's	N	2700	mg/kg	2.0			
Dichlorodifluoromethane	U	2760	µg/kg	1.0			
Chloromethane	M	2760	µg/kg	1.0			
Vinyl Chloride	M	2760	µg/kg	1.0			
Bromomethane	M	2760	µg/kg	20			
Chloroethane	U	2760	µg/kg	2.0			
Trichlorofluoromethane	M	2760	µg/kg	1.0			
1,1-Dichloroethene	M	2760	µg/kg	1.0			
Dichloromethane	N	2760	µg/kg	50			
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0			
1,1-Dichloroethane	M	2760	µg/kg	1.0			
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0			
Bromochloromethane	U	2760	µg/kg	5.0			
Trichloromethane	M	2760	µg/kg	1.0			
1,1,1-Trichloroethane	M	2760	µg/kg	1.0			
Tetrachloromethane	M	2760	µg/kg	1.0			
1,1-Dichloropropene	U	2760	µg/kg	1.0			
Benzene	M	2760	µg/kg	1.0			
1,2-Dichloroethane	M	2760	µg/kg	2.0			
Trichloroethene	N	2760	µg/kg	1.0			
1,2-Dichloropropane	M	2760	µg/kg	1.0			
Dibromomethane	M	2760	µg/kg	1.0			
Bromodichloromethane	M	2760	µg/kg	5.0			
cis-1,3-Dichloropropene	N	2760	µg/kg	10			

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705227	1705228	1705229
			Sample Location:		WS06A	CPT05	TP05
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.30	2.40
			Bottom Depth (m):		0.40		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Toluene	M	2760	µg/kg	1.0			
Trans-1,3-Dichloropropene	N	2760	µg/kg	10			
1,1,2-Trichloroethane	M	2760	µg/kg	10			
Tetrachloroethene	M	2760	µg/kg	1.0			
1,3-Dichloropropane	U	2760	µg/kg	2.0			
Dibromochloromethane	U	2760	µg/kg	10			
1,2-Dibromoethane	M	2760	µg/kg	5.0			
Chlorobenzene	M	2760	µg/kg	1.0			
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0			
Ethylbenzene	M	2760	µg/kg	1.0			
m & p-Xylene	M	2760	µg/kg	1.0			
o-Xylene	M	2760	µg/kg	1.0			
Styrene	M	2760	µg/kg	1.0			
Tribromomethane	U	2760	µg/kg	1.0			
Isopropylbenzene	M	2760	µg/kg	1.0			
Bromobenzene	M	2760	µg/kg	1.0			
1,2,3-Trichloropropane	N	2760	µg/kg	50			
N-Propylbenzene	U	2760	µg/kg	1.0			
2-Chlorotoluene	M	2760	µg/kg	1.0			
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0			
4-Chlorotoluene	U	2760	µg/kg	1.0			
Tert-Butylbenzene	U	2760	µg/kg	1.0			
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0			
Sec-Butylbenzene	U	2760	µg/kg	1.0			
1,3-Dichlorobenzene	M	2760	µg/kg	1.0			
4-Isopropyltoluene	U	2760	µg/kg	1.0			
1,4-Dichlorobenzene	M	2760	µg/kg	1.0			
N-Butylbenzene	U	2760	µg/kg	1.0			
1,2-Dichlorobenzene	M	2760	µg/kg	1.0			
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50			
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0			
Hexachlorobutadiene	N	2760	µg/kg	1.0			
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0			
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0			
PCB 28	U	2815	mg/kg	0.010			
PCB 52	U	2815	mg/kg	0.010			
PCB 90+101	U	2815	mg/kg	0.010			
PCB 118	U	2815	mg/kg	0.010			

Results - Soil

Project: 129-002870 Grimsby

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31573	23-31573	23-31573
Quotation No.:			**Chemtest Sample ID.:**		1705227	1705228	1705229
			Sample Location:		WS06A	CPT05	TP05
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.00	1.30	2.40
			Bottom Depth (m):		0.40		
			Date Sampled:		13-Sep-2023	13-Sep-2023	13-Sep-2023
			Asbestos Lab:				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
PCB 153	U	2815	mg/kg	0.010			
PCB 138	U	2815	mg/kg	0.010			
PCB 180	U	2815	mg/kg	0.010			
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10			
Total Phenols	M	2920	mg/kg	0.10			
Total Stones >2mm	N		%	0.1			

Results - Single Stage WAC

Project: 129-002870 Grimsby

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-31573						
Chemtest Sample ID:	1705201						
Sample Ref:							
Sample ID:							
Sample Location:	WS02						
Top Depth(m):	2.00						
Bottom Depth(m):	3.00						
Sampling Date:	13-Sep-2023						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	1.2	3	5	6
Loss On Ignition	2610	M	%	3.0	--	--	10
Total BTEX					6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	< 10	500	--	--
Total (of 17) PAHs					100	--	--
pH at 20C	2010	M		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.018	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0004	0.0040	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0050	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0006	0.0061	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.025	4	50	200
Chloride	1220	U	9.9	99	800	15000	25000
Fluoride	1220	U	0.10	1.0	10	150	500
Sulphate	1220	U	12	120	1000	20000	50000
Total Dissolved Solids	1020	N	46	450	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	23

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 129-002870 Grimsby

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-31573						
Chemtest Sample ID:	1705207						
Sample Ref:							
Sample ID:							
Sample Location:	WS04						
Top Depth(m):	0.00						
Bottom Depth(m):	0.40						
Sampling Date:	13-Sep-2023						
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	M	%	52	3	5	6
Loss On Ignition	2610	M	%	7.9	--	--	10
Total BTEX					6	--	--
Total PCBs (7 Congeners)	2815	M	mg/kg	< 0.10	1	--	--
TPH Total WAC	2670	M	mg/kg	[C] 500	500	--	--
Total (of 17) PAHs					100	--	--
pH at 20C	2010	M		8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0030	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0059	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0008	0.0078	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0003	0.0035	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.003	0.032	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.13	1.3	10	150	500
Sulphate	1220	U	5.1	51	1000	20000	50000
Total Dissolved Solids	1020	N	21	210	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	< 2.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	12

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1705185			TP05	13-Sep-2023	C	Plastic Bag
1705194			WS01	13-Sep-2023	C	Plastic Bag
1705196			WS01	13-Sep-2023	C	Plastic Bag
1705203			WS03	13-Feb-2023	B	Amber Glass 250ml
1705203			WS03	13-Feb-2023	B	Amber Glass 60ml
1705203			WS03	13-Feb-2023	B	Plastic Bag
1705207			WS04	13-Sep-2023	C	Plastic Bag

Test Methods

SOP	Title	Parameters included	Method summary
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH at 20°C	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

Test Methods

SOP	Title	Parameters included	Method summary
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35–C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quanitation if present.
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-31838-1
Initial Date of Issue:	19-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Monitoring
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	22-Sep-2023
Order No.:		**Date Instructed:**	22-Sep-2023
No. of Samples:	6		
Turnaround (Wkdays):	5	**Results Due:**	28-Sep-2023
Date Approved:	19-Oct-2023	**Subcon Results Due:**	13-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31838	23-31838	23-31838	23-31838	23-31838	23-31838
Quotation No.:			**Chemtest Sample ID.:**		1706314	1706318	1706320	1706324	1706325	1706326
			Sample Location:		CBR05	CBR07	CBR08	TP08	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.00	0.00	0.50	0.80	2.00
			Bottom Depth (m):		0.40	0.40	0.40			
			Date Sampled:		14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-	-	-	-	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	
Moisture	N	2030	%	0.020	16	17	20	18	22	22
pH at 20C	M	2010		4.0	8.7	8.6	7.7	8.8	8.4	8.5
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	300	310	510	520	430	750
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	2.1	2.1	1.6	1.4	2.0	3.3
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	0.013	0.014	0.025	0.055	0.076	0.16
Total Sulphur	U	2175	%	0.010	0.19	0.040	0.33	0.37	0.021	0.044
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	0.70	0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.5	1.8	2.6	3.0	2.2	2.3
Arsenic	M	2455	mg/kg	0.5	0.8	< 0.5	0.6	2.2	0.7	0.6
Cadmium	M	2455	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	1.9	1.4	1.5	14	7.2	1.5
Copper	M	2455	mg/kg	0.50	0.91	0.76	0.67	6.3	1.4	0.61
Mercury	M	2455	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	M	2455	mg/kg	0.50	2.0	1.3	1.3	4.1	1.5	1.3
Lead	M	2455	mg/kg	0.50	1.2	1.0	1.9	1.5	0.76	0.76
Selenium	M	2455	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Zinc	M	2455	mg/kg	0.50	4.1	3.3	3.6	14	4.1	2.8
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	0.57	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	[C] < 0.10	[C] < 0.10	[C] < 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	[C] < 0.25	[C] < 0.25	[C] < 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	[C] 2.3	[C] < 2.0	[C] 2.3	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	[C] 1.1	[C] 1.3	[C] 1.2	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	[C] < 2.0	[C] < 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	[C] < 3.0	[C] < 3.0	[C] < 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	[C] < 10	[C] < 10	[C] < 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	[C] < 5.0	[C] < 5.0	[C] < 5.0	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	[C] < 10	[C] < 10	[C] < 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	[C] < 0.05	[C] < 0.05	[C] < 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	[C] < 0.25	[C] < 0.25	[C] < 0.25	< 0.25	< 0.25	< 0.25

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31838	23-31838	23-31838	23-31838	23-31838	23-31838
Quotation No.:			**Chemtest Sample ID.:**		1706314	1706318	1706320	1706324	1706325	1706326
			Sample Location:		CBR05	CBR07	CBR08	TP08	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.00	0.00	0.50	0.80	2.00
			Bottom Depth (m):		0.40	0.40	0.40			
			Date Sampled:		14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	[C] < 1.0	[C] < 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	[C] < 1.0	[C] < 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	[C] < 2.0	[C] < 2.0	[C] < 2.0	4.3	5.2	5.0
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	[C] < 2.0	[C] < 2.0	[C] < 2.0	< 2.0	< 2.0	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	[C] < 1.0	[C] < 1.0	[C] < 1.0	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	[C] < 5.0	[C] < 5.0	[C] < 5.0	5.7	5.9	5.6
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	[C] < 10	[C] < 10	[C] < 10	< 10	< 10	< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	[C] < 0.50	[C] < 0.50	[C] < 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	[C] < 10	[C] < 10	[C] < 10	< 10	< 10	< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	[C] < 10	[C] < 10	[C] < 10	< 10	< 10	< 10
Organic Matter	M	2625	%	0.40	1.2	2.6	2.7	45	20	1.2
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.0	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.98	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.78	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	2.7	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.8	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.32	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.49	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.74	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	9.8	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0				< 1.0	< 1.0	
Chloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Bromomethane	M	2760	µg/kg	20				< 20	< 20	
Chloroethane	U	2760	µg/kg	2.0				< 2.0	< 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Dichloromethane	N	2760	µg/kg	50				< 50	< 50	
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,1-Dichloroethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31838	23-31838	23-31838	23-31838	23-31838	23-31838
Quotation No.:			**Chemtest Sample ID.:**		1706314	1706318	1706320	1706324	1706325	1706326
			Sample Location:		CBR05	CBR07	CBR08	TP08	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.00	0.00	0.50	0.80	2.00
			Bottom Depth (m):		0.40	0.40	0.40			
			Date Sampled:		14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0				< 5.0	< 5.0	
Trichloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
Benzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0				< 2.0	< 2.0	
Trichloroethene	N	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Dibromomethane	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0				< 5.0	< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10				< 10	< 10	
Toluene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10				< 10	< 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10				< 10	< 10	
Tetrachloroethene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0				< 2.0	< 2.0	
Dibromochloromethane	U	2760	µg/kg	10				< 10	< 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0				< 5.0	< 5.0	
Chlorobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0				< 2.0	< 2.0	
Ethylbenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Styrene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Tribromomethane	U	2760	µg/kg	1.0				< 1.0	< 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Bromobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50				< 50	< 50	
N-Propylbenzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
1,3-Dichlorobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-31838	23-31838	23-31838	23-31838	23-31838	23-31838
Quotation No.:			**Chemtest Sample ID.:**		1706314	1706318	1706320	1706324	1706325	1706326
			Sample Location:		CBR05	CBR07	CBR08	TP08	TP08	TP08
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.00	0.00	0.00	0.50	0.80	2.00
			Bottom Depth (m):		0.40	0.40	0.40			
			Date Sampled:		14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023	14-Sep-2023
			Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
4-Isopropyltoluene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50				< 50	< 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0				< 1.0	< 1.0	
Hexachlorobutadiene	N	2760	µg/kg	1.0				< 1.0	< 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0				< 2.0	< 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0				< 1.0	< 1.0	
PCB 28	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 52	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 90+101	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 118	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 153	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 138	U	2815	mg/kg	0.010				< 0.010	< 0.010	
PCB 180	U	2815	mg/kg	0.010				< 0.010	< 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10				< 0.10	< 0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
SVOC Subcon	SN		mg/kg	N/A				See Attached	See Attached	

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1706314			CBR05	14-Sep-2023	C	Plastic Tub 1000g
1706318			CBR07	14-Sep-2023	C	Plastic Tub 1000g
1706320			CBR08	14-Sep-2023	C	Plastic Tub 1000g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-33070-1
Initial Date of Issue:	19-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:	Q23-31900	**Date Received:**	03-Oct-2023
Order No.:	##	**Date Instructed:**	03-Oct-2023
No. of Samples:	6		
Turnaround (Wkdays):	5	**Results Due:**	09-Oct-2023
Date Approved:	19-Oct-2023	**Subcon Results Due:**	24-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33070	23-33070	23-33070	23-33070	23-33070	23-33070
Quotation No.: Q23-31900			**Chemtest Sample ID.:**		1711327	1711328	1711331	1711333	1711335	1711338
			Sample Location:		TP11	TP11	TP12	TP12	TP13	TP13
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.35	1.10	0.40	1.60	0.30	3.20
			Date Sampled:		27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
			Asbestos Lab:		DURHAM		DURHAM		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
ACM Type	U	2192		N/A	-		-		-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected		No Asbestos Detected		No Asbestos Detected	
Moisture	N	2030	%	0.020	10	13	10	19	8.4	32
Soil Colour	N	2040		N/A	Brown	Brown	Black	Brown	Brown	Brown
Other Material	N	2040		N/A	Stones and Roots	Stones	Stones	None	Stones	None
Soil Texture	N	2040		N/A	Loam	Clay	Loam	Clay	Loam	Clay
pH at 20C	M	2010		4.0	8.3	8.2	8.0	8.0	8.3	8.1
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	270	840	1500	570	410	2200
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	1.5	1.9	2.7	4.6	1.2	0.52
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	1.2	0.61	1.7	1.7	0.24	0.039
Total Sulphur	U	2175	%	0.010	0.48	0.47	0.93	0.049	0.63	0.35
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	51	17	6.5	7.1	91	94
Arsenic	M	2455	mg/kg	0.5	23	13	15	18	25	13
Cadmium	M	2455	mg/kg	0.10	0.38	0.18	0.26	0.18	0.27	0.23
Chromium	M	2455	mg/kg	0.5	51	29	13	45	33	28
Copper	M	2455	mg/kg	0.50	74	99	32	33	38	38
Mercury	M	2455	mg/kg	0.05	0.22	0.08	0.12	0.15	0.11	0.08
Nickel	M	2455	mg/kg	0.50	36	33	14	41	36	26
Lead	M	2455	mg/kg	0.50	84	64	63	63	40	32
Selenium	M	2455	mg/kg	0.25	1.7	1.0	0.99	1.0	2.7	2.4
Zinc	M	2455	mg/kg	0.50	550	390	97	110	180	170
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	0.11	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0	2.7	< 2.0	8.1	2.1
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0	6.3	< 1.0	7.1	1.7
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0	5.4	< 2.0	9.9	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0	5.3	< 3.0	7.3	4.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0	20	< 5.0	32	7.9
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10	20	< 10	32	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33070	23-33070	23-33070	23-33070	23-33070	23-33070
Quotation No.: Q23-31900			**Chemtest Sample ID.:**		1711327	1711328	1711331	1711333	1711335	1711338
			Sample Location:		TP11	TP11	TP12	TP12	TP13	TP13
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.35	1.10	0.40	1.60	0.30	3.20
			Date Sampled:		27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
			Asbestos Lab:		DURHAM		DURHAM		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	11	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0	44	< 1.0	43	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	23	3.0	120	2.9	65	5.6
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	48	< 2.0	170	< 2.0	98	7.7
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0	2.1	< 1.0	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	71	< 5.0	330	< 5.0	220	13
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	71	< 10	340	< 10	220	13
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	74	< 10	350	< 10	250	21
Total EPH >C10-C40	N	2690	mg/kg	10.00	74	< 10	360	< 10	250	21
Organic Matter	M	2625	%	0.40	16	9.9	78	2.4	26	1.9
Naphthalene	M	2700	mg/kg	0.10	1.7	< 0.10	5.3	< 0.10	3.6	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	1.1	< 0.10	2.0	< 0.10	2.2	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	0.53	< 0.10	1.0	< 0.10	1.0	< 0.10
Fluorene	M	2700	mg/kg	0.10	0.83	< 0.10	2.8	< 0.10	2.2	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	5.1	< 0.10	9.7	< 0.10	8.5	< 0.10
Anthracene	M	2700	mg/kg	0.10	2.8	< 0.10	3.8	< 0.10	4.4	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	22	< 0.10	20	< 0.10	41	< 0.10
Pyrene	M	2700	mg/kg	0.10	24	< 0.10	21	< 0.10	47	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	14	< 0.10	11	< 0.10	29	< 0.10
Chrysene	M	2700	mg/kg	0.10	16	< 0.10	13	< 0.10	32	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	21	< 0.10	16	< 0.10	37	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	8.7	< 0.10	6.9	< 0.10	15	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	15	< 0.10	13	< 0.10	28	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	11	< 0.10	8.9	< 0.10	18	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	3.8	< 0.10	3.1	< 0.10	5.2	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	9.0	< 0.10	8.4	< 0.10	16	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	160	< 2.0	150	< 2.0	290	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0				< 1.0	
Chloromethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Bromomethane	M	2760	µg/kg	20	< 20				< 20	
Chloroethane	U	2760	µg/kg	2.0	< 2.0				< 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Dichloromethane	N	2760	µg/kg	50	< 50				< 50	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33070	23-33070	23-33070	23-33070	23-33070	23-33070
Quotation No.: Q23-31900			**Chemtest Sample ID.:**		1711327	1711328	1711331	1711333	1711335	1711338
			Sample Location:		TP11	TP11	TP12	TP12	TP13	TP13
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.35	1.10	0.40	1.60	0.30	3.20
			Date Sampled:		27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
			Asbestos Lab:		DURHAM		DURHAM		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0				< 5.0	
Trichloromethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
Benzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0				< 2.0	
Trichloroethene	N	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Dibromomethane	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0				< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10				< 10	
Toluene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10				< 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10				< 10	
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0				< 2.0	
Dibromochloromethane	U	2760	µg/kg	10	< 10				< 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0				< 5.0	
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0				< 2.0	
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
o-Xylene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Styrene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Tribromomethane	U	2760	µg/kg	1.0	< 1.0				< 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Bromobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50				< 50	
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33070	23-33070	23-33070	23-33070	23-33070	23-33070
Quotation No.: Q23-31900			**Chemtest Sample ID.:**		1711327	1711328	1711331	1711333	1711335	1711338
			Sample Location:		TP11	TP11	TP12	TP12	TP13	TP13
			Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):		0.35	1.10	0.40	1.60	0.30	3.20
			Date Sampled:		27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
			Asbestos Lab:		DURHAM		DURHAM		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50				< 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0				< 1.0	
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0				< 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0				< 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0				< 1.0	
PCB 28	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 52	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 90+101	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 118	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 153	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 138	U	2815	mg/kg	0.010	< 0.010				< 0.010	
PCB 180	U	2815	mg/kg	0.010	< 0.010				< 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10				< 0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
SVOC Subcon	SN		mg/kg	N/A	See Attached				See Attached	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-33079-1
Initial Date of Issue:	19-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	03-Oct-2023
Order No.:		**Date Instructed:**	03-Oct-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	09-Oct-2023
Date Approved:	19-Oct-2023	**Subcon Results Due:**	24-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33079	23-33079
Quotation No.:		**Chemtest Sample ID.:**			1711378	1711380
		Sample Location:			BH03	BH03
		Sample Type:			SOIL	SOIL
		Top Depth (m):			1.00	3.00
		Date Sampled:			20-Sep-2023	20-Sep-2023
		Asbestos Lab:			DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	
Moisture	N	2030	%	0.020	23	28
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Loam
pH at 20C	M	2010		4.0	8.2	8.7
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	400	860
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	< 0.40	12
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.27
Total Sulphur	U	2175	%	0.010	0.025	0.27
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	4.8	5.1
Arsenic	M	2455	mg/kg	0.5	13	14
Cadmium	M	2455	mg/kg	0.10	< 0.10	< 0.10
Chromium	M	2455	mg/kg	0.5	35	39
Copper	M	2455	mg/kg	0.50	13	18
Mercury	M	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel	M	2455	mg/kg	0.50	34	39
Lead	M	2455	mg/kg	0.50	21	24
Selenium	M	2455	mg/kg	0.25	0.64	0.79
Zinc	M	2455	mg/kg	0.50	73	91
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33079	23-33079
Quotation No.:			**Chemtest Sample ID.:**		1711378	1711380
			Sample Location:		BH03	BH03
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		20-Sep-2023	20-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	5.6	3.8
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	2.2	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	7.7	< 5.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	< 10	< 10
Total EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Organic Matter	M	2625	%	0.40	1.3	1.8
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	
Chloromethane	M	2760	µg/kg	1.0	< 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0	
Bromomethane	M	2760	µg/kg	20	< 20	
Chloroethane	U	2760	µg/kg	2.0	< 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	
Dichloromethane	N	2760	µg/kg	50	< 50	
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33079	23-33079
Quotation No.:			**Chemtest Sample ID.:**		1711378	1711380
			Sample Location:		BH03	BH03
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		20-Sep-2023	20-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0	
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	
Trichloromethane	M	2760	µg/kg	1.0	< 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	
Benzene	M	2760	µg/kg	1.0	< 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0	
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0	
Dibromomethane	M	2760	µg/kg	1.0	< 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	
Toluene	M	2760	µg/kg	1.0	< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10	
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	
Dibromochloromethane	U	2760	µg/kg	10	< 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0	
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0	
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0	< 1.0	
Styrene	M	2760	µg/kg	1.0	< 1.0	
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0	
Bromobenzene	M	2760	µg/kg	1.0	< 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33079	23-33079
Quotation No.:			**Chemtest Sample ID.:**		1711378	1711380
			Sample Location:		BH03	BH03
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		20-Sep-2023	20-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	
PCB 28	U	2815	mg/kg	0.010	< 0.010	
PCB 52	U	2815	mg/kg	0.010	< 0.010	
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	
PCB 118	U	2815	mg/kg	0.010	< 0.010	
PCB 153	U	2815	mg/kg	0.010	< 0.010	
PCB 138	U	2815	mg/kg	0.010	< 0.010	
PCB 180	U	2815	mg/kg	0.010	< 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10
SVOC Subcon	SN		mg/kg	N/A	See Attached	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quanitation if present.

Test Methods

SOP	Title	Parameters included	Method summary
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-33080-1
Initial Date of Issue:	19-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	03-Oct-2023
Order No.:		**Date Instructed:**	03-Oct-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	09-Oct-2023
Date Approved:	19-Oct-2023	**Subcon Results Due:**	24-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33080	23-33080
Quotation No.:		**Chemtest Sample ID.:**			1711387	1711389
		Sample Location:			BH05	BH05
		Sample Type:			SOIL	SOIL
		Top Depth (m):			1.00	3.00
		Date Sampled:			26-Sep-2023	26-Sep-2023
		Asbestos Lab:			DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	
Moisture	N	2030	%	0.020	23	30
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Loam
pH at 20C	M	2010		4.0	8.5	8.3
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	450	2300
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	4.9	4.4
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.43
Total Sulphur	U	2175	%	0.010	0.036	0.38
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.2	680
Arsenic	M	2455	mg/kg	0.5	11	8.8
Cadmium	M	2455	mg/kg	0.10	0.16	< 0.10
Chromium	M	2455	mg/kg	0.5	32	21
Copper	M	2455	mg/kg	0.50	15	12
Mercury	M	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel	M	2455	mg/kg	0.50	31	22
Lead	M	2455	mg/kg	0.50	19	14
Selenium	M	2455	mg/kg	0.25	0.64	0.37
Zinc	M	2455	mg/kg	0.50	68	50
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	< 1.0	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	< 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	< 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	< 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	< 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	< 0.05	< 0.05

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33080	23-33080
Quotation No.:			**Chemtest Sample ID.:**		1711387	1711389
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		26-Sep-2023	26-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	< 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	10	12
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	< 2.0	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	< 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	12	13
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	12	13
Total VPH >C5-C10	U	2780	mg/kg	0.50	< 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	13	14
Total EPH >C10-C40	N	2690	mg/kg	10.00	13	14
Organic Matter	M	2625	%	0.40	1.4	2.1
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	< 1.0	
Chloromethane	M	2760	µg/kg	1.0	< 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0	< 1.0	
Bromomethane	M	2760	µg/kg	20	< 20	
Chloroethane	U	2760	µg/kg	2.0	< 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0	< 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	
Dichloromethane	N	2760	µg/kg	50	< 50	
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33080	23-33080
Quotation No.:			**Chemtest Sample ID.:**		1711387	1711389
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		26-Sep-2023	26-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
1,1-Dichloroethane	M	2760	µg/kg	1.0	< 1.0	
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	< 1.0	
Bromochloromethane	U	2760	µg/kg	5.0	< 5.0	
Trichloromethane	M	2760	µg/kg	1.0	< 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	< 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0	< 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0	< 1.0	
Benzene	M	2760	µg/kg	1.0	< 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0	< 2.0	
Trichloroethene	N	2760	µg/kg	1.0	< 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0	< 1.0	
Dibromomethane	M	2760	µg/kg	1.0	< 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0	< 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	
Toluene	M	2760	µg/kg	1.0	< 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	< 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10	< 10	
Tetrachloroethene	M	2760	µg/kg	1.0	< 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0	< 2.0	
Dibromochloromethane	U	2760	µg/kg	10	< 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0	< 5.0	
Chlorobenzene	M	2760	µg/kg	1.0	< 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	< 2.0	
Ethylbenzene	M	2760	µg/kg	1.0	< 1.0	
m & p-Xylene	M	2760	µg/kg	1.0	< 1.0	
o-Xylene	M	2760	µg/kg	1.0	< 1.0	
Styrene	M	2760	µg/kg	1.0	< 1.0	
Tribromomethane	U	2760	µg/kg	1.0	< 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0	< 1.0	
Bromobenzene	M	2760	µg/kg	1.0	< 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50	< 50	
N-Propylbenzene	U	2760	µg/kg	1.0	< 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0	< 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0	< 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	< 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33080	23-33080
Quotation No.:			**Chemtest Sample ID.:**		1711387	1711389
			Sample Location:		BH05	BH05
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	3.00
			Date Sampled:		26-Sep-2023	26-Sep-2023
			Asbestos Lab:		DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
4-Isopropyltoluene	U	2760	µg/kg	1.0	< 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0	< 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	< 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	< 1.0	
Hexachlorobutadiene	N	2760	µg/kg	1.0	< 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	< 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	< 1.0	
PCB 28	U	2815	mg/kg	0.010	< 0.010	
PCB 52	U	2815	mg/kg	0.010	< 0.010	
PCB 90+101	U	2815	mg/kg	0.010	< 0.010	
PCB 118	U	2815	mg/kg	0.010	< 0.010	
PCB 153	U	2815	mg/kg	0.010	< 0.010	
PCB 138	U	2815	mg/kg	0.010	< 0.010	
PCB 180	U	2815	mg/kg	0.010	< 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	< 0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10
SVOC Subcon	SN		mg/kg	N/A	See Attached	

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quanitation if present.

Test Methods

SOP	Title	Parameters included	Method summary
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-33082-1
Initial Date of Issue:	15-Nov-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	03-Oct-2023
Order No.:		**Date Instructed:**	03-Oct-2023
No. of Samples:	2		
Turnaround (Wkdays):	5	**Results Due:**	09-Oct-2023
Date Approved:	15-Nov-2023	**Subcon Results Due:**	24-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33082	23-33082
Quotation No.:		**Chemtest Sample ID.:**			1711398	1711403
		Sample Location:			BH04	BH04
		Sample Type:			SOIL	SOIL
		Top Depth (m):			1.00	6.00
		Date Sampled:			25-Sep-2023	25-Sep-2023
		Asbestos Lab:			DURHAM	IN-TRAN-D
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
ACM Type	U	2192		N/A	-	
Asbestos Identification	U	2192		N/A	No Asbestos Detected	
Moisture	N	2030	%	0.020	15	25
Soil Colour	N	2040		N/A	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones
Soil Texture	N	2040		N/A	Loam	Loam
pH at 20C	M	2010		4.0	8.7	8.8
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	200	2000
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	9.7	4.3
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	< 0.010	0.22
Total Sulphur	U	2175	%	0.010	0.027	0.46
Cyanide (Total)	M	2300	mg/kg	0.50	< 0.50	< 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	3.9	45
Arsenic	M	2455	mg/kg	0.5	19	17
Cadmium	M	2455	mg/kg	0.10	< 0.10	0.13
Chromium	M	2455	mg/kg	0.5	41	41
Copper	M	2455	mg/kg	0.50	17	19
Mercury	M	2455	mg/kg	0.05	< 0.05	< 0.05
Nickel	M	2455	mg/kg	0.50	38	43
Lead	M	2455	mg/kg	0.50	23	24
Selenium	M	2455	mg/kg	0.25	0.63	0.83
Zinc	M	2455	mg/kg	0.50	89	95
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	[C] < 0.10	< 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	[C] < 0.25	< 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	[C] < 2.0	< 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	[C] < 1.0	< 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	[C] < 2.0	< 2.0
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	[C] < 3.0	< 3.0
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	[C] < 10	< 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	[C] < 5.0	< 5.0
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	[C] < 10	< 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33082	23-33082
Quotation No.:			**Chemtest Sample ID.:**		1711398	1711403
			Sample Location:		BH04	BH04
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	6.00
			Date Sampled:		25-Sep-2023	25-Sep-2023
			Asbestos Lab:		DURHAM	IN-TRAN-D
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	[C] < 0.05	< 0.05
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	[C] < 0.25	< 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	[C] < 1.0	< 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	[C] < 1.0	< 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	[C] 9.1	11
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	[C] < 2.0	< 2.0
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	[C] < 1.0	< 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	[C] 10	12
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	[C] 10	12
Total VPH >C5-C10	U	2780	mg/kg	0.50	[C] < 0.50	< 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	[C] 11	13
Total EPH >C10-C40	N	2690	mg/kg	10.00	[C] 11	13
Organic Matter	M	2625	%	0.40	1.4	2.0
Naphthalene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Acenaphthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluorene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Phenanthrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Chrysene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	< 0.10	< 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	< 2.0	< 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	[C] < 1.0	
Chloromethane	M	2760	µg/kg	1.0	[C] < 1.0	
Vinyl Chloride	M	2760	µg/kg	1.0	[C] < 1.0	
Bromomethane	M	2760	µg/kg	20	[C] < 20	
Chloroethane	U	2760	µg/kg	2.0	[C] < 2.0	
Trichlorofluoromethane	M	2760	µg/kg	1.0	[C] < 1.0	
1,1-Dichloroethene	M	2760	µg/kg	1.0	[C] < 1.0	
Dichloromethane	N	2760	µg/kg	50	[C] < 50	
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	[C] < 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33082	23-33082
Quotation No.:			**Chemtest Sample ID.:**		1711398	1711403
			Sample Location:		BH04	BH04
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	6.00
			Date Sampled:		25-Sep-2023	25-Sep-2023
			Asbestos Lab:		DURHAM	IN-TRAN-D
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
1,1-Dichloroethane	M	2760	µg/kg	1.0	[C] < 1.0	
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	[C] < 1.0	
Bromochloromethane	U	2760	µg/kg	5.0	[C] < 5.0	
Trichloromethane	M	2760	µg/kg	1.0	[C] < 1.0	
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	[C] < 1.0	
Tetrachloromethane	M	2760	µg/kg	1.0	[C] < 1.0	
1,1-Dichloropropene	U	2760	µg/kg	1.0	[C] < 1.0	
Benzene	M	2760	µg/kg	1.0	[C] < 1.0	
1,2-Dichloroethane	M	2760	µg/kg	2.0	[C] < 2.0	
Trichloroethene	N	2760	µg/kg	1.0	[C] < 1.0	
1,2-Dichloropropane	M	2760	µg/kg	1.0	[C] < 1.0	
Dibromomethane	M	2760	µg/kg	1.0	[C] < 1.0	
Bromodichloromethane	M	2760	µg/kg	5.0	[C] < 5.0	
cis-1,3-Dichloropropene	N	2760	µg/kg	10	[C] < 10	
Toluene	M	2760	µg/kg	1.0	[C] < 1.0	
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	[C] < 10	
1,1,2-Trichloroethane	M	2760	µg/kg	10	[C] < 10	
Tetrachloroethene	M	2760	µg/kg	1.0	[C] < 1.0	
1,3-Dichloropropane	U	2760	µg/kg	2.0	[C] < 2.0	
Dibromochloromethane	U	2760	µg/kg	10	[C] < 10	
1,2-Dibromoethane	M	2760	µg/kg	5.0	[C] < 5.0	
Chlorobenzene	M	2760	µg/kg	1.0	[C] < 1.0	
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	[C] < 2.0	
Ethylbenzene	M	2760	µg/kg	1.0	[C] < 1.0	
m & p-Xylene	M	2760	µg/kg	1.0	[C] < 1.0	
o-Xylene	M	2760	µg/kg	1.0	[C] < 1.0	
Styrene	M	2760	µg/kg	1.0	[C] < 1.0	
Tribromomethane	U	2760	µg/kg	1.0	[C] < 1.0	
Isopropylbenzene	M	2760	µg/kg	1.0	[C] < 1.0	
Bromobenzene	M	2760	µg/kg	1.0	[C] < 1.0	
1,2,3-Trichloropropane	N	2760	µg/kg	50	[C] < 50	
N-Propylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	
2-Chlorotoluene	M	2760	µg/kg	1.0	[C] < 1.0	
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	[C] < 1.0	
4-Chlorotoluene	U	2760	µg/kg	1.0	[C] < 1.0	
Tert-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	[C] < 1.0	
Sec-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	[C] < 1.0	

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33082	23-33082
Quotation No.:			**Chemtest Sample ID.:**		1711398	1711403
			Sample Location:		BH04	BH04
			Sample Type:		SOIL	SOIL
			Top Depth (m):		1.00	6.00
			Date Sampled:		25-Sep-2023	25-Sep-2023
			Asbestos Lab:		DURHAM	IN-TRAN-D
Determinand	**Accred.**	**SOP**	**Units**	**LOD**		
4-Isopropyltoluene	U	2760	µg/kg	1.0	[C] < 1.0	
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	[C] < 1.0	
N-Butylbenzene	U	2760	µg/kg	1.0	[C] < 1.0	
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	[C] < 1.0	
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	[C] < 50	
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	[C] < 1.0	
Hexachlorobutadiene	N	2760	µg/kg	1.0	[C] < 1.0	
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	[C] < 2.0	
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	[C] < 1.0	
PCB 28	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 52	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 101	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 118	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 153	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 138	U	2815	mg/kg	0.010	[C] < 0.010	
PCB 180	U	2815	mg/kg	0.010	[C] < 0.010	
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	[C] < 0.10	
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1711398			BH04	25-Sep-2023	C	Plastic Tub 1000g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2810	Polychlorinated Biphenyls (PCB) as Aroclors in Soils by GC-ECD	Polychlorinated Biphenyls expressed as an Aroclor (normally reported as *Aroclor 1242)	Extraction of a soil sample, as received, into hexane/acetone (50:50) followed by gas chromatography (GC) using mass spectrometric (MS) detection for identification of polychlorinated biphenyls and electron capture detection (ECD) for quanitation if present.

Test Methods

SOP	Title	Parameters included	Method summary
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-33083-1
Initial Date of Issue:	19-Oct-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	03-Oct-2023
Order No.:		**Date Instructed:**	03-Oct-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	09-Oct-2023
Date Approved:	19-Oct-2023	**Subcon Results Due:**	24-Oct-2023

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33083	23-33083	23-33083
Quotation No.:		**Chemtest Sample ID.:**			1711407	1711408	1711410
			Sample Location:		TP09	TP09	TP09
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	3.00
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type	U	2192		N/A	Fibres/Clumps	Fibres/Clumps	
Asbestos Identification	U	2192		N/A	Chrysotile Crocidolite	Chrysotile	
Moisture	N	2030	%	0.020	11	16	32
Soil Colour	N	2040		N/A	Black	Brown	Brown
Other Material	N	2040		N/A	Stones	Stones	None
Soil Texture	N	2040		N/A	Loam	Clay	Clay
pH at 20C	M	2010		4.0	[A] 7.4	[A] 8.2	[A] 8.6
Electrical Conductivity (2:1)	N	2020	µS/cm	1.0	[A] 960	[A] 1000	[A] 800
Boron (Hot Water Soluble)	M	2120	mg/kg	0.40	[A] 0.94	[A] 1.8	[A] < 0.40
Sulphate (2:1 Water Soluble) as SO4	M	2120	g/l	0.010	[A] 0.41	[A] 0.34	[A] 0.066
Total Sulphur	U	2175	%	0.010	[A] 0.45	[A] 0.19	[A] 0.061
Cyanide (Total)	M	2300	mg/kg	0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 31	[A] 74	[A] 61
Arsenic	M	2455	mg/kg	0.5	12	20	18
Cadmium	M	2455	mg/kg	0.10	0.28	0.16	0.10
Chromium	M	2455	mg/kg	0.5	24	40	43
Copper	M	2455	mg/kg	0.50	120	99	17
Mercury	M	2455	mg/kg	0.05	0.05	< 0.05	< 0.05
Nickel	M	2455	mg/kg	0.50	27	50	35
Lead	M	2455	mg/kg	0.50	29	33	25
Selenium	M	2455	mg/kg	0.25	0.63	1.1	1.0
Zinc	M	2455	mg/kg	0.50	390	95	71
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05
Aliphatic VPH >C6-C7	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05
Aliphatic VPH >C7-C8	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05
Aliphatic VPH >C6-C8 (Sum)	N	2780	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Aliphatic VPH >C8-C10	U	2780	mg/kg	0.05	[A] 0.12	[A] < 0.05	[A] < 0.05
Total Aliphatic VPH >C5-C10	U	2780	mg/kg	0.25	[A] < 0.25	[A] < 0.25	[A] < 0.25
Aliphatic EPH >C10-C12	M	2690	mg/kg	2.00	[A] 5.1	[A] < 2.0	[A] < 2.0
Aliphatic EPH >C12-C16	M	2690	mg/kg	1.00	[A] 12	[A] < 1.0	[A] < 1.0
Aliphatic EPH >C16-C21	M	2690	mg/kg	2.00	[A] 12	[A] 10	[A] 3.9
Aliphatic EPH >C21-C35	M	2690	mg/kg	3.00	[A] 7.2	[A] 3.3	[A] 5.1
Aliphatic EPH >C35-C40	N	2690	mg/kg	10.00	[A] < 10	[A] 11	[A] < 10
Total Aliphatic EPH >C10-C35	M	2690	mg/kg	5.00	[A] 36	[A] 14	[A] 10
Total Aliphatic EPH >C10-C40	N	2690	mg/kg	10.00	[A] 36	[A] 25	[A] 10
Aromatic VPH >C5-C7	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05
Aromatic VPH >C7-C8	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05
Aromatic VPH >C8-C10	U	2780	mg/kg	0.05	[A] < 0.05	[A] < 0.05	[A] < 0.05

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33083	23-33083	23-33083
Quotation No.:		**Chemtest Sample ID.:**			1711407	1711408	1711410
			Sample Location:		TP09	TP09	TP09
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	3.00
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Total Aromatic VPH >C5-C10	U	2780	mg/kg	0.25	[A] < 0.25	[A] < 0.25	[A] < 0.25
Aromatic EPH >C10-C12	U	2690	mg/kg	1.00	[A] 2.6	[A] < 1.0	[A] < 1.0
Aromatic EPH >C12-C16	U	2690	mg/kg	1.00	[A] 18	[A] < 1.0	[A] < 1.0
Aromatic EPH >C16-C21	U	2690	mg/kg	2.00	[A] 35	[A] 4.9	[A] 3.7
Aromatic EPH >C21-C35	U	2690	mg/kg	2.00	[A] 7.5	[A] 2.2	[A] 3.3
Aromatic EPH >C35-C40	N	2690	mg/kg	1.00	[A] < 1.0	[A] < 1.0	[A] < 1.0
Total Aromatic EPH >C10-C35	U	2690	mg/kg	5.00	[A] 63	[A] 7.1	[A] 7.0
Total Aromatic EPH >C10-C40	N	2690	mg/kg	10.00	[A] 63	[A] < 10	[A] < 10
Total VPH >C5-C10	U	2780	mg/kg	0.50	[A] < 0.50	[A] < 0.50	[A] < 0.50
Total EPH >C10-C35	U	2690	mg/kg	10.00	[A] 100	[A] 21	[A] 17
Total EPH >C10-C40	N	2690	mg/kg	10.00	[A] 100	[A] 32	[A] 17
Organic Matter	M	2625	%	0.40	[A] 60	[A] 1.8	[A] 2.3
Naphthalene	M	2700	mg/kg	0.10	[A] 13	[A] < 0.10	[A] < 0.10
Acenaphthylene	M	2700	mg/kg	0.10	[A] 1.5	[A] < 0.10	[A] < 0.10
Acenaphthene	M	2700	mg/kg	0.10	[A] 1.2	[A] < 0.10	[A] < 0.10
Fluorene	M	2700	mg/kg	0.10	[A] 3.3	[A] < 0.10	[A] < 0.10
Phenanthrene	M	2700	mg/kg	0.10	[A] 3.6	[A] < 0.10	[A] < 0.10
Anthracene	M	2700	mg/kg	0.10	[A] 0.55	[A] < 0.10	[A] < 0.10
Fluoranthene	M	2700	mg/kg	0.10	[A] 2.3	[A] < 0.10	[A] < 0.10
Pyrene	M	2700	mg/kg	0.10	[A] 2.8	[A] < 0.10	[A] < 0.10
Benzo[a]anthracene	M	2700	mg/kg	0.10	[A] 1.1	[A] < 0.10	[A] < 0.10
Chrysene	M	2700	mg/kg	0.10	[A] 1.5	[A] < 0.10	[A] < 0.10
Benzo[b]fluoranthene	M	2700	mg/kg	0.10	[A] 1.3	[A] < 0.10	[A] < 0.10
Benzo[k]fluoranthene	M	2700	mg/kg	0.10	[A] 1.5	[A] < 0.10	[A] < 0.10
Benzo[a]pyrene	M	2700	mg/kg	0.10	[A] 0.87	[A] < 0.10	[A] < 0.10
Indeno(1,2,3-c,d)Pyrene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Dibenz(a,h)Anthracene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Benzo[g,h,i]perylene	M	2700	mg/kg	0.10	[A] < 0.10	[A] < 0.10	[A] < 0.10
Total Of 16 PAH's	M	2700	mg/kg	2.0	[A] 35	[A] < 2.0	[A] < 2.0
Dichlorodifluoromethane	U	2760	µg/kg	1.0	[A] < 1.0		
Chloromethane	M	2760	µg/kg	1.0	[A] < 1.0		
Vinyl Chloride	M	2760	µg/kg	1.0	[A] < 1.0		
Bromomethane	M	2760	µg/kg	20	[A] < 20		
Chloroethane	U	2760	µg/kg	2.0	[A] < 2.0		
Trichlorofluoromethane	M	2760	µg/kg	1.0	[A] < 1.0		
1,1-Dichloroethene	M	2760	µg/kg	1.0	[A] < 1.0		
Dichloromethane	N	2760	µg/kg	50	[A] < 50		
Trans 1,2-Dichloroethene	M	2760	µg/kg	1.0	[A] < 1.0		
1,1-Dichloroethane	M	2760	µg/kg	1.0	[A] < 1.0		
cis 1,2-Dichloroethene	M	2760	µg/kg	1.0	[A] < 1.0		

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-33083	23-33083	23-33083
Quotation No.:			**Chemtest Sample ID.:**		1711407	1711408	1711410
			Sample Location:		TP09	TP09	TP09
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	3.00
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Bromochloromethane	U	2760	µg/kg	5.0	[A] < 5.0		
Trichloromethane	M	2760	µg/kg	1.0	[A] < 1.0		
1,1,1-Trichloroethane	M	2760	µg/kg	1.0	[A] < 1.0		
Tetrachloromethane	M	2760	µg/kg	1.0	[A] < 1.0		
1,1-Dichloropropene	U	2760	µg/kg	1.0	[A] < 1.0		
Benzene	M	2760	µg/kg	1.0	[A] < 1.0		
1,2-Dichloroethane	M	2760	µg/kg	2.0	[A] < 2.0		
Trichloroethene	N	2760	µg/kg	1.0	[A] < 1.0		
1,2-Dichloropropane	M	2760	µg/kg	1.0	[A] < 1.0		
Dibromomethane	M	2760	µg/kg	1.0	[A] < 1.0		
Bromodichloromethane	M	2760	µg/kg	5.0	[A] < 5.0		
cis-1,3-Dichloropropene	N	2760	µg/kg	10	[A] < 10		
Toluene	M	2760	µg/kg	1.0	[A] < 1.0		
Trans-1,3-Dichloropropene	N	2760	µg/kg	10	[A] < 10		
1,1,2-Trichloroethane	M	2760	µg/kg	10	[A] < 10		
Tetrachloroethene	M	2760	µg/kg	1.0	[A] < 1.0		
1,3-Dichloropropane	U	2760	µg/kg	2.0	[A] < 2.0		
Dibromochloromethane	U	2760	µg/kg	10	[A] < 10		
1,2-Dibromoethane	M	2760	µg/kg	5.0	[A] < 5.0		
Chlorobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
1,1,1,2-Tetrachloroethane	M	2760	µg/kg	2.0	[A] < 2.0		
Ethylbenzene	M	2760	µg/kg	1.0	[A] < 1.0		
m & p-Xylene	M	2760	µg/kg	1.0	[A] < 1.0		
o-Xylene	M	2760	µg/kg	1.0	[A] < 1.0		
Styrene	M	2760	µg/kg	1.0	[A] < 1.0		
Tribromomethane	U	2760	µg/kg	1.0	[A] < 1.0		
Isopropylbenzene	M	2760	µg/kg	1.0	[A] < 1.0		
Bromobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
1,2,3-Trichloropropane	N	2760	µg/kg	50	[A] < 50		
N-Propylbenzene	U	2760	µg/kg	1.0	[A] < 1.0		
2-Chlorotoluene	M	2760	µg/kg	1.0	[A] < 1.0		
1,3,5-Trimethylbenzene	M	2760	µg/kg	1.0	[A] < 1.0		
4-Chlorotoluene	U	2760	µg/kg	1.0	[A] < 1.0		
Tert-Butylbenzene	U	2760	µg/kg	1.0	[A] < 1.0		
1,2,4-Trimethylbenzene	M	2760	µg/kg	1.0	[A] < 1.0		
Sec-Butylbenzene	U	2760	µg/kg	1.0	[A] < 1.0		
1,3-Dichlorobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
4-Isopropyltoluene	U	2760	µg/kg	1.0	[A] < 1.0		
1,4-Dichlorobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
N-Butylbenzene	U	2760	µg/kg	1.0	[A] < 1.0		

Results - Soil

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd		**Chemtest Job No.:**			23-33083	23-33083	23-33083
Quotation No.:		**Chemtest Sample ID.:**			1711407	1711408	1711410
			Sample Location:		TP09	TP09	TP09
			Sample Type:		SOIL	SOIL	SOIL
			Top Depth (m):		0.40	1.00	3.00
			Asbestos Lab:		DURHAM	DURHAM	
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
1,2-Dichlorobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
1,2-Dibromo-3-Chloropropane	U	2760	µg/kg	50	[A] < 50		
1,2,4-Trichlorobenzene	M	2760	µg/kg	1.0	[A] < 1.0		
Hexachlorobutadiene	N	2760	µg/kg	1.0	[A] < 1.0		
1,2,3-Trichlorobenzene	U	2760	µg/kg	2.0	[A] < 2.0		
Methyl Tert-Butyl Ether	M	2760	µg/kg	1.0	[A] < 1.0		
PCB 28	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 52	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 90+101	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 118	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 153	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 138	U	2815	mg/kg	0.010	[A] < 0.010		
PCB 180	U	2815	mg/kg	0.010	[A] < 0.010		
Total PCBs (7 Congeners)	U	2815	mg/kg	0.10	[A] < 0.10		
Total Phenols	M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10
SVOC Subcon	SN		mg/kg	N/A	See Attached		

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1711407			TP09		A	Amber Glass 250ml
1711407			TP09		A	Amber Glass 60ml
1711407			TP09		A	Plastic Tub 1000g
1711408			TP09		A	Amber Glass 250ml
1711408			TP09		A	Amber Glass 60ml
1711408			TP09		A	Plastic Tub 1000g
1711410			TP09		A	Amber Glass 250ml
1711410			TP09		A	Amber Glass 60ml
1711410			TP09		A	Plastic Tub 1000g

Test Methods

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH at 20°C	pH Meter
2020	Electrical Conductivity	Electrical conductivity (EC) of aqueous extract or calcium sulphate solution for topsoil	Measurement of the electrical resistance of a 2:1 water/soil extract.
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N–dimethyl-p-phenylenediamine.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

ANALYTICAL TEST REPORT

Contract no: 127416-14-15

Contract name: SVOC Testing

Client reference: -

Clients name: Chemtest Eurofins

Clients address: 11 Depot Road
Newmarket
CB8 0AL

Samples received: 11 October 2023

Analysis started: 11 October 2023

Analysis completed: 17 October 2023

Report issued: 17 October 2023

Key

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

Approved by: E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127416-14	127416-15
Sample id			1711327	1711335
Depth (m)			-	-
Date sampled			03/10/2023	10/09/2023
Test	**Method**	**Units**		
Semi-volatiles				
N-Nitrosodimethylamine	CE189	mg/kg	<0.01	<0.01
Phenol	CE189	mg/kg	<0.01	<0.01
Bis(2-chloroethyl)ether	CE189	mg/kg	<0.01	<0.01
2-Chlorophenol	CE189	mg/kg	<0.01	<0.01
1,3-Dichlorobenzene	CE189	mg/kg	<0.01	<0.01
1,4-Dichlorobenzene	CE189	mg/kg	<0.01	<0.01
2-Methylphenol	CE189	mg/kg	<0.01	<0.01
1,2-Dichlorobenzene	CE189	mg/kg	<0.01	<0.01
Bis(2-chloroisopropyl)ether	CE189	mg/kg	<0.01	<0.01
3&4-Methylphenol	CE189	mg/kg	<0.01	<0.01
N-Nitrosodi-n-propylamine	CE189	mg/kg	<0.01	<0.01
Hexachloroethane	CE189	mg/kg	<0.01	<0.01
Nitrobenzene	CE189	mg/kg	<0.01	<0.01
Isophorone	CE189	mg/kg	<0.01	<0.01
2,4-Dimethylphenol	CE189	mg/kg	<0.01	<0.01
2-Nitrophenol	CE189	mg/kg	<0.01	<0.01
Bis(2-chloroethoxy)methane	CE189	mg/kg	<0.01	<0.01
2,4-Dichlorophenol	CE189	mg/kg	<0.01	<0.01
1,2,4-Trichlorobenzene	CE189	mg/kg	<0.01	<0.01
4-Chloroaniline	CE189	mg/kg	<0.01	<0.01
Hexachlorobutadiene	CE189	mg/kg	<0.01	<0.01
4-Chloro-3-methylphenol	CE189	mg/kg	<0.01	<0.01
2-Methylnaphthalene	CE189	mg/kg	<0.01	<0.01
1-Methylnaphthalene	CE189	mg/kg	<0.01	3.0
Hexachlorocyclopentadiene	CE189	mg/kg	<0.01	<0.01
2,4,6-Trichlorophenol	CE189	mg/kg	<0.01	<0.01
2,4,5-Trichlorophenol	CE189	mg/kg	<0.01	<0.01
2-Chloronaphthalene	CE189	mg/kg	<0.01	<0.01
2-Nitroaniline	CE189	mg/kg	<0.01	<0.01
Dimethyl phthalate	CE189	mg/kg	<0.01	<0.01
2,6-Dinitrotoluene	CE189	mg/kg	<0.01	<0.01
3-Nitroaniline	CE189	mg/kg	<0.01	<0.01
2,4-Dinitrophenol	CE189	mg/kg	<0.01	<0.01
4-Nitrophenol	CE189	mg/kg	<0.01	<0.01
2,4-Dinitrotoluene	CE189	mg/kg	<0.01	<0.01
Dibenzofuran	CE189	mg/kg	0.5	0.9
Diethyl phthalate	CE189	mg/kg	<0.01	<0.01
4-Chlorophenylphenyl ether	CE189	mg/kg	<0.01	<0.01
4-Nitroaniline	CE189	mg/kg	<0.01	<0.01
2-Methyl-4,6-dinitrophenol	CE189	mg/kg	<0.01	<0.01

Chemtech Environmental Limited

SOILS

Lab number			127416-14	127416-15
Sample id			1711327	1711335
Depth (m)			-	-
Date sampled			03/10/2023	10/09/2023
Test	**Method**	**Units**		
Azobenzene	CE189	mg/kg	<0.01	<0.01
4-Bromophenylphenyl ether	CE189	mg/kg	<0.01	<0.01
Hexachlorobenzene	CE189	mg/kg	<0.01	<0.01
Pentachlorophenol	CE189	mg/kg	<0.01	<0.01
Carbazole	CE189	mg/kg	<0.01	<0.01
Di-n-butyl phthalate	CE189	mg/kg	<0.01	<0.01
Butylbenzyl phthalate	CE189	mg/kg	<0.01	<0.01
Bis(2-ethylhexyl)phthalate	CE189	mg/kg	<0.01	<0.01
Di-n-octyl phthalate	CE189	mg/kg	<0.01	<0.01

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	N-Nitrosodimethylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Phenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,3-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,4-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroisopropyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3&4-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	N-Nitrosodi-n-propylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachloroethane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Nitrobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Isophorone	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dimethylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethoxy)methane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2,4-Trichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobutadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloro-3-methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorocyclopentadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,6-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,5-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chloronaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dimethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,6-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dibenzofuran	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Diethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chlorophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methyl-4,6-dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Azobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Bromophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Pentachlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	Carbazole	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-butyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Butylbenzyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-ethylhexyl)phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-octyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127416-14	1711327	-	N	
127416-15	1711335	-	Y	SVOC (EHT)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

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

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

Methods, procedures and performance data are available on request.

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

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

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

ANALYTICAL TEST REPORT

Contract no: 127416-16

Contract name: SVOC Testing

Client reference: -

Clients name: Chemtest Eurofins

Clients address: 11 Depot Road
Newmarket
CB8 0AL

Samples received: 11 October 2023

Analysis started: 11 October 2023

Analysis completed: 17 October 2023

Report issued: 17 October 2023

Key

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

Approved by: E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127416-16
Sample id			1711378
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Semi-volatiles			
N-Nitrosodimethylamine	CE189	mg/kg	<0.01
Phenol	CE189	mg/kg	<0.01
Bis(2-chloroethyl)ether	CE189	mg/kg	<0.01
2-Chlorophenol	CE189	mg/kg	<0.01
1,3-Dichlorobenzene	CE189	mg/kg	<0.01
1,4-Dichlorobenzene	CE189	mg/kg	<0.01
2-Methylphenol	CE189	mg/kg	<0.01
1,2-Dichlorobenzene	CE189	mg/kg	<0.01
Bis(2-chloroisopropyl)ether	CE189	mg/kg	<0.01
3&4-Methylphenol	CE189	mg/kg	<0.01
N-Nitrosodi-n-propylamine	CE189	mg/kg	<0.01
Hexachloroethane	CE189	mg/kg	<0.01
Nitrobenzene	CE189	mg/kg	<0.01
Isophorone	CE189	mg/kg	<0.01
2,4-Dimethylphenol	CE189	mg/kg	<0.01
2-Nitrophenol	CE189	mg/kg	<0.01
Bis(2-chloroethoxy)methane	CE189	mg/kg	<0.01
2,4-Dichlorophenol	CE189	mg/kg	<0.01
1,2,4-Trichlorobenzene	CE189	mg/kg	<0.01
4-Chloroaniline	CE189	mg/kg	<0.01
Hexachlorobutadiene	CE189	mg/kg	<0.01
4-Chloro-3-methylphenol	CE189	mg/kg	<0.01
2-Methylnaphthalene	CE189	mg/kg	<0.01
1-Methylnaphthalene	CE189	mg/kg	<0.01
Hexachlorocyclopentadiene	CE189	mg/kg	<0.01
2,4,6-Trichlorophenol	CE189	mg/kg	<0.01
2,4,5-Trichlorophenol	CE189	mg/kg	<0.01
2-Chloronaphthalene	CE189	mg/kg	<0.01
2-Nitroaniline	CE189	mg/kg	<0.01
Dimethyl phthalate	CE189	mg/kg	<0.01
2,6-Dinitrotoluene	CE189	mg/kg	<0.01
3-Nitroaniline	CE189	mg/kg	<0.01
2,4-Dinitrophenol	CE189	mg/kg	<0.01
4-Nitrophenol	CE189	mg/kg	<0.01
2,4-Dinitrotoluene	CE189	mg/kg	<0.01
Dibenzofuran	CE189	mg/kg	<0.01
Diethyl phthalate	CE189	mg/kg	<0.01
4-Chlorophenylphenyl ether	CE189	mg/kg	<0.01
4-Nitroaniline	CE189	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	CE189	mg/kg	<0.01

Chemtech Environmental Limited

SOILS

Lab number			127416-16
Sample id			1711378
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Azobenzene	CE189	mg/kg	<0.01
4-Bromophenylphenyl ether	CE189	mg/kg	<0.01
Hexachlorobenzene	CE189	mg/kg	<0.01
Pentachlorophenol	CE189	mg/kg	<0.01
Carbazole	CE189	mg/kg	<0.01
Di-n-butyl phthalate	CE189	mg/kg	<0.01
Butylbenzyl phthalate	CE189	mg/kg	<0.01
Bis(2-ethylhexyl)phthalate	CE189	mg/kg	<0.01
Di-n-octyl phthalate	CE189	mg/kg	<0.01

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	N-Nitrosodimethylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Phenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,3-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,4-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroisopropyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3&4-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	N-Nitrosodi-n-propylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachloroethane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Nitrobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Isophorone	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dimethylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethoxy)methane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2,4-Trichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobutadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloro-3-methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorocyclopentadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,6-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,5-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chloronaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dimethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,6-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dibenzofuran	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Diethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chlorophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methyl-4,6-dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Azobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Bromophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Pentachlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	Carbazole	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-butyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Butylbenzyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-ethylhexyl)phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-octyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127416-16	1711378	-	Y	SVOC (EHT)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

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

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

Methods, procedures and performance data are available on request.

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

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

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

ANALYTICAL TEST REPORT

Contract no: 127416-17

Contract name: SVOC Testing

Client reference: -

Clients name: Chemtest Eurofins

Clients address: 11 Depot Road
Newmarket
CB8 0AL

Samples received: 11 October 2023

Analysis started: 11 October 2023

Analysis completed: 17 October 2023

Report issued: 17 October 2023

Key

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

Approved by: E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127416-17
Sample id			1711387
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Semi-volatiles			
N-Nitrosodimethylamine	CE189	mg/kg	<0.01
Phenol	CE189	mg/kg	<0.01
Bis(2-chloroethyl)ether	CE189	mg/kg	<0.01
2-Chlorophenol	CE189	mg/kg	<0.01
1,3-Dichlorobenzene	CE189	mg/kg	<0.01
1,4-Dichlorobenzene	CE189	mg/kg	<0.01
2-Methylphenol	CE189	mg/kg	<0.01
1,2-Dichlorobenzene	CE189	mg/kg	<0.01
Bis(2-chloroisopropyl)ether	CE189	mg/kg	<0.01
3&4-Methylphenol	CE189	mg/kg	<0.01
N-Nitrosodi-n-propylamine	CE189	mg/kg	<0.01
Hexachloroethane	CE189	mg/kg	<0.01
Nitrobenzene	CE189	mg/kg	<0.01
Isophorone	CE189	mg/kg	<0.01
2,4-Dimethylphenol	CE189	mg/kg	<0.01
2-Nitrophenol	CE189	mg/kg	<0.01
Bis(2-chloroethoxy)methane	CE189	mg/kg	<0.01
2,4-Dichlorophenol	CE189	mg/kg	<0.01
1,2,4-Trichlorobenzene	CE189	mg/kg	<0.01
4-Chloroaniline	CE189	mg/kg	<0.01
Hexachlorobutadiene	CE189	mg/kg	<0.01
4-Chloro-3-methylphenol	CE189	mg/kg	<0.01
2-Methylnaphthalene	CE189	mg/kg	<0.01
1-Methylnaphthalene	CE189	mg/kg	<0.01
Hexachlorocyclopentadiene	CE189	mg/kg	<0.01
2,4,6-Trichlorophenol	CE189	mg/kg	<0.01
2,4,5-Trichlorophenol	CE189	mg/kg	<0.01
2-Chloronaphthalene	CE189	mg/kg	<0.01
2-Nitroaniline	CE189	mg/kg	<0.01
Dimethyl phthalate	CE189	mg/kg	<0.01
2,6-Dinitrotoluene	CE189	mg/kg	<0.01
3-Nitroaniline	CE189	mg/kg	<0.01
2,4-Dinitrophenol	CE189	mg/kg	<0.01
4-Nitrophenol	CE189	mg/kg	<0.01
2,4-Dinitrotoluene	CE189	mg/kg	<0.01
Dibenzofuran	CE189	mg/kg	<0.01
Diethyl phthalate	CE189	mg/kg	<0.01
4-Chlorophenylphenyl ether	CE189	mg/kg	<0.01
4-Nitroaniline	CE189	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	CE189	mg/kg	<0.01

Chemtech Environmental Limited

SOILS

Lab number			127416-17
Sample id			1711387
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Azobenzene	CE189	mg/kg	<0.01
4-Bromophenylphenyl ether	CE189	mg/kg	<0.01
Hexachlorobenzene	CE189	mg/kg	<0.01
Pentachlorophenol	CE189	mg/kg	<0.01
Carbazole	CE189	mg/kg	<0.01
Di-n-butyl phthalate	CE189	mg/kg	<0.01
Butylbenzyl phthalate	CE189	mg/kg	<0.01
Bis(2-ethylhexyl)phthalate	CE189	mg/kg	<0.01
Di-n-octyl phthalate	CE189	mg/kg	<0.01

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	N-Nitrosodimethylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Phenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,3-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,4-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroisopropyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3&4-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	N-Nitrosodi-n-propylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachloroethane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Nitrobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Isophorone	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dimethylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethoxy)methane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2,4-Trichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobutadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloro-3-methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorocyclopentadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,6-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,5-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chloronaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dimethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,6-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dibenzofuran	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Diethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chlorophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methyl-4,6-dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Azobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Bromophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Pentachlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	Carbazole	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-butyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Butylbenzyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-ethylhexyl)phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-octyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments
Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.
For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.
Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127416-17	1711387	-	Y	SVOC (EHT)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

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

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

Methods, procedures and performance data are available on request.

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

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Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

ANALYTICAL TEST REPORT

Contract no: 127416-18

Contract name: SVOC Testing

Client reference: -

Clients name: Chemtest Eurofins

Clients address: 11 Depot Road
Newmarket
CB8 0AL

Samples received: 11 October 2023

Analysis started: 11 October 2023

Analysis completed: 17 October 2023

Report issued: 17 October 2023

Key

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

Approved by: E. McCulloch

Ellis McCulloch
Senior Reporting Administrator

Chemtech Environmental Limited

SOILS

Lab number			127416-18
Sample id			1711407
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Semi-volatiles			
N-Nitrosodimethylamine	CE189	mg/kg	<0.01
Phenol	CE189	mg/kg	<0.01
Bis(2-chloroethyl)ether	CE189	mg/kg	<0.01
2-Chlorophenol	CE189	mg/kg	<0.01
1,3-Dichlorobenzene	CE189	mg/kg	<0.01
1,4-Dichlorobenzene	CE189	mg/kg	<0.01
2-Methylphenol	CE189	mg/kg	<0.01
1,2-Dichlorobenzene	CE189	mg/kg	<0.01
Bis(2-chloroisopropyl)ether	CE189	mg/kg	<0.01
3&4-Methylphenol	CE189	mg/kg	<0.01
N-Nitrosodi-n-propylamine	CE189	mg/kg	<0.01
Hexachloroethane	CE189	mg/kg	<0.01
Nitrobenzene	CE189	mg/kg	<0.01
Isophorone	CE189	mg/kg	<0.01
2,4-Dimethylphenol	CE189	mg/kg	<0.01
2-Nitrophenol	CE189	mg/kg	<0.01
Bis(2-chloroethoxy)methane	CE189	mg/kg	<0.01
2,4-Dichlorophenol	CE189	mg/kg	<0.01
1,2,4-Trichlorobenzene	CE189	mg/kg	<0.01
4-Chloroaniline	CE189	mg/kg	<0.01
Hexachlorobutadiene	CE189	mg/kg	<0.01
4-Chloro-3-methylphenol	CE189	mg/kg	<0.01
2-Methylnaphthalene	CE189	mg/kg	<0.01
1-Methylnaphthalene	CE189	mg/kg	1.7
Hexachlorocyclopentadiene	CE189	mg/kg	<0.01
2,4,6-Trichlorophenol	CE189	mg/kg	<0.01
2,4,5-Trichlorophenol	CE189	mg/kg	<0.01
2-Chloronaphthalene	CE189	mg/kg	<0.01
2-Nitroaniline	CE189	mg/kg	<0.01
Dimethyl phthalate	CE189	mg/kg	<0.01
2,6-Dinitrotoluene	CE189	mg/kg	<0.01
3-Nitroaniline	CE189	mg/kg	<0.01
2,4-Dinitrophenol	CE189	mg/kg	<0.01
4-Nitrophenol	CE189	mg/kg	<0.01
2,4-Dinitrotoluene	CE189	mg/kg	<0.01
Dibenzofuran	CE189	mg/kg	<0.01
Diethyl phthalate	CE189	mg/kg	<0.01
4-Chlorophenylphenyl ether	CE189	mg/kg	<0.01
4-Nitroaniline	CE189	mg/kg	<0.01
2-Methyl-4,6-dinitrophenol	CE189	mg/kg	<0.01

Chemtech Environmental Limited

SOILS

Lab number			127416-18
Sample id			1711407
Depth (m)			-
Date sampled			10/09/2023
Test	**Method**	**Units**	
Azobenzene	CE189	mg/kg	<0.01
4-Bromophenylphenyl ether	CE189	mg/kg	<0.01
Hexachlorobenzene	CE189	mg/kg	<0.01
Pentachlorophenol	CE189	mg/kg	<0.01
Carbazole	CE189	mg/kg	<0.01
Di-n-butyl phthalate	CE189	mg/kg	<0.01
Butylbenzyl phthalate	CE189	mg/kg	<0.01
Bis(2-ethylhexyl)phthalate	CE189	mg/kg	<0.01
Di-n-octyl phthalate	CE189	mg/kg	<0.01

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	N-Nitrosodimethylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Phenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,3-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,4-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2-Dichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroisopropyl)ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3&4-Methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	N-Nitrosodi-n-propylamine	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachloroethane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Nitrobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Isophorone	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dimethylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-chloroethoxy)methane	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1,2,4-Trichlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobutadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chloro-3-methylphenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	1-Methylnaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorocyclopentadiene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,6-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4,5-Trichlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Chloronaphthalene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dimethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,6-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	3-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2,4-Dinitrotoluene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Dibenzofuran	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Diethyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Chlorophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Nitroaniline	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	2-Methyl-4,6-dinitrophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Azobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	4-Bromophenylphenyl ether	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Hexachlorobenzene	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Pentachlorophenol	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE189	Carbazole	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-butyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Butylbenzyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Bis(2-ethylhexyl)phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg
CE189	Di-n-octyl phthalate	Solvent extraction, GC-MS	As received		0.1	mg/kg

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

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

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

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
127416-18	1711407	-	Y	SVOC (EHT)

Chemtech Environmental Limited

ADDITIONAL INFORMATION

Notes

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

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

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

Methods, procedures and performance data are available on request.

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

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Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Moisture Content Calculated on a Wet Weight basis

Client	GRG	Client Ref	
Job Name	Grimsby	Mayer Ref	129-002870
Report Date	12 October 2023	Suite	LF1
Sample Date	13 September 2023	Lab Ref	23-31573

Leachability Testing		WS02 2-3m (brown clay)		Threshold Inert		Threshold SNRHW		Threshold Haz Waste LF	
BS EN 12457-3 at L/S 10 1 kg-1				mg/kg		mg/kg		mg/kg	
Arsenic (As)	mg/kg	0.004		0.5		2		25	
Barium (Ba)	mg/kg	<0.05		20		100		300	
Cadmium (Cd)	mg/kg	< 0.0011		0.04		1		5	
Chromium (Cr)	mg/kg	<0.005		0.5		10		70	
Copper (Cu)	mg/kg	<0.005		2		50		100	
Mercury (Hg)	mg/kg	< 0.00050		0.01		0.2		2	
Molybdenum (Mo)	mg/kg	0.0061		0.5		10		30	
Nickel (Ni)	mg/kg	< 0.0050		0.4		10		40	
Lead (Pb)	mg/kg	< 0.0050		0.5		10		50	
Antimony (Sb)	mg/kg	< 0.0050		0.06		0.7		5	
Selenium (Se)	mg/kg	< 0.0050		0.1		0.5		7	
Zinc (Zn)	mg/kg	< 0.025		4		50		200	
Chloride (Cl)	mg/kg	99		800		15000		25000	
Fluoride (F)	mg/kg	1.0		10		150		500	
Sulphate (SO_4)	mg/kg	120		1,000		20,000		50,000	
Total Dissolved Solids (TDS)	mg/kg	450		4,000		60,000		100,000	
Total Phenols	mg/kg	< 0.30		1		n/a		n/a	
Dissolved Organic Carbon (DOC)	mg/kg	<50		500		800		1000	

				Threshold Inert		Threshold SNRHW		Threshold Haz Waste LF	
Additional Total Parameters				units defined		units defined		units defined	
Loss on Ignition (LOI)	%	3.0		n/a		n/a		10 +	
pH	units	8.2		n/a		>6		n/a	
Total Organic Carbon (TOC)	%C	1.2		3%		5%		6% +	
Acid Neutralisation Capacity to pH 7	mol/kg	0.018		n/a		to be evaluated		to be evaluated	
BTEX	mg/kg	<0.001		6 mg/kg		n/a		n/a	
Mineral Oil	mg/kg	<0.001		500 mg/kg		n/a		n/a	
Total PAHs (sum WAC 17)	mg/kg	<2		100 mg/kg		n/a		n/a	
PCBs (7 congeners)	mg/kg	<0.10		1 mg/kg		n/a		n/a	

SNRHW	Granular stable non-reactive hazardous waste and non hazardous waste deposited in the same cell as such waste
+	TOC OR LOI may be used for Haz Waste

Value in excess of threshold

Value within threshold

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LRQA CERTIFIED ISO 9001 · ISO 14001 ISO 45001
UKAS MANAGEMENT SYSTEMS 0001

Client	GRG	Client Ref	
Job Name	Grimsby	Mayer Ref	129-002870
Report Date	12 October 2023	Suite	LF1
Sample Date	13 September 2023	Lab Ref	23-31573

Leachability Testing	WS04 0-0.4 (topsoil)		Threshold Inert		Threshold SNRHW		Threshold Haz Waste LF	
BS EN 12457-3 at L/S 10 1 kg-1			mg/kg		mg/kg		mg/kg	
Arsenic (As)	mg/kg	0.0059	0.5		2		25	
Barium (Ba)	mg/kg	< 0.050	20		100		300	
Cadmium (Cd)	mg/kg	< 0.0011	0.04		1		5	
Chromium (Cr)	mg/kg	<0.005	0.5		10		70	
Copper (Cu)	mg/kg	0.0078	2		50		100	
Mercury (Hg)	mg/kg	< 0.000050	0.01		0.2		2	
Molybdenum (Mo)	mg/kg	0.0035	0.5		10		30	
Nickel (Ni)	mg/kg	< 0.0050	0.4		10		40	
Lead (Pb)	mg/kg	< 0.0050	0.5		10		50	
Antimony (Sb)	mg/kg	< 0.0050	0.06		0.7		5	
Selenium (Se)	mg/kg	< 0.0050	0.1		0.5		7	
Zinc (Zn)	mg/kg	0.032	4		50		200	
Chloride (Cl)	mg/kg	<10	800		15000		25000	
Fluoride (F)	mg/kg	1.3	10		150		500	
Sulphate (SO_4)	mg/kg	51	1,000		20,000		50,000	
Total Dissolved Solids (TDS)	mg/kg	210	4,000		60,000		100,000	
Total Phenols	mg/kg	< 0.30	1		n/a		n/a	
Dissolved Organic Carbon (DOC)	mg/kg	< 50	500		800		1000	

			Threshold Inert		Threshold SNRHW		Threshold Haz Waste LF	
Additional Total Parameters			units defined		units defined		units defined	
Loss on Ignition (LOI)	%	7.9	n/a		n/a		10 +	
pH	units	8	n/a		>6		n/a	
Total Organic Carbon (TOC)	%C	52	3%		5%		6% +	
Acid Neutralisation Capacity to pH 7	mol/kg	0.003	n/a		to be evaluated		to be evaluated	
BTEX	mg/kg	0.087	6 mg/kg		n/a		n/a	
Mineral Oil	mg/kg	0.59	500 mg/kg		n/a		n/a	
Total PAHs (sum WAC 17)	mg/kg	38	100 mg/kg		n/a		n/a	
PCBs (7 congeners)	mg/kg	<0.1	1 mg/kg		n/a		n/a	

SNRHW	Granular stable non-reactive hazardous waste and non hazardous waste deposited in the same cell as such waste
+	TOC OR LOI may be used for Haz Waste

Value in excess of threshold

Value within threshold

Transport Avenue, Brentford, Middlesex TW8 9HA
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Appendix I

Analytical Data Certificates – Groundwater

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-36693-1
Initial Date of Issue:	08-Nov-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	Rebecca Beddard
Project	129-002870 Grimsby HTI

Quotation No.:		**Date Received:**	02-Nov-2023
Order No.:	129005520	**Date Instructed:**	02-Nov-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	08-Nov-2023
Date Approved:	08-Nov-2023		

Approved By:

Details: Stuart Henderson, Technical Manager

Results - Water

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-36693	23-36693	23-36693
Quotation No.:			**Chemtest Sample ID.:**		1725965	1725966	1725967
			Sample Location:		BH01	BH03	BH05
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		30-Oct-2023	30-Oct-2023	30-Oct-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
pH at 20C	U	1010		N/A	8.8	8.8	8.3
Electrical Conductivity at 25C	U	1020	µS/cm	1.0	2600	3500	6500
Chemical Oxygen Demand	U	1100	mg O2/l	10	50	39	130
Alkalinity (Total)	U	1220	mg/l	10	760	780	760
Ammonia (Free)	N	1220	mg/l	0.050	1.0	1.4	0.75
Nitrate as NO3	U	1220	mg/l	0.50	0.73	< 0.50	< 0.50
Phosphate	U	1220	mg/l	0.200	< 0.20	< 0.20	< 0.20
Sulphate	U	1220	mg/l	1.0	90	140	42
Cyanide (Total)	U	1300	mg/l	0.050	< 0.050	< 0.050	0.14
Sulphide	U	1325	mg/l	0.050	[B] < 0.050	[B] < 0.050	[B] < 0.050
Arsenic (Dissolved)	U	1455	µg/l	0.20	4.8	5.8	5.6
Boron (Dissolved)	U	1455	µg/l	10.0	790	1500	1900
Cadmium (Dissolved)	U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Iron (Dissolved)	N	1455	µg/l	5.0	700	36	360
Mercury (Dissolved)	U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05
Manganese (Dissolved)	U	1455	µg/l	0.50	300	300	770
Nickel (Dissolved)	U	1455	µg/l	0.50	8.6	3.3	1.3
Lead (Dissolved)	U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)	U	1455	µg/l	0.50	0.82	0.54	1.3
Zinc (Dissolved)	U	1455	µg/l	2.5	< 2.5	< 2.5	< 2.5
Aliphatic TPH >C5-C6	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	N	1675	µg/l	10	< 10	< 10	< 10

Results - Water

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-36693	23-36693	23-36693
Quotation No.:			**Chemtest Sample ID.:**		1725965	1725966	1725967
			Sample Location:		BH01	BH03	BH05
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		30-Oct-2023	30-Oct-2023	30-Oct-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Dichlorodifluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Chloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromomethane	U	1760	µg/l	5	< 5	< 5	< 5
Chloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	U	1760	µg/l	5	< 5	< 5	< 5
Trichloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Benzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Trichloroethene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	U	1760	µg/l	10	< 10	< 10	< 10
Bromodichloromethane	U	1760	µg/l	5	< 5	< 5	< 5
cis-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
Toluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene	N	1760	µg/l	10	< 10	< 10	< 10
1,1,2-Trichloroethane	U	1760	µg/l	10	< 10	< 10	< 10
Tetrachloroethene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane	U	1760	µg/l	10	< 10	< 10	< 10
1,2-Dibromoethane	U	1760	µg/l	5	< 5	< 5	< 5
Chlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Styrene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tribromomethane	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	N	1760	µg/l	50	< 50	< 50	< 50
N-Propylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-36693	23-36693	23-36693
Quotation No.:			**Chemtest Sample ID.:**		1725965	1725966	1725967
			Sample Location:		BH01	BH03	BH05
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		30-Oct-2023	30-Oct-2023	30-Oct-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
1,3,5-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane	U	1760	µg/l	50	< 50	< 50	< 50
1,2,4-Trichlorobenzene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether	N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Isophorone	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Naphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorocyclopentadiene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 129-002870 Grimsby HTI

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-36693	23-36693	23-36693
Quotation No.:			**Chemtest Sample ID.:**		1725965	1725966	1725967
			Sample Location:		BH01	BH03	BH05
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		30-Oct-2023	30-Oct-2023	30-Oct-2023
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
2,4,5-Trichlorophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluorene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene	N	1790	µg/l	0.50	< 0.50	2.9	2.0
Anthracene	N	1790	µg/l	0.50	< 0.50	0.87	0.53
Carbazole	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene	N	1790	µg/l	0.50	< 0.50	4.4	3.1
Pyrene	N	1790	µg/l	0.50	< 0.50	3.6	2.8
Butylbenzyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene	N	1790	µg/l	0.50	< 0.50	1.1	0.82
Chrysene	N	1790	µg/l	0.50	< 0.50	1.3	0.80
Bis(2-Ethylhexyl)Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol	N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Total Phenols	U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1725965			BH01	30-Oct-2023	B	Coloured Winchester 1000ml
1725965			BH01	30-Oct-2023	B	EPA Vial 40ml
1725966			BH03	30-Oct-2023	B	Coloured Winchester 1000ml
1725966			BH03	30-Oct-2023	B	EPA Vial 40ml
1725967			BH05	30-Oct-2023	B	Coloured Winchester 1000ml
1725967			BH05	30-Oct-2023	B	EPA Vial 40ml

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH at 20°C	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

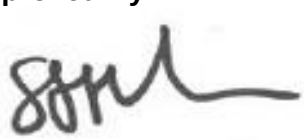
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	23-38552-1
Initial Date of Issue:	24-Nov-2023
Re-Issue Details:	
Client	Mayer Environmental Ltd
Client Address:	Transport Avenue Brentford TW8 9HA
Contact(s):	rebecca.beddard@mayer-enviro.com; landquality@mayer-enviro.com; monitoring@mayer-enviro.com
Project	129-002870 Grimsby HTI Dissolved Gas

Quotation No.:	Q23-33078	**Date Received:**	20-Nov-2023
Order No.:	129005572	**Date Instructed:**	20-Nov-2023
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	24-Nov-2023
Date Approved:	24-Nov-2023		

Approved By:



Details: Stuart Henderson, Technical Manager

Results - Water

Project: 129-002870 Grimsby HTI Dissolved Gas

Client: Mayer Environmental Ltd			**Chemtest Job No.:**		23-38552	23-38552	23-38552
Quotation No.: Q23-33078			**Chemtest Sample ID.:**		1733718	1733719	1733720
Order No.: 129005572			Client Sample Ref.:		1	2	3
			Client Sample ID.:		BH01	BH03	BH05
			Sample Location:		BH01	BH03	BH05
			Sample Type:		WATER	WATER	WATER
			Date Sampled:		16-Nov-2023	16-Nov-2023	16-Nov-2023
			Time Sampled:		12:00	12:00	12:00
Determinand	**Accred.**	**SOP**	**Units**	**LOD**			
Dissolved Methane	N	1630	mg/l	0.050	9.2	9.9	9.3

Report Information

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Sample Deviation Codes

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Sample Retention and Disposal

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Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix J

Analytical Data Certificates – Geotechnical

4041

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

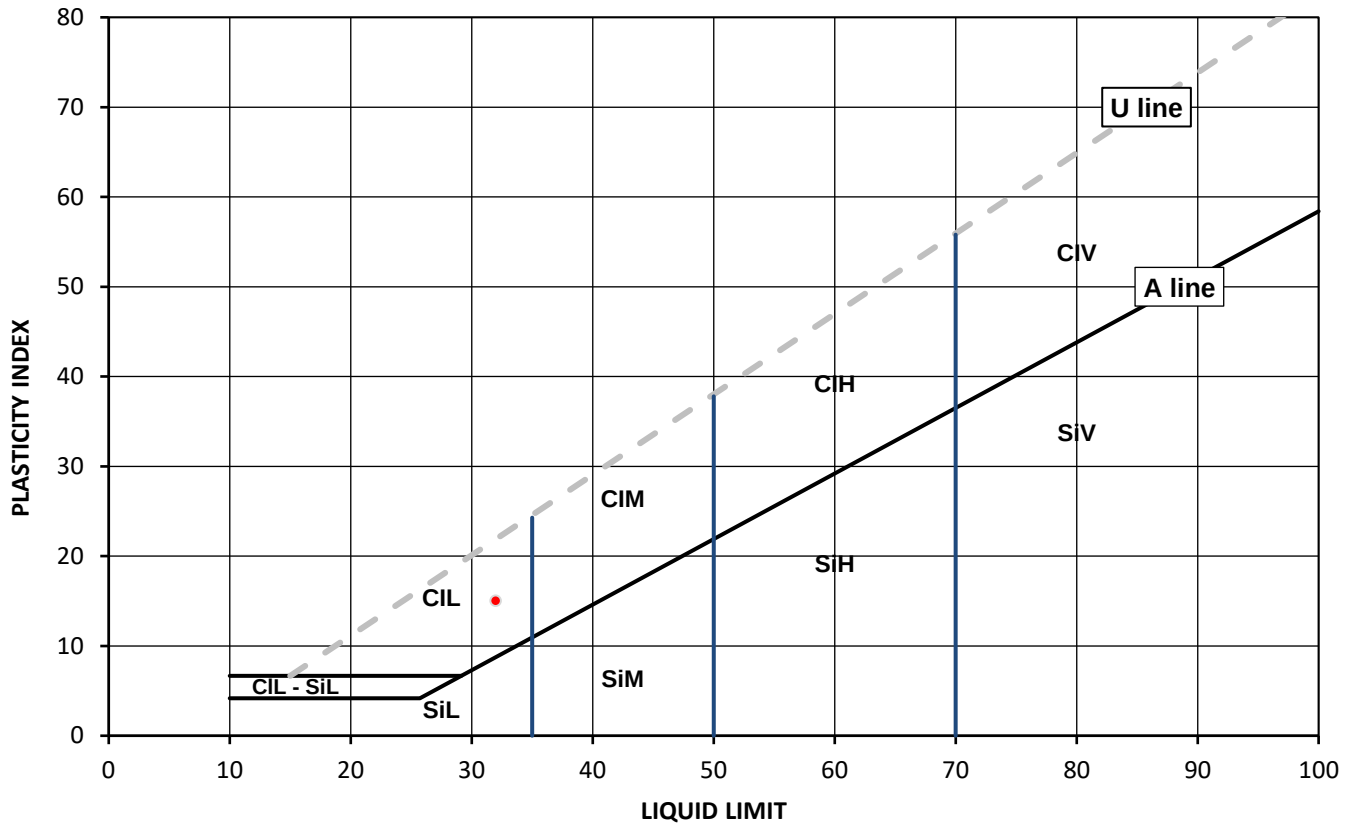
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839707	Depth Top [m]:	9.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown very sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
18	32	17	15	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

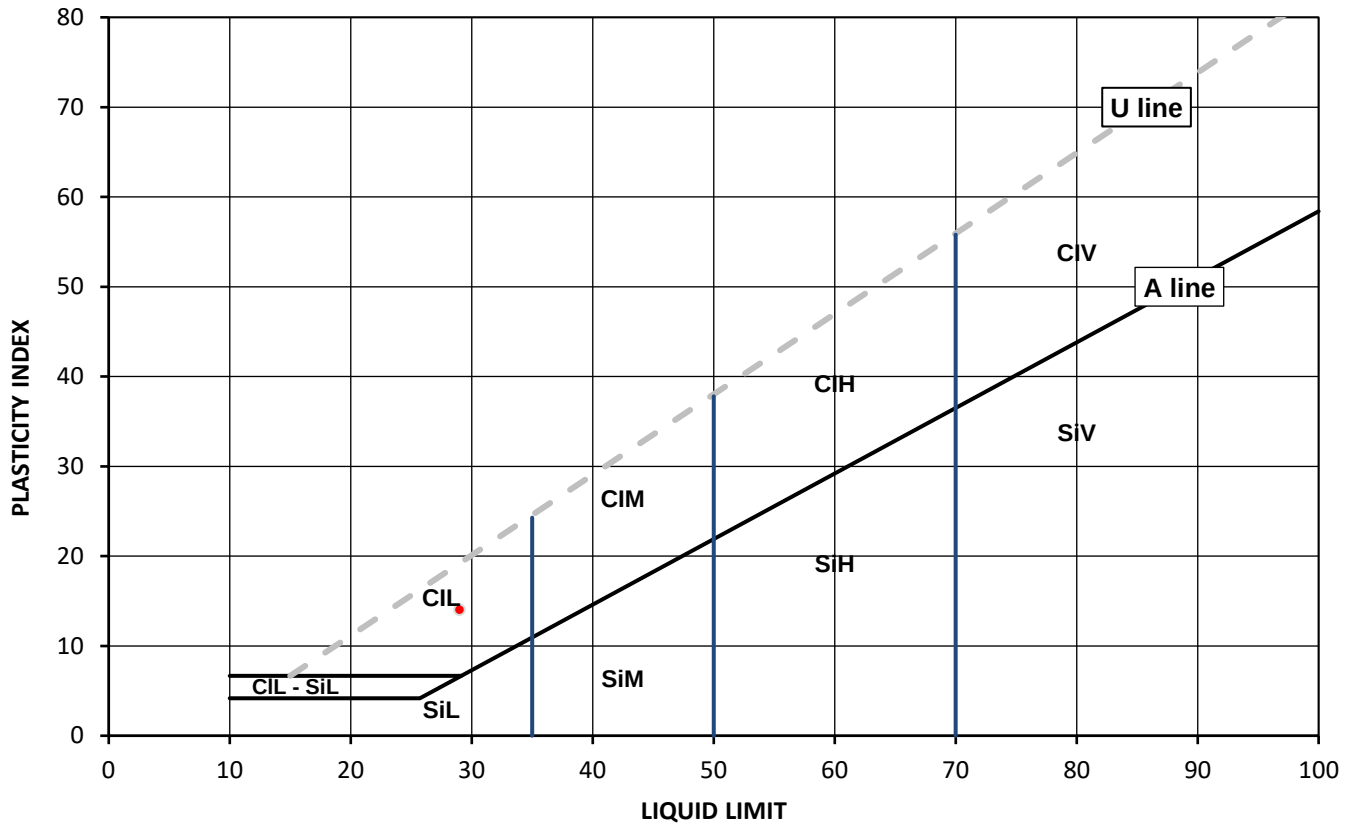
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839709	Depth Top [m]:	12.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	29	15	14	89



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

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Cl	Clay	L	Low	below 35
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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

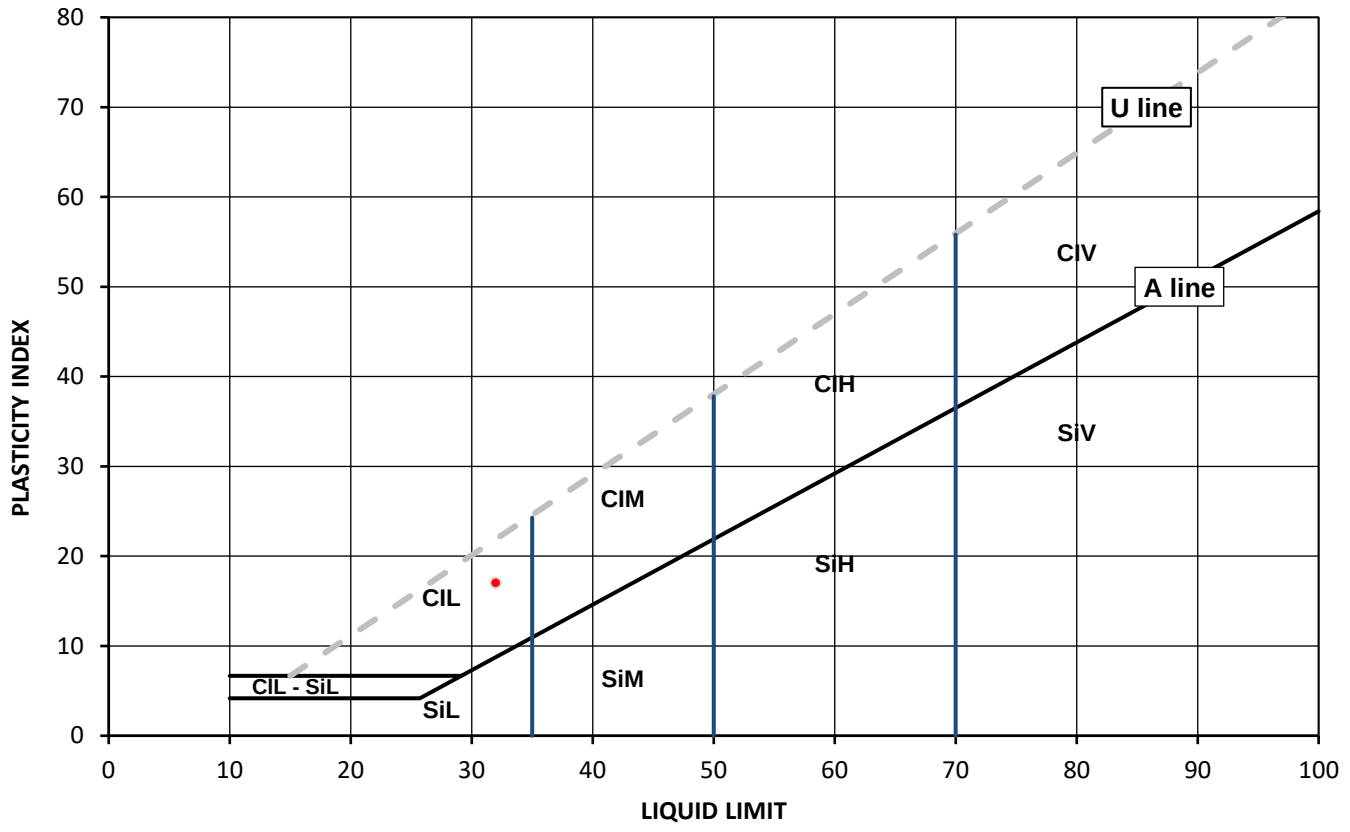
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839711	Depth Top [m]:	15.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
15	32	15	17	88



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
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		V	Very high	exceeding 70
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Note: Water Content by BS 1377-2: 1990: Clause 3.2

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Brackmills Industrial Estate
Northampton NN4 7EB

4041

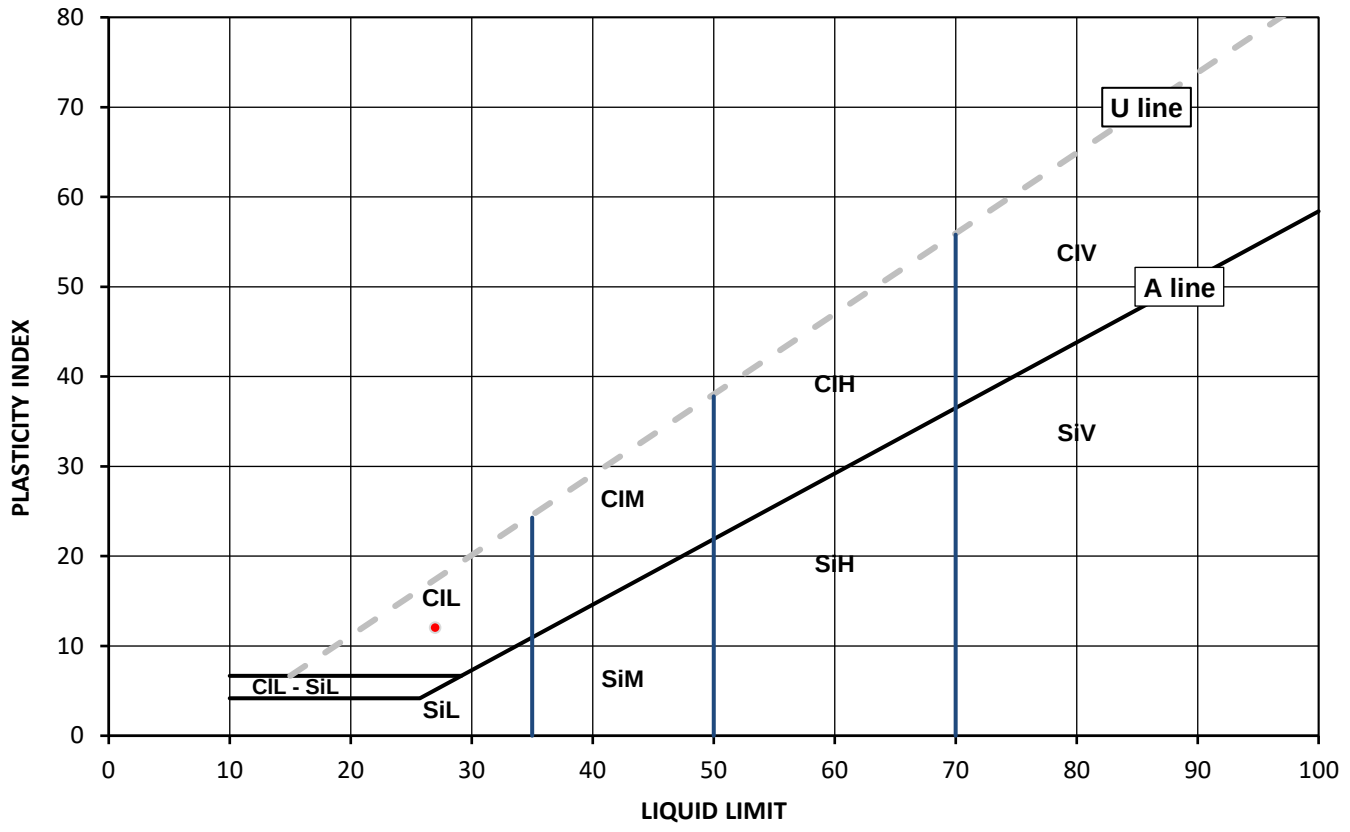
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839713	Depth Top [m]:	10.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
15	27	15	12	85



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

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Cl	Clay	L	Low	below 35
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Brackmills Industrial Estate
Northampton NN4 7EB

4041

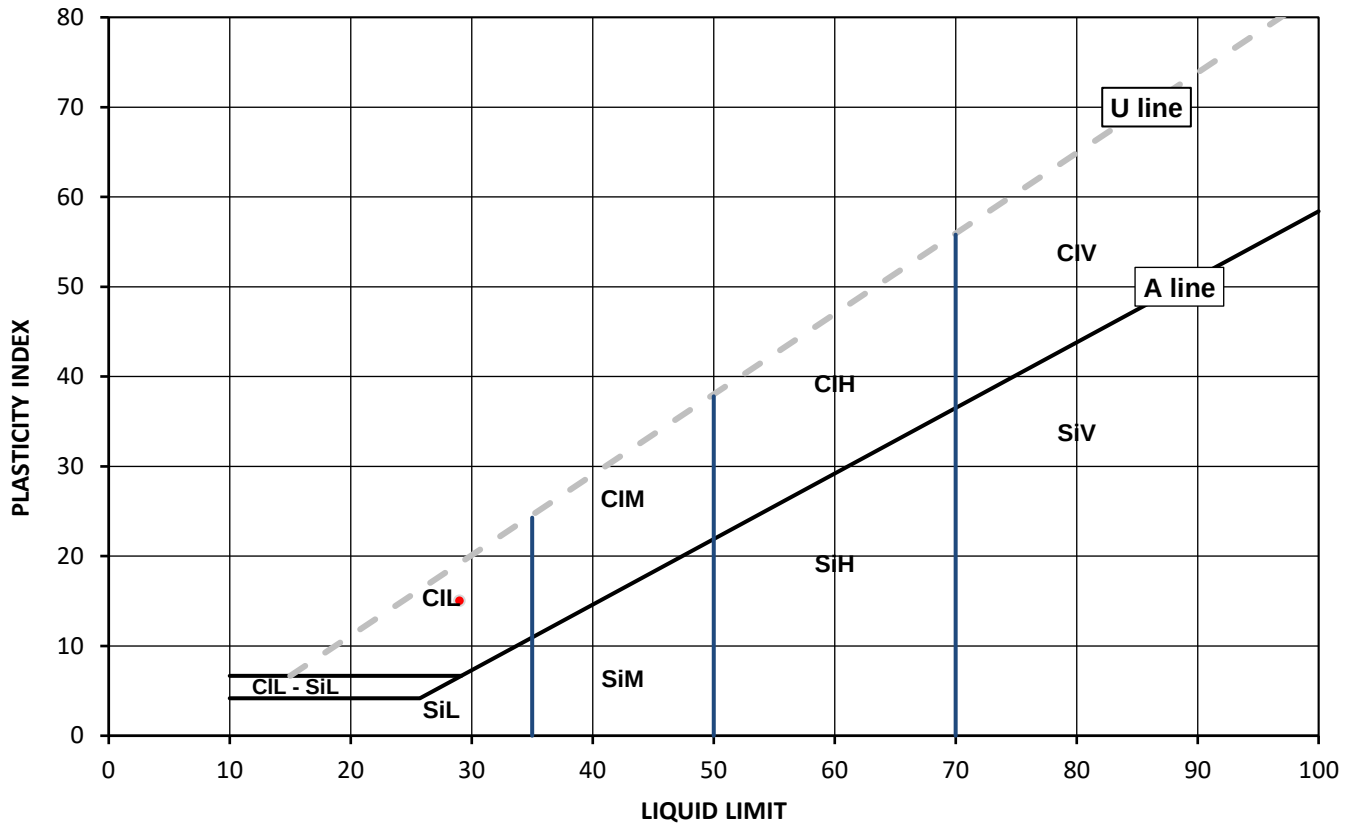
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839715	Depth Top [m]:	14.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
22	29	14	15	88



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		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
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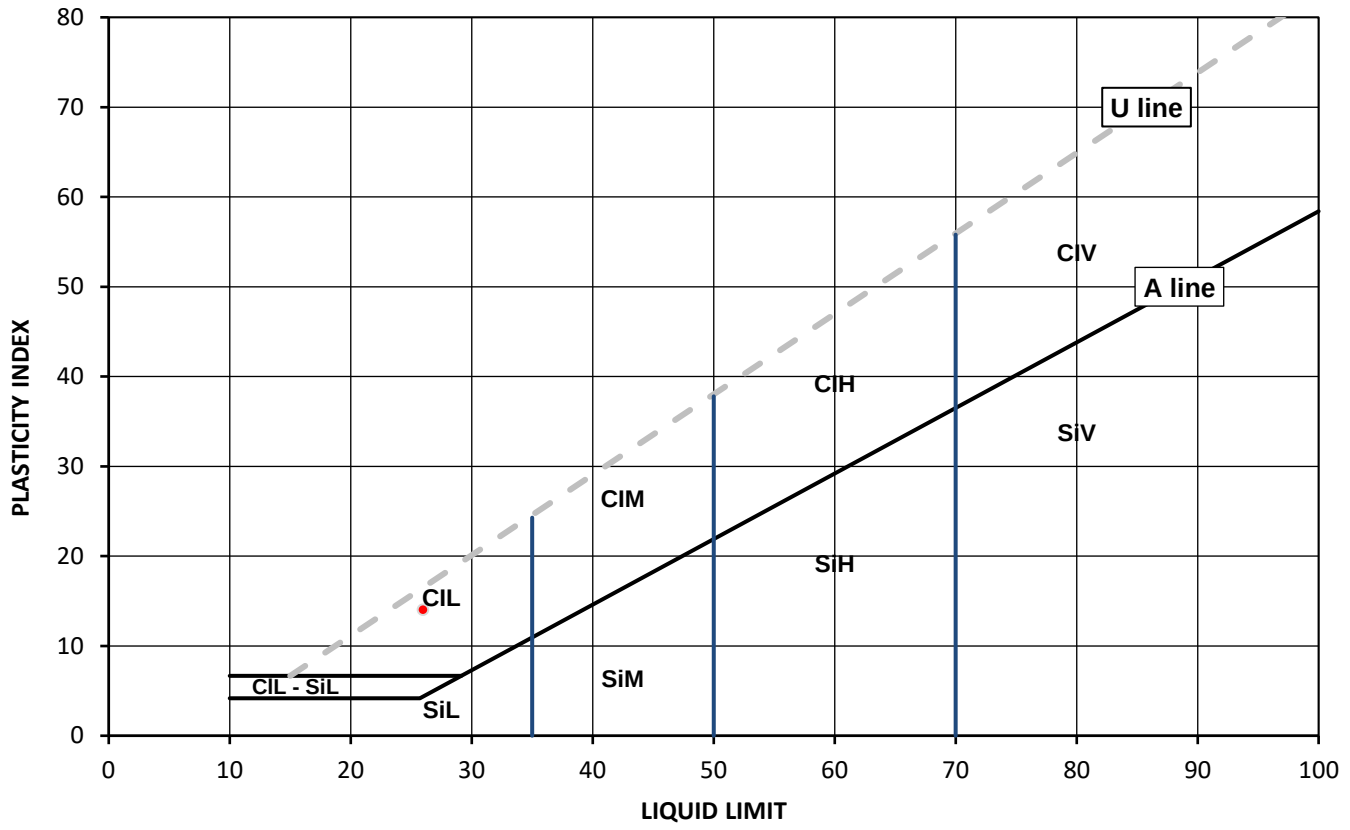
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839717	Depth Top [m]:	10.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
12	26	12	14	89



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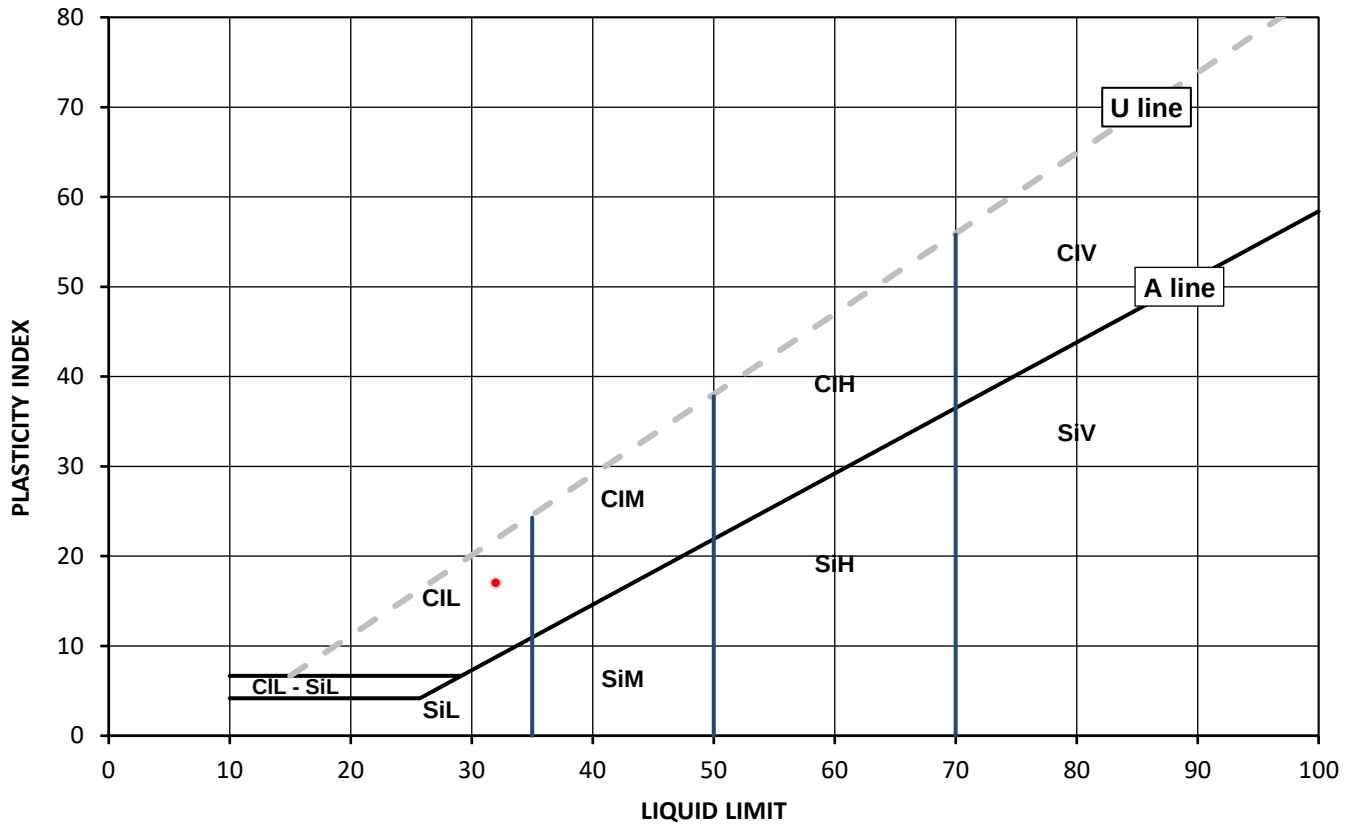
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839719	Depth Top [m]:	13.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
14	32	15	17	88



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		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

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DETERMINATION OF LIQUID AND PLASTIC LIMITS
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i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

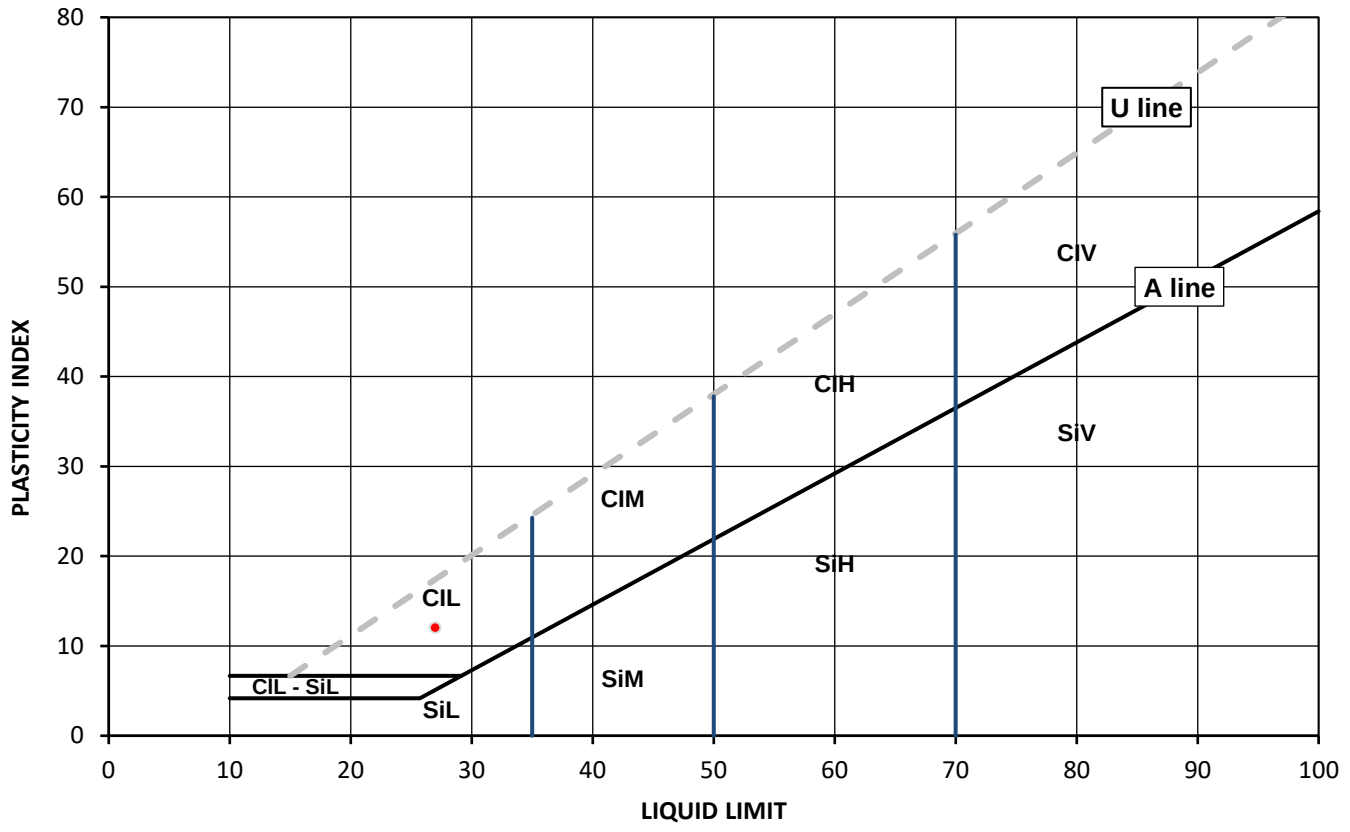
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839721	Depth Top [m]:	10.00
Hole No.:	BH4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
16	27	15	12	87



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

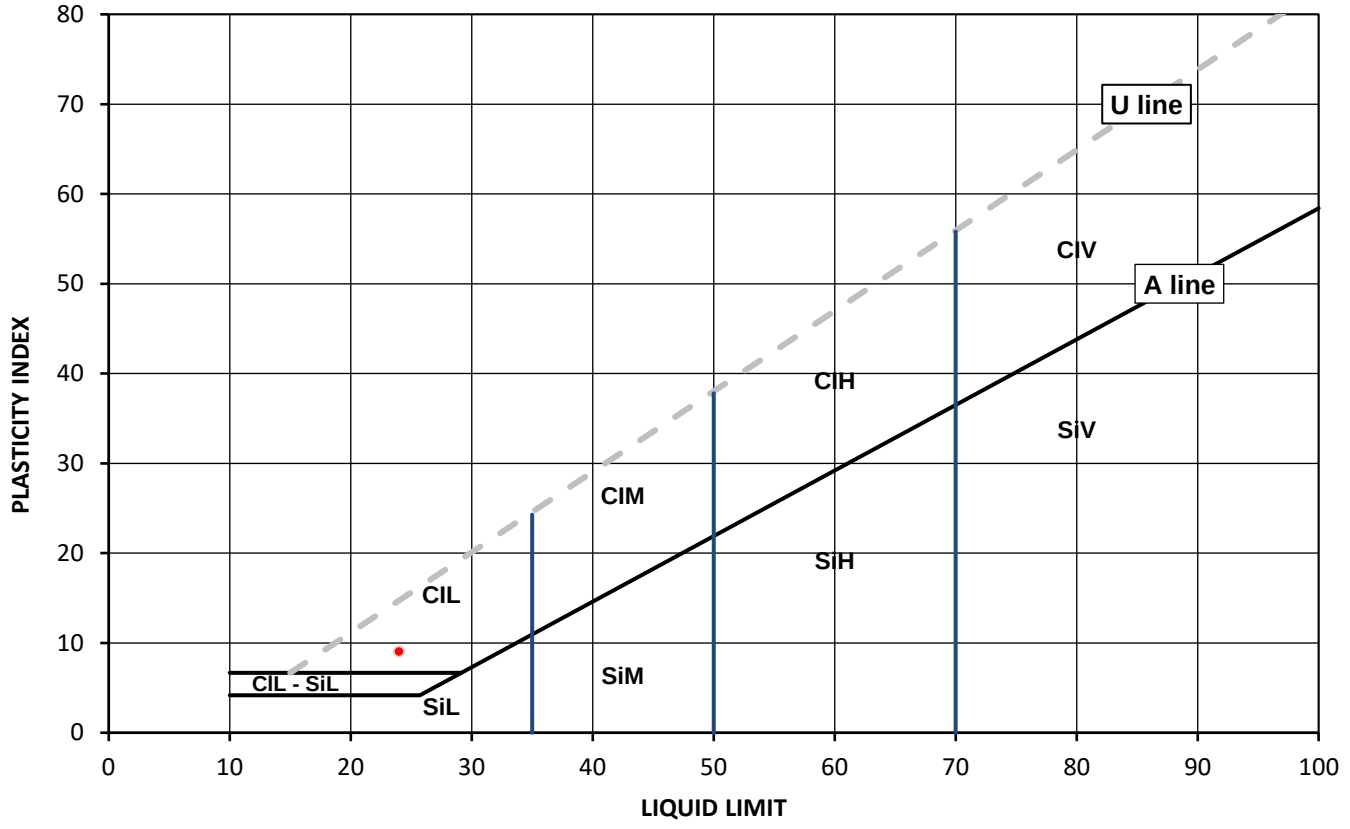
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839725	Depth Top [m]:	11.00
Hole No.:	BH5	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
15	24	15	9	85



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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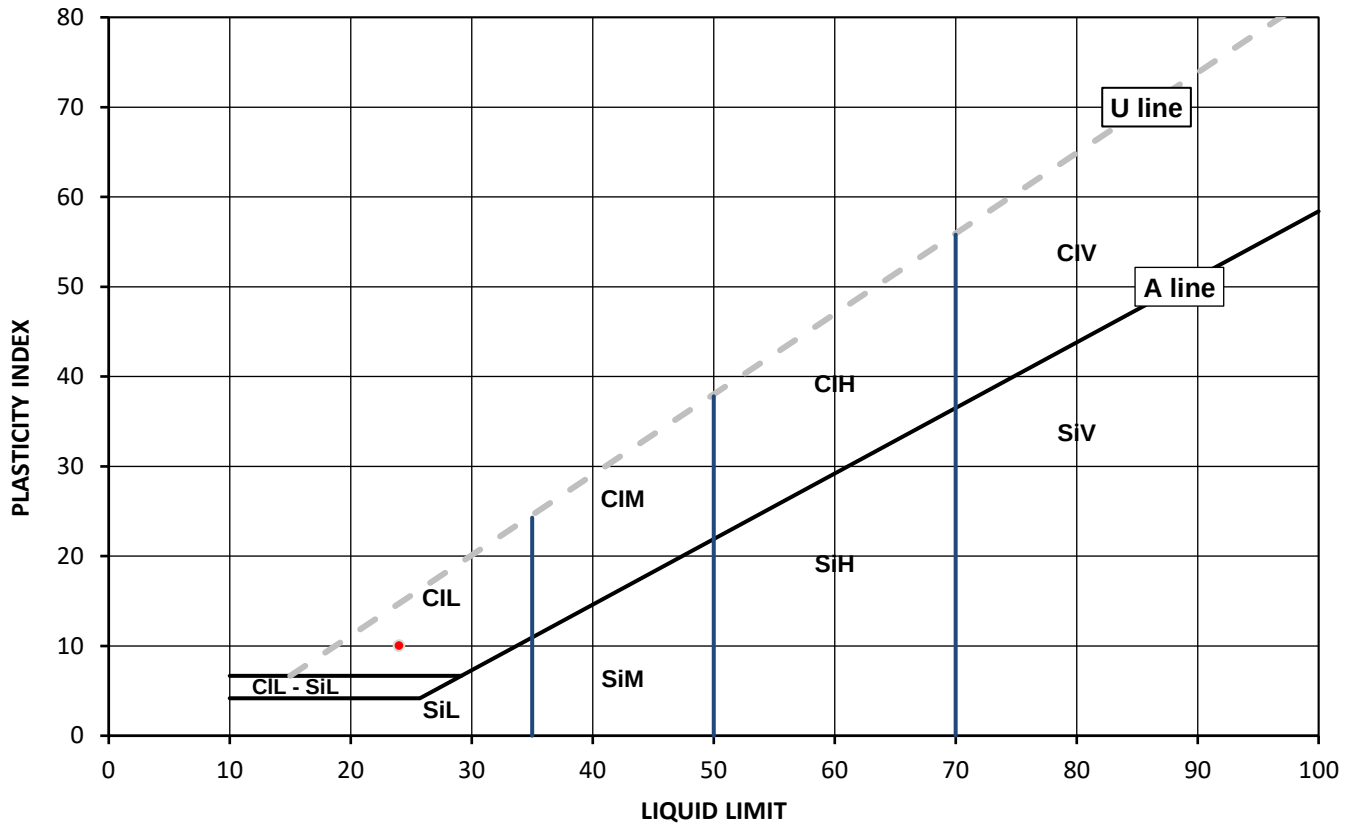
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839726	Depth Top [m]:	14.00
Hole No.:	BH5	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY with fragments of chalk		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	24	14	10	87



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

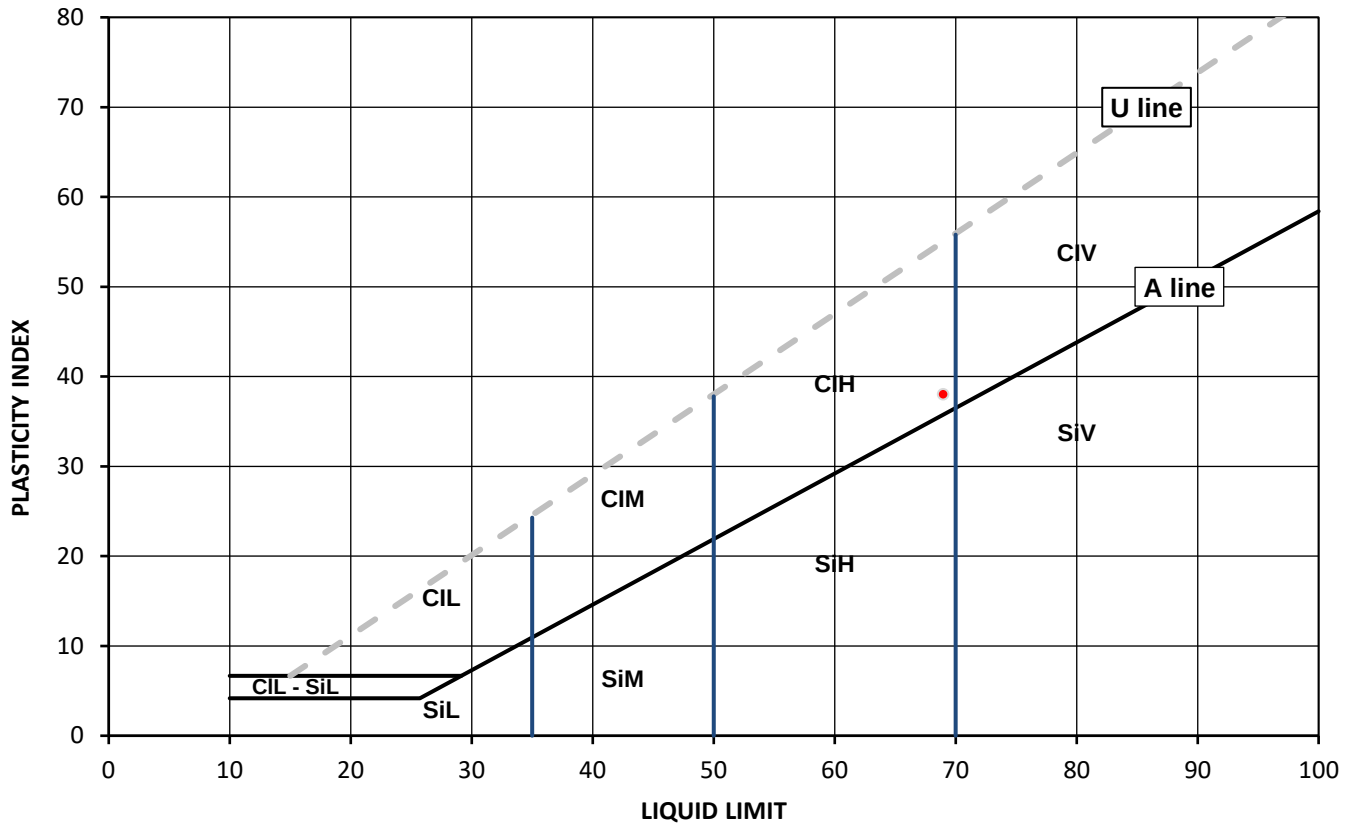
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839727	Depth Top [m]:	1.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown CLAY		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
46	69	31	38	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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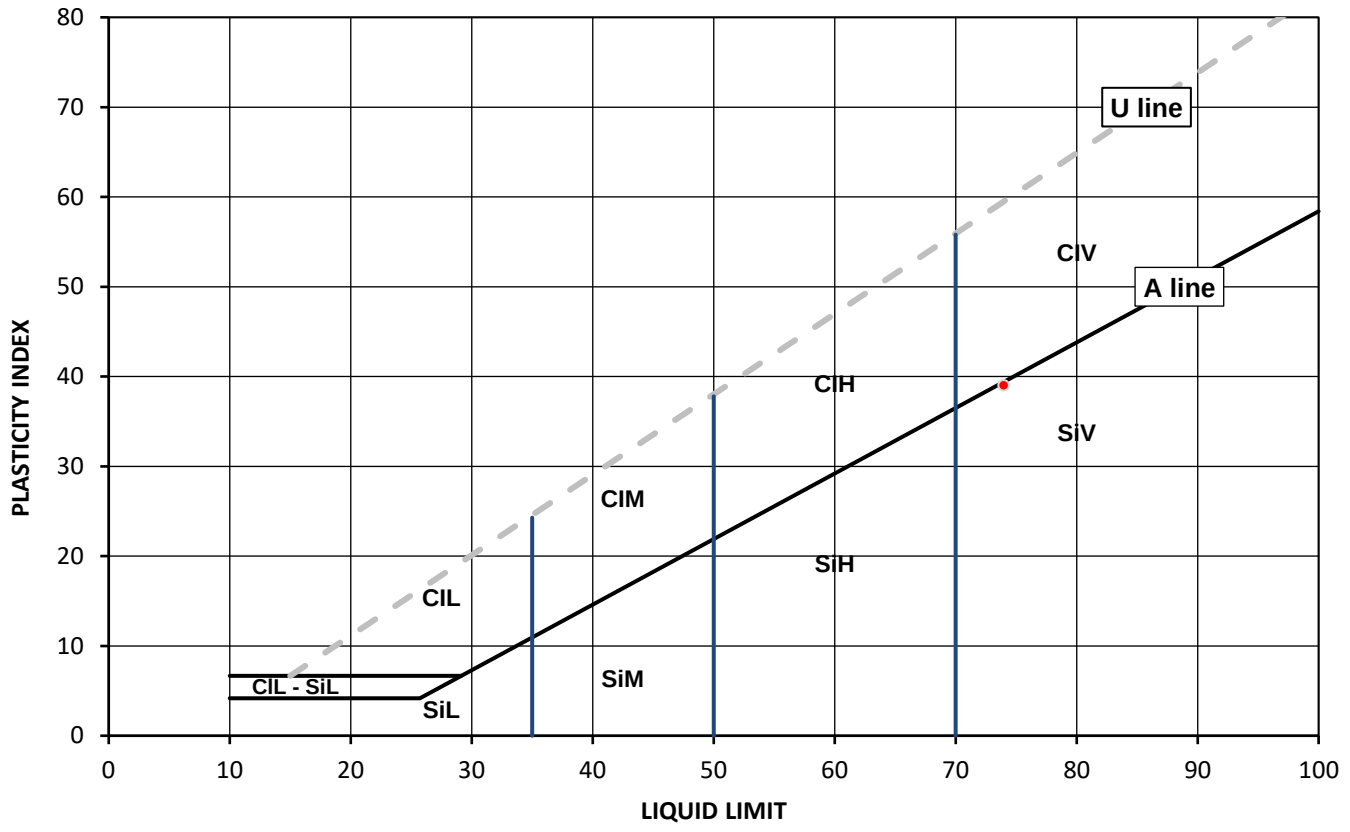
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839729	Depth Top [m]:	4.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Greyish brown silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
53	74	35	39	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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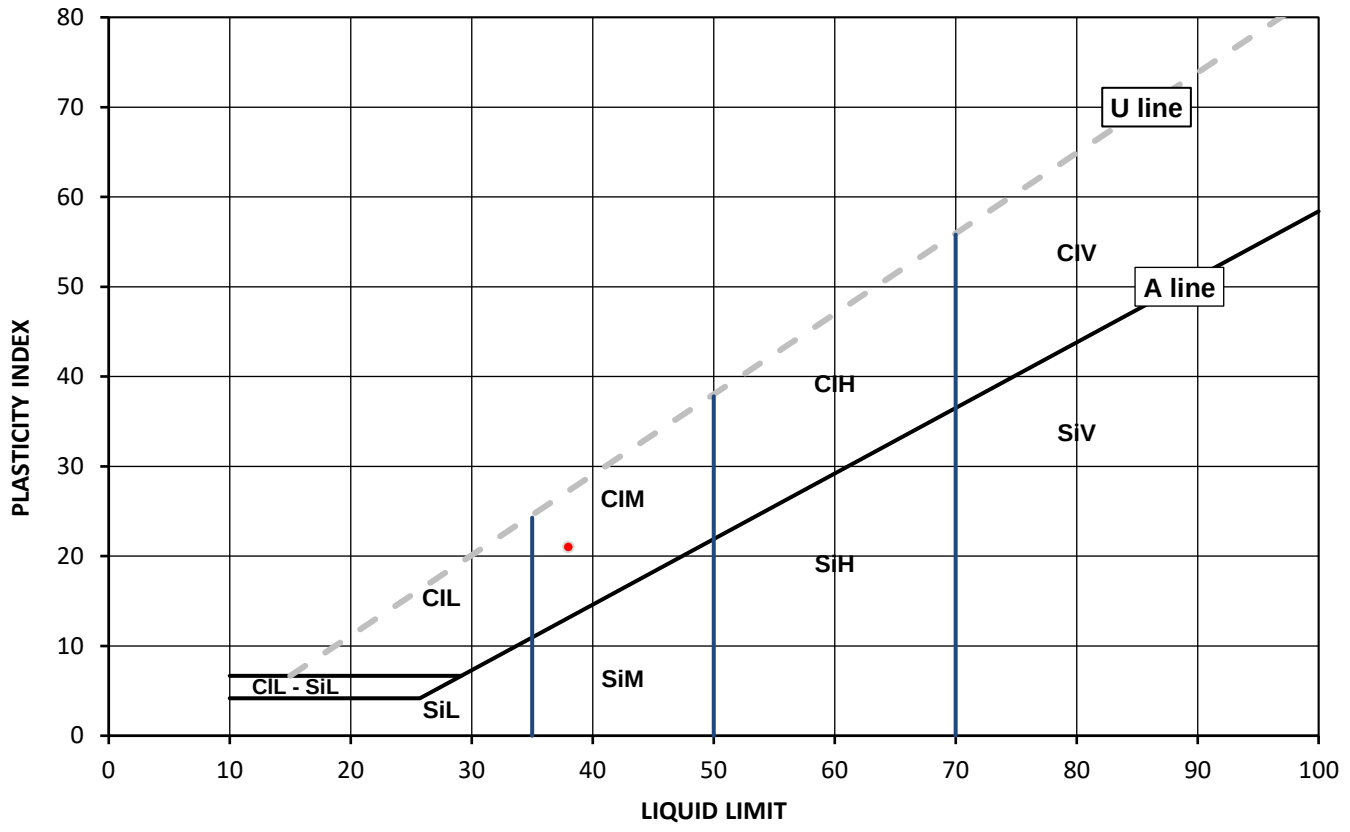
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839731	Depth Top [m]:	7.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Greyish brown sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
30	38	17	21	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

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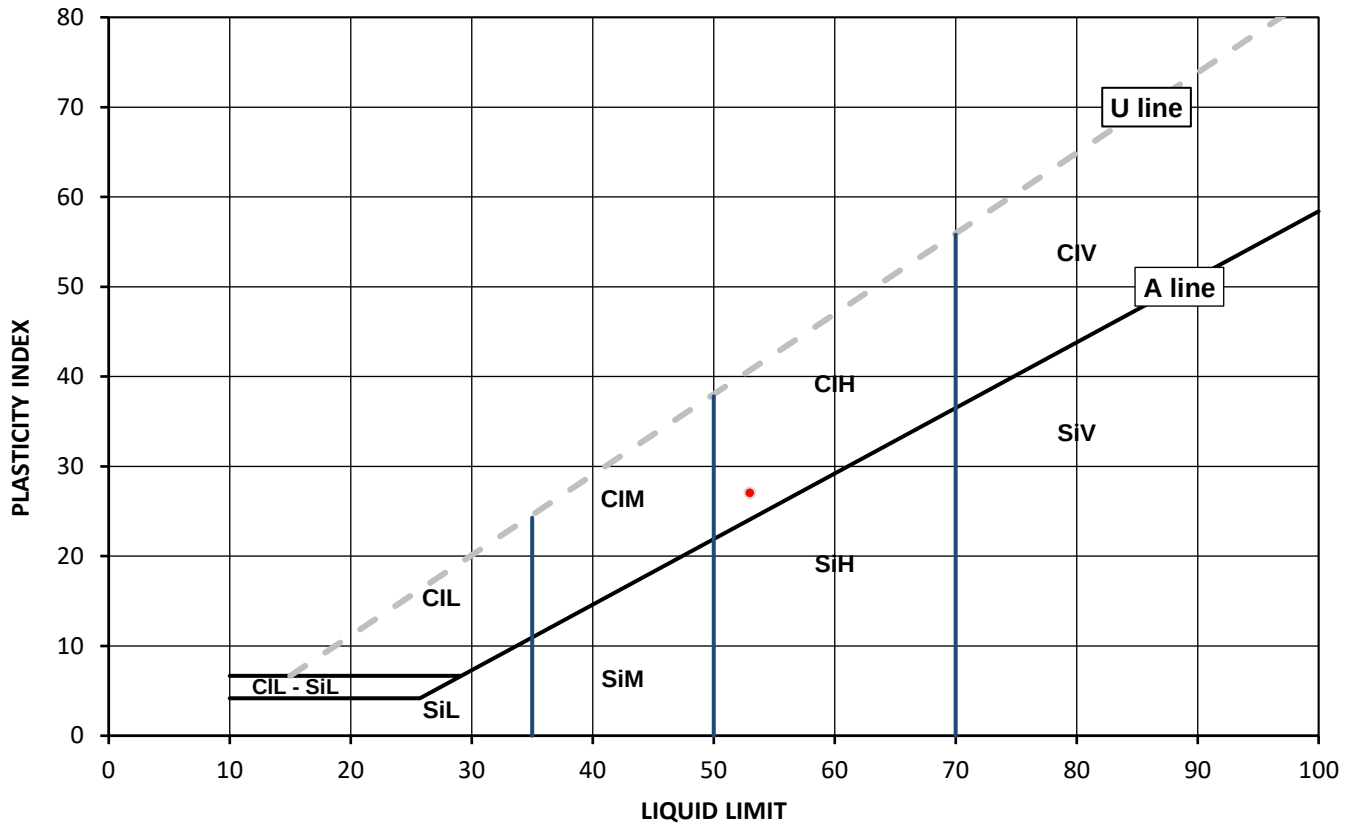
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839732	Depth Top [m]:	8.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Dark grey sandy CLAY		
Sample Preparation:	Tested after >425 µm removed by hand		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
31	53	26	27	93



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

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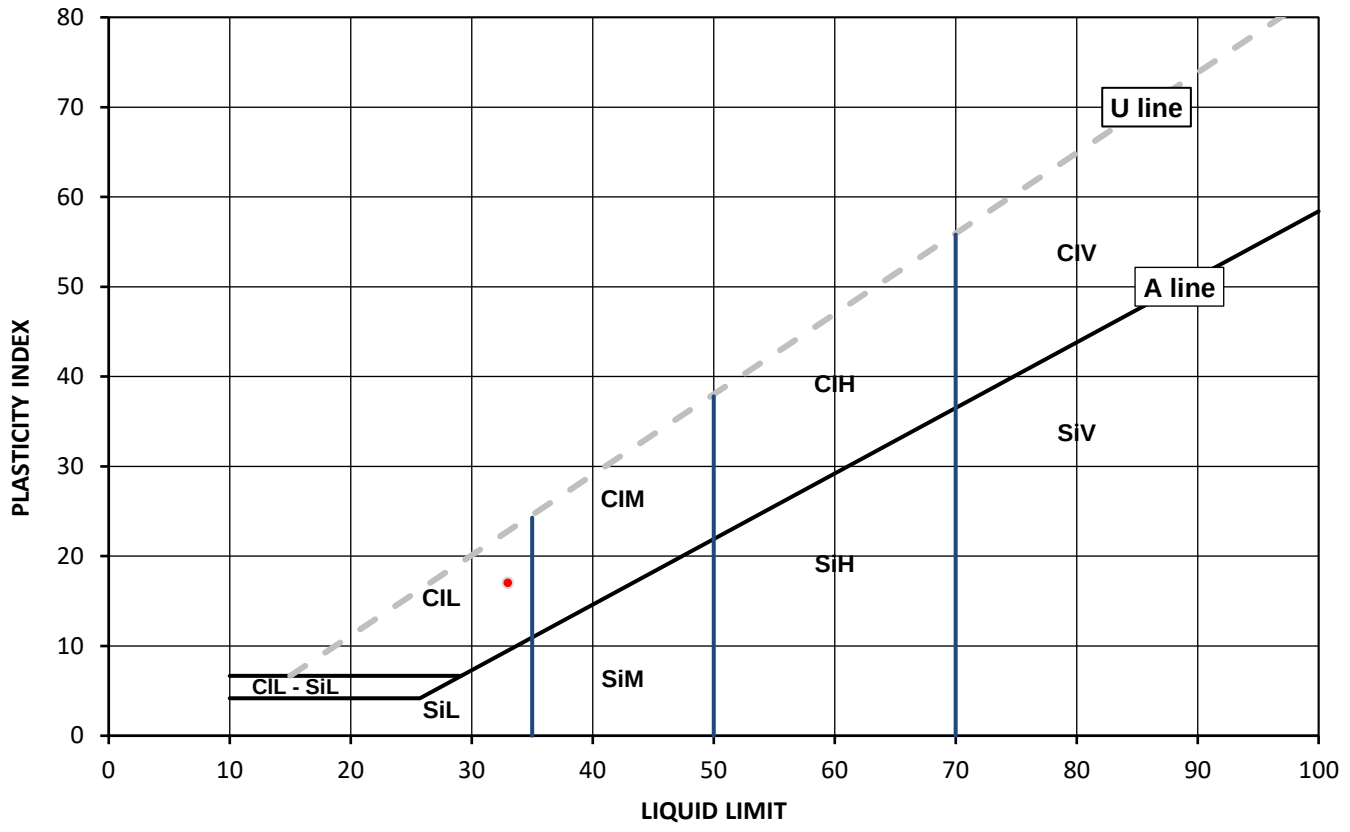
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839733	Depth Top [m]:	10.50
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
19	33	16	17	88



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		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
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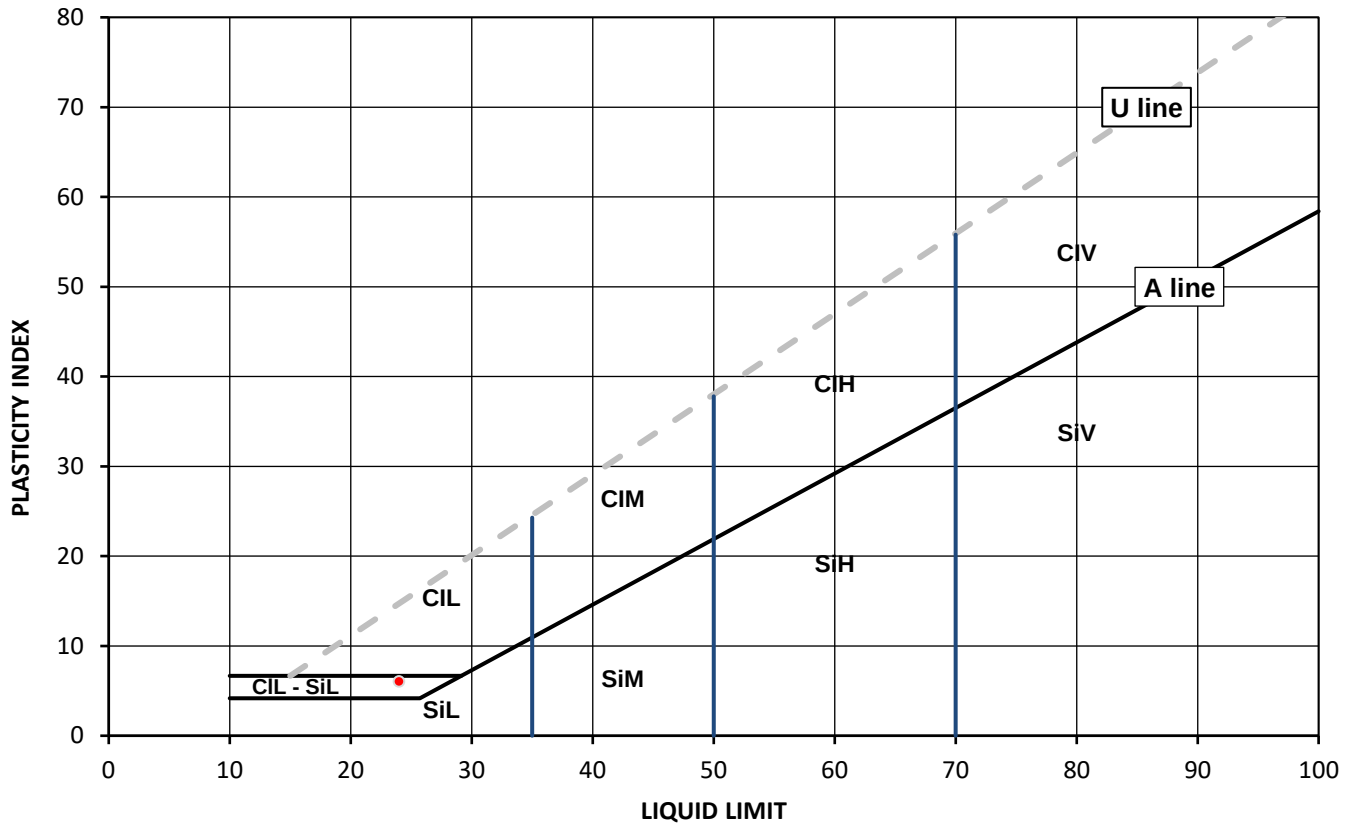
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839736	Depth Top [m]:	27.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	White CHALK		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
2.3	24	18	6	100



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		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
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Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

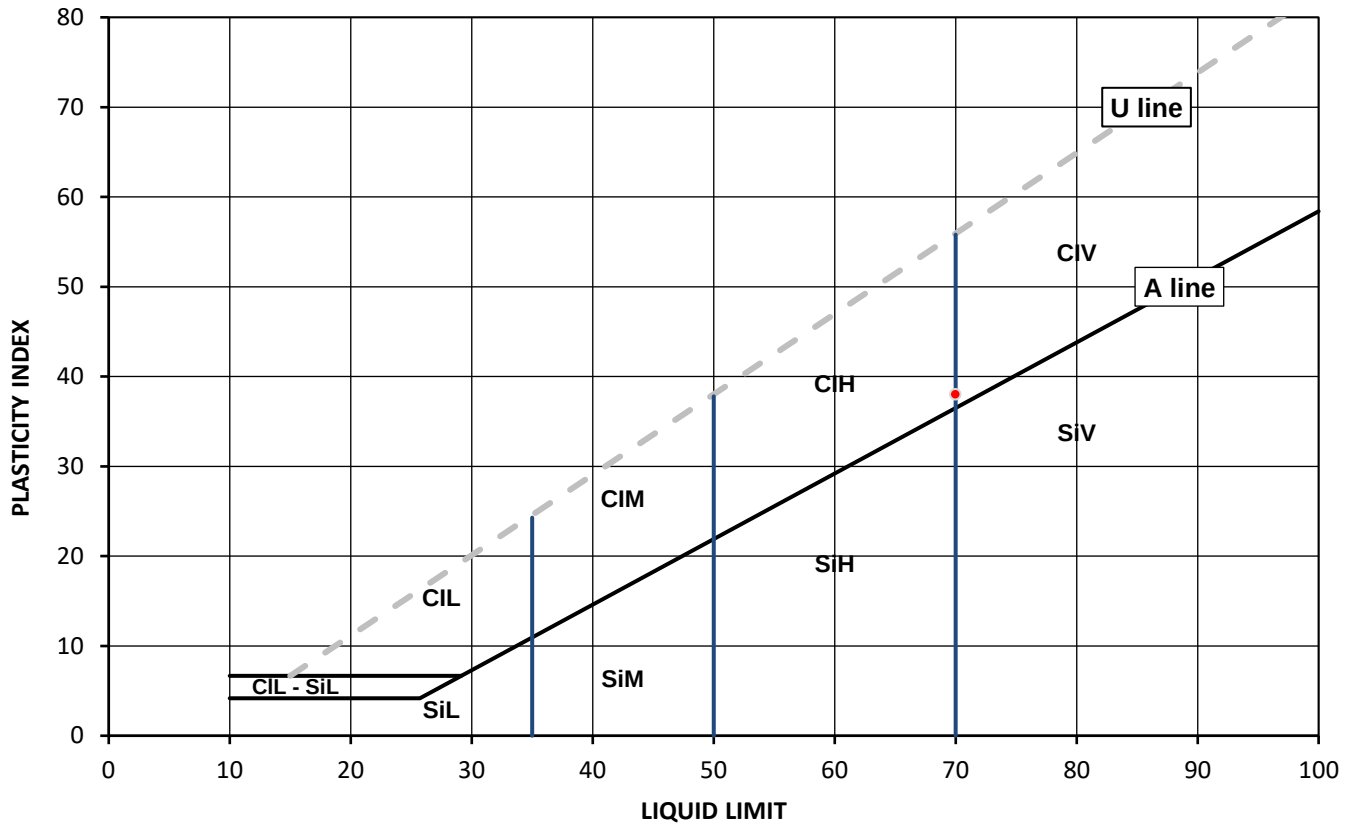
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839741	Depth Top [m]:	1.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown CLAY		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
33	70	32	38	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
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Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
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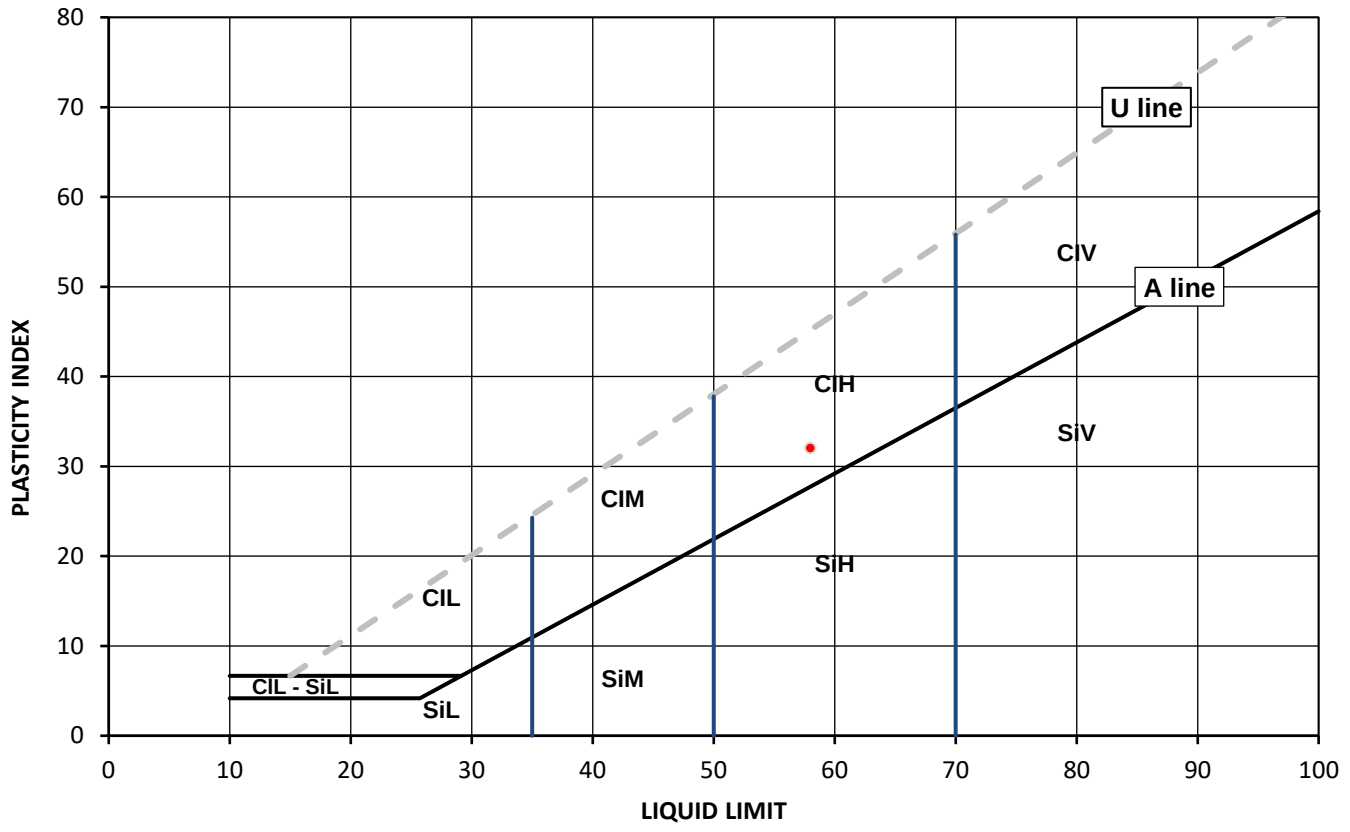
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839742	Depth Top [m]:	3.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
47	58	26	32	100



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		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
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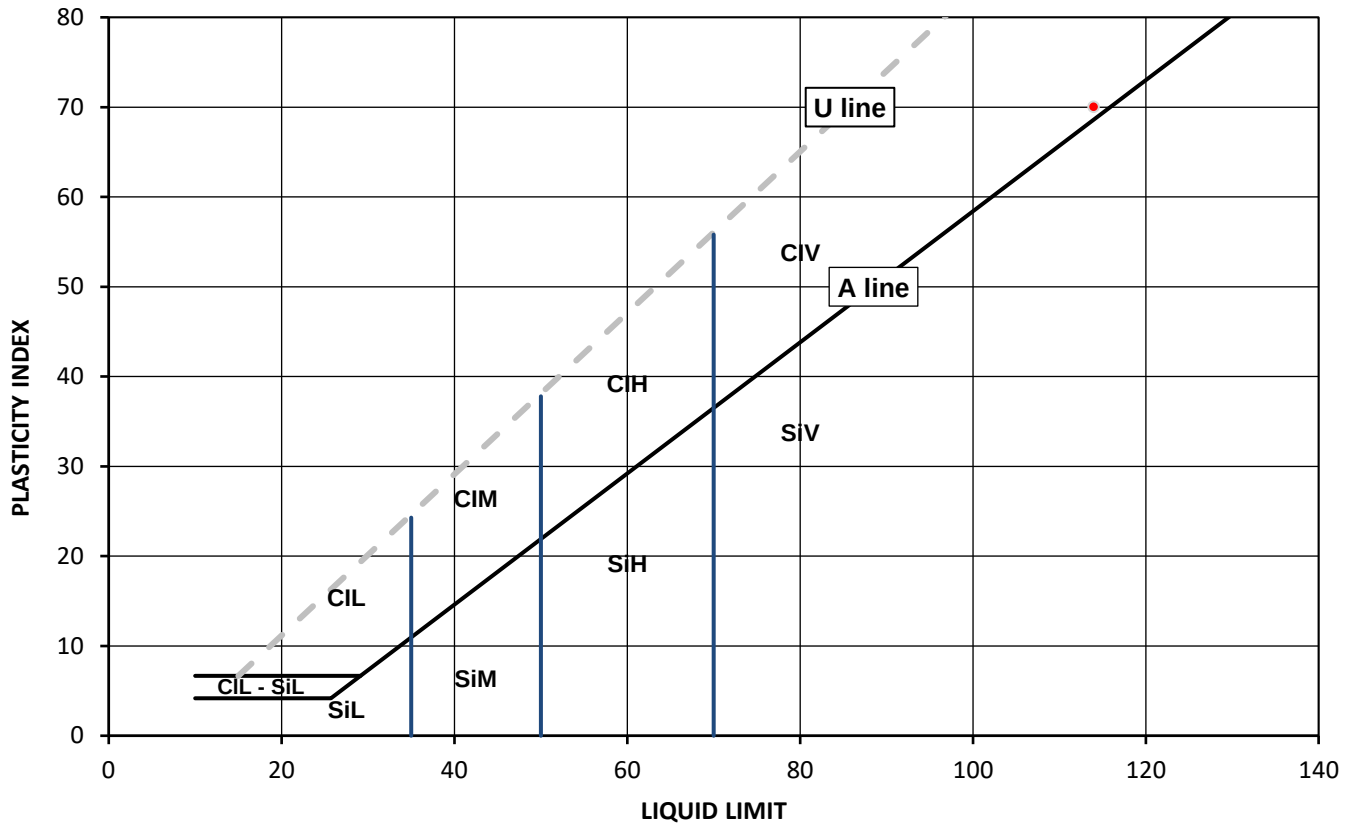
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839744	Depth Top [m]:	6.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Greyish brown slightly organic CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
69	114	44	70	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

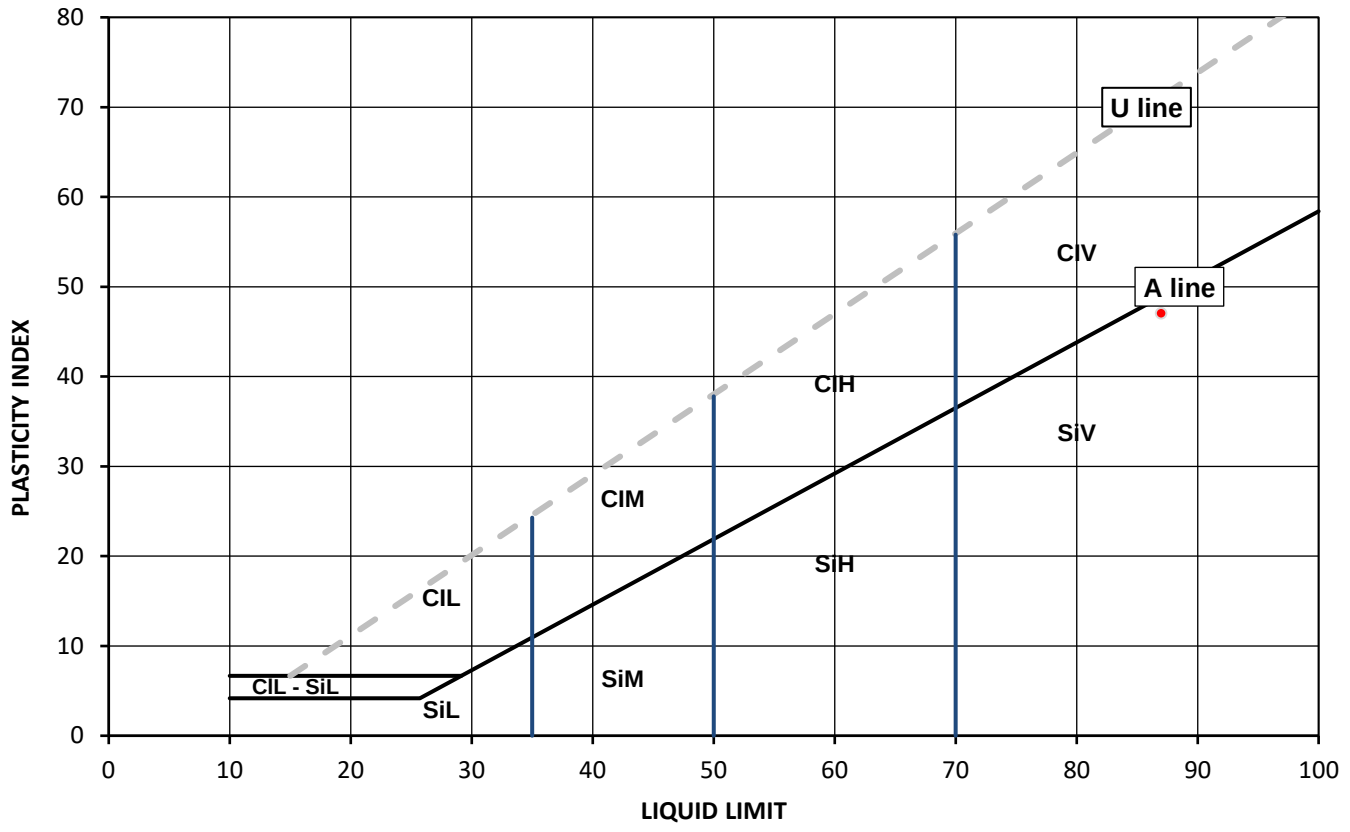
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839745	Depth Top [m]:	7.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown slightly organic CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
71	87	40	47	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

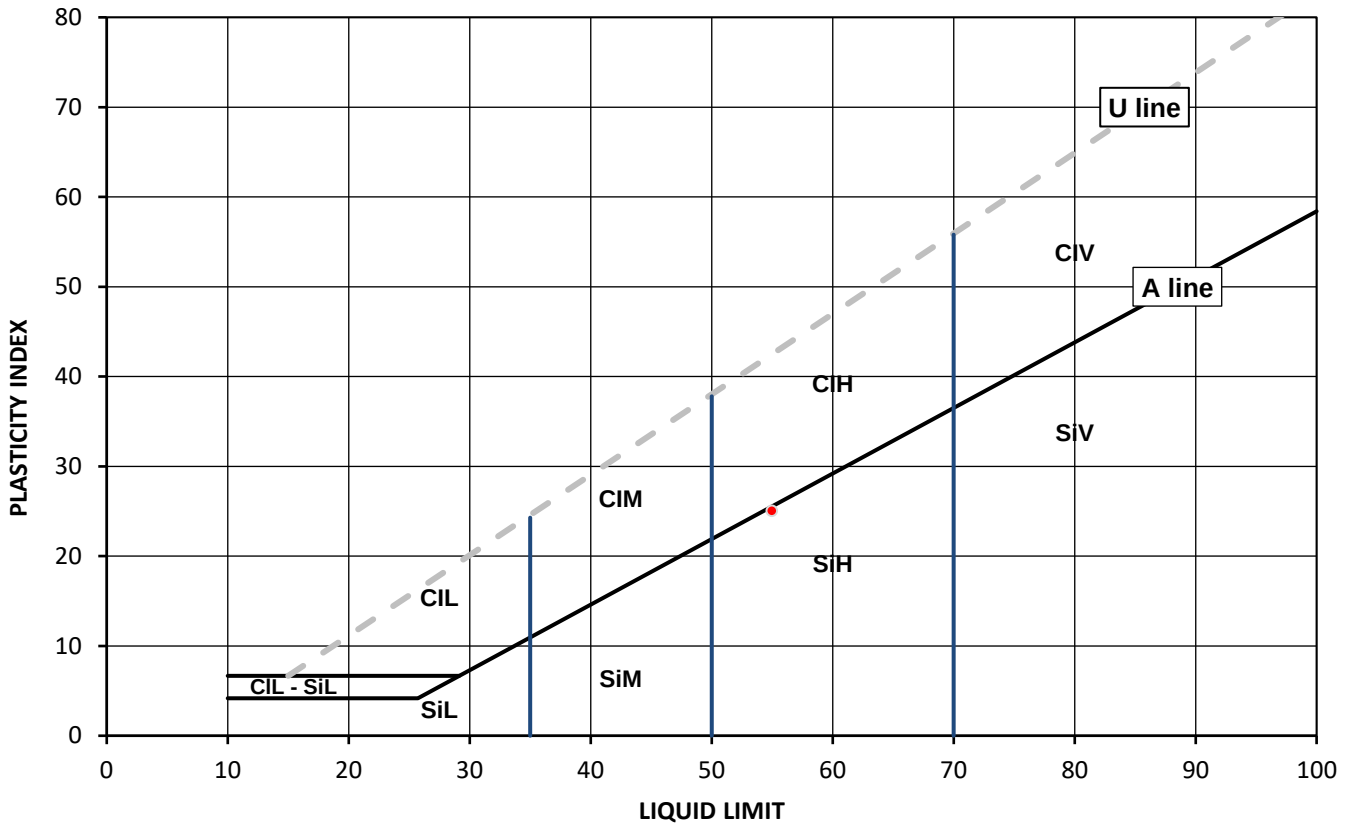
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839747	Depth Top [m]:	0.00
Hole No.:	WS01	Depth Base [m]:	0.40
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
25	55	30	25	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

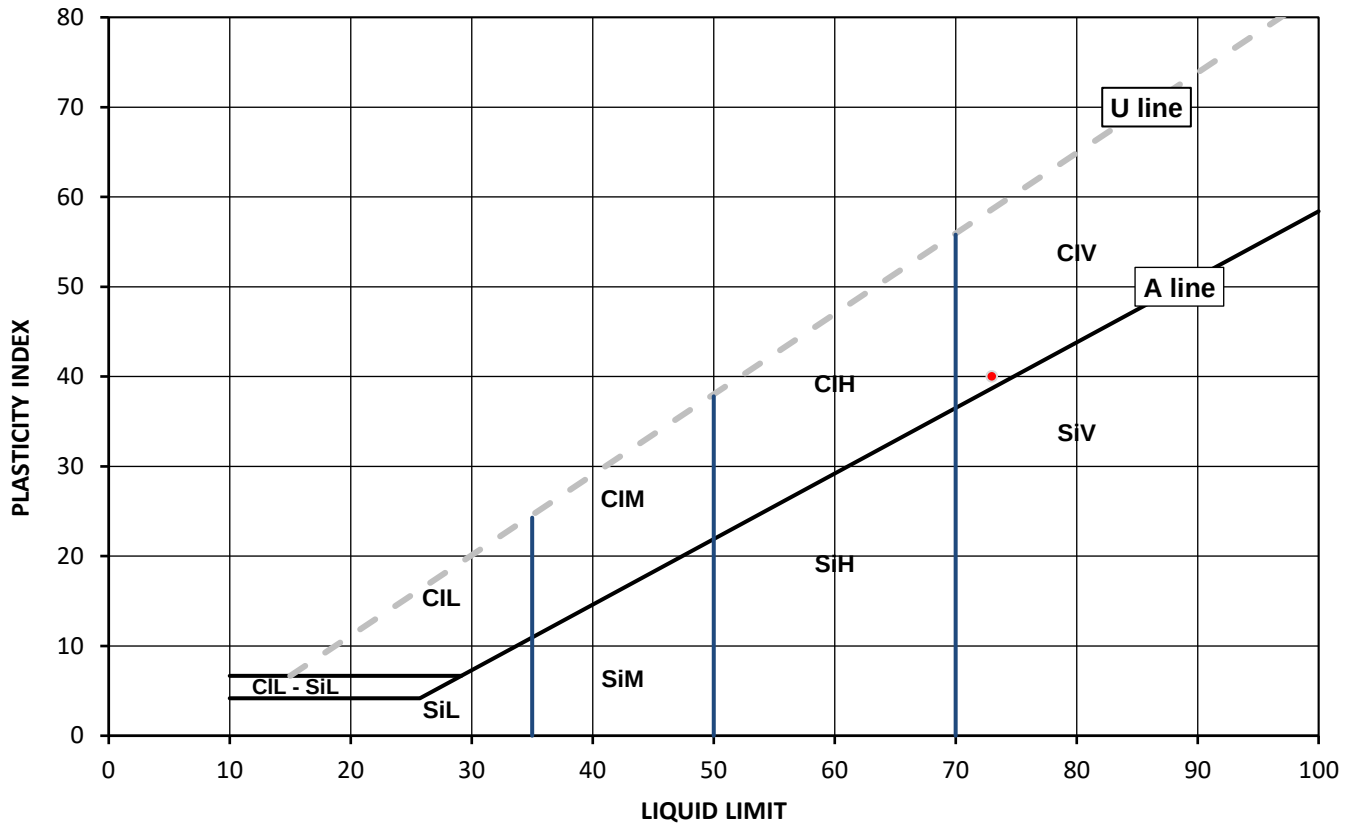
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839748	Depth Top [m]:	0.40
Hole No.:	WS02	Depth Base [m]:	1.00
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown silty CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
38	73	33	40	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Date Reported: 08/11/2023

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4041

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

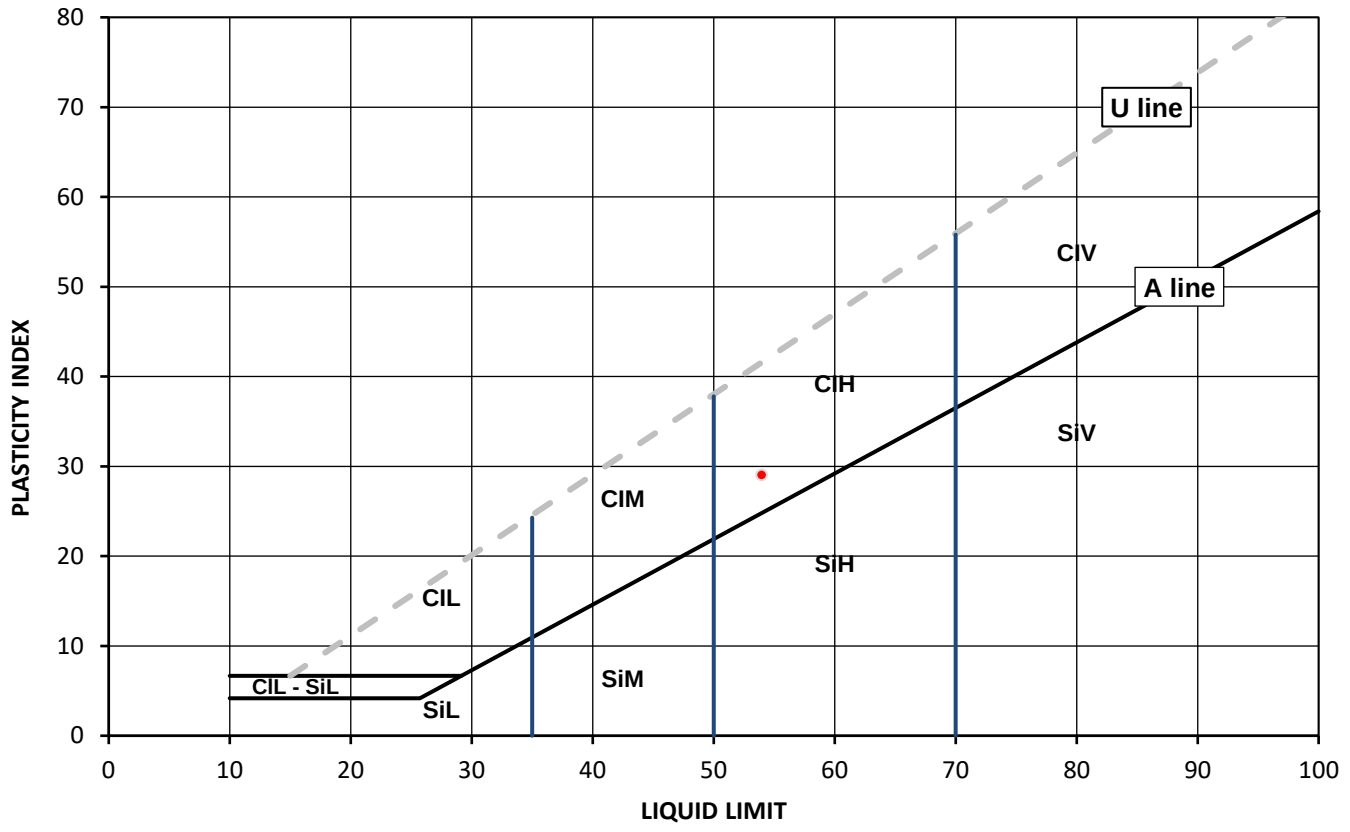
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839749	Depth Top [m]:	1.00
Hole No.:	WS03	Depth Base [m]:	2.00
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly sandy CLAY		
Sample Preparation:	Tested in natural condition		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
42	54	25	29	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

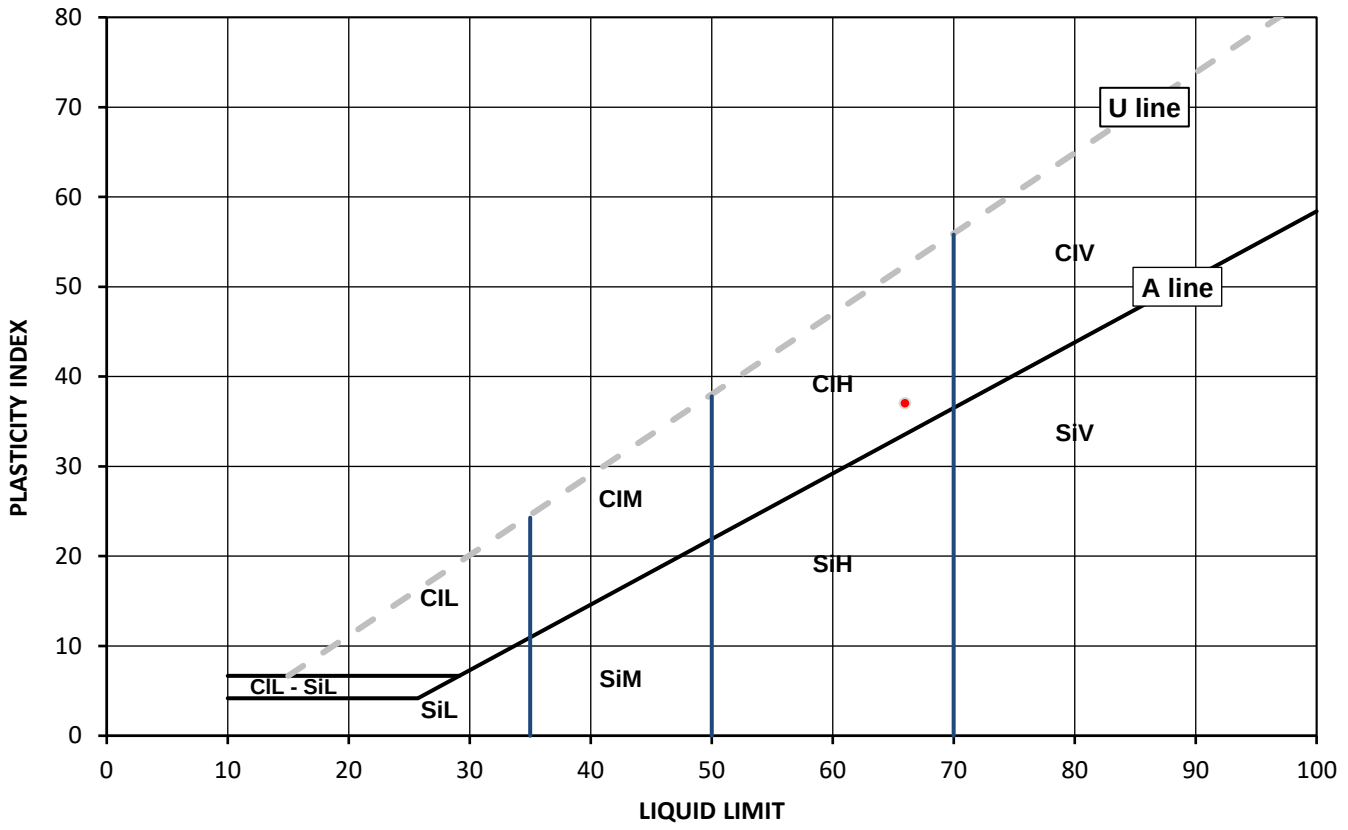
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839750	Depth Top [m]:	1.00
Hole No.:	WS04	Depth Base [m]:	2.00
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown CLAY		

Sample Preparation: Tested in natural condition

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
48	66	29	37	100



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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Date Reported: 08/11/2023

GF 232.13

4041

TEST CERTIFICATE

DETERMINATION OF LIQUID AND PLASTIC LIMITS
Tested in Accordance with:BS 1377-2:1990:Clause 4.4 and 5

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

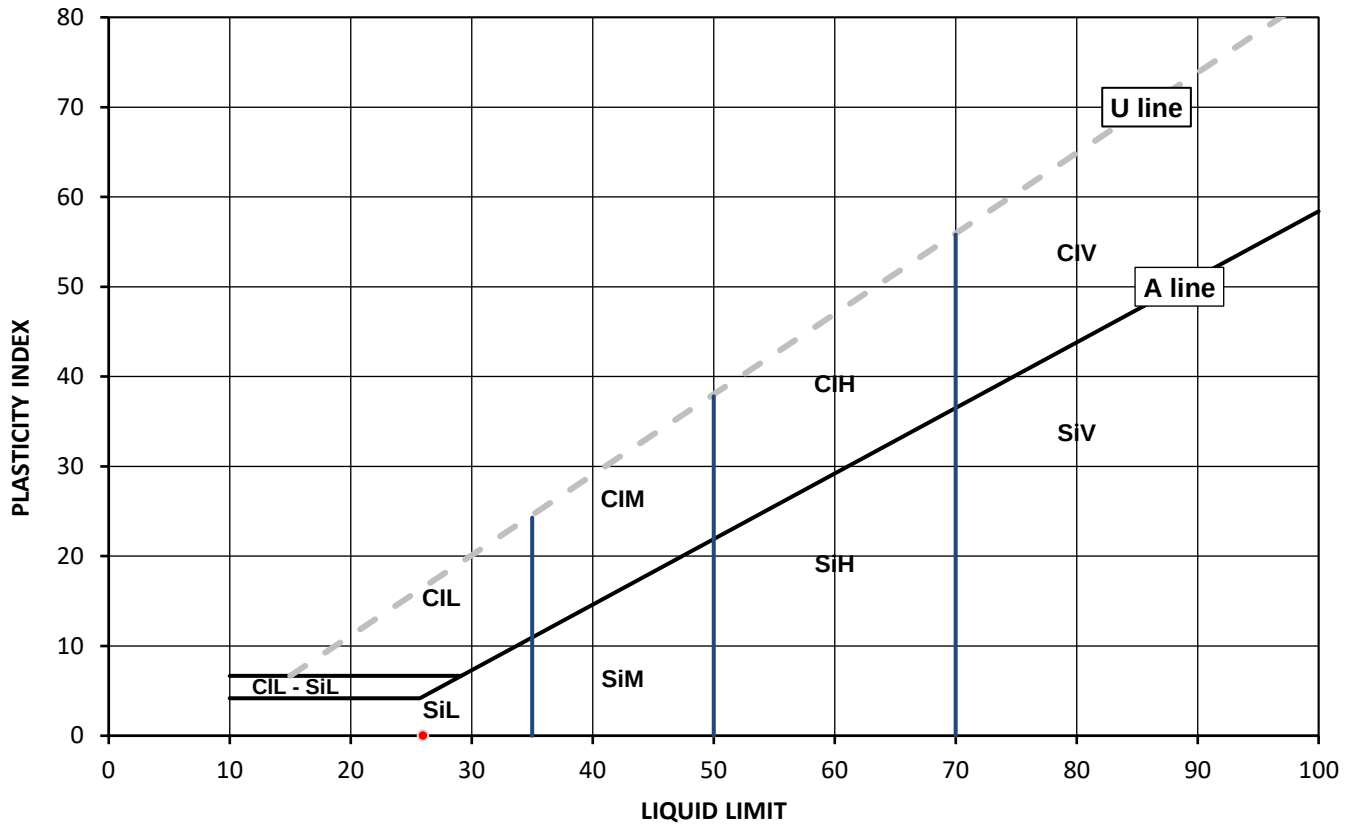
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	24/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839751	Depth Top [m]:	0.20
Hole No.:	WS05	Depth Base [m]:	0.40
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Brown slightly gravelly slightly clayey SAND with fragments of root		
Sample Preparation:	Tested after washing to remove >425 µm		

As Received Water Content [W] %	Liquid Limit [WL] %	Plastic Limit [Wp] %	Plasticity Index [Ip] %	% Passing 425µm BS Test Sieve
17	26	NP	NP	79



Legend, based on BS EN ISO 14688 2:2018 Geotechnical investigation and testing – Identification and classification of soil

		Plasticity		Liquid Limit
Cl	Clay	L	Low	below 35
Si	Silt	M	Medium	35 to 50
		H	High	50 to 70
		V	Very high	exceeding 70
		O	Organic	append to classification for organic material (eg ClHO)

Note: Water Content by BS 1377-2: 1990: Clause 3.2

Remarks: NP - non plastic

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Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 232.13

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5; PD by BS 1377-2: 1990: Clause 8.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top m	Depth Base m	Type			%	%	% Passing 425um %	WL %	Wp %	Ip %	bulk Mg/m3	dry Mg/m3	PD Mg/m3	%		
2839706	BH1	Not Given	9.00	9.45	U	Brown gravelly CLAY										2.70			
2839707	BH1	Not Given	9.50	Not Given	D	Brown very sandy CLAY	Atterberg 1 Point	18		100	32	17	15						
2839709	BH1	Not Given	12.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	17		89	29	15	14						
2839711	BH1	Not Given	15.50	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	15		88	32	15	17						
2839713	BH2	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	15		85	27	15	12						
2839714	BH2	Not Given	13.50	13.95	U	Brown slightly gravelly CLAY with fragments of chalk										2.68			
2839715	BH2	Not Given	14.00	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	22		88	29	14	15						
2839717	BH3	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	12		89	26	12	14						
2839719	BH3	Not Given	13.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	14		88	32	15	17						
2839721	BH4	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	16		87	27	15	12						

Note: # Non accredited; NP - Non plastic

Comments:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 234.16

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Water Content by BS 1377-2:1990: Clause 3.2Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2839725	BH5	Not Given	11.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	15		85	24	15	9						
2839726	BH5	Not Given	14.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	19		87	24	14	10						
2839727	BH1	Not Given	1.50	Not Given	D	Brown CLAY	Atterberg 1 Point	46		100	69	31	38						
2839729	BH1	Not Given	4.50	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	53		100	74	35	39						
2839731	BH1	Not Given	7.50	Not Given	D	Greyish brown sandy CLAY	Atterberg 1 Point	30		100	38	17	21						
2839732	BH1	Not Given	8.00	Not Given	B	Dark grey sandy CLAY	Atterberg 1 Point	31		93	53	26	27						
2839733	BH1	Not Given	10.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	19		88	33	16	17						
2839736	BH1	Not Given	27.00	Not Given	B	White CHALK	Atterberg 1 Point	2.3		100	24	18	6						
2839738	BH2	Not Given	7.00	Not Given	B	Black PEAT		365											
2839741	BH3	Not Given	1.00	Not Given	B	Brown CLAY	Atterberg 1 Point	33		100	70	32	38						

Note: # Non accredited; NP - Non plastic

Comments:

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Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 234.16

SUMMARY REPORT

SUMMARY OF CLASSIFICATION TEST RESULTS

Tested in Accordance with:

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Water Content by BS 1377-2:1990: Clause 3.2Atterberg by BS 1377-2: 1990: Clause 4.3 (4 Point Test), Clause 4.4 (1 Point Test) and 5

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	Water Content BS 1377-2 [W]	Water Content BS EN ISO 17892-1 [W]	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	WL	Wp	Ip	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
2839742	BH3	Not Given	3.00	Not Given	B	Brown slightly sandy CLAY	Atterberg 1 Point	47		100	58	26	32						
2839744	BH3	Not Given	6.00	Not Given	D	Greyish brown slightly organic CLAY	Atterberg 1 Point	69		100	114	44	70						
2839745	BH3	Not Given	7.00	Not Given	B	Brown slightly organic CLAY	Atterberg 1 Point	71		100	87	40	47						
2839747	WS01	Not Given	0.00	0.40	D	Brown slightly gravelly very sandy CLAY with fragments of chalk	Atterberg 1 Point	25		100	55	30	25						
2839748	WS02	Not Given	0.40	1.00	D	Brown silty CLAY	Atterberg 1 Point	38		100	73	33	40						
2839749	WS03	Not Given	1.00	2.00	D	Brown slightly sandy CLAY	Atterberg 1 Point	42		100	54	25	29						
2839750	WS04	Not Given	1.00	2.00	D	Brown CLAY	Atterberg 1 Point	48		100	66	29	37						
2839751	WS05	Not Given	0.20	0.40	D	Brown slightly gravelly slightly clayey SAND with fragments of root	Atterberg 1 Point	17		79	26	NP	NP						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

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Date Reported: 08/11/2023

GF 234.16

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2839707	BH1	Not Given	9.50	Not Given	D	Brown very sandy CLAY		18	Sample was quartered, oven dried at 108.4 °C			
2839709	BH1	Not Given	12.50	Not Given	D	Brown slightly gravelly very sandy CLAY		17	Sample was quartered, oven dried at 108.9 °C			
2839711	BH1	Not Given	15.50	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk		15	Sample was quartered, oven dried at 108.9 °C			
2839713	BH2	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY		15	Sample was quartered, oven dried at 106.2 °C			
2839715	BH2	Not Given	14.00	Not Given	D	Brown slightly gravelly very sandy CLAY		22	Sample was quartered, oven dried at 108.9 °C			
2839717	BH3	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY		12	Sample was quartered, oven dried at 106.2 °C			
2839719	BH3	Not Given	13.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk		14	Sample was quartered, oven dried at 108.4 °C			
2839721	BH4	Not Given	10.00	Not Given	D	Brown slightly gravelly very sandy CLAY		16	Sample was quartered, oven dried at 106.2 °C			
2839725	BH5	Not Given	11.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk		15	Sample was quartered, oven dried at 108.9 °C			
2839726	BH5	Not Given	14.00	Not Given	D	Brown slightly gravelly very sandy CLAY with fragments of chalk		19	Sample was quartered, oven dried at 108.9 °C			

Comments:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 099.17

SUMMARY REPORT

DETERMINATION OF WATER CONTENT

Tested in Accordance with: BS 1377-2: 1990: Clause 3.2

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford,
Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2839727	BH1	Not Given	1.50	Not Given	D	Brown CLAY		46	Sample was quartered, oven dried at 108.9 °C			
2839729	BH1	Not Given	4.50	Not Given	D	Greyish brown silty CLAY		53	Sample was quartered, oven dried at 108.4 °C			
2839731	BH1	Not Given	7.50	Not Given	D	Greyish brown sandy CLAY		30	Sample was quartered, oven dried at 107.5 °C			
2839732	BH1	Not Given	8.00	Not Given	B	Dark grey sandy CLAY		31	Sample was quartered, oven dried at 108.4 °C			
2839733	BH1	Not Given	10.50	Not Given	D	Brown slightly gravelly very sandy CLAY		19	Sample was quartered, oven dried at 108.4 °C			
2839736	BH1	Not Given	27.00	Not Given	B	White CHALK		2.3	Sample was quartered, oven dried at 107.2 °C			
2839738	BH2	Not Given	7.00	Not Given	B	Black PEAT		365	Sample was quartered, oven dried at 108.9 °C			
2839741	BH3	Not Given	1.00	Not Given	B	Brown CLAY		33	Sample was quartered, oven dried at 106.2 °C			
2839742	BH3	Not Given	3.00	Not Given	B	Brown slightly sandy CLAY		47	Sample was quartered, oven dried at 106.2 °C			
2839744	BH3	Not Given	6.00	Not Given	D	Greyish brown slightly organic CLAY		69	Sample was quartered, oven dried at 108.9 °C			

Comments:

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SUMMARY REPORT

DETERMINATION OF WATER CONTENT

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i2 Analytical Ltd
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Northampton NN4 7EB

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Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 20/10 - 26/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	WC	Sample preparation / Oven temperature at the time of testing			
		Reference	Depth Top m	Depth Base m	Type			%				
2839745	BH3	Not Given	7.00	Not Given	B	Brown slightly organic CLAY		71	Sample was quartered, oven dried at 106.2 °C			
2839747	WS01	Not Given	0.00	0.40	D	Brown slightly sandy CLAY		25	Sample was quartered, oven dried at 108.9 °C			
2839748	WS02	Not Given	0.40	1.00	D	Brown silty CLAY		38	Sample was quartered, oven dried at 108.9 °C			
2839749	WS03	Not Given	1.00	2.00	D	Brown slightly sandy CLAY		42	Sample was quartered, oven dried at 108.9 °C			
2839750	WS04	Not Given	1.00	2.00	D	Brown CLAY		48	Sample was quartered, oven dried at 107.2 °C			
2839751	WS05	Not Given	0.20	0.40	D	Brown slightly gravelly slightly clayey SAND with fragments of root		17	Sample was quartered, oven dried at 107.2 °C			

Comments:

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Date Reported: 08/11/2023

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

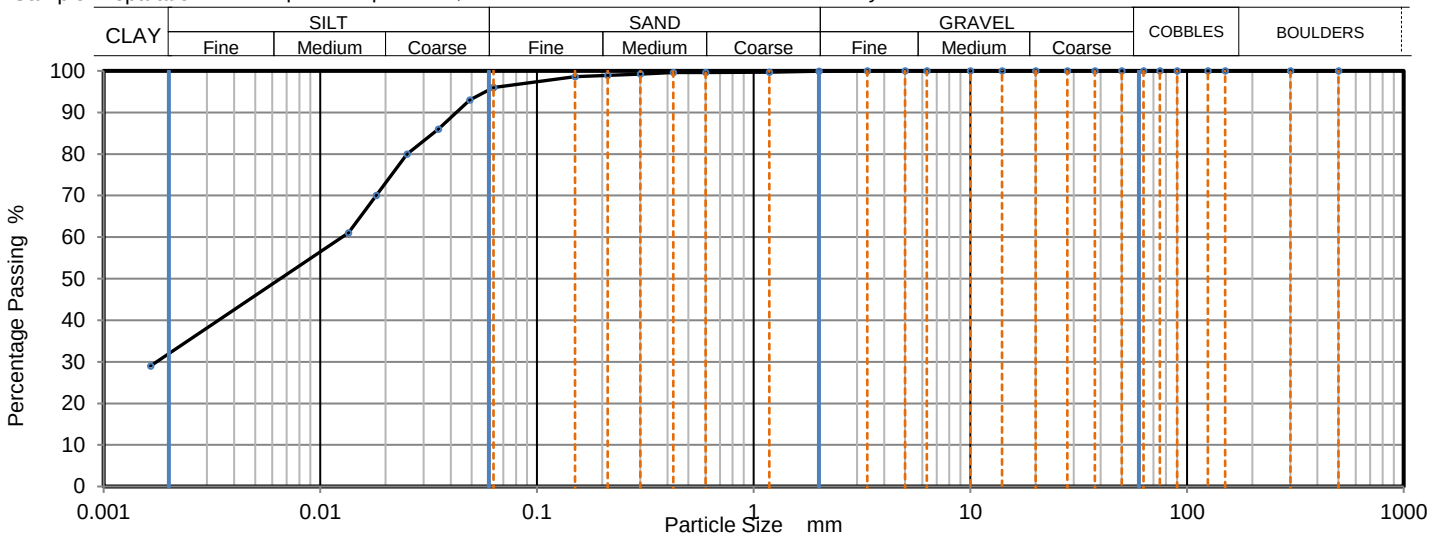
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839728	Depth Top [m]:	4.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Sample Description:	Greyish brown CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	96
300	100	0.0489	93
150	100	0.0350	86
125	100	0.0251	80
90	100	0.0181	70
75	100	0.0135	61
63	100	0.0016	29
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100	Particle density	(assumed)
2	100	2.65	Mg/m3
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	99		
0.15	99		
0.063	96		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	4
Silt	64
Clay	32

Grading Analysis		
D100	mm	5
D60	mm	0.0128
D30	mm	0.00178
D10	mm	
Uniformity Coefficient		> 7.8
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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Date Reported: 08/11/2023

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

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Brackmills Industrial Estate
Northampton NN4 7EB

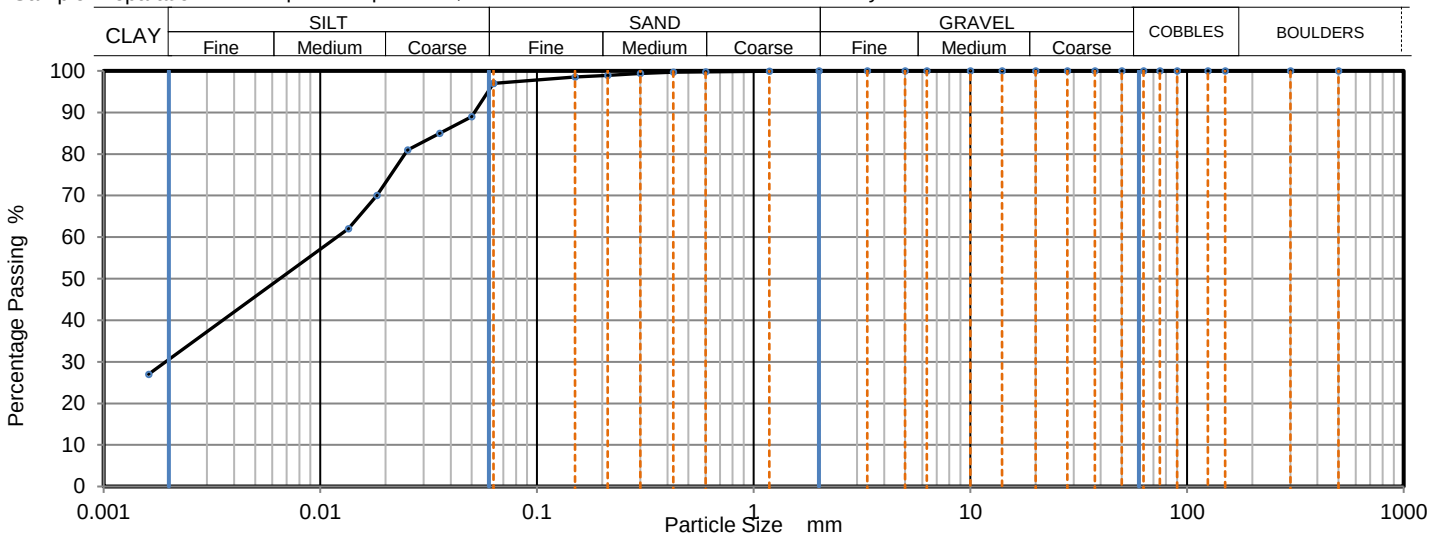
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839730	Depth Top [m]:	5.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.5 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	97
300	100	0.0499	89
150	100	0.0355	85
125	100	0.0253	81
90	100	0.0182	70
75	100	0.0135	62
63	100	0.0016	27
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100	Particle density	(assumed)
2	100	2.65	Mg/m3
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	99		
0.15	99		
0.063	97		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	3
Silt	66
Clay	31

Grading Analysis		
D100	mm	3.35
D60	mm	0.012
D30	mm	0.00192
D10	mm	
Uniformity Coefficient		> 7.4
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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PL Environmental & Geotechnical Lab Production Specialist
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Date Reported: 08/11/2023

GF 100.23

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

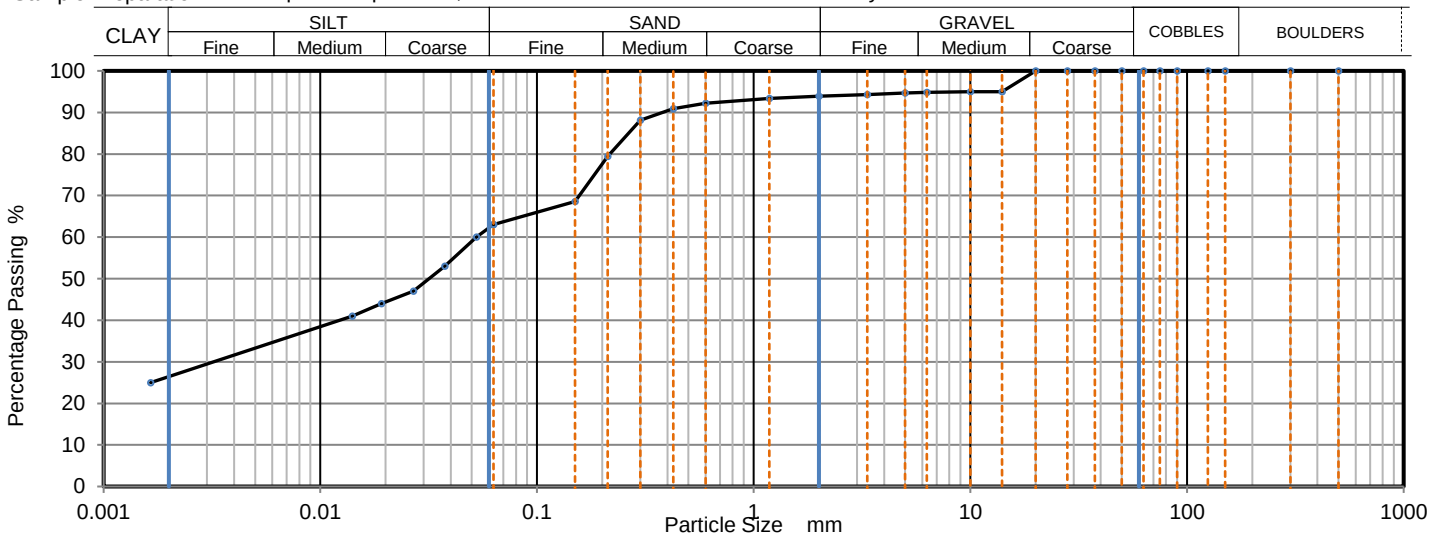
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839732	Depth Top [m]:	8.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Dark grey sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	63
300	100	0.0525	60
150	100	0.0376	53
125	100	0.0269	47
90	100	0.0191	44
75	100	0.0140	41
63	100	0.0016	25
50	100		
37.5	100		
28	100		
20	100		
14	95		
10	95		
6.3	95		
5	95		
3.35	94	Particle density	(assumed)
2	94	2.65	Mg/m3
1.18	93		
0.6	92		
0.425	91		
0.3	88		
0.212	79		
0.15	69		
0.063	63		

Sample Proportions	% dry mass
Very coarse	0
Gravel	6
Sand	31
Silt	36
Clay	27

Grading Analysis		
D100	mm	20
D60	mm	0.0535
D30	mm	0.00321
D10	mm	
Uniformity Coefficient		> 33
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 100.23

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

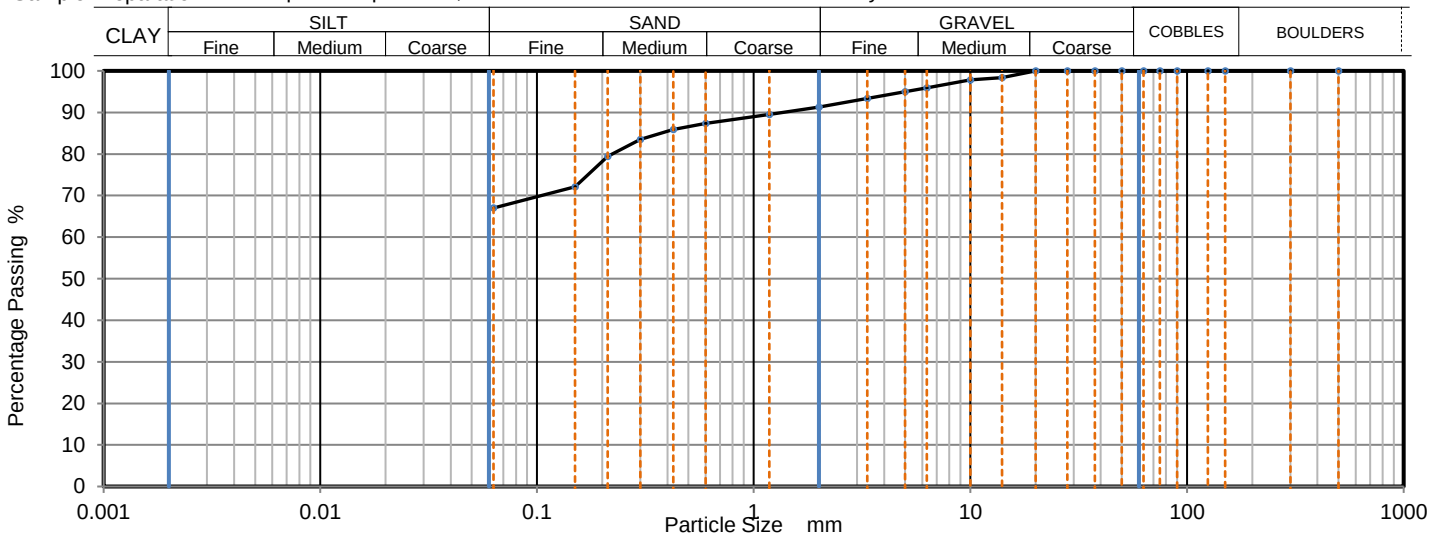
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839734	Depth Top [m]:	19.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	98		
6.3	96		
5	95		
3.35	93		
2	91		
1.18	90		
0.6	87		
0.425	86		
0.3	84		
0.212	79		
0.15	72		
0.063	67		

Sample Proportions	% dry mass
Very coarse	0
Gravel	9
Sand	24
Fines <0.063mm	67

Grading Analysis		
D100	mm	20
D60	mm	
D30	mm	
D10	mm	
Uniformity Coefficient		N/A
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Northampton NN4 7EB

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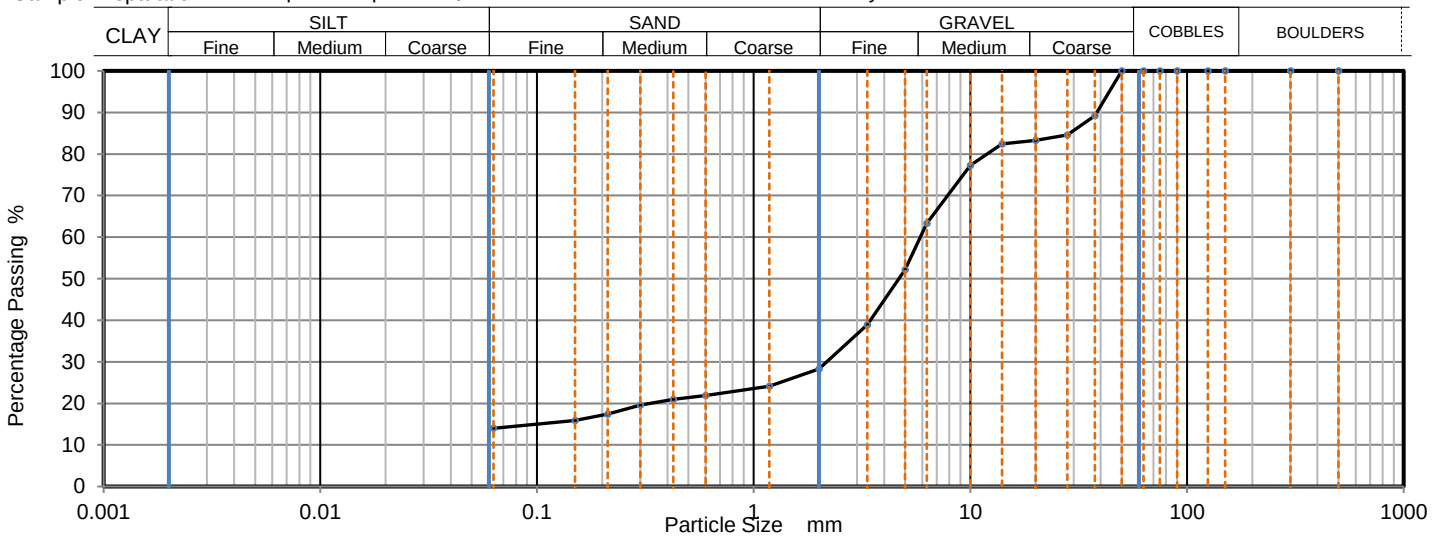
Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839735	Depth Top [m]:	21.00
Hole No.:	BH1	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Light grey GRAVEL with fragments of chalk		
Sample Preparation:	Sample was quartered, oven dried at 108.4 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	85		
20	83		
14	82		
10	77		
6.3	63		
5	52		
3.35	39		
2	28		
1.18	24		
0.6	22		
0.425	21		
0.3	20		
0.212	17		
0.15	16		
0.063	14		

Sample Proportions	% dry mass
Very coarse	0
Gravel	72
Sand	14
Fines <0.063mm	14

Grading Analysis		
D100	mm	50
D60	mm	5.88
D30	mm	2.18
D10	mm	
Uniformity Coefficient		> 93
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Date Reported: 08/11/2023

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TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

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Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

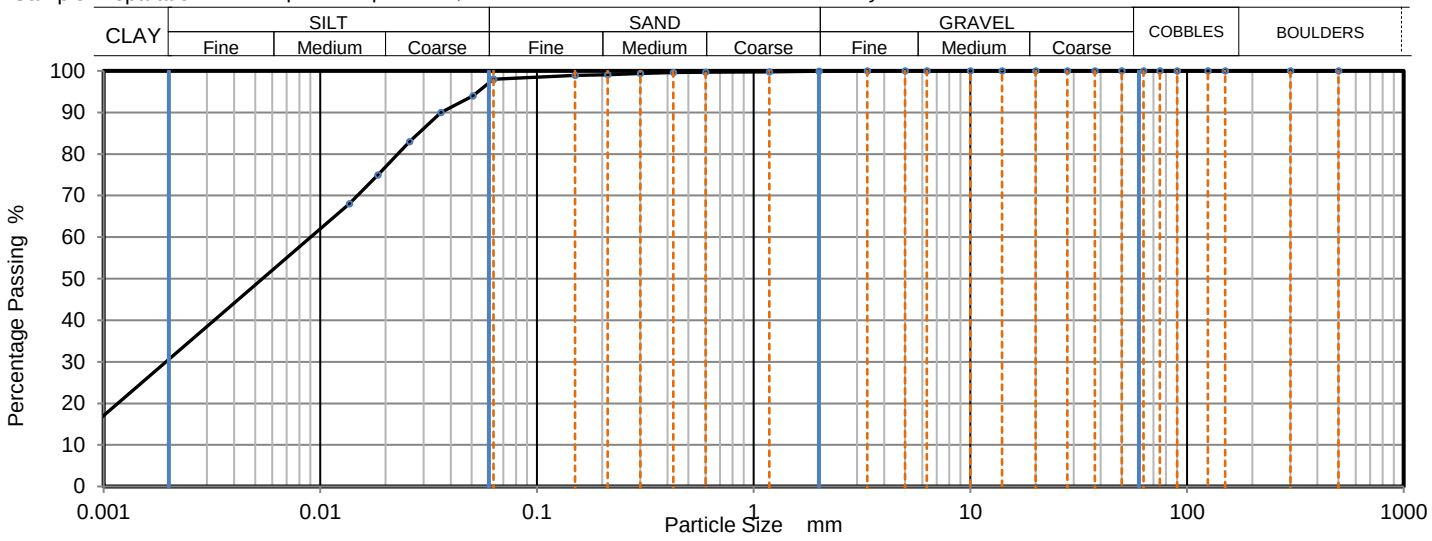
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839737	Depth Top [m]:	3.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brownish grey CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	98
300	100	0.0506	94
150	100	0.0360	90
125	100	0.0258	83
90	100	0.0184	75
75	100	0.0136	68
63	100	0.0009	15
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100	Particle density	(assumed)
2	100	2.65	Mg/m3
1.18	100		
0.6	100		
0.425	100		
0.3	99		
0.212	99		
0.15	99		
0.063	98		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	2
Silt	67
Clay	31

Grading Analysis		
D100	mm	3.35
D60	mm	0.0091
D30	mm	0.00194
D10	mm	
Uniformity Coefficient		> 10
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

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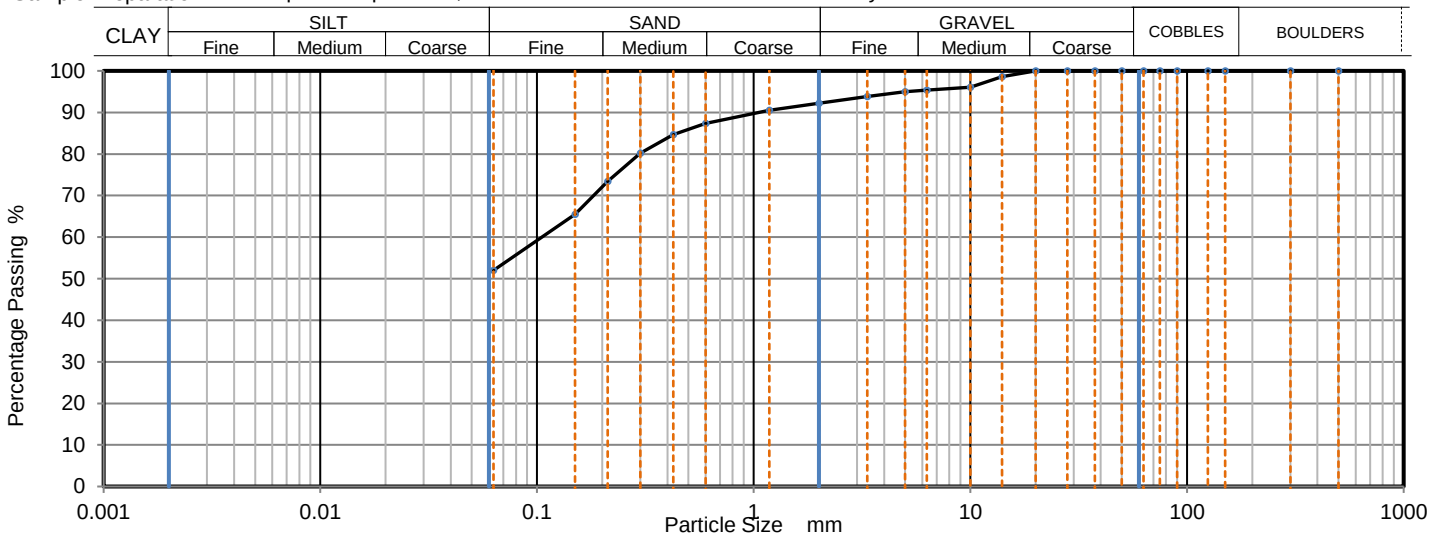
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839739	Depth Top [m]:	9.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown sandy CLAY		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	96		
6.3	95		
5	95		
3.35	94		
2	92		
1.18	91		
0.6	87		
0.425	85		
0.3	80		
0.212	73		
0.15	66		
0.063	52		

Sample Proportions	% dry mass
Very coarse	0
Gravel	8
Sand	40
Fines <0.063mm	52

Grading Analysis		
D100	mm	20
D60	mm	0.105
D30	mm	
D10	mm	
Uniformity Coefficient		> 1.7
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 100.23

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

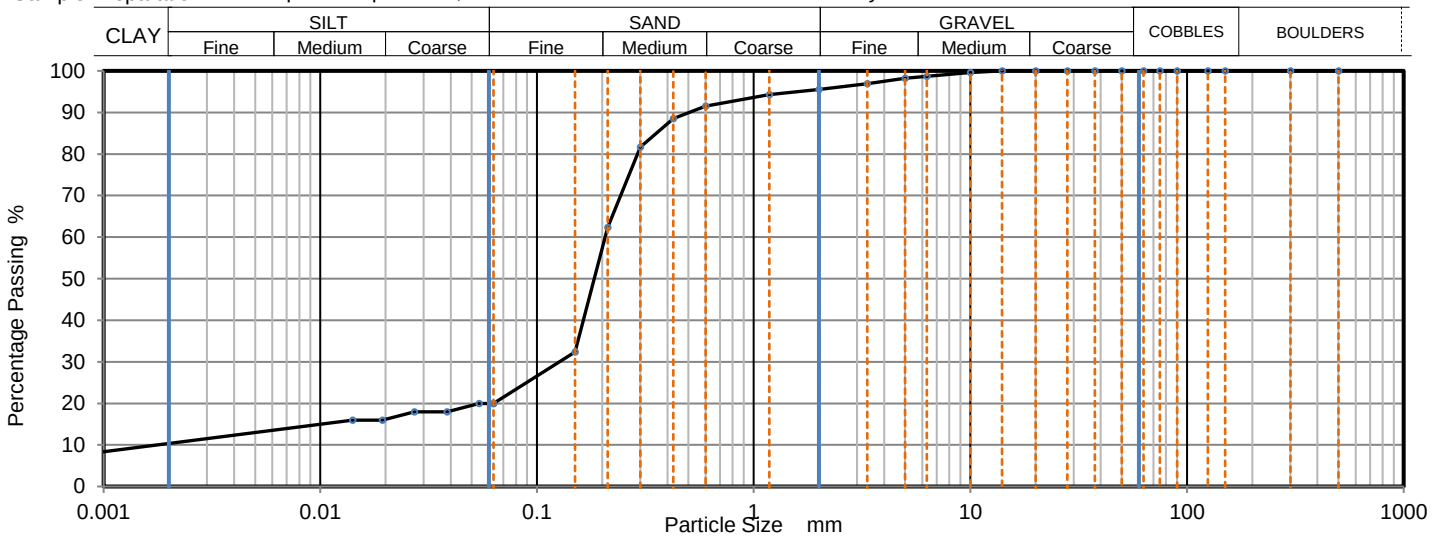
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	25/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839740	Depth Top [m]:	20.00
Hole No.:	BH2	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown clayey SAND		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	20
300	100	0.0540	20
150	100	0.0384	18
125	100	0.0271	18
90	100	0.0193	16
75	100	0.0141	16
63	100	0.0009	8
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	98		
3.35	97	Particle density	(assumed)
2	96	2.65	Mg/m3
1.18	94		
0.6	92		
0.425	89		
0.3	82		
0.212	62		
0.15	32		
0.063	20		

Sample Proportions	% dry mass
Very coarse	0
Gravel	4
Sand	76
Silt	10
Clay	10

Grading Analysis		
D100	mm	14
D60	mm	0.206
D30	mm	0.127
D10	mm	0.00189
Uniformity Coefficient		110
Curvature Coefficient		41

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 100.23

4041

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

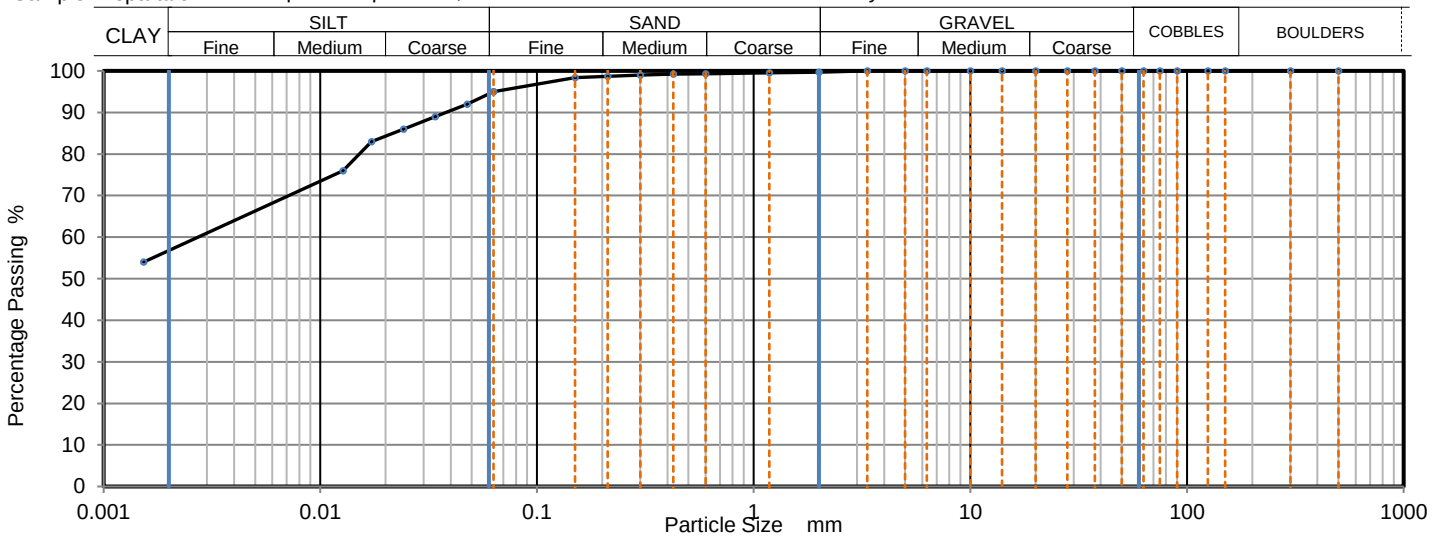
Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	20/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839743	Depth Top [m]:	4.00
Hole No.:	BH3	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Brown CLAY		
Sample Preparation:	Sample was quartered, oven dried at 107.7 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100	0.0630	95
300	100	0.0476	92
150	100	0.0339	89
125	100	0.0242	86
90	100	0.0172	83
75	100	0.0127	76
63	100	0.0015	54
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100	Particle density	(assumed)
2	100	2.65	Mg/m3
1.18	100		
0.6	99		
0.425	99		
0.3	99		
0.212	99		
0.15	98		
0.063	95		

Sample Proportions	% dry mass
Very coarse	0
Gravel	0
Sand	4
Silt	39
Clay	57

Grading Analysis		
D100	mm	3.35
D60	mm	0.00269
D30	mm	
D10	mm	
Uniformity Coefficient		> 1.8
Curvature Coefficient		

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clauses 9.2 and 9.5

Remarks:

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Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 100.23

TEST CERTIFICATE

DETERMINATION OF PARTICLE SIZE DISTRIBUTION

Tested in Accordance with: BS 1377-2: 1990

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

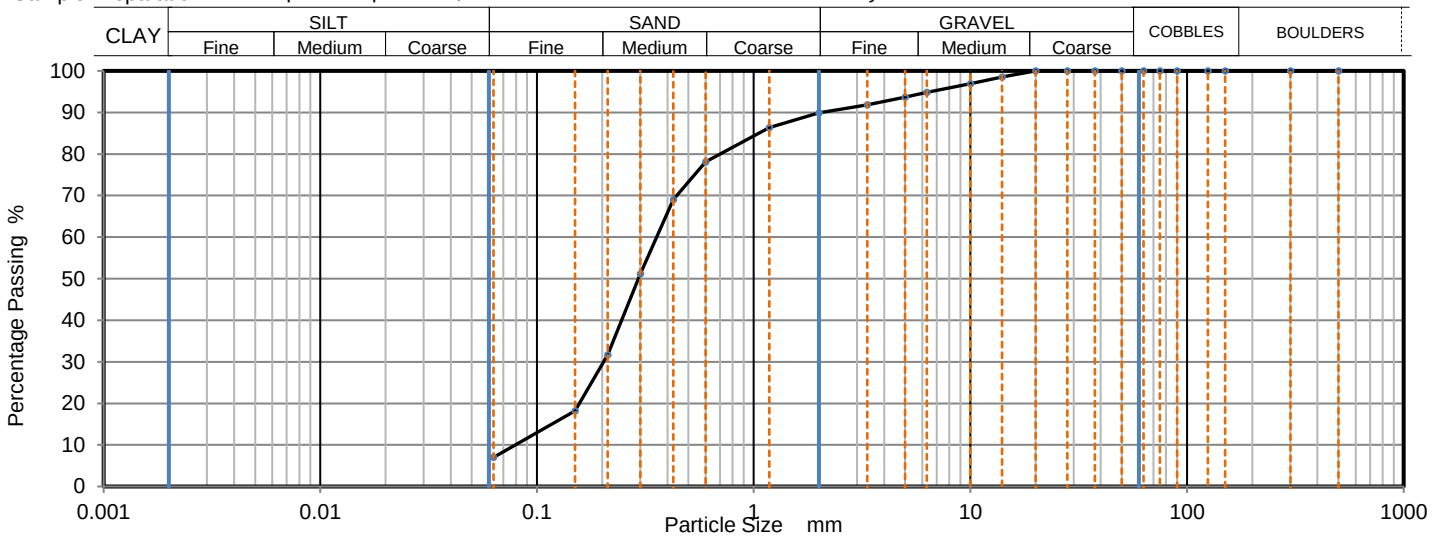
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	26/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839746	Depth Top [m]:	17.00
Hole No.:	BH4	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	B
Sample Description:	Light brown SAND with fragments of chalk		
Sample Preparation:	Sample was quartered, oven dried at 108.9 °C and broken down by hand.		



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
500	100		
300	100		
150	100		
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	97		
6.3	95		
5	94		
3.35	92		
2	90		
1.18	86		
0.6	78		
0.425	69		
0.3	51		
0.212	32		
0.15	18		
0.063	8		

Sample Proportions	% dry mass
Very coarse	0
Gravel	10
Sand	82
Fines <0.063mm	8

Grading Analysis		
D100	mm	20
D60	mm	0.356
D30	mm	0.203
D10	mm	0.0758
Uniformity Coefficient		4.7
Curvature Coefficient		1.5

Uniformity and Curvature Coefficient calculated in accordance with BS EN ISO 14688-2:2018

Note: Tested in Accordance with BS1377:Part 2:1990, clause 9.2

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 100.23

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

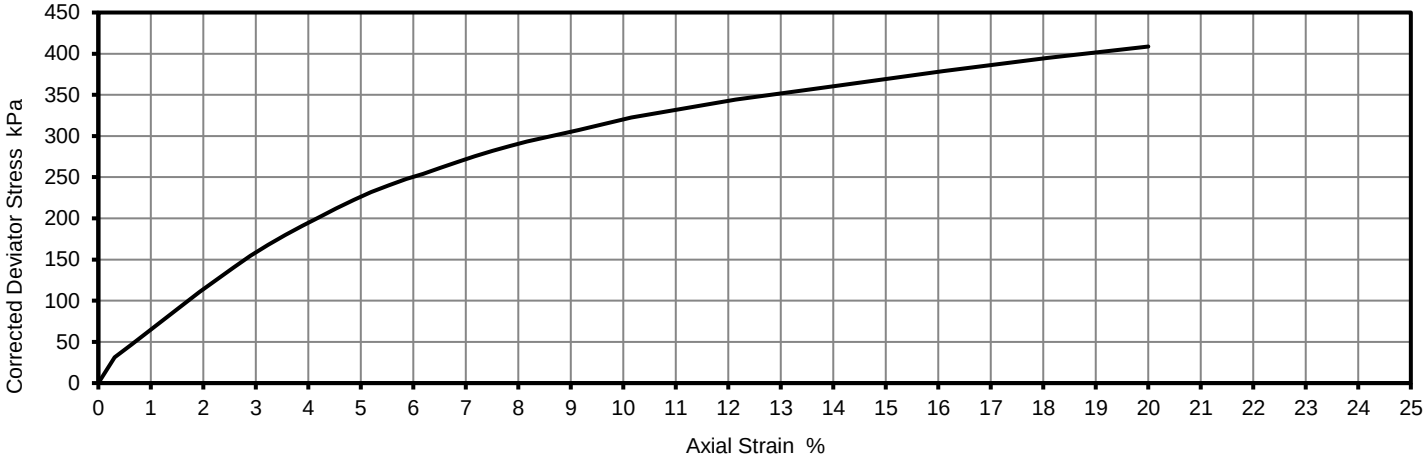
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

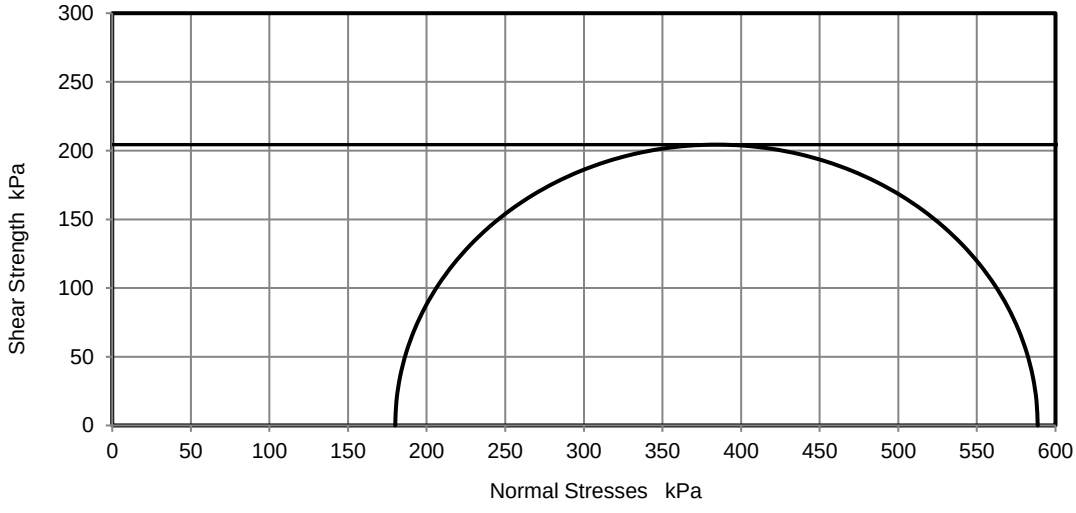
Laboratory Reference:	2839706	Depth Top [m]:	9.00
Hole No.:	BH1	Depth Base [m]:	9.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	1.99	%/min
Length	201.20	mm	Cell Pressure	180	kPa
Diameter	103.25	mm	Axial Strain at failure	20.0	%
Bulk Density	2.18	Mg/m3	Deviator Stress, (σ1 - σ3)f	409	kPa
Moisture Content	22	%	Undrained Shear Strength, cu	204	kPa ½(σ1 - σ3)f
Dry Density	1.78	Mg/m3	Mode of Failure	Compound	
Membrane Correction	1.01	kPa	Latex membrane thickness	0.27	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

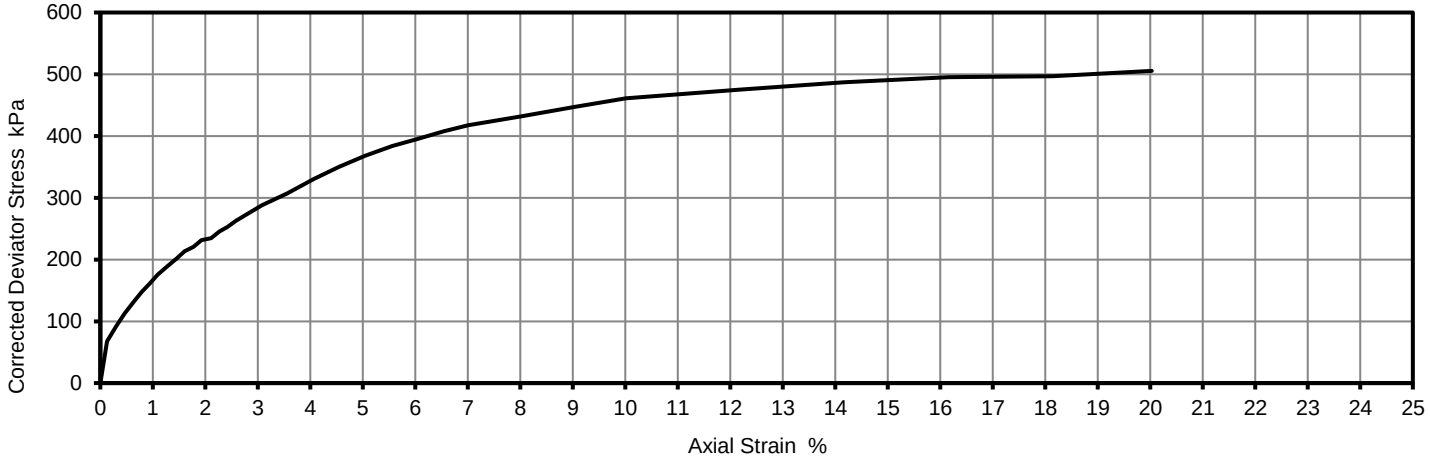
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

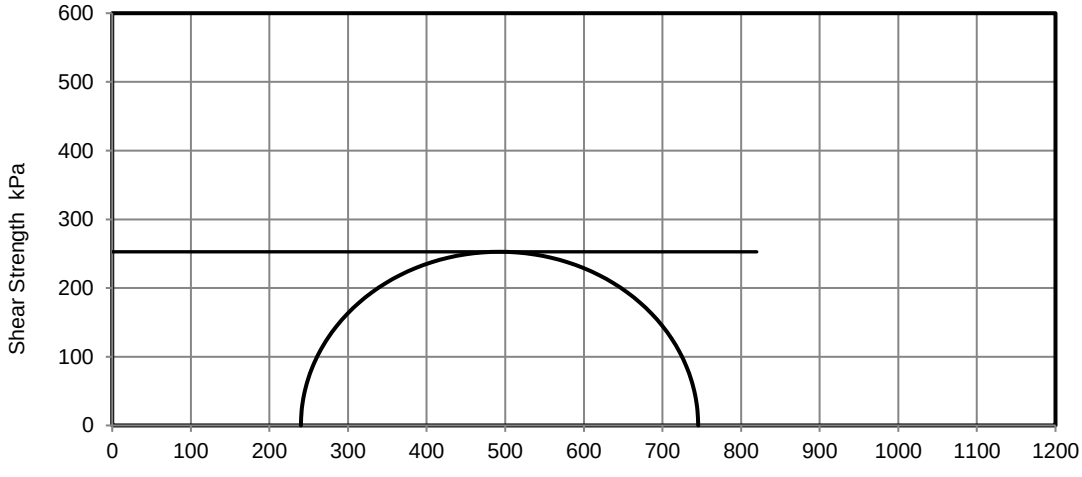
Laboratory Reference:	2839708	Depth Top [m]:	12.00
Hole No.:	BH1	Depth Base [m]:	12.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min	
Length	99.67	mm	Cell Pressure	240	kPa	
Diameter	49.43	mm	Axial Strain at failure	20.0	%	
Bulk Density	2.16	Mg/m3	Deviator Stress, (σ1 - σ3)f	505	kPa	
Moisture Content	12	%	Undrained Shear Strength, cu	253	kPa	½(σ1 - σ3)f
Dry Density	1.92	Mg/m3	Mode of Failure	Compound		
Membrane Correction	1.79	kPa	Latex membrane thickness	0.23	mm	

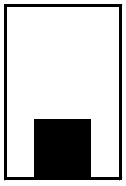
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

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Date Reported: 08/11/2023

GF 184.14

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

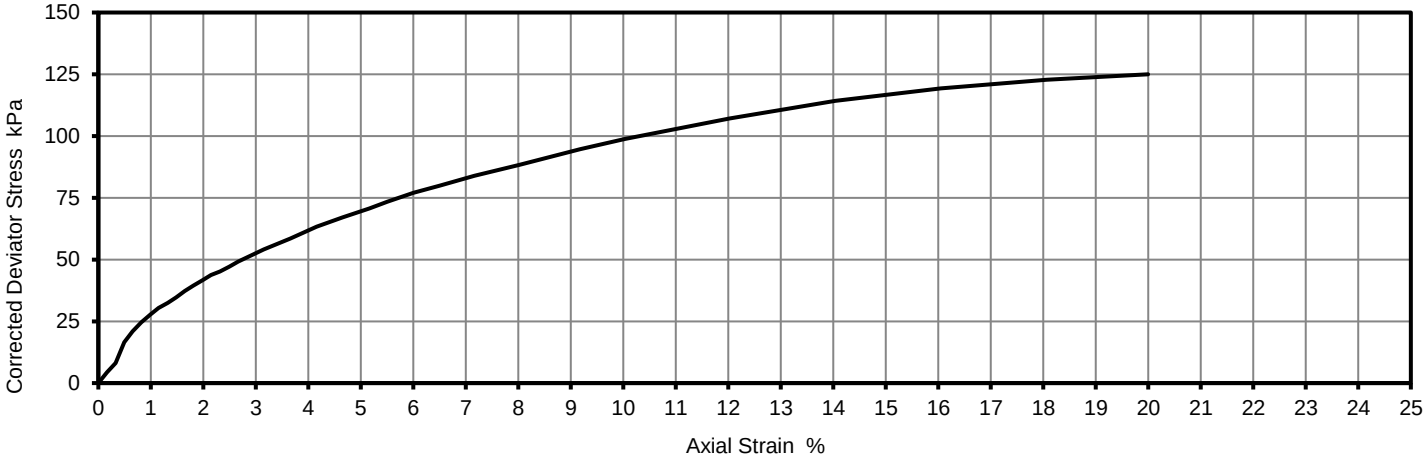
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

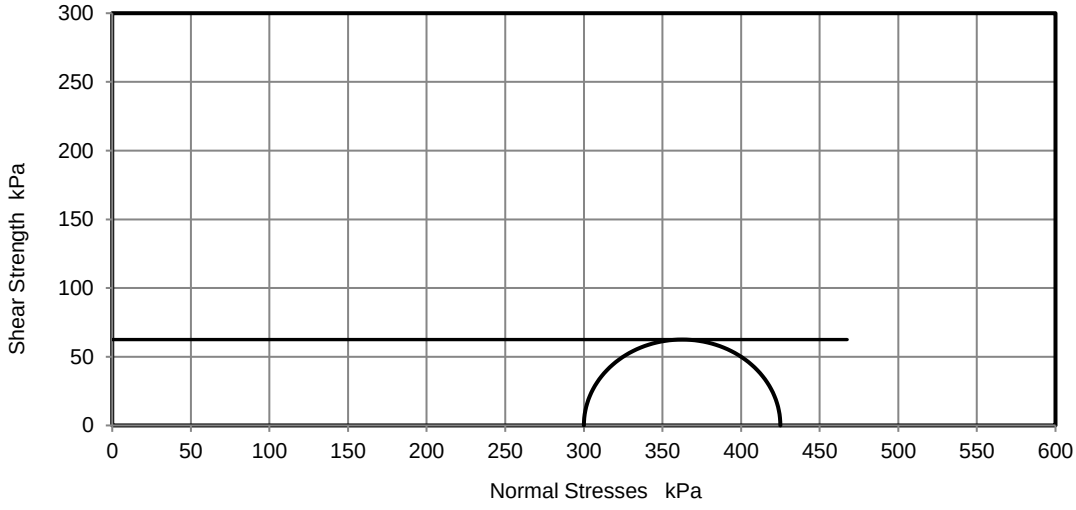
Laboratory Reference:	2839710	Depth Top [m]:	15.00
Hole No.:	BH1	Depth Base [m]:	15.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly silty CLAY with fragments od chalk		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min
Length	200.25	mm	Cell Pressure	300	kPa
Diameter	103.68	mm	Axial Strain at failure	20.0	%
Bulk Density	2.16	Mg/m3	Deviator Stress, (σ1 - σ3)f	125	kPa
Moisture Content	18	%	Undrained Shear Strength, cu	62	kPa ½(σ1 - σ3)f
Dry Density	1.83	Mg/m3	Mode of Failure	Compound	
Membrane Correction	0.96	kPa	Latex membrane thickness	0.26	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	28/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

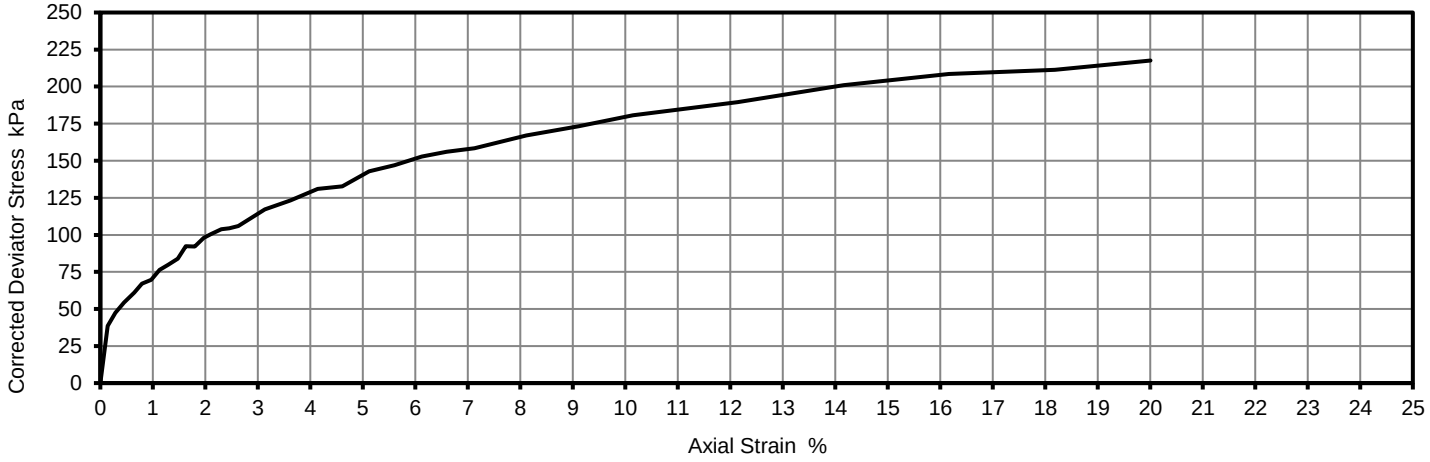
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

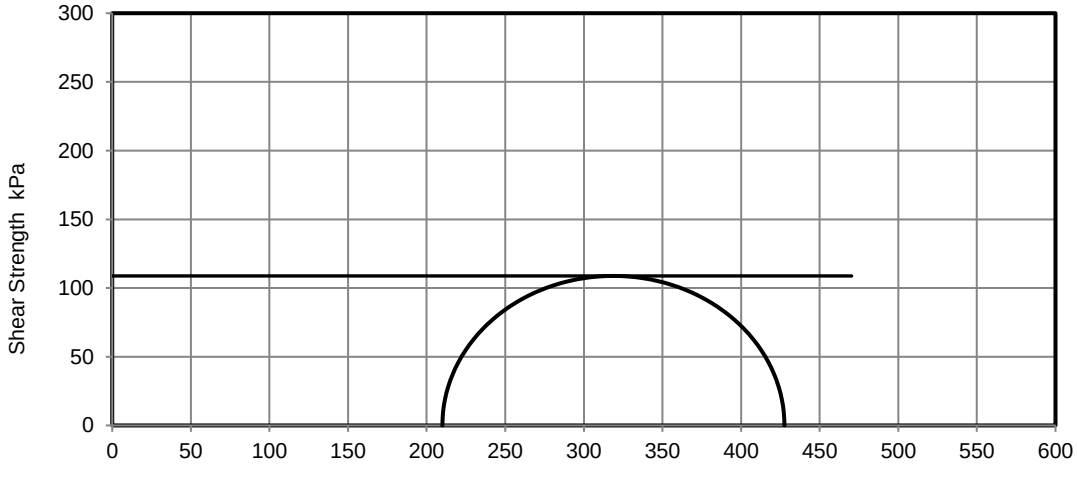
Laboratory Reference:	2839712	Depth Top [m]:	10.50
Hole No.:	BH2	Depth Base [m]:	10.95
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly gravelly CLAY		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min	
Length	77.29	mm	Cell Pressure	210	kPa	
Diameter	38.04	mm	Axial Strain at failure	20.0	%	
Bulk Density	2.16	Mg/m3	Deviator Stress, (σ1 - σ3)f	218	kPa	
Moisture Content	14	%	Undrained Shear Strength, cu	109	kPa	½(σ1 - σ3)f
Dry Density	1.90	Mg/m3	Mode of Failure	Compound		
Membrane Correction	2.02	kPa	Latex membrane thickness	0.20	mm	

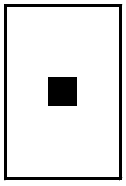
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	28/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

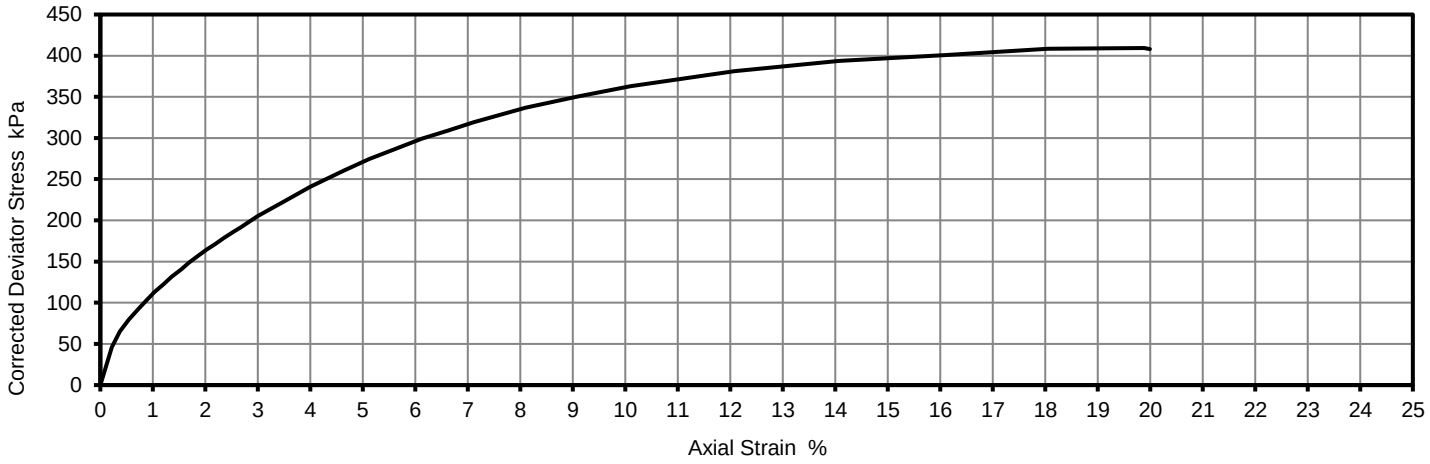
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

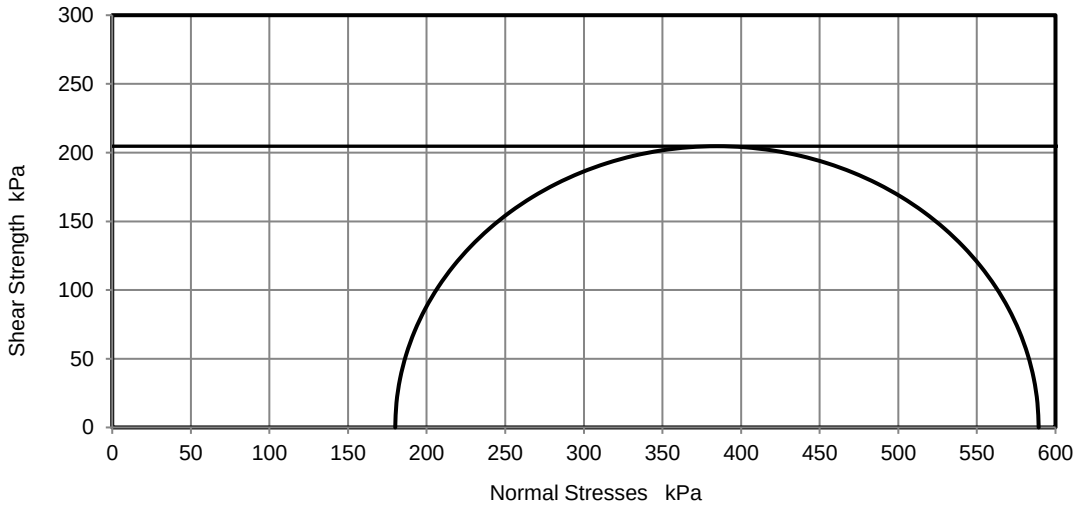
Laboratory Reference:	2839716	Depth Top [m]:	9.00
Hole No.:	BH3	Depth Base [m]:	9.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly gravelly CLAY with fragments of chalk		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min
Length	139.86	mm	Cell Pressure	180	kPa
Diameter	68.45	mm	Axial Strain at failure	19.9	%
Bulk Density	2.28	Mg/m3	Deviator Stress, (σ1 - σ3)f	409	kPa
Moisture Content	14	%	Undrained Shear Strength, cu	205	kPa ½(σ1 - σ3)f
Dry Density	1.99	Mg/m3	Mode of Failure	Compound	
Membrane Correction	1.34	kPa	Latex membrane thickness	0.24	mm

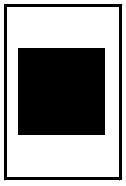
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks: Unable to determine orientation – test carried out on intact part of core.

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

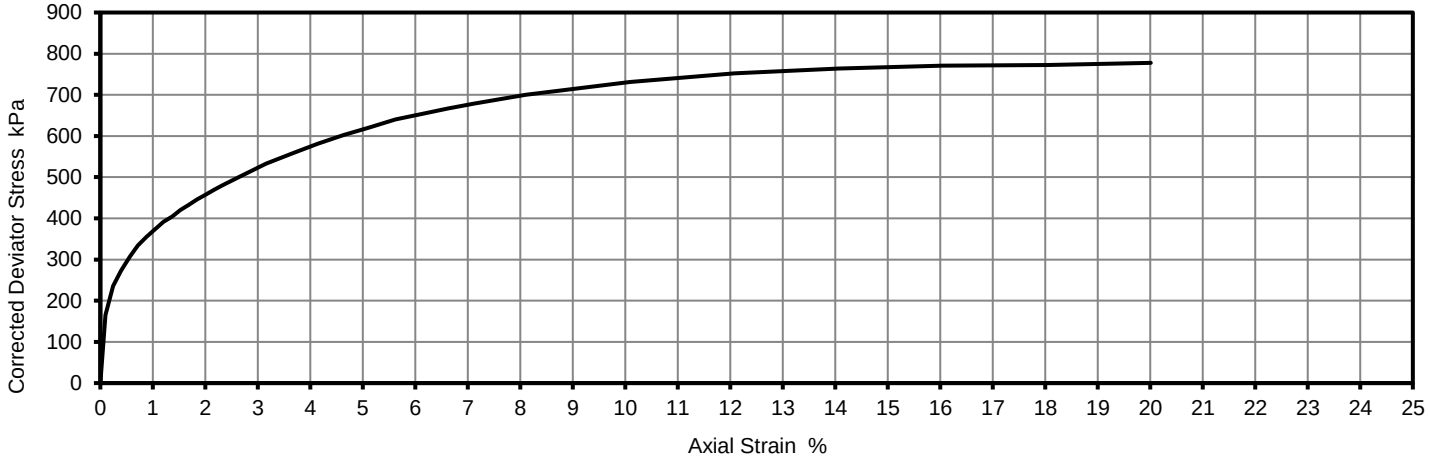
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

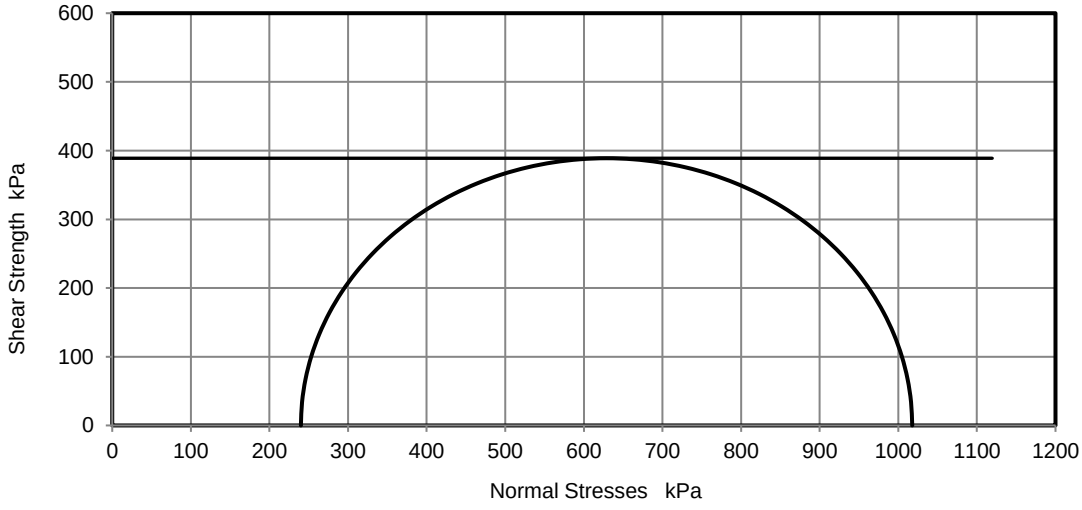
Laboratory Reference:	2839718	Depth Top [m]:	12.00
Hole No.:	BH3	Depth Base [m]:	12.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY with fragments of chalk		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	1.99	%/min
Length	200.87	mm	Cell Pressure	240	kPa
Diameter	102.83	mm	Axial Strain at failure	20.0	%
Bulk Density	2.21	Mg/m3	Deviator Stress, (σ1 - σ3)f	778	kPa
Moisture Content	11	%	Undrained Shear Strength, cu	389	kPa ½(σ1 - σ3)f
Dry Density	1.99	Mg/m3	Mode of Failure	Compound	
Membrane Correction	0.97	kPa	Latex membrane thickness	0.26	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

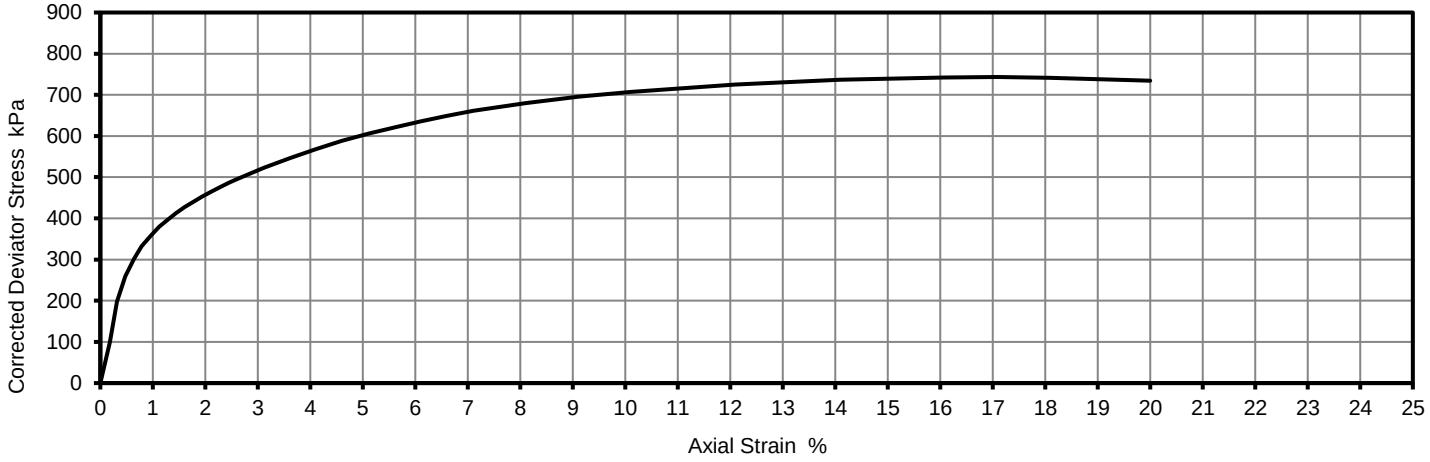
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

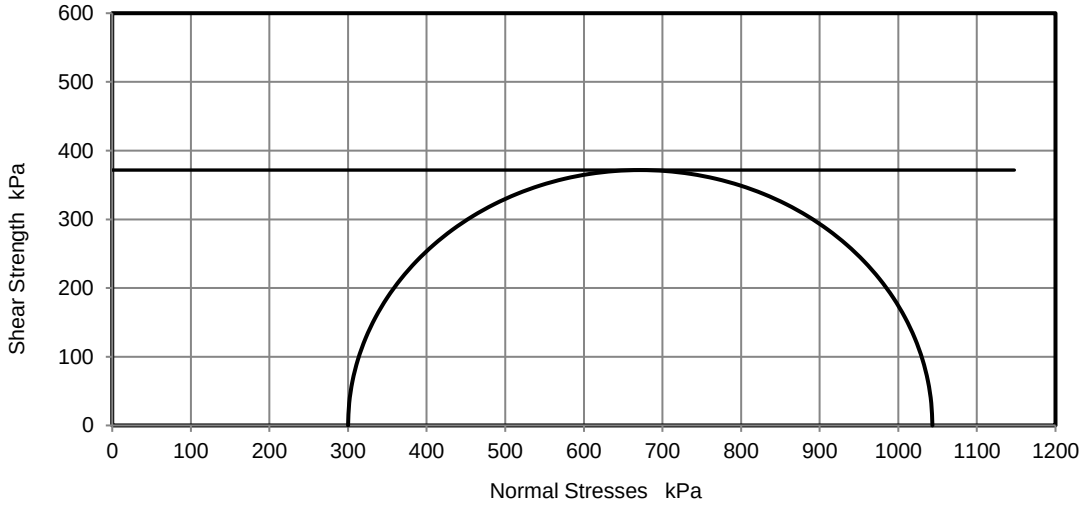
Laboratory Reference:	2839723	Depth Top [m]:	15.00
Hole No.:	BH4	Depth Base [m]:	15.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown silty CLAY with fragments of chalk		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min
Length	200.48	mm	Cell Pressure	300	kPa
Diameter	101.56	mm	Axial Strain at failure	17.1	%
Bulk Density	2.23	Mg/m3	Deviator Stress, (σ1 - σ3)f	743	kPa
Moisture Content	10	%	Undrained Shear Strength, cu	372	kPa ½(σ1 - σ3)f
Dry Density	2.02	Mg/m3	Mode of Failure	Compound	
Membrane Correction	0.86	kPa	Latex membrane thickness	0.26	mm

Deviator Stress v Axial Strain



Mohr Circles



Position within sample

Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

4041

TEST CERTIFICATE

DETERMINATION OF THE UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

Tested in Accordance with: BS 1377-7: 1990: Clause 8

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

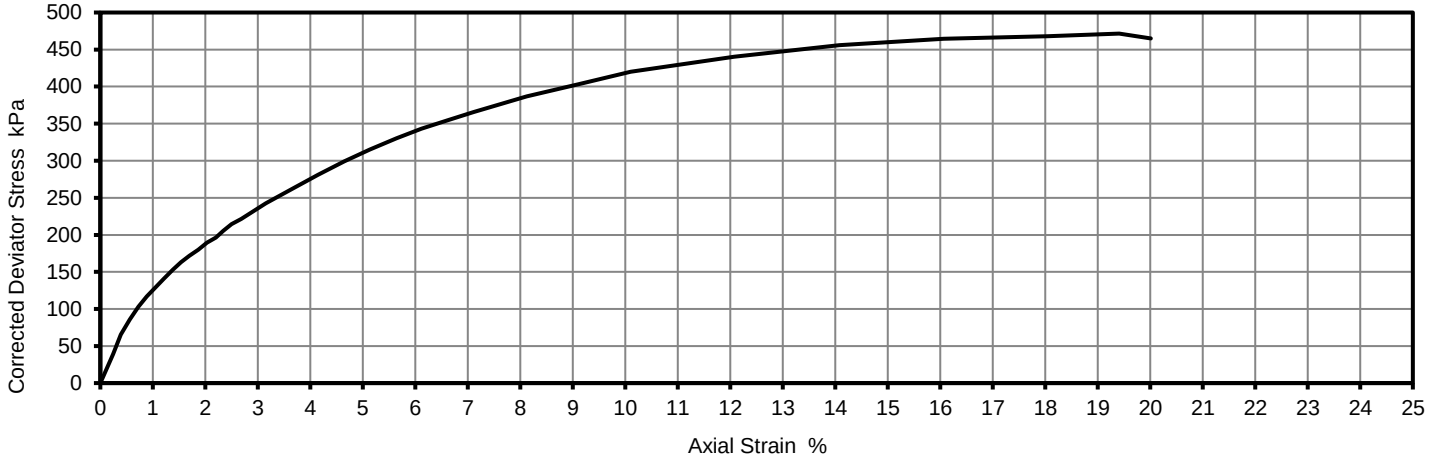
Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

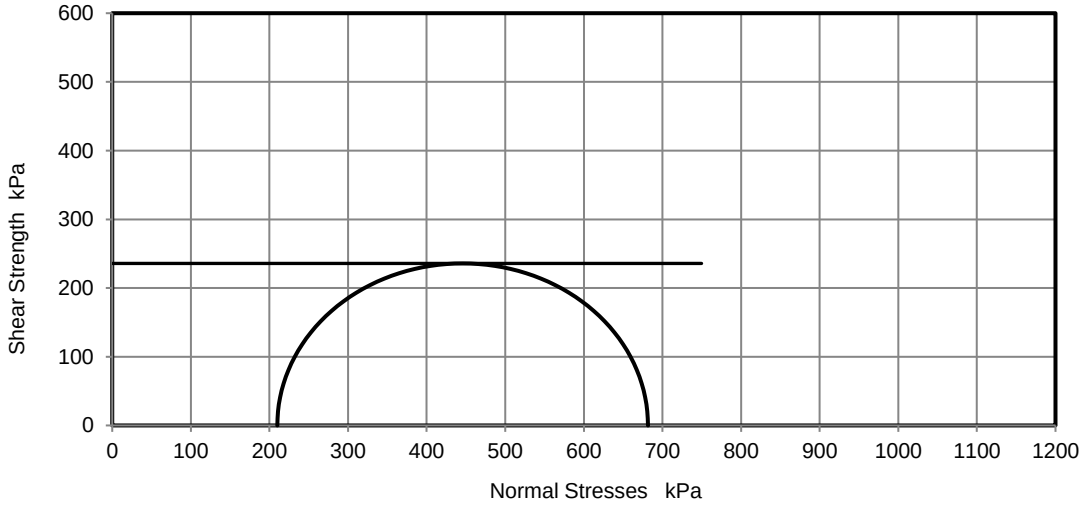
Laboratory Reference:	2839724	Depth Top [m]:	10.50
Hole No.:	BH5	Depth Base [m]:	10.95
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY with fragments of chalk		
Sample Preparation:	Sample prepared in accordance with BS 1377-1:2016 Clause 9.1.1.		

Test Number	1		Rate of Strain	2.00	%/min
Length	99.60	mm	Cell Pressure	210	kPa
Diameter	48.93	mm	Axial Strain at failure	19.4	%
Bulk Density	2.21	Mg/m3	Deviator Stress, (σ1 - σ3)f	472	kPa
Moisture Content	12	%	Undrained Shear Strength, cu	236	kPa ½(σ1 - σ3)f
Dry Density	1.97	Mg/m3	Mode of Failure	Compound	
Membrane Correction	1.69	kPa	Latex membrane thickness	0.22	mm

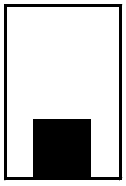
Deviator Stress v Axial Strain



Mohr Circles



Position within sample



Note: Deviator stress corrected for area change and membrane effects. Mohr circles and their interpretation is not covered by BS1377. This is provided for information only.

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 184.14

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

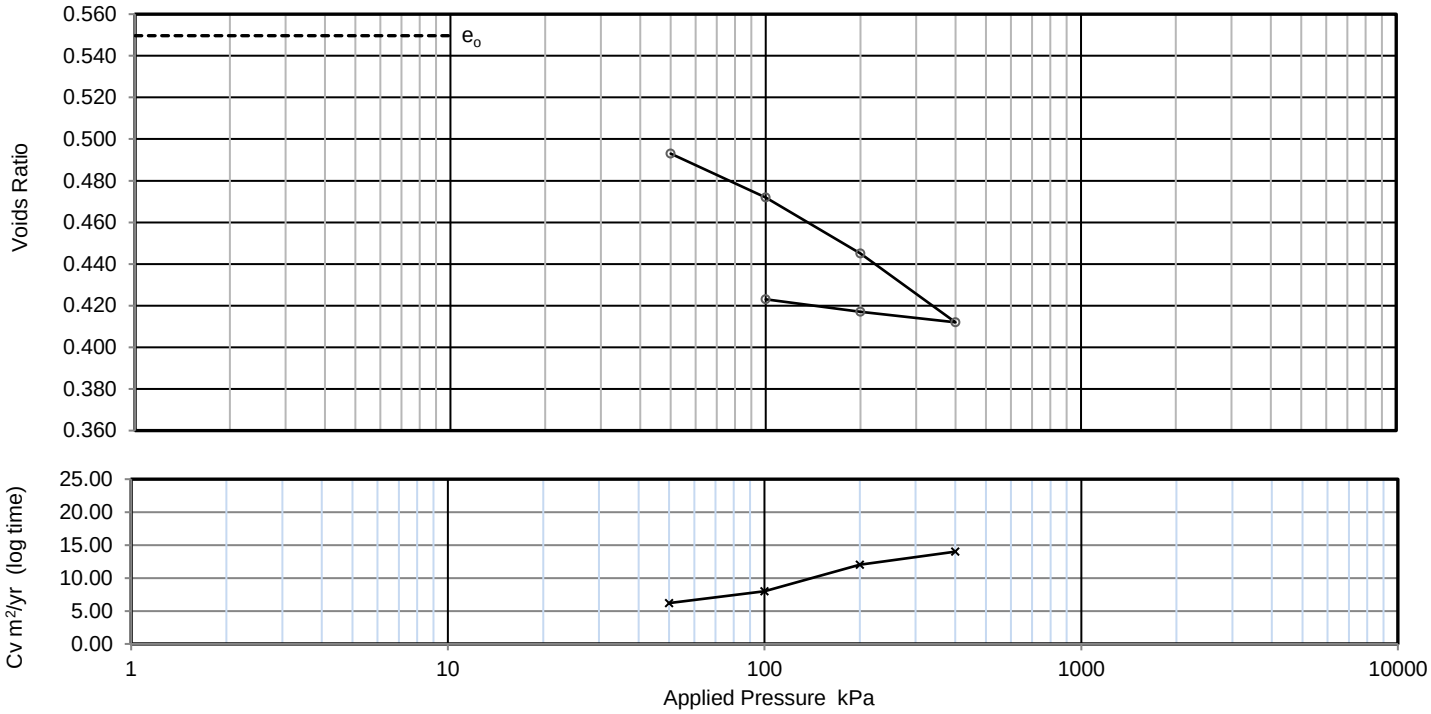
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839706	Depth Top [m]:	9.00
Hole No.:	BH1	Depth Base [m]:	9.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.550	-	-	-	-
50	0.493	0.73	6.2	5.4	0.00062
100	0.472	0.29	8	4.5	0.00062
200	0.445	0.18	12	4.1	0.001
400	0.412	0.11	14	4.1	0.0013
200	0.417	0.017			
100	0.423	0.043			

Preparation

Carried out on top of U100

Index tests

Orientation of the sample	Vertical		
Particle density	measured	2.70	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.02	-	mm
Height	20.02	18.38	mm
Moisture Content	19	17	%
Bulk density	2.08	2.22	Mg/m3
Dry density	1.74	1.90	Mg/m3
Voids Ratio	0.550	0.423	
Saturation	95	107	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

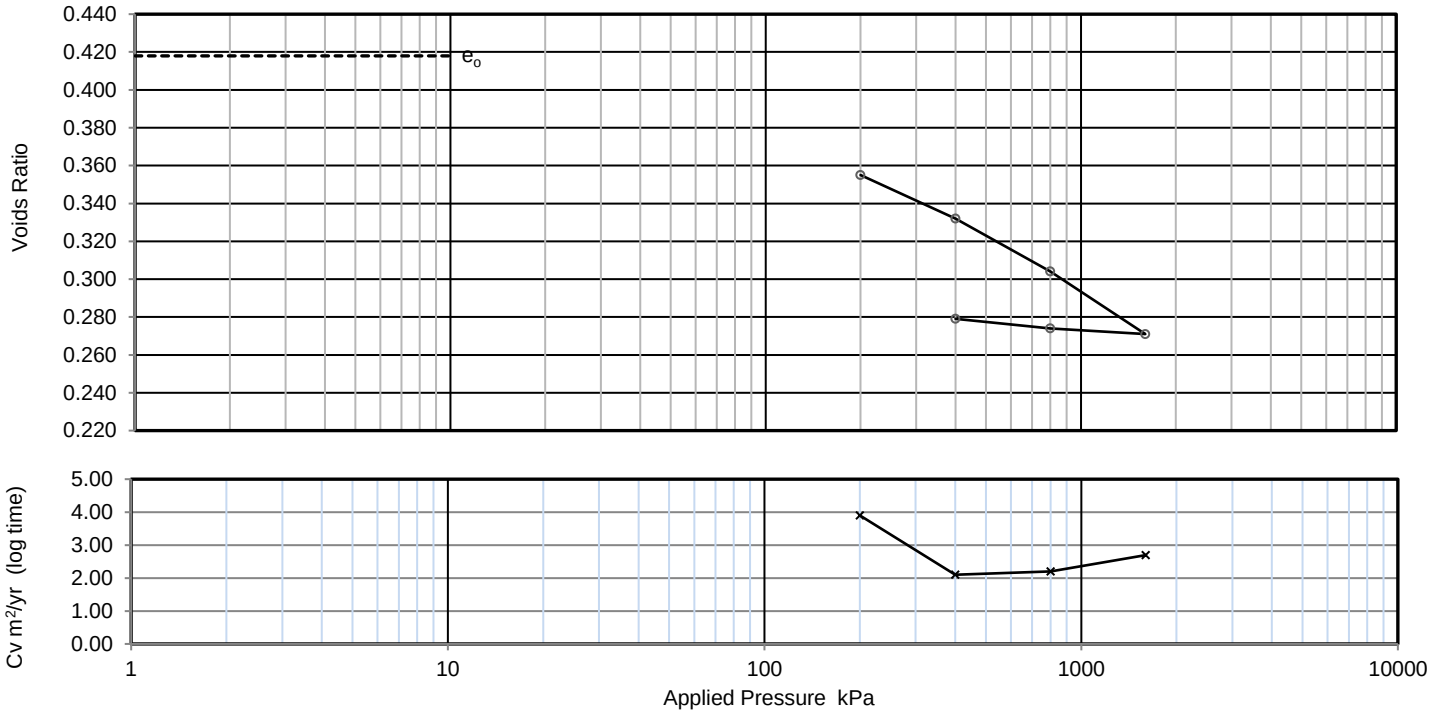
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839710	Depth Top [m]:	15.00
Hole No.:	BH1	Depth Base [m]:	15.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly silty CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.418	-	-	-	-
200	0.355	0.22	3.9	1.4	0.0013
400	0.332	0.085	2.1	1.4	0.0015
800	0.304	0.054	2.2	1.5	0.0013
1 600	0.271	0.032	2.7	1.3	0.0021
800	0.274	0.0034			
400	0.279	0.01			

Preparation

Carried out on top of U100

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.04	-	mm
Height	20.16	18.19	mm
Moisture Content	16	14	%
Bulk density	2.17	2.36	Mg/m3
Dry density	1.87	2.07	Mg/m3
Voids Ratio	0.418	0.279	
Saturation	101	133	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Client: Mayer Environmental

Client Address: Transport Avenue, Brentford, Middlesex, TW8 9HA

Contact: Rebecca Beddard

Site Address: Grimsby HTI

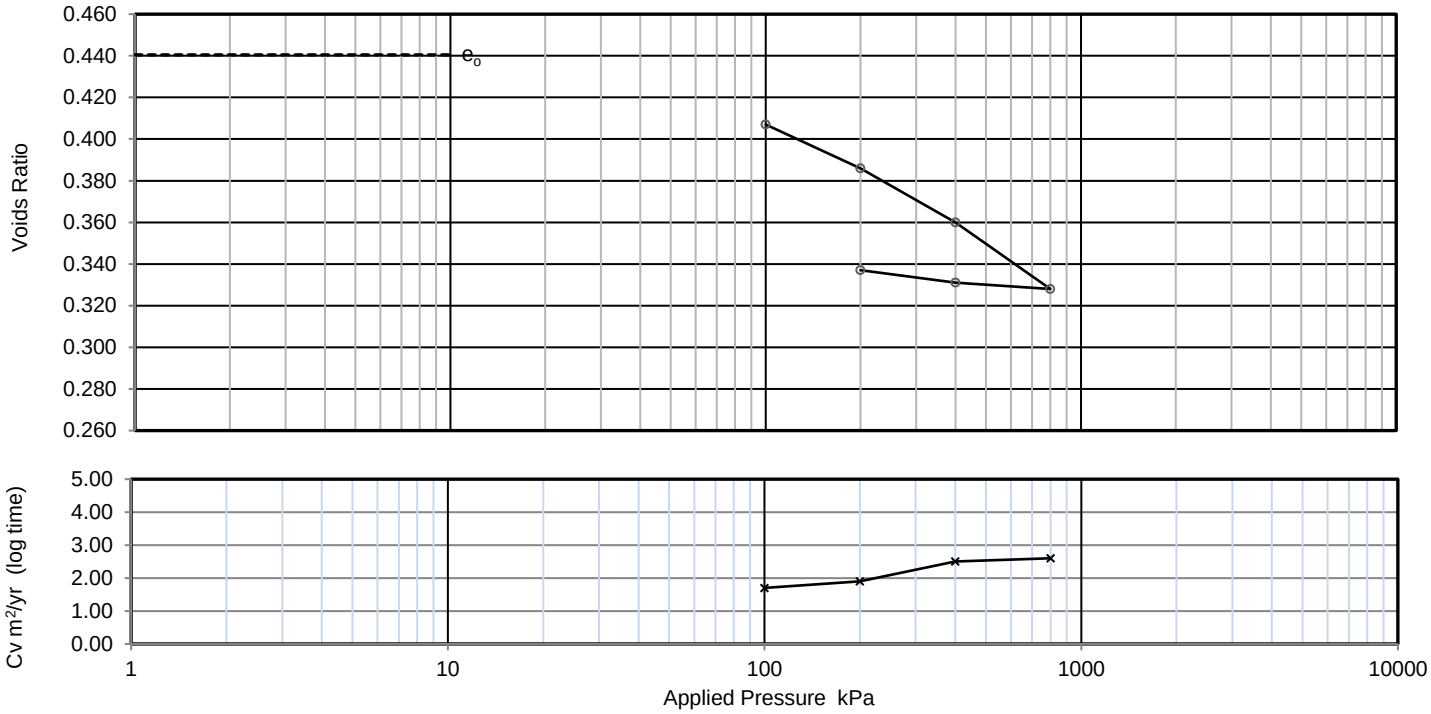
Client Reference: 129-002870
Job Number: 23-61503-1
Date Sampled: Not Given
Date Received: 02/10/2023
Date Tested: 30/10/2023
Sampled By: Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference: 2839712
Hole No.: BH2
Sample Reference: Not Given
Sample Description: Brown slightly gravelly CLAY

Depth Top [m]: 10.50
Depth Base [m]: 10.95
Sample Type: U



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.440	-	-	-	-
100	0.407	0.23	1.7	1.2	0.00064
200	0.386	0.15	1.9	1.3	0.00064
400	0.360	0.096	2.5	2	0.0013
800	0.328	0.058	2.6	1.7	0.0015
400	0.331	0.0061			
200	0.337	0.02			

Preparation

Carried out on bottom of U100

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.10	-	mm
Height	20.00	18.56	mm
Moisture Content	17	14	%
Bulk density	2.16	2.26	Mg/m3
Dry density	1.84	1.98	Mg/m3
Voids Ratio	0.440	0.337	
Saturation	104	111	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

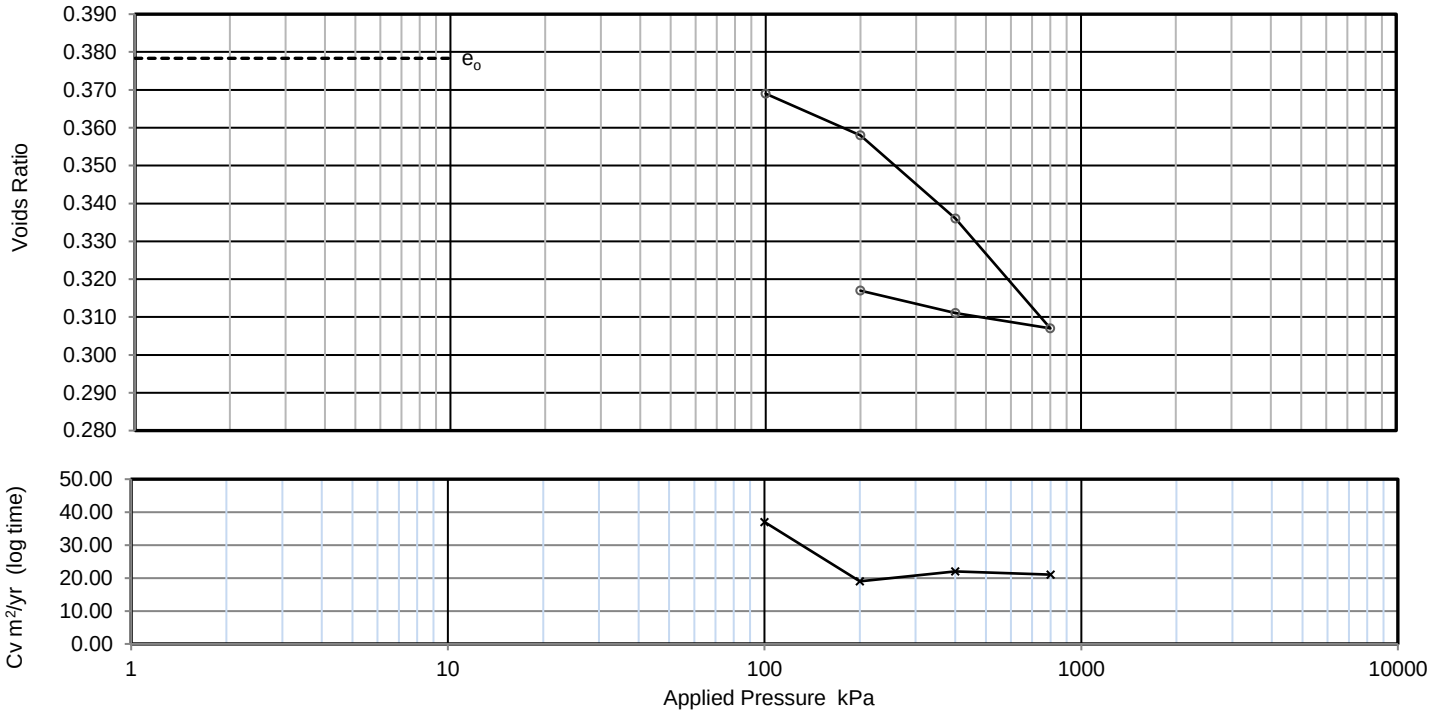
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	30/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839714	Depth Top [m]:	13.50
Hole No.:	BH2	Depth Base [m]:	13.95
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly gravelly CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.378	-	-	-	-
100	0.369	0.065	37	20	0.0004
200	0.358	0.083	19	12	0.00047
400	0.336	0.081	22	13	0.00095
800	0.307	0.055	21	14	0.0013
400	0.311	0.0082			
200	0.317	0.024			

Preparation

Sample squeezed out of core

Index tests

Orientation of the sample	Vertical		
Particle density	measured	2.68	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.17	-	mm
Height	20.03	19.14	mm
Moisture Content	12	13	%
Bulk density	2.17	2.31	Mg/m3
Dry density	1.94	2.03	Mg/m3
Voids Ratio	0.378	0.317	
Saturation	84	113	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

4041

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

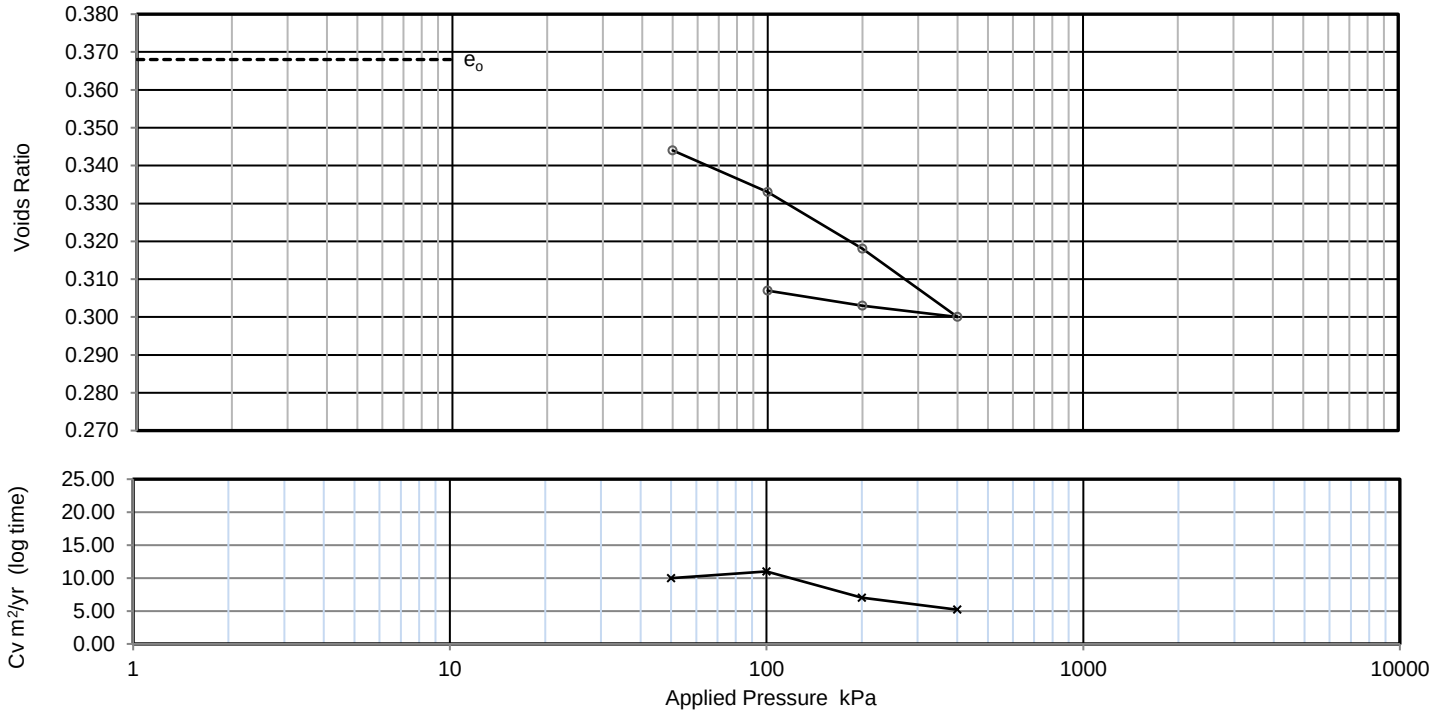
Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	30/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839716	Depth Top [m]:	9.00
Hole No.:	BH3	Depth Base [m]:	9.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown slightly gravelly CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.368	-	-	-	-
50	0.344	0.35	10	8.1	0.00043
100	0.333	0.17	11	8	0.00062
200	0.318	0.11	7	5.7	0.00076
400	0.300	0.068	5.2	3.8	0.0011
200	0.303	0.0094			
100	0.307	0.029			

Preparation

Sample squeezed out of core

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.04	-	mm
Height	20.16	19.25	mm
Moisture Content	14	14	%
Bulk density	2.20	2.31	Mg/m3
Dry density	1.94	2.03	Mg/m3
Voids Ratio	0.368	0.307	
Saturation	99	121	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

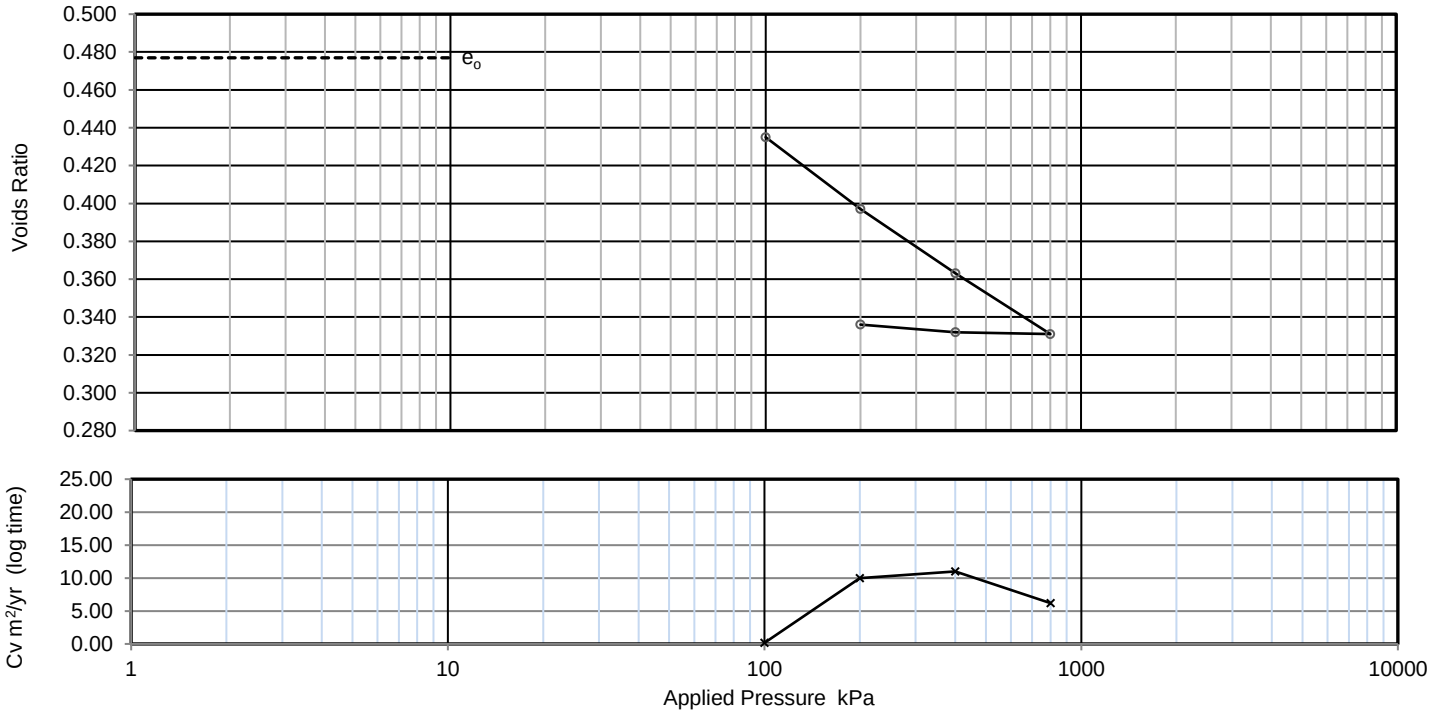
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839718	Depth Top [m]:	12.00
Hole No.:	BH3	Depth Base [m]:	12.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.477	-	-	-	-
100	0.435	0.28	0.17	0.088	0.0013
200	0.397	0.27	10	7.4	0.00076
400	0.363	0.12	11	5.4	0.00061
800	0.331	0.058	6.2	3.8	0.0013
400	0.332	0.00069			
200	0.336	0.016			

Note: Cv corrected to 20°C

Preparation

Carried out on top of U100

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.17	-	mm
Height	20.03	18.12	mm
Moisture Content	11	12	%
Bulk density	2.00	2.23	Mg/m3
Dry density	1.79	1.98	Mg/m3
Voids Ratio	0.477	0.336	
Saturation	63	96	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

4041

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

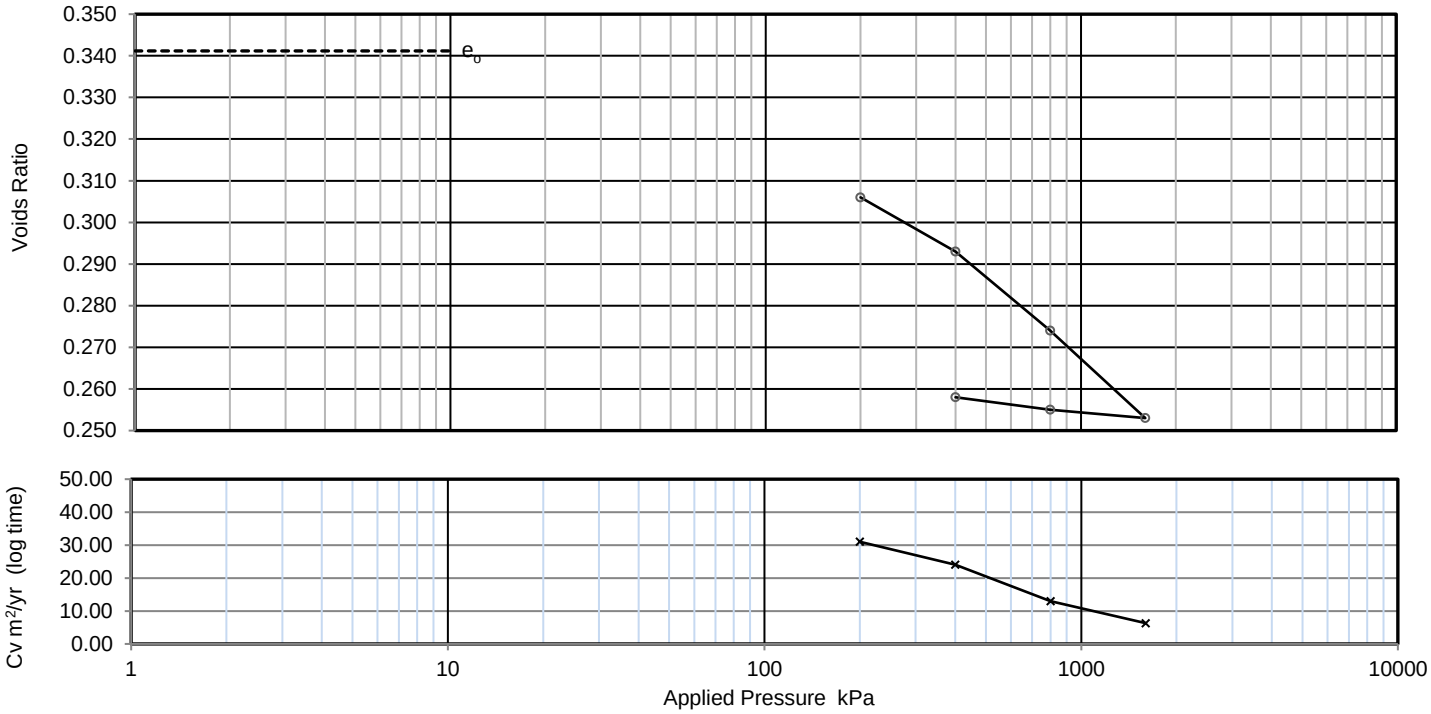
Environmental Science

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839723	Depth Top [m]:	15.00
Hole No.:	BH4	Depth Base [m]:	15.45
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown silty CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.341	-	-	-	-
200	0.306	0.13	31	20	0.00043
400	0.293	0.052	24	14	0.00054
800	0.274	0.035	13	4.3	0.00078
1 600	0.253	0.021	6.3	3.5	0.00092
800	0.255	0.0019			
400	0.258	0.0076			

Preparation: Carried out on top of U100

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.03	-	mm
Height	20.03	18.79	mm
Moisture Content	11	11	%
Bulk density	2.20	2.34	Mg/m3
Dry density	1.98	2.11	Mg/m3
Voids Ratio	0.341	0.258	
Saturation	89	115	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Note: Cv corrected to 20°C

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

TEST CERTIFICATE

DETERMINATION OF THE ONE-DIMENSIONAL CONSOLIDATION PROPERTIES

Tested in Accordance with: BS 1377-5:1990: Clause 3

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

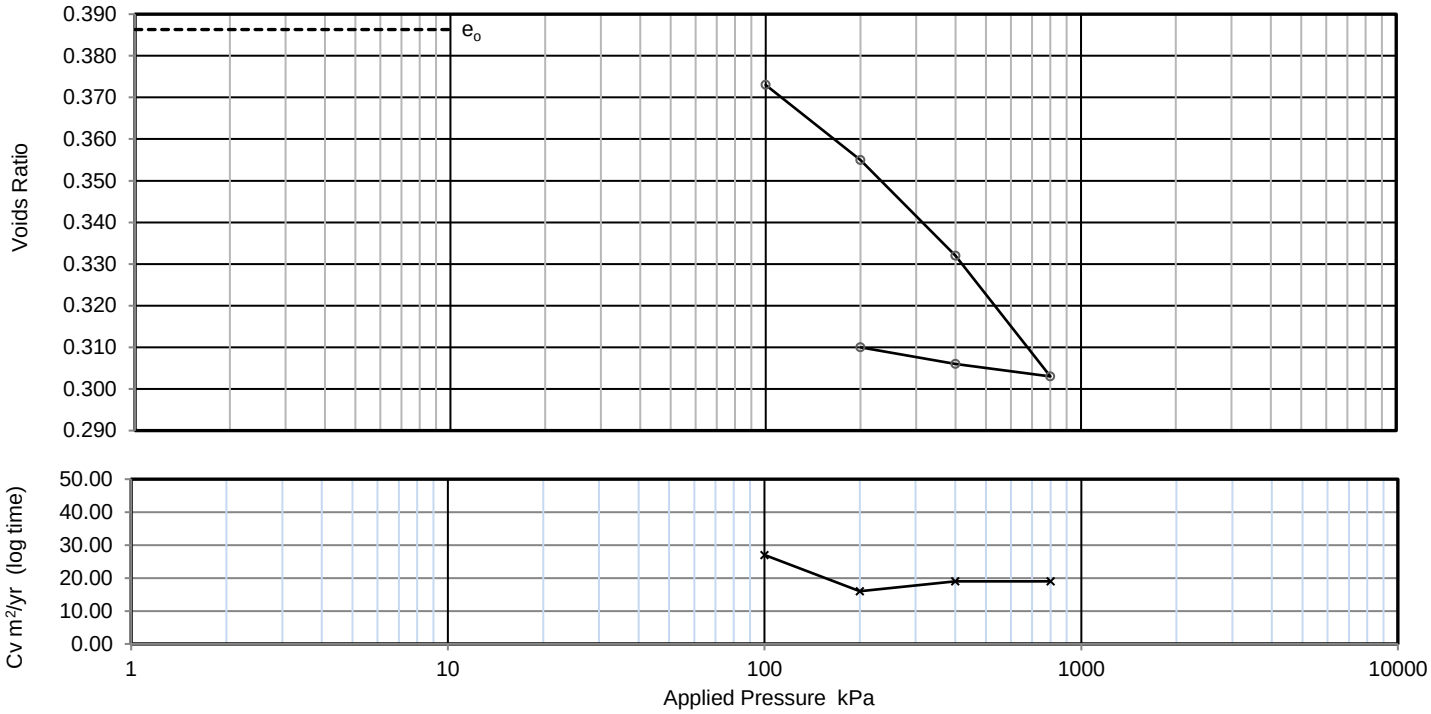
4041

Client:	Mayer Environmental	Client Reference:	129-002870
Client Address:	Transport Avenue, Brentford, Middlesex, TW8 9HA	Job Number:	23-61503-1
		Date Sampled:	Not Given
		Date Received:	02/10/2023
Contact:	Rebecca Beddard	Date Tested:	19/10/2023
Site Address:	Grimsby HTI	Sampled By:	Not Given

Testing carried out at i2 Analytical Limited, ul. Pionierow, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	2839724	Depth Top [m]:	10.50
Hole No.:	BH5	Depth Base [m]:	10.95
Sample Reference:	Not Given	Sample Type:	U
Sample Description:	Brown gravelly CLAY with fragments of chalk		



Applied Pressure kPa	Voids ratio	Mv m2/MN	Cv (t50, log) m2/yr	Cv (t90, root m2/yr	Csec
0	0.386	-	-	-	-
100	0.373	0.094	27	27	0.00062
200	0.355	0.13	16	5.7	0.00078
400	0.332	0.086	19	5.5	0.0013
800	0.303	0.054	19	4.9	0.0016
400	0.306	0.0058			
200	0.310	0.016			

Note: Cv corrected to 20°C

Preparation

Carried out on top of U100

Index tests

Orientation of the sample	Vertical		
Particle density	assumed	2.65	Mg/m3
Liquid limit	N/A		%
Plastic limit	N/A		%

Specimen details	Initial	Final	
Diameter	50.08	-	mm
Height	20.09	18.99	mm
Moisture Content	13	13	%
Bulk density	2.16	2.30	Mg/m3
Dry density	1.91	2.02	Mg/m3
Voids Ratio	0.386	0.310	
Saturation	88	115	%
Avg. temperature for test	22.0		°C
Swelling Pressure	Not measured		kPa
Settlement on saturation			%
Total test time	6		days

Remarks:

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Signed:

Monika Janoszek
PL Environmental & Geotechnical Lab Production Specialist
for and on behalf of i2 Analytical Ltd

Date Reported: 08/11/2023

GF 172.17

Rebecca Beddard
Mayer Environmental☐
Transport Avenue
Brentford
Middlesex
TW8 9HA

t: 020 8847 3637
f: 020 8847 3638
e: Mayer

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

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

Analytical Report Number : 23-61504

Project / Site name:	Grimsby HTI	**Samples received on:**	02/10/2023
Your job number:	129-002870	**Samples instructed on/ Analysis started on:**	10/10/2023
Your order number:	129005453	**Analysis completed by:**	25/10/2023
Report Issue Number:	1	**Report issued on:**	25/10/2023
Samples Analysed:	11 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

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

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

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-61504
Project / Site name: Grimsby HTI
Your Order No: 129005453

Lab Sample Number				2839752	2839753	2839754	2839755	2839756
Sample Reference				BH1	BH1	BH1	BH1	BH1
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.50	4.50	10.50	19.00	21.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	22	32	15	12	14
Total mass of sample received	kg	0.001	NONE	0.5	0.6	0.5	0.6	0.6

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.5	8	8.6	7.9	8.6
Total Sulphate as SO4	%	0.005	MCERTS	0.048	0.21	0.024	0.034	0.033
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.125	1.16	0.0279	0.0841	0.0228
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	125	1160	27.9	84.1	22.8
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	25	410	42	3	6.1
Total Sulphur	%	0.005	MCERTS	0.047	1.53	0.079	0.175	0.018
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	< 0.5	1.9	19	< 0.5	< 0.5
Ammonium as NH4 (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	0.19	1.87	< 0.05	< 0.05
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	2.7	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	27	98	< 5.0	15	< 5.0
Magnesium (leachate equivalent)	mg/l	2.5	NONE	14	49	< 2.5	7.7	< 2.5

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number: 23-61504
Project / Site name: Grimsby HTI
Your Order No: 129005453

Lab Sample Number				2839757	2839758	2839759	2839760	2839761
Sample Reference				BH1	BH2	BH2	BH3	BH3
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				27.00	7.00	9.00	3.00	7.00
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	0.01	NONE	15	70	17	27	36
Total mass of sample received	kg	0.001	NONE	0.6	0.5	1.1	0.4	0.2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.6	I/S	8.9	7.7	8.5
Total Sulphate as SO4	%	0.005	MCERTS	0.037	1.28	0.049	0.144	0.2
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0965	7.68	0.136	0.613	0.731
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	96.5	7680	136	613	731
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	5.6	I/S	170	140	500
Total Sulphur	%	0.005	MCERTS	0.054	3.34	0.102	0.37	2.51
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	< 0.5	97	< 0.5	1.6	52
Ammonium as NH4 (10:1 leachate equivalent)	mg/l	0.05	MCERTS	< 0.05	9.72	< 0.05	0.16	5.24
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	12	1100	14	130	55
Magnesium (leachate equivalent)	mg/l	2.5	NONE	5.9	540	6.8	65	28

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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Analytical Report Number: 23-61504
Project / Site name: Grimsby HTI
Your Order No: 129005453

Lab Sample Number				2839762
Sample Reference				BH3
Sample Number				None Supplied
Depth (m)				8.00
Date Sampled				Deviating
Time Taken				None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**	
Stone Content	%	0.1	NONE	< 0.1
Moisture Content	%	0.01	NONE	12
Total mass of sample received	kg	0.001	NONE	1.2

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.9
Total Sulphate as SO4	%	0.005	MCERTS	0.024
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0071
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	7.1
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	72
Total Sulphur	%	0.005	MCERTS	0.036
Ammoniacal Nitrogen as NH4	mg/kg	0.5	MCERTS	20
Ammonium as NH4 (10:1 leachate equivalent)	mg/l	0.05	MCERTS	1.96
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	< 2.0

Heavy Metals / Metalloids

Magnesium (water soluble)	mg/kg	5	NONE	13
Magnesium (leachate equivalent)	mg/l	2.5	NONE	6.6

U/S = Unsuitable Sample I/S = Insufficient Sample ND = Not detected

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The results included within the report relate only to the sample(s) submitted for testing.

Analytical Report Number : 23-61504
Project / Site name: Grimsby HTI

* 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 *
2839752	BH1	None Supplied	1.5	Brown clay with vegetation.
2839753	BH1	None Supplied	4.5	Brown clay.
2839754	BH1	None Supplied	10.5	Brown clay.
2839755	BH1	None Supplied	19	Brown clay with gravel.
2839756	BH1	None Supplied	21	Beige clay and sand with chalk and vegetation.
2839757	BH1	None Supplied	27	Beige clay and sand with chalk.
2839758	BH2	None Supplied	7	Brown clay and sand.
2839759	BH2	None Supplied	9	Brown clay and sand with gravel.
2839760	BH3	None Supplied	3	Brown clay.
2839761	BH3	None Supplied	7	Brown clay.
2839762	BH3	None Supplied	8	Brown clay with gravel.

Analytical Report Number : 23-61504
Project / Site name: Grimsby HTI

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Ammonium as NH4 in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Sulphate, water soluble, in soil	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK 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.

Sample Deviation Report

Analytical Report Number : 23-61504
Project / Site name: Grimsby HTI

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 c - Holding time d - Headspace e - Temperature

Sample ID	Other ID	Sample Type	Lab Sample Number	Sample Deviation	Test Name	Test Ref	Test Deviation
BH1	None Supplied	S	2839752	a	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2839753	a	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2839754	a	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2839755	a	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2839756	a	None Supplied	None Supplied	None Supplied
BH1	None Supplied	S	2839757	a	None Supplied	None Supplied	None Supplied
BH2	None Supplied	S	2839758	a	None Supplied	None Supplied	None Supplied
BH2	None Supplied	S	2839759	a	None Supplied	None Supplied	None Supplied
BH3	None Supplied	S	2839760	a	None Supplied	None Supplied	None Supplied
BH3	None Supplied	S	2839761	a	None Supplied	None Supplied	None Supplied
BH3	None Supplied	S	2839762	a	None Supplied	None Supplied	None Supplied

Appendix K

CPT Report

Grimsby CPT

Static Cone Penetration Testing Report

2390127

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CENTRAL ALLIANCE GENERAL NOTES

Project No.: 2390127

Title: Grimsby CPT

Client: Mayer

Date: Sep 2023

Office: Central Alliance Preconstruction Services Limited, (Part of RSK Environment Limited), Alliance House, South Park Way, Wakefield 41 Business Park, Wakefield, WF2 0XJ

Status: 2390127-FAC-001

Author	Ben Bilsbrough	**Technical reviewer**	Thomas Goldsby-West
Signature		Signature	
Project manager	Ben Bilsbrough	**Quality reviewer**	Sean Blaney
Signature		Signature	

Revision control sheet

Revision reference	Date	Reason for revision	Amended by:	Approved by:

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1 INTRODUCTION

1.1 Commissioning

Central Alliance Pre-Construction Services Limited (Central Alliance) was instructed by Mayer to undertake intrusive ground investigation at Grimsby.

The scope of the investigation was designed by the designer with final exploratory hole locations agreed between client and Central Alliance, following consideration of the existing site conditions and site access restrictions.

1.2 Objectives

The aim of this report is to present the in situ Soil conditions and derived geotechnical parameters obtained, during the ground investigation, from 6 Static Piezocone Penetration Tests (CPTu).

1.3 Limitations

This report presents a description of the site at the time of the fieldwork, results of the fieldwork and in-situ testing undertaken, strata encountered and geotechnical test results.

Any of the comments and opinions contained within this report, are based on the information obtained by Central Alliance during the investigation.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been considered by this report. Responsibility cannot be accepted for conditions at the site not revealed by the investigation and confirmation of intermediate ground conditions between exploratory holes should be considered if deemed necessary.

Unless instructed by the client, Central Alliance is not obliged to and disclaims any obligation to update the report for events taking place after the date on which this investigation was undertaken.

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2 SITE DETAILS

2.1 Site location

Site location details are presented in **Table 1**

Table 1 Site location details

Site name	Grimsby
Full site address and postcode	Humber Gate, Energy Park Way, DN31 2TT

3 FIELD WORK

3.1 Completed Works

- 6 number of CPTu tests with real-time temperature compensation.
- Factual Report with measure and interpreted parameters.

3.1.1 Equipment Used

Type	ID	Date of Service / Calibration
200KN Crawler CPT Rig	CPT01	12/01/2023
15cm² Piezocone (u2)	71175	20/07/2023

3.1.2 Cone Calibration

The CPTu load cells and pore pressure transducer are calibrated regularly by the manufacturer adhering to BS EN ISO 224576-1:2012. Appendix (C) contains cone calibration certificates for all cones used on this project.

3.1.3 CPTu Pore Pressure Transducer Saturation

The u2 position was used with a HDPE filter which had been vacuum saturated with glycerine oil of viscosity 1412mPas.

3.1.4 Summary of Field Work

Testing was carried out by a 200kn tracked CPT rig. Where shallow refusals were met, the clients onsite represent was advised, retests were carried out as agreed with client. Appendix (A) includes final depths and refusal criteria as determined by the operator.

3.2 Methodology

All testing carried out adhered strictly to BS EN ISO 224576-1:2012.

Before each test is started the operator will take a zero value of the probe before loading, this will be compared with the unloaded zero values at the end of the test to ensure the sensors have not experienced any significant drift during the push. The push will be completed, at speeds not exceeding 2.2cm/s, in 1m stokes taking continuous readings. The readings on the probe are transmitted via the data cable to the datalogger and can be viewed in real-time on the computer. The test is ended when the specified depth is reach or when the operator believes the equipment will be damaged by continuing.

4 DATA PROCESSING

4.1 Applied Corrections

4.1.1 Corrected Cone Resistance (q_t)

During the push excess pore pressure acts on the tip of the probe due to unequal area effect. Pore pressure acts behind the tip of the probe with an unequal force than on the tip affecting qc. The difference between qc and qt is largest when in low strength soils with a high excess pore pressure, such as very soft clays. This report uses the correction defined by Lunne et al., 1997:

$$qt = qc + \left(u_2(1-\alpha)\right)$$

Where a is the cone area ratio.

The cone area ratio for this project is 0.75. And can be found on the cone calibration sheet in appendix B.

4.1.2 Corrected sleeve friction, (f_t)

Sleeve friction corrected for pore water pressure effects at either end of the friction sleeve, due to the geometry of the sleeve, there is closer to equal pressures at either end therefore the effect is often negligible.

4.1.3 Depth Correction

An automatic depth correction is applied to all tests, to show the data relative to the vertical axis, accounting for inclination. This completed in accordance with ISO 22476-1:2012.

4.2 DERIVED PARAMETERS

The following table presents the derived parameters.

DGD Field Name	Symbol	Unit
Penetration Rate		
Bulk Unit Weight	γ_b	kN/m^3
In Situ Pore Pressure	u_o	kPa
Excess Pore Pressure	Δu	kPa
Normalised Excess Pore Pressure	Normalised Δu	
Slope Indicator	a	deg
Total Stress	σ_{vo}	kPa
Effective Stress	σ'_{vo}	kPa
Total Cone Resistance	q_t	MPa
Total Cone Resistance Moving Average		MPa
Total Cone Resistance Moving Average Inc		MPa

DGD Field Name	Symbol	Unit
Net Cone Resistance	q_n	MPa
Corrected Sleeve Friction	f_t	kPa
Friction Ratio	R_f	%
Normalised Friction Ratio	F_r	%
Normalised Cone Resistance	Q_t	-
Stress Normalised Cone Resistance	q_{t1}	-
Pore Pressure Ratio	B_q	-
Differential Pore Pressure Ratio	DPPR	-
Dimensionless Penetration Resistance	$Q_t(1-B_q)+1$	-

4.3 Calculated Geotechnical Parameters

4.3.1 Soil Behaviour Type

The Soil behaviour type can be provided based on the following eight interpretation methods:

- Begemann 1965
- Eslami Fellenius 1997
- Ramsey 2002
- Robertson 1990
- Robertson 1990 Extrapolated (axis extrapolated out one order of magnitude)
- Robertson et al. 1986
- Schmertmann 1978
- Schneider et al. 2008 (defined by formula in paper's table 6)

The Default for reporting, unless otherwise stated is Robertson 1990 and Robertson et al. 1986.

4.3.2 Angle of friction

Soil friction angle is a shear strength parameter of soils. Its definition is derived from the Mohr-Coulomb failure criterion, and it is used to describe the friction shear resistance of soils together with the normal effective stress. φ' is derived for uncemented coarse grained soils by correlations with empirical data.

4.3.2.1 Friction Angle 1

The angle of internal friction of mixed soils (Φ') in Friction Angle 1 is defined as:

$$\Phi' = C1º \cdot B_{C2q} \cdot [C3 + C4 \cdot B_q + logQ_t]$$

Mayne and Campanella (2005), NCHRP Synthesis 368 pp 38-39

Where:

C1 is 29.5

*C*2 is 0.121

*C*3 is 0.256

*C*4 is 0.336

This correlation of *Φ'* is only applicable for 0.1<*Bq*<1.0 and hence will only be calculated if *Bq* in the Pore Pressure Ratio field on the same row lies within this range.

4.3.2.2 Friction Angle 2

The angle of internal friction of sands (Φ') in Friction Angle 2 is defined as:

$$\Phi' = \tan - 1(\mathrm{C1} + \mathrm{C2} \cdot \log({}^{\mathrm{qt}}/_{\sigma'\mathrm{v0}}))$$

Robertson and Campanella (1983), NCHRP Synthesis 368 p 38

Where:

C1 is 0.10

C2 is 0.38

This correlation of Φ′ is only applicable for Sands and hence will only be calculated if the Soil Type is coarse or mixed.

4.3.2.3 Friction Angle 3

The angle of internal friction of sand (Φ′) in Friction Angle 3 is defined as:

$$\Phi' = \mathrm{C1} + \mathrm{C2} \cdot \log(\mathrm{qt1})$$

Kulhawy and Mayne (1990), NCHRP Synthesis 368 p 38

Where:

C1 is 17.6°

C2 is 11.0°

This correlation of Φ′ is only applicable for Sands and hence will only be calculated if the soil type is coarse or mixed.

4.3.3 Coefficient of Lateral Earth Pressure

4.3.3.1 Coefficient of Lateral Earth Pressure 1

Coefficient of Lateral Earth Pressure 1 *(K0)* for uncemented sands and well behaved clays in Coefficient Lateral Earth Pressure 1 is defined as:

$$\mathrm{K0} = (1 - \sin\Phi') \cdot \mathrm{OCR}^{\sin\Phi'}$$

$$\mathrm{MaximumK0} = \mathrm{KP} = 1 + \frac{\sin\Phi' 1}{\sin\Phi'}$$

Mayne (2007), NCHRP Synthesis 368 p 42

Where:

Φ′ is taken from the Friction Angle 3 and Friction Angle 1.

4.3.3.2 Coefficient of Lateral Earth Pressure 2

Coefficient of Lateral Earth Pressure 2 (K0) for sand in Coefficient Lateral Earth Pressure 2 is defined as:

$$K0 = C1 \cdot (\frac{qt}{\sigma_{atm}})C2 \cdot (\frac{\sigma atm}{\sigma'_{v0}})C3 \cdot OCR^{C4}$$

Mayne (2007), NCHRP Synthesis 368 p 43

Where:

C1 is 0.192

C2 is 0.22

C3 is 0.31

C4 is 0.27

4.3.3.3 Coefficient of Lateral Earth Pressure 3

Coefficient of Lateral Earth Pressure 3 (K0) for fine grained soils in Coefficient_Lateral_Earth_Pressure_3 is defined as:

$$K_0 = C_1 \cdot (\frac{q_t - \sigma_{v0}}{\sigma'_{v0}})$$

Kulhawy and Mayne (1990), CPT Guide p 32

Where:

C1 is 0.1

4.3.4 Coefficient of volume change

The coefficient of volume change 1 (mv) in Coefficent Volume Change 1 is defined as:

$$m_v = \frac{1}{M}$$

CPT in Geotechnical Practice p 71

Where:

M the constrained modulus.

4.3.5 Compression Index

The Compression Index 1 (Cc) in Compression Index 1 is defined as:

$$C_c = \frac{2.3(1+e) \cdot \sigma'_{v0}}{M}$$

CPT in Geotechnical Practice p 71

Where:

e is the Void Ratio and is stored in the Void Ratio field.

M is the constrained modulus and is taken from the Constrained Modulus 1 field.

4.3.6 Constrained Modulus

4.3.6.1 Constrained Modulus 1

The constrained modulus 1 (M) in Constrained Modulus 1 is defined as:

$$M = C_1 \cdot (q_t - \sigma_{vo})$$

Kulhawy and Mayne (1990), NCHRP Synthesis 368 p 33, CPT in Geotechnical Practice p 72

Where:

C1 is 8.25

4.3.6.2 Constrained Modulus 2

The constrained modulus 2 (M) in Constrained Modulus 2 is defined as:

$$M = C_1 \cdot G_0$$

Burns and Mayne (2002), NCHRP Synthesis 368 pp 33-34

Where:

C1 is 0.02 for organic plastic clays, up to 2 for over consolidated quartz sands in the published literature.

G0 is taken from Small Strain Shear Modulus 2.

4.3.7 Effective Cohesion

The cohesion *(c')* in Effective Cohesion 1 is defined as:

$$c' = C_1 \cdot \sigma'_p$$

Mayne and Stewart (1988), Mesri and Abdel-Ghaffar (1993), NCHRP Synthesis 368 p 44

Where:

C_1 is 0.02 in the published formula.

σ'_p is taken from Preconsolidation Stress.

4.3.8 Preconsolidation Stress and Overconsolidation Ratio

4.3.8.1 Preconsolidation Stress 1

The Preconsolidation Stress 1 (σ'_p) of clay defined as:

$$\sigma'_p = C_1 \cdot (q_t - \sigma_{v0})$$

Mayne (1995), Demers and Leroueil (2002), NCHRP Synthesis 368 p 34

Where:

C_1 is 0.33

4.3.8.2 Preconsolidation Stress 2

The Preconsolidation Stress 2 (σ'p) of clay is defined as:

$$\sigma'_p = C1 \cdot \Delta u$$

Chen and Mayne (1996), NCHRP Synthesis 368 p 34

Where:

C1 is 0.53

4.3.8.3 Preconsolidation Stress 3

The Preconsolidation Stress 3 (σ'p) of clay is defined as:

$$\sigma'_p = C_1 \cdot (q_t - u_2)$$

Mayne (2005), NCHRP Synthesis 368 p 35

Where:

C1 is 0.6.

4.3.8.4 Preconsolidation Stress 4

The Preconsolidation Stress 4 (σ'p) of clay is defined as:

$$\sigma' p = C1 \cdot Q_t^{C2} \cdot \sigma' v0$$

Robertson (2009), Guide to CPT p 31

Where:

C1 is 0.25.

C2 is 1.25.

4.3.8.5 Preconsolidation Stress 5

The Preconsolidation Stress 5 (σ'p) of sand is defined as:

$$\sigma' p = [\frac{C1 \cdot (qt/\sigma_{atm})C2}{(1 - sin\Phi') \cdot (\sigma' v0/\sigma_{atm})C3}]^{\frac{1}{sin\Phi' - C4}} \cdot \sigma'_{v0}$$

Mayne (2005), NCHRP Synthesis 368 p 35

Where:

C1 is 0.192.

C2 is 0.22.

C3 is 0.31.

C4 is 0.27.

Φ' is taken from Friction_Angle_3

4.3.8.6 Preconsolidation Stress 6

The Preconsolidation Stress 6 (σ'p) of all soil types is defined as:

$$\sigma'p = C1 \cdot \sigma_{atm}^{C2} \cdot (G0)^{C3} \cdot \sigma'^{C4}_{v0}$$

Mayne (2007), NCHRP Synthesis 368 pp 37

Where:

σ'p, σatm, G0 and σ'v0 are in kPa

C1 is 0.101

C2 is 0.102

C3 is 0.478

C4 is 0.420

G0 is taken from Small Strain Shear Modulus 2

4.3.8.7 Overconsolidation Ratio

Overconsolidation ratio is defined as the maximum historical effective stress and the current overburden effective stress.

The Overconsolidation ratio is defined as:

$$OCR = \frac{\sigma'p}{\sigma'v0}$$

OCR 1: σ'p is taken from Preconsolidation Stress 1.

OCR 2: σ'p is taken from Preconsolidation Stress 2.

OCR 3: σ'p is taken from Preconsolidation Stress 3.

OCR 4: σ'p is taken from Preconsolidation Stress 4.

OCR 5: σ'p is taken from Preconsolidation Stress 5.

OCR 6: σ'p is taken from Preconsolidation Stress 6.

4.3.9 Relative Density (D_r)

4.3.9.1 Relative Density 1

$$D_r = \frac{1}{C_2} \cdot \ln\left(\frac{q_c \cdot W_{ehr}}{C_0 \cdot (\sigma'_{v0})^{C_1}}\right) \cdot 100$$

Baldi et al. (1986) and Al-Homoud and Wehr (2006), CPT in Geotechnical Practice p 83

Where:

qc and σ'_{v0} are in kPa

C0 value for normally consolidated 157, over consolidated 181

C1 is 0.55.

C2 is 2.46

W_{ehr} is the Wehr Correction for Calcareous Soils, this constant was suggested in Al-Homoud and Wehr (2006). If the field is empty the default is 1.

4.3.9.2 Relative Density 2

$$D_r = 100 \cdot \left[C1 \cdot \ln\left(\frac{\frac{q_c}{\sigma_{atm}}}{\sqrt{\frac{\sigma_{v0}}{\sigma_{atm}}}}\right) + C2\right]$$

Jamiolkowski et al. (2001), NCHRP Synthesis 368 pp 41-42

Where:

C1 is 0.268 for all Sands

C2 is −0.675 , for high compressibility and sands of carbonate or calcareous composition: C2≤1.0, for low compressibility: C2≥2.0.

4.3.9.3 Relative Density 3

$$D_r = \left[\frac{q_{C1}}{305 \cdot OCR^{0.18} \cdot (12 + 0.5 \cdot Log\left(\frac{t}{100}\right))}\right]^{0.5} \cdot 100$$

Kulhawy and Mayne (1990), CPT in Geotechnical Practice p 84

Where:

$q_{c1} = q_c / \sqrt{(\sigma'_{vo} - \sigma_{atm})}$

C1 is 0.91 for low compressibility, 1.0 for medium compressible sands, to 1.09 for highly compressible

t is time in years

4.3.10 Rigidity index

4.3.10.1 Rigidity index 1

Rigidity index 1 (Ir) for fine material is defined as:

$$I_r = exp[(\frac{C_1}{M} + C_2) \cdot (\frac{q_t - \sigma_{v0}}{q_t - u_2}) - C_3]$$

Mayne (2001), NCHRP Synthesis 368 p 46

Where:

C1 is 1.5

C2 is 2.925

C3 is 2.925

M is the Cam clay constant, slope of the critical state line and is defined as:

$$M = \frac{6 \cdot sin\Phi'}{3 - sin\Phi'}$$

4.3.10.2 Rigidity index 2

Rigidity index 2 (Ir) for fine material based on plasticity is defined as:

$$I_r = \frac{exp[C_1 \cdot (C_2 - PI)]}{[1 + ln\{1 + C_3 \cdot (OCR - 1)^{C_4}\}]^{C_5}}$$

Keaveny and Mitchel (1986), NCHRP Synthesis 368 p 46

Where:

C1 is 0.0435

C2 is 137

C3 is 0.385

C4 is 3.2

C5 is 0.8

PI is the Plasticity Index

OCR is taken from OCR 4

This correlation of Ir is calculated only when the Soil Type is fine.

4.3.11 Sensitivity

4.3.11.1 Sensitivity 1

The Sensitivity (S_t) is defined as:

$$S_t = \frac{N_s}{R_f}$$

Schmertmann (1978), Rad and Lunne (1986), CPT in Geotechnical Practice p 68

Where:

Ns is a value between 5 and 10

4.3.11.2 Sensitivity 2

The Sensitivity (St) is defined as:

$$S_t = \frac{C_1 \cdot (q_t - \sigma_{v0})}{f_s}$$

Mayne (2007), NCHRP Synthesis 368 p 41

C1 is 0.073

This correlation of St is based on the assumption of OCR<2, su=0.22·σ'p and σ'p=0.33(qt−σv0).

4.3.12 Shear Wave Velocity

4.3.12.1 Shear Wave Velocity 1

Shear Wave velocity (V_s) is defined as:

$$Vs = C1 \cdot log(fs) + C2$$

Mayne (2006), NCHRP Synthesis 368 p 30

Where:

fs is in kPa.

C1 is 118.8

C2is 18.5

4.3.12.2 Shear Wave Velocity 2

Shear Wave velocity 2 (V_s) is defined as:

$$Vs = (C1 \cdot log(qt) - C2)^{C3} \cdot (\frac{fs}{qt} \cdot 100)^{C4}$$

Hegazy and Mayne (1995), NCHRP Synthesis 368 p 30

qt and fs are in kPa.

C1 is 10.1

C2 is 11.4

C3 is 1.67

C4 is 0.3

4.3.12.3 Shear Wave Velocity 3 (CLAYS)

Shear Wave velocity 3 (V_s) is defined as:

$$\mathrm{Vs} = \mathrm{C1} \cdot (\mathrm{qt})^{\mathrm{C2}}$$

Mayne and Rix (1995), NCHRP Synthesis 368 p 30

Where:

qt and fs are in kPa

C1 is 1.75

C2 is 0.627

4.3.12.4 Shear Wave Velocity 4 (SANDS)

Shear Wave velocity 4 (Vs) is defined as:

$$Vs = C1 \cdot qt^{c2} \cdot (\sigma'_{v0})^{C3}$$

Baldi et al. (1989), NCHRP Synthesis 368 p 30

Where:

qt and σ'v0 are in MPa.

C1 is 277

C2 is 0.13

C3 is 0.27

4.3.13 Small-Strain Shear Modulus

4.3.13.1 Small-Strain Shear Modulus 1

Small-Strain Shear Modulus 1 (G_0) is defined as:

$$G_0 = C_1 \cdot \left(\frac{q_c}{\sqrt{\sigma'_{v0}}}\right)^{C_2} \cdot q_c$$

Rix and Stokoe (1992), CPT in Geotechnical Practice p 94

Where:

qc, σ'v0 and G0 are in kPa.

C1 is 1634

C2 is -0.75

This correlation of G0 is calculated only when the Soil Type is Coarse or Mixed.

4.3.13.2 Small-Strain Shear Modulus 2

Small-Strain Shear Modulus 2 (G_0) is defined as:

$$G_0 = \frac{\gamma_{bulk}}{g} \cdot {V_s}^2$$

Elastic theory, CPT in Geotechnical Practice p 74 and 94, NCHRP Synthesis 368 p 31

Where:

Vs is taken from the Shear Wave Velocity 1, or extrapolated shear wave velocities.

γ_{bulk} is taken from Bulk Unit Weight

This correlation of G0 is applicable to all soil types.

4.3.14 Soil Behaviour Type Index

4.3.14.1 Soil Behaviour Type Index 1

The soil behaviour type index (Ic) is defined as:

$$Ic = ((C1 - log_{10}Qt)^2 + (log_{10}Fr + C2)^2)^{0.5}$$

$$Qt = qc - \sigma_{v0}Pa(\frac{Pa}{\sigma'_{v0}})^n$$

$$(\frac{Pa}{\sigma'_{v0}}) \leq 1.7$$

$$Fr = \frac{fs}{qt - \sigma_{v0}} \times 100\%$$

Ic is calculated using n=1, if Ic>Ic break, then it's been accepted, otherwise it's calculated using n=0.5. If Ic<Ic break break then it's accepted, otherwise it's calculated using n=0.7.

Robertson and Wride (1998)

Where:

C1 is 3.47

C2 is 1.22

4.3.14.2 Transition zones

A Transition Zone in Soil_Behaviour_Type_Index_Transition_1 for a certain depth is considered when:

2.3<Ic<2.9;

The rate of Ic change is rapid (slope of Ic vs. depth above and below of the current depth > 5) and crosses the Ic=2.6 line.

4.3.14.3 Soil Behaviour Type Index 2

The soil behaviour type index (Ic) is defined as:

$$Ic = \sqrt{[C1 - log_{10}Qt(1 - Bq)]2 + [C2 + C3 \cdot log_{10}Fr]^2}$$

Jefferies and Davies (1993), NCHRP Synthesis 368 p 27

Where:

C1 is 3

C2 is 1.5

C3 is 1.3

4.3.14.4 Soil Behaviour Type Index 3

The non-normalised Soil Behaviour Type Index (ISBT) in is defined as:

$$((C1 - log(\frac{(q_c)}{p_a}))^2 + (log(R_f) + C2)^2)^{0.5}$$

Robertson (2010), CPT 10, paper 2-56

Where:

C1 is 3.47

pa is the Atmospheric pressure, 101.4 kPa

C2 is 1.22

4.3.14.5 Soil Behaviour Type Index 4

The soil behaviour type index (Ic):

$$I_c = \sqrt{[C1 - log_{10}Q_t(1 - B_q) + 1]^2 + [C2 + C3 \cdot log_{10}Fr]^2}$$

Been and Jefferies (1992), Soil liquefaction, a critical state approach, pp. 206-207

Where:

C1 is 3

C2 is 1.5

C3 is 1.3

4.3.15 SPT N_{60} Value

4.3.15.1 SPT N_{60} Value 1

The SPT N_{60} is defined as:

$$N_{60} = \frac{qc}{C1 \cdot pa(1 - \frac{Ic}{C2})}$$

Robertson and Wride (1998), CPT in Geotechnical Practice p 151

Where:

C_1 is 8.5

C_2 is 4.6

p_a is the Atmospheric pressure, 100 kPa

4.3.15.2 SPT N_{60} Value 2

The SPT N_{60} is defined as:

$$N_{60} = \frac{qc}{C1 \cdot (1 - \frac{Ic}{C2})}$$

Jefferies and Davies (1993)

Where:

C1 is 0.85

C2 is 4.75

4.3.15.3 SPT Average N_{60} Value

The SPT average N_{60} value is a stepped average of SPT N_{60} for each defined depth interval step.

4.3.16 Undrained shear strength

4.3.16.1 Undrained shear Strength 1

Undrained Shear Strength 1 is defined as:

When qt has data,

$$su = \frac{(qt - \sigma_{v0})}{N_{kt}}$$

Otherwise,

$$su = \frac{(qc - \sigma_{v0})}{N_k}$$

NCHRP Synthesis 368 p 39

Different values for Nk and Nkt can be defined for when qc or qt is either greater than or equal to, or less than a defined break point.

4.3.16.2 Undrained shear Strength 2

Undrained Shear Strength 2 is defined as:

When qt has data,

$$su = \frac{(qt)}{N_{kt}}$$

Otherwise,

$$su = \frac{(qc - \sigma_{v0})}{N_{kt}}$$

4.3.16.3 Undrained shear Strength 3

Undrained Shear Strength 3 is defined as:

$$su = 0.5 \cdot sin\Phi' \cdot OCR^{\Lambda} \cdot \sigma'_{v0}$$

Wroth (1984), NCHRP Synthesis 368 p 39

Φ' is taken from Friction Angle 3 and Friction Angle 1

OCR is taken from Overconsolidation Ratio 1

Λ=1−CsCc , typically low to medium sensitivity clays are 0.7≤Λ≤0.8 , and sensitive and structured clays are 0.9≤Λ≤1.0, and is stored in the Undrained_Shear_Strength_3_Lambda field.

4.3.16.4 Undrained shear Strength 4

Undrained Shear Strength 4 is defined as:

$$su = C1 \cdot \sigma'_p$$

Trak et al. (1980), Terzaghi et al. (1996), NCHRP Synthesis 368 p 40

C1 is 0.22

4.3.16.5 Undrained shear Strength 5

Undrained Shear Strength 5 is defined as:

$$su = \frac{\Delta u}{N\Delta u}$$

Robertson (2009), pp 28-29

4.3.17 Unit Weight

4.3.17.1 Dry Unit Weight (γ_{dry})

Dry Unit Weight (γ_{dry}) is defined as:

$$\gamma_{dry} = C1 \cdot \log(qt) + C2$$

Mayne (2007), NCHRP Synthesis 368 p 31

Where:

C1 is 1.89

C2 is 11.8

4.3.17.2 Saturated Unit Weight 1

Saturated Unit Weight 1 (γ_{sat}) is defined as:

$$\gamma_{sat} = C1 \cdot log(Vs) - C2 \cdot log(z)$$

Mayne (2007), NCHRP Synthesis 368 p 31

Where:

Vs is in m/s and z is in m VS is taken from shear wave velocity 1 or extrapolated shear wave velocity.

C1 is 8.32

C2 is 1.61

z is Depth

4.3.17.3 Saturated Unit Weight 2

Saturated Unit Weight 2 (γ_{sat}) is defined as:

$$\gamma sat = C1 \cdot log(fs) + C2 \cdot Gs - C3$$

Mayne (2007), NCHRP Synthesis 368 p 32

Where:

fs is in kPa.

C1 is 2.6

C2 is 15

C3 is 26.5

Gs is Specific Gravity of Solids, typically 2.4 to 2.9

4.3.18 Young's Modulus

4.3.18.1 Small Strain Young's Modulus

Small Strain Young's Modulus 1 (E_0) is defined as:

$$E_0 = 2 \cdot (1 + v) \cdot G_0$$

Elastic theory, CPT in Geotechnical Practice p 74 and 94, NCHRP Synthesis 368 p 32

Where:

v = 0.2 is applied and can be varied in the Formula Tool. Published literature states: v'=0.2 applies for drained soils and vu=0.5 applies for undrained soils.

G0 is taken from Small Strain Shear Modulus 2.

This correlation of E0 is applicable to all soil types.

4.3.18.2 Young's Modulus 2

Young's Modulus2 (E_0) is defined as:

$$E_0 = \alpha q_c$$

CPT in Geotechnical Practice p 160, Figure 6.13

Where:

a is calculated from degree of loading, qc, effective stress and reduction factor

5 BIBLOGRAPHY

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6 APPENDIX A – CPT RESULTS TABLE

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

Project Number:	**2390127**
Project Name:	Grimsby
Client:	Mayer
Date:	13/09/2023
Rig:	CPT01
Operator:	RH

Test #	PointID	Predrill (m)	Final Depth (m)	Refusal Criteria	Operator Comments	Cone ID	Cone Area	Filter & Position	Friction Reducer	Groundwater depth	GW Depth Supplied by	Eastings	Northings
1	CPT01	1.20	24.94	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689832.4	5942525
2	CPT02	1.20	16.85	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689838.6	5942597
3	CPT03	1.20	14.85	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689798.4	5942595
4	CPT04	1.20	21.15	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689688.9	5942719
5	CPT05	1.20	15.01	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689687.1	5942715
6	CPT06	1.20	15.12	Total Pressure		71175	15000	U2 HDPE	None	2	Assumed for calculation purposes	689770.5	5942502

7 APPENDIX B – CPT PLOTS

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

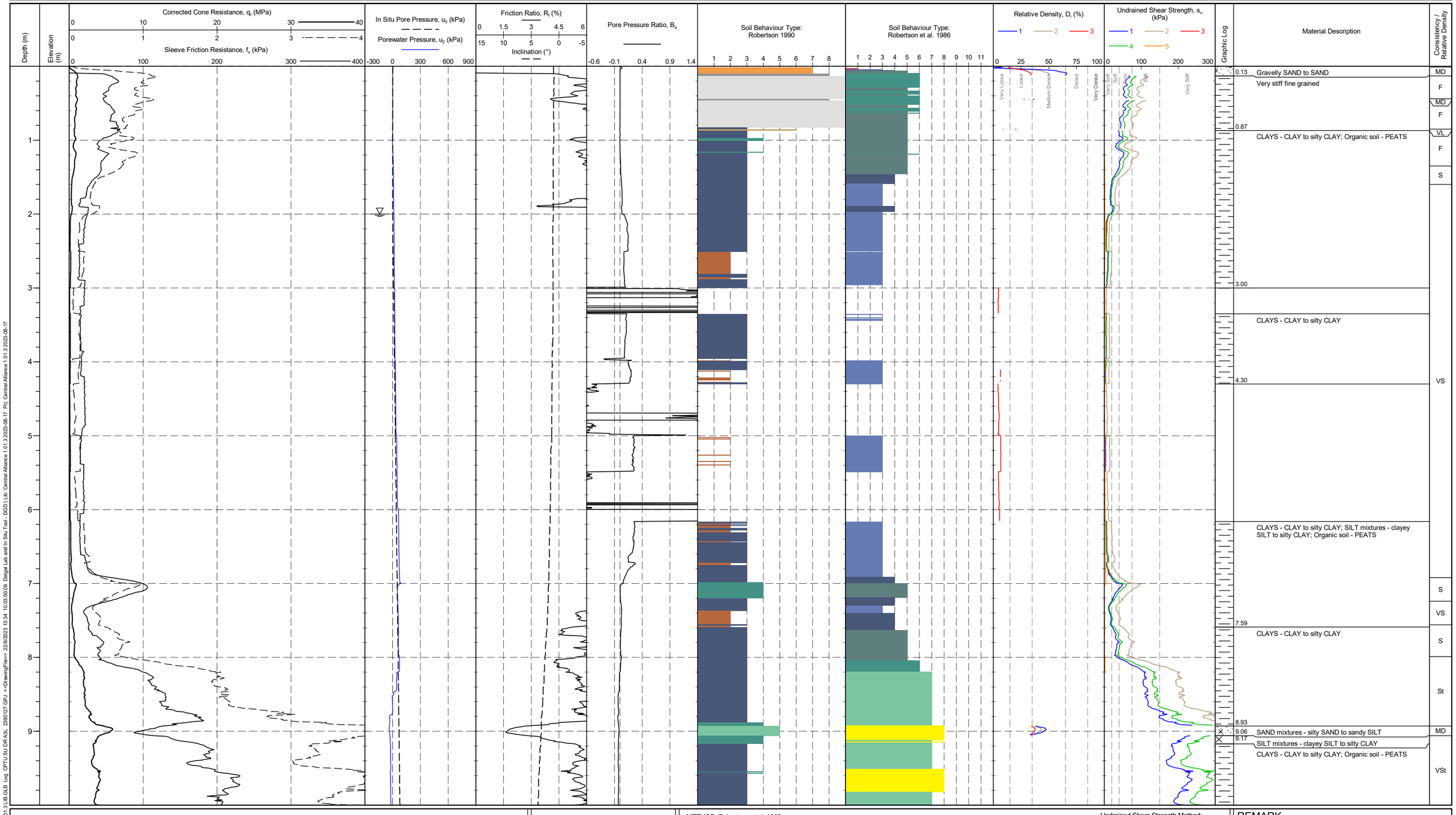
CPT LOG

PointID **CPT01**

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689832.4 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942525.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{cone}$ or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{cone}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:24 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689832.4 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942525.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0–40 | Sleeve Friction Resistance, f_s (kPa) 0–400 | In Situ Pore Pressure, u_0 (kPa) | Porewater Pressure, u_2 (kPa) -300–900 | Friction Ratio, R_f (%) 0–6 | Inclination (°) 15–-5 | Pore Pressure Ratio, B_q -0.6–1.4 | Soil Behaviour Type: Robertson 1990 1–8 | Soil Behaviour Type: Robertson et al. 1986 1–11 | Relative Density, D_r (%) 0–100 (Very Loose, Loose, Medium Dense, Dense, Very Dense) | Undrained Shear Strength, s_u (kPa) 0–300 (Very Soft, Soft, Firm, Stiff, Very Stiff) | Graphic Log | Material Description | Consistency / Relative Density

CLAYS - CLAY to silty CLAY; Organic soil - PEATS *(continued)* — VSt

14.60

SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT — VD

D

16.46

16.60 SILT mixtures - clayey SILT to silty CLAY — VSt

CLAYS - CLAY to silty CLAY — St

VSt

St

19.82

D

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{cone}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

REMARK

CENTRAL_ALLIANCE 1.01.3.LIB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFiles>> 22/9/2023 13:34 10.00.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2022-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT	: Mayer	AREA	:	SHEET	: 3 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689832.4 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942525.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0 10 20 30 40 | Sleeve Friction Resistance, f_s (kPa) 0 1 2 3 4 | In Situ Pore Pressure, u_0 (kPa) -300 0 300 600 900 | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) 0 1.5 3 4.5 6 | Inclination (°) 15 10 5 0 -5 | Pore Pressure Ratio, B_q -0.6 -0.1 0.4 0.9 1.4 | Soil Behaviour Type: Robertson 1990 1 2 3 4 5 6 7 8 | Soil Behaviour Type: Robertson et al. 1986 1 2 3 4 5 6 7 8 9 10 11 | Relative Density, D_r (%) 1 2 3 0 25 50 75 100 Very Loose Loose Medium Dense Dense Very Dense | Undrained Shear Strength, s_u (kPa) 1 2 3 4 5 0 100 200 300 Very Soft Soft Firm Stiff Very Stiff | Graphic Log | Material Description | Consistency / Relative Density

Depth (m)	Material Description	Consistency / Relative Density
	SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT *(continued)*	VD / D / MD
20.77		
20.91	SILT mixtures - clayey SILT to silty CLAY	H
21.06	SAND mixtures - silty SAND to sandy SILT	MD
21.20	SILT mixtures - clayey SILT to silty CLAY	H
	SAND mixtures - silty SAND to sandy SILT	MD
22.51		
22.62	SILT mixtures - clayey SILT to silty CLAY	H
	SAND mixtures - silty SAND to sandy SILT	MD
23.73		
	SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT	D / MD
24.94		

Terminated at 24.94 m
Refusal

RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$ or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_c/N_{kc}$ or q_c/N_c
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:34 10.03.00.09 Datgel Lab and In Situ Tools - DGD | Lib: Central Alliance 1.01.3 2025-06-17 Prj: Central Alliance 1.01.3 2025-06-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID
CPT02

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689838.6 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942597.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) | Sleeve Friction Resistance, f_s (kPa) | In Situ Pore Pressure, u_0 (kPa) | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) | Inclination (°) | Pore Pressure Ratio, B_q | Soil Behaviour Type: Robertson 1990 | Soil Behaviour Type: Robertson et al. 1986 | Relative Density, D_r (%) | Undrained Shear Strength, s_u (kPa) | Graphic Log | Material Description | Consistency / Relative Density

Graphic Log	Material Description	Consistency / Relative Density
0.11	SANDS - clean SAND to silty SAND Very stiff fine grained	VL F
0.82		VL VS
	CLAYS - CLAY to silty CLAY; Organic soil - PEATS	VS S
2.78	CLAYS - CLAY to silty CLAY; Sensitive, fine grained	VS
6.69	CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY	S VS S F St VSt MD
9.84	CLAYS - CLAY to silty CLAY	VSt

RIG : ; Crawler based20 Ton;
CONE TYPE : C+F+W2
CONE ID : DP15-CFPTxy.71175
OPERATOR : Central Alliance

CHECKED BY : BB
CHECKED DATE : 20/9/2023
APPROVED BY : BB
APPROVED DATE : 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_c/N_{kc}$ or q_c/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009). $s_u = \Delta u/N$

REMARK

CENTRAL_ALLIANCE 1.01.3 LIB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFiles>> 22/9/2023 13:35 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689838.6 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942597.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0 10 20 30 40 | Sleeve Friction Resistance, f_s (kPa) 0 1 2 3 4 | In Situ Pore Pressure, u_0 (kPa) -300 0 300 600 900 | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) 0 1.5 3 4.5 6 | Inclination (°) 15 10 5 0 -5 | Pore Pressure Ratio, B_q -0.6 -0.1 0.4 0.9 1.4 | Soil Behaviour Type: Robertson 1990 1 2 3 4 5 6 7 8 | Soil Behaviour Type: Robertson et al. 1986 1 2 3 4 5 6 7 8 9 10 11 | Relative Density, D_r (%) 1 2 3 0 25 50 75 100 Very Loose Loose Medium Dense Dense Very Dense | Undrained Shear Strength, s_u (kPa) 1 2 3 4 5 0 100 200 300 Very Soft Soft Firm Stiff Very Stiff | Graphic Log | Material Description | Consistency / Relative Density

Depth (m)	Material Description	Consistency / Relative Density
11	CLAYS - CLAY to silty CLAY *(continued)*	VSt
12		VSt
13		St
14		
15		
16		VSt
16.58		VSt
16.85	SANDS - clean SAND to silty SAND	VD
17	Terminated at 16.85 m Refusal	
18		
19		

RIG : ; Crawler based20 Ton;
CONE TYPE : C+F+W2
CONE ID : DP15-CFPTxy.71175
OPERATOR : Central Alliance

CHECKED BY : BB
CHECKED DATE : 20/9/2023
APPROVED BY : BB
APPROVED DATE : 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_E - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:35 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

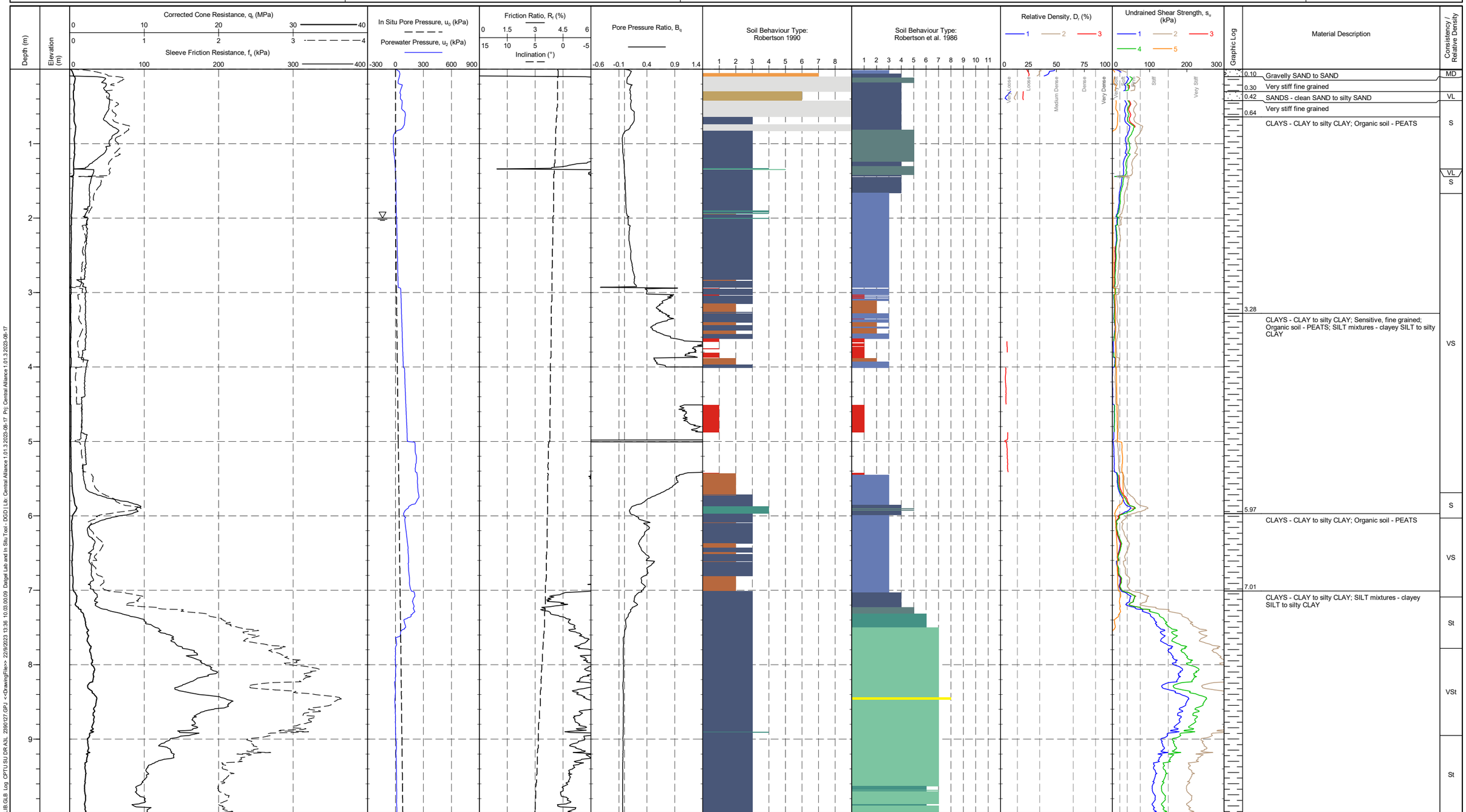
CPT LOG

PointID **CPT03**

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689798.4 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942595.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$ or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:36 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689798.4 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942595.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0 10 20 30 40 | Sleeve Friction Resistance, f_s (kPa) 0 1 2 3 4 | In Situ Pore Pressure, u_0 (kPa) -300 0 300 600 900 | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) 0 1.5 3 4.5 6 | Inclination (°) 15 10 5 0 -5 | Pore Pressure Ratio, B_q -0.6 -0.1 0.4 0.9 1.4 | Soil Behaviour Type: Robertson 1990 1 2 3 4 5 6 7 8 | Soil Behaviour Type: Robertson et al. 1986 1 2 3 4 5 6 7 8 9 10 11 | Relative Density, D_r (%) 1 2 3 0 25 50 75 100 Very Loose Loose Medium Dense Dense Very Dense | Undrained Shear Strength, s_u (kPa) 1 2 3 4 5 0 100 200 300 Very Soft Soft Firm Stiff Very Stiff | Graphic Log | Material Description | Consistency / Relative Density

11
12
13
14
15
16
17
18
19

CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY *(continued)* — St

14.34

SANDS - clean SAND to silty SAND — VD

14.85

Terminated at 14.85 m
Refusal

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_E - \sigma_{vo})/N_k$
2. $s_u = q_c/N_{kc}$ or q_c/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

REMARK

CENTRAL_ALLIANCE 1.01.3.ULB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:36 10.00.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-06-17 Prj: Central Alliance 1.01.3

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

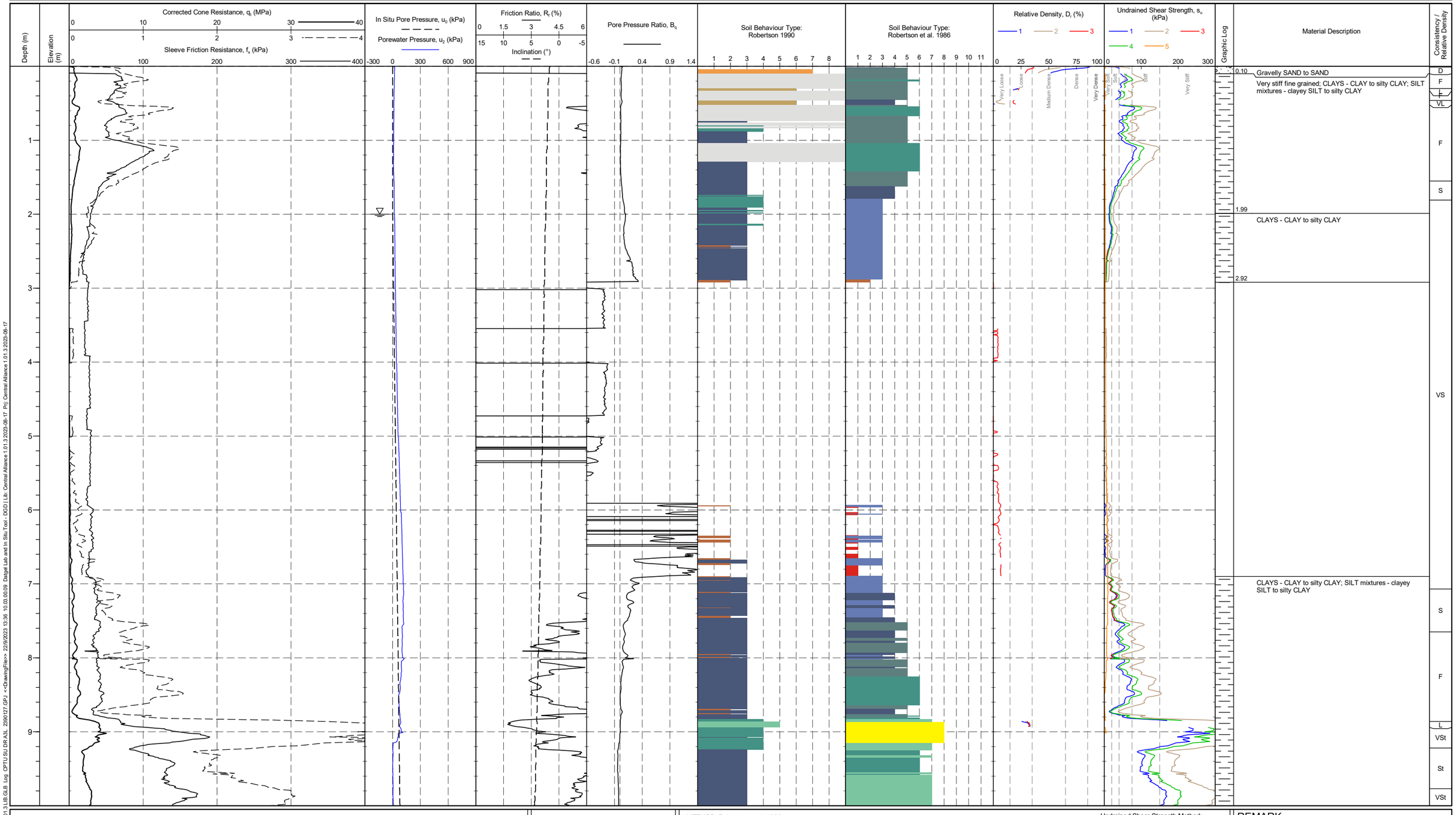
CPT LOG

PointID **CPT04**

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689688.9 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942719.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{\Delta u}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL_ALLIANCE 1.01.3.LIB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFiles>> 22/9/2023 13:36 10.00.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

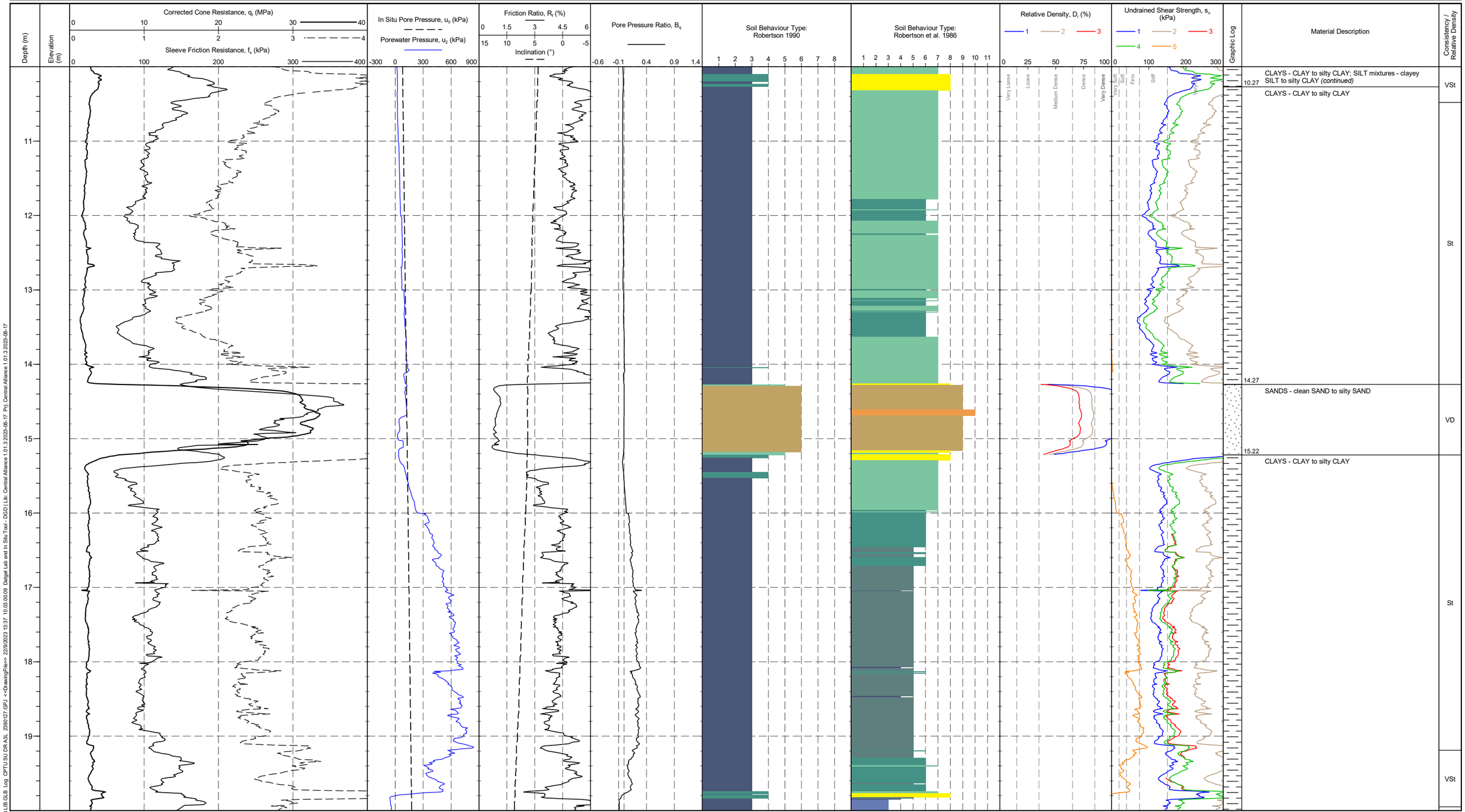
CPT LOG

PointID **CPT04**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689688.9 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942719.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB	Dissipation Test	
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023		
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB		
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023		

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$ or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:37 10.03.00.09 Datgel Lab and In Situ Tools - DGD | Lib: Central Alliance 1.01.3 2025-08-17 Prj: Central Alliance 1.01.3 2025-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT	: Mayer	AREA	:	SHEET	: 3 OF 3
ENGINEER	: Ben Bilsbrough	EASTING	: 689688.9 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942719.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0 10 20 30 40 | Sleeve Friction Resistance, f_s (kPa) 0 1 2 3 4 | In Situ Pore Pressure, u_0 (kPa) -300 0 300 600 900 | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) 0 1.5 3 4.5 6 | Inclination (°) 15 10 5 0 -5 | Pore Pressure Ratio, B_q -0.6 -0.1 0.4 0.9 1.4 | Soil Behaviour Type: Robertson 1990 1 2 3 4 5 6 7 8 | Soil Behaviour Type: Robertson et al. 1986 1 2 3 4 5 6 7 8 9 10 11 | Relative Density, D_r (%) 1 2 3 0 25 50 75 100 Very Loose Loose Medium Dense Dense Very Dense | Undrained Shear Strength, s_u (kPa) 1 2 3 4 5 0 100 200 300 Very Soft Soft Firm Stiff Very Stiff | Graphic Log | Material Description | Consistency / Relative Density

21 — Terminated at 21.15 m
Refusal

CLAYS - CLAY to silty CLAY *(continued)* — St/S / VSt / MD / VSt

21.06
21.15 SANDS - clean SAND to silty SAND — MD

22 23 24 25 26 27 28 29

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_E - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{cone}$ or q_c/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB	Dissipation Test	
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023		
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB		
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023		

REMARK

CENTRAL_ALLIANCE 1.01.3.LIB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:37 10.00.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-06-17 Prj: Central Alliance 1.01.3 2023-06-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

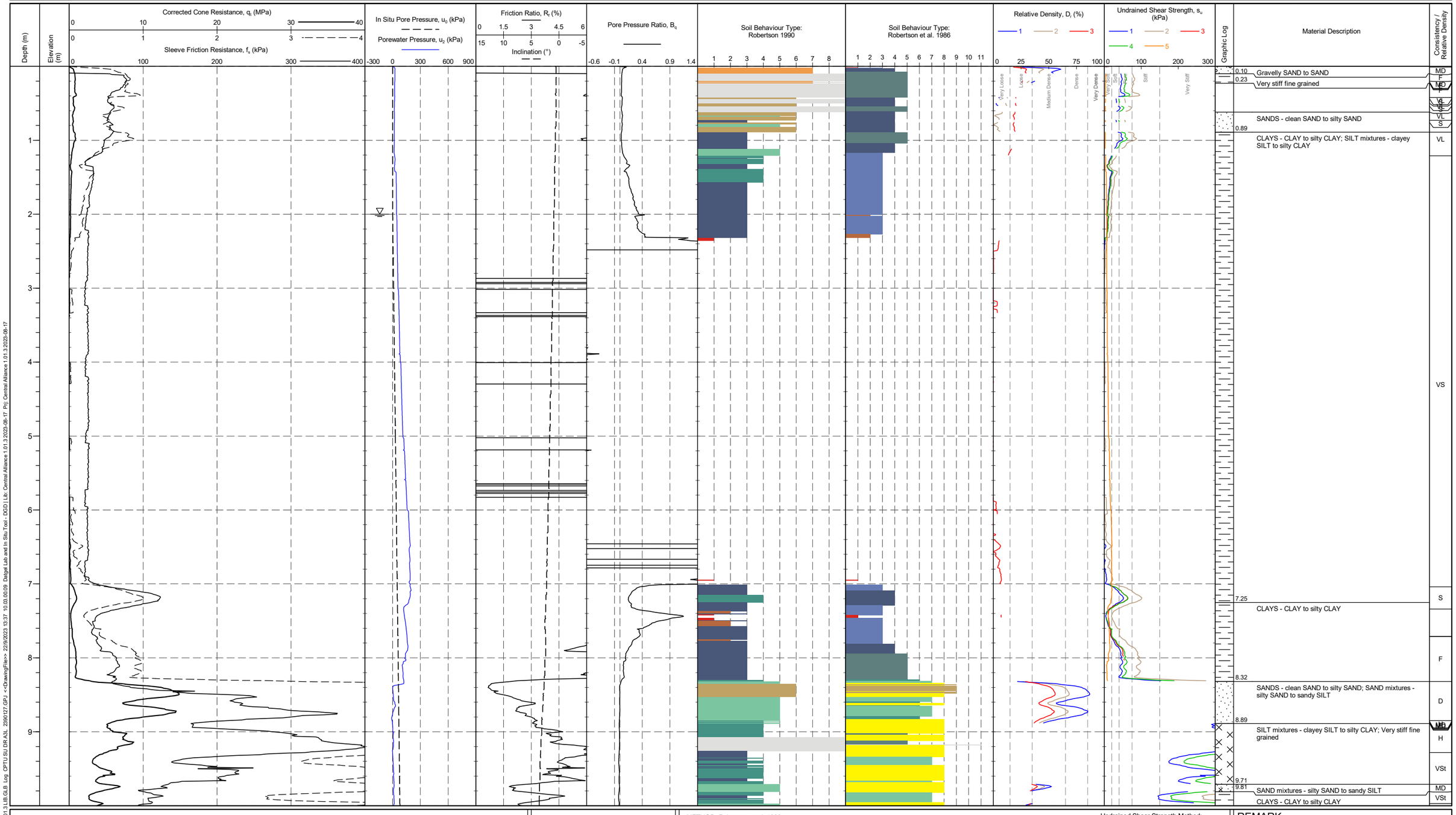
CPT LOG

PointID
CPT05

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689687.1 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942715.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:37 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689687.1 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942715.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)

Depth (m) | Elevation (m) | Corrected Cone Resistance, q_t (MPa) 0 10 20 30 40 | Sleeve Friction Resistance, f_s (kPa) 0 1 2 3 4 | In Situ Pore Pressure, u_0 (kPa) -300 0 300 600 900 | Porewater Pressure, u_2 (kPa) | Friction Ratio, R_f (%) 0 1.5 3 4.5 6 | Inclination (°) 15 10 5 0 -5 | Pore Pressure Ratio, B_q -0.6 -0.1 0.4 0.9 1.4 | Soil Behaviour Type: Robertson 1990 1 2 3 4 5 6 7 8 | Soil Behaviour Type: Robertson et al. 1986 1 2 3 4 5 6 7 8 9 10 11 | Relative Density, D_r (%) 1 2 3 0 25 50 75 100 Very Loose Loose Medium Dense Dense Very Dense | Undrained Shear Strength, s_u (kPa) 1 2 3 4 5 0 100 200 300 Very Soft Soft Firm Very Stiff | Graphic Log | Material Description | Consistency / Relative Density

11
12
13
14
15
16
17
18
19

CLAYS - CLAY to silty CLAY *(continued)* — St

14.92
15.01 Gravelly SAND to SAND — VSt / D

Terminated at 15.01 m
Refusal

RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$ or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPTU SU DR ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:37 10.03.00.09 Datgel Lab and In Situ Tools - DGD | Lib: Central Alliance 1.01.3 2022-06-17 Prj: Central Alliance 1.01.3 2022-06-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

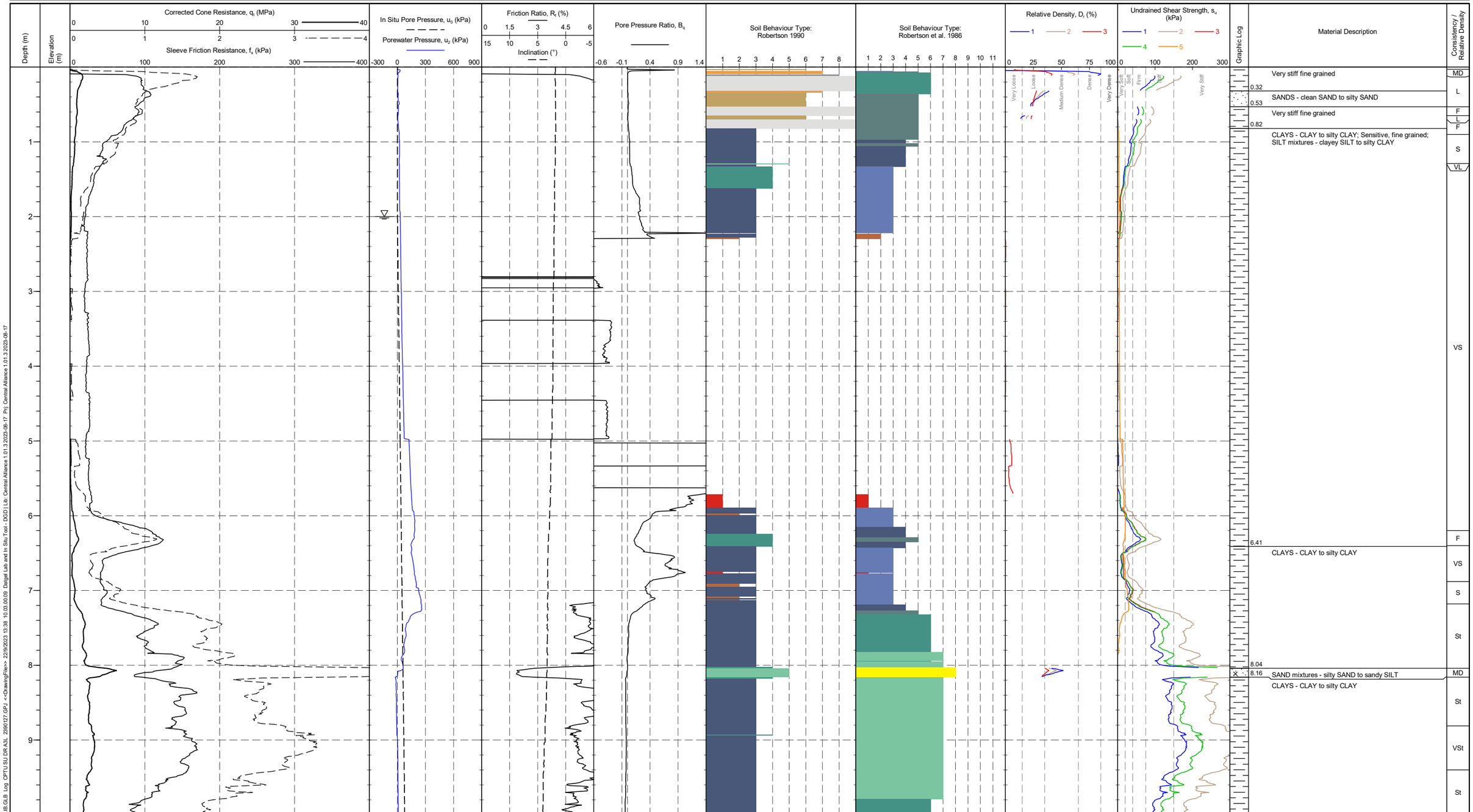
CPT LOG

PointID
CPT06

CLIENT	: Mayer	AREA	:	SHEET	: 1 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689770.5 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942502.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_E - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{kt}$; or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009), $s_u = \Delta u/N$

REMARK

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPTU_SU_DR.ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:38 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2022-08-17 Prj: Central Alliance 1.01.3 2022-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

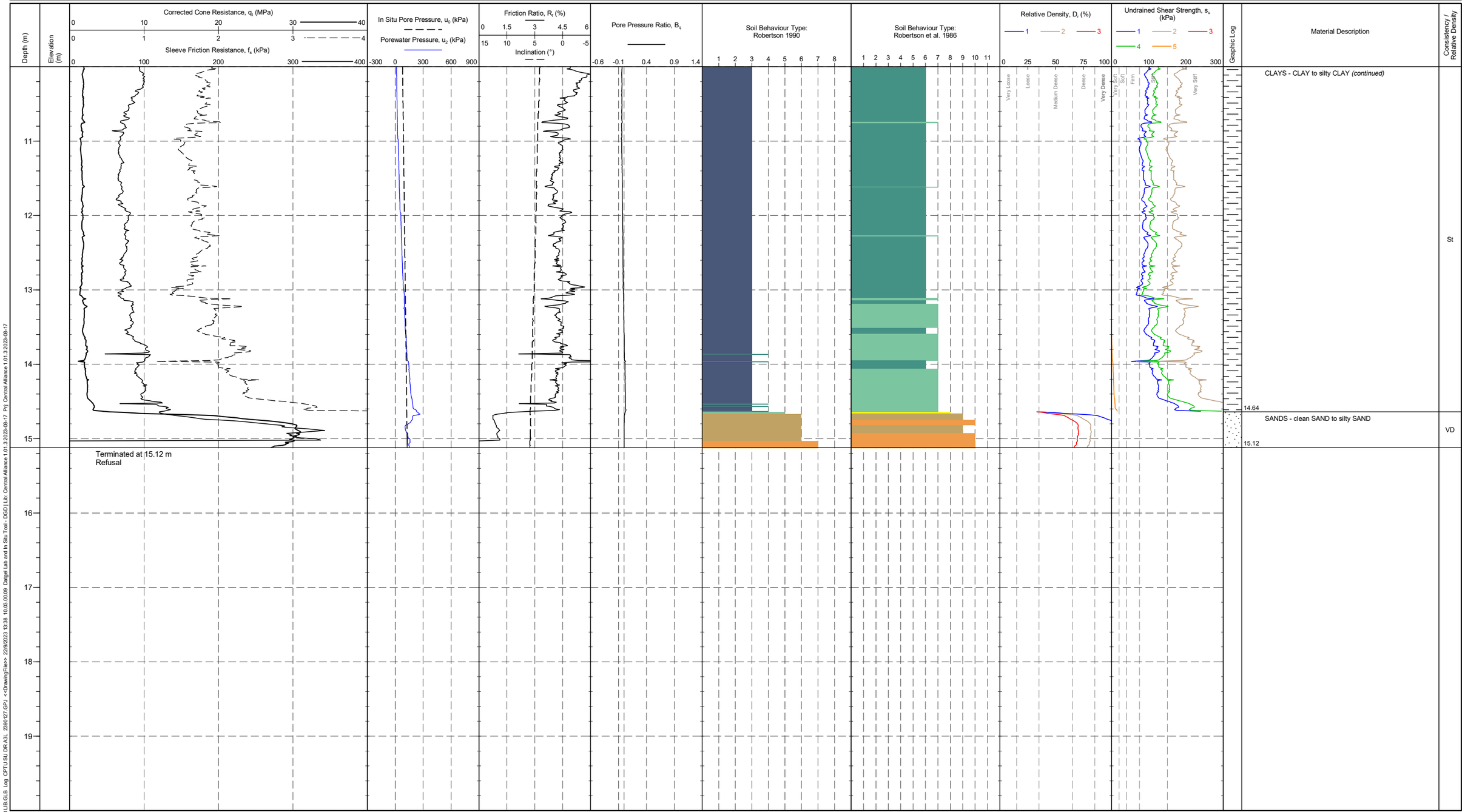
CPT LOG

PointID **CPT06**

CLIENT	: Mayer	AREA	:	SHEET	: 2 OF 2
ENGINEER	: Ben Bilsbrough	EASTING	: 689770.5 m	STATUS	:
PROJECT	: Grimsby CPT	NORTHING	: 5942502.0 m	DATE	: 13/9/2023
LOCATION	: Grimsby	COORD. SYS.	:		
PROJECT No.	: 2390127	ELEVATION	:		

METHOD: Robertson 1990
1 - Sensitive, fine grained
2 - Organic soil - PEATS
3 - CLAYS - CLAY to silty CLAY
4 - SILT mixtures - clayey SILT to silty CLAY
5 - SAND mixtures - silty SAND to sandy SILT
6 - SANDS - clean SAND to silty SAND
7 - Gravelly SAND to SAND
8 - Very stiff SAND to clayey SAND
9 - Very stiff fine grained

Relative Density Method:
1. Baldi et al. (1986); Al-Homoud & Wehr (2006)
2. Jamiolkowski et al. (2001)
3. Kulhawy & Mayne (1990)



RIG	: ; Crawler based20 Ton;	CHECKED BY	: BB
CONE TYPE	: C+F+W2	CHECKED DATE	: 20/9/2023
CONE ID	: DP15-CFPTxy.71175	APPROVED BY	: BB
OPERATOR	: Central Alliance	APPROVED DATE	: 20/9/2023

Dissipation Test

METHOD: Robertson et al. 1986
1 - Sensitive fine grained material
2 - Organic material
3 - CLAY
4 - Silty CLAY to CLAY
5 - Clayey SILT to silty CLAY
6 - Sandy SILT to clayey SILT
7 - Silty SAND to sandy SILT
8 - SAND to silty SAND
9 - SAND
10 - Gravelly SAND to SAND
11 - Very stiff fine grained
12 - SAND to clayey SAND

Undrained Shear Strength Method:
1. $s_u = (q_t - \sigma_{vo})/N_{kt}$; or $(q_t - \sigma_{vo})/N_k$
2. $s_u = q_t/N_{\Delta u}$ or q_t/N_k
3. Wroth (1984)
4. Trak et al. (1980), Terzaghi et al. (1996)
5. Robertson (2009). $s_u = \Delta u/N$

REMARK

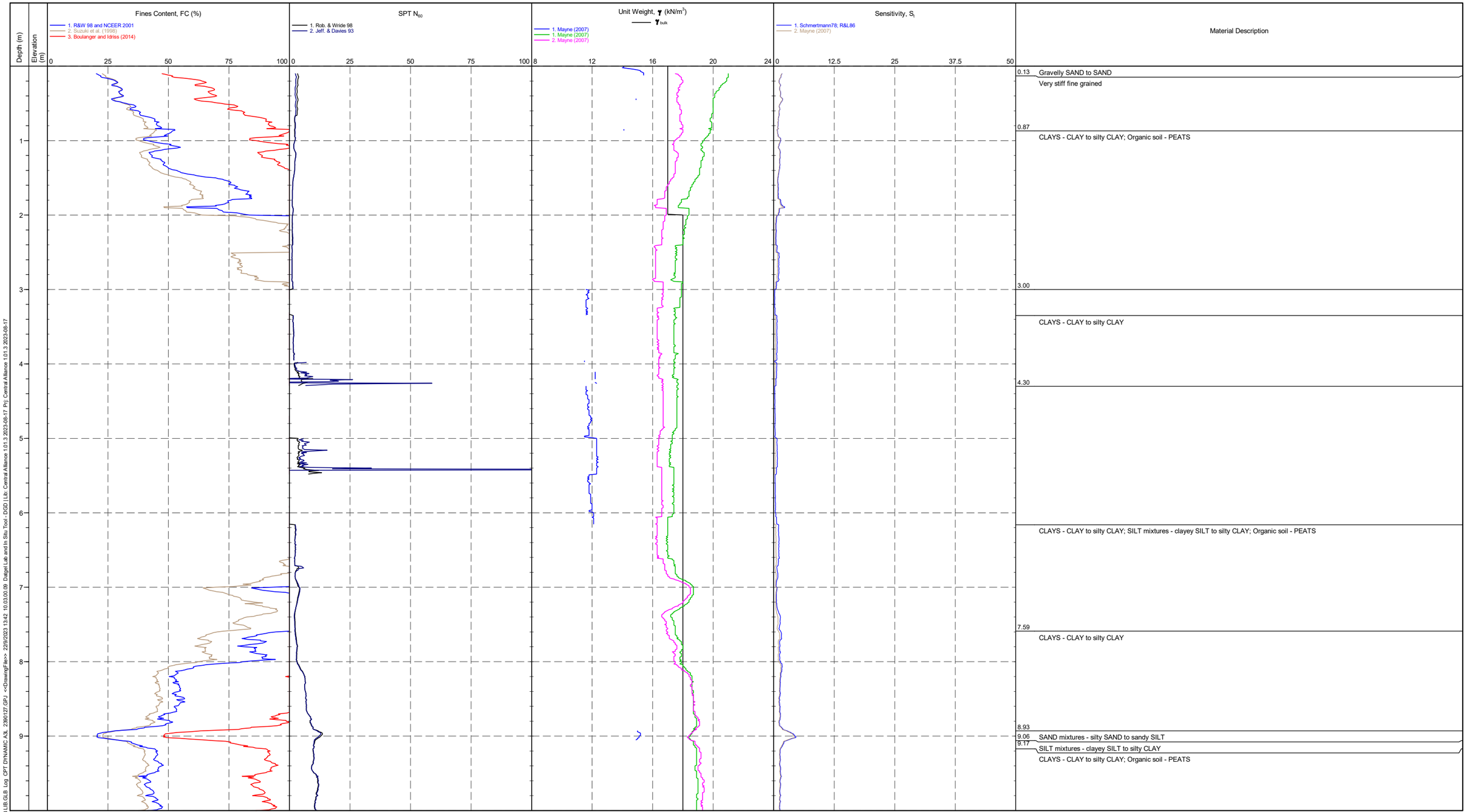
CENTRAL_ALLIANCE 1.01.3.UB.GLB Log CPTU SU DR.ASL 2390127.GPJ <<DrawingFiles>> 22/9/2023 13:38 10.00.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

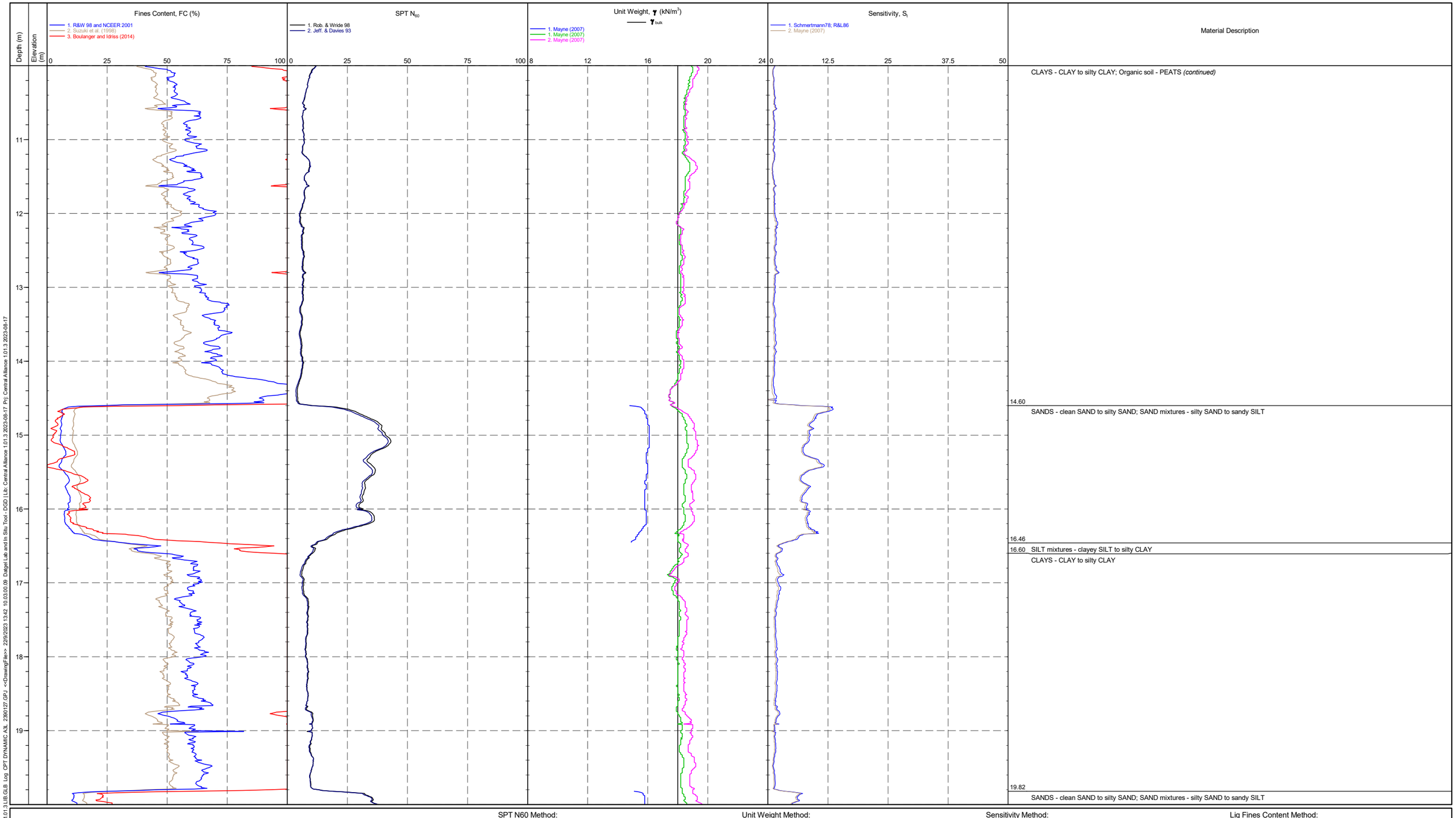
CENTRAL ALLIANCE 101.3 LIB GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:42 10.03.00.09 Dataet Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Prj: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 2 OF 3
ENGINEER : Ben Bilsbrough	EASTING : 689832.4 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942525.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

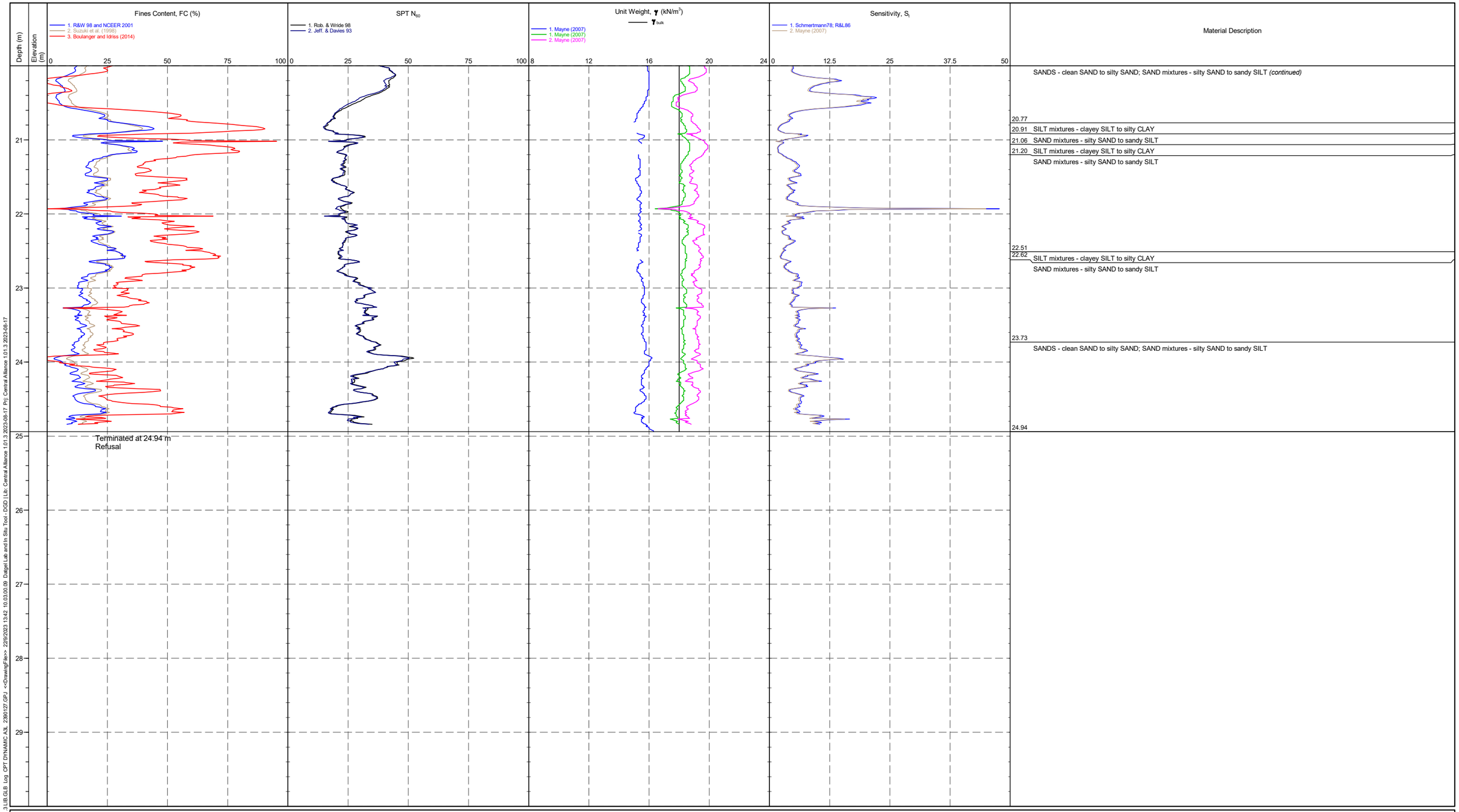
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

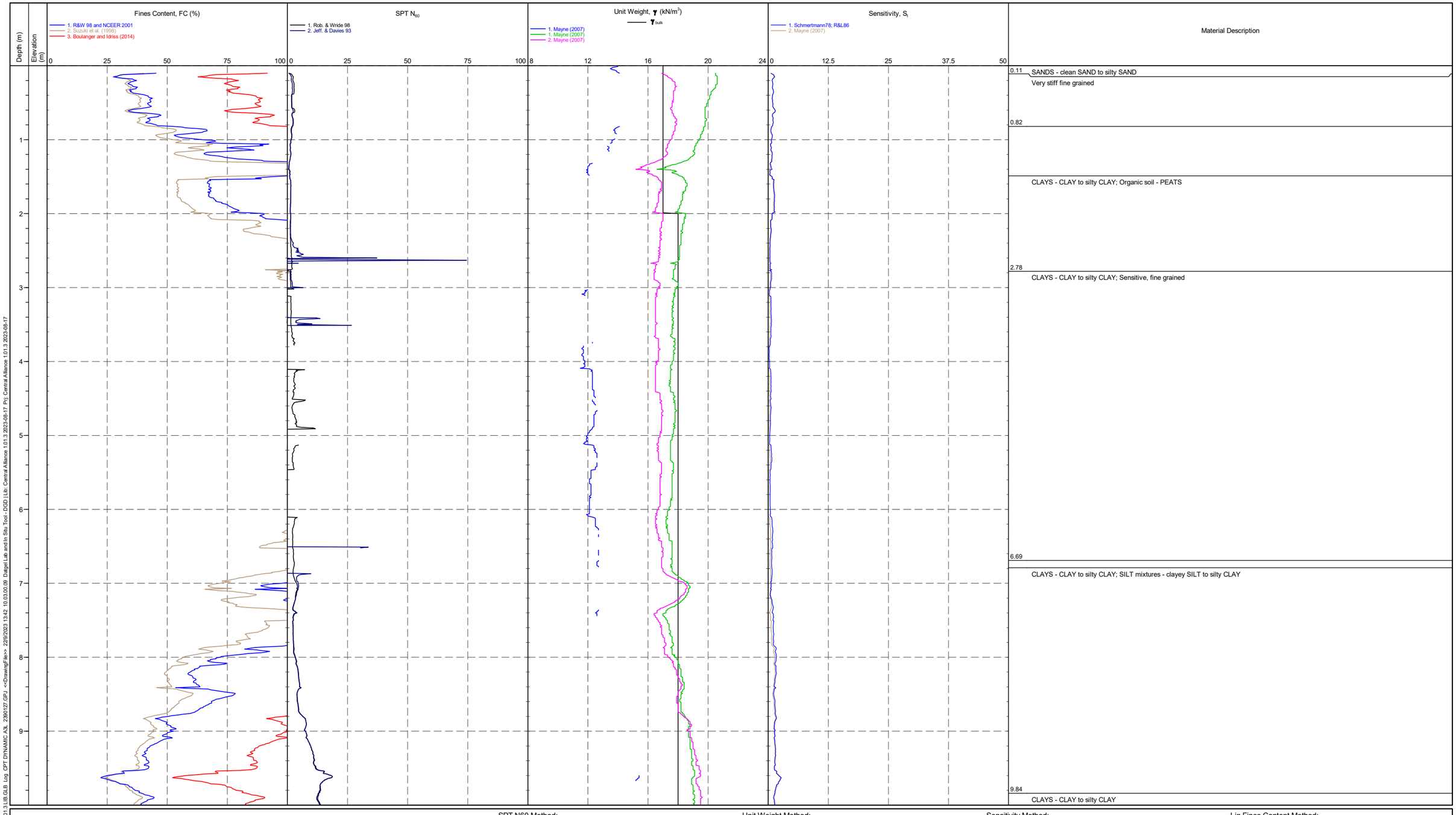
GENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

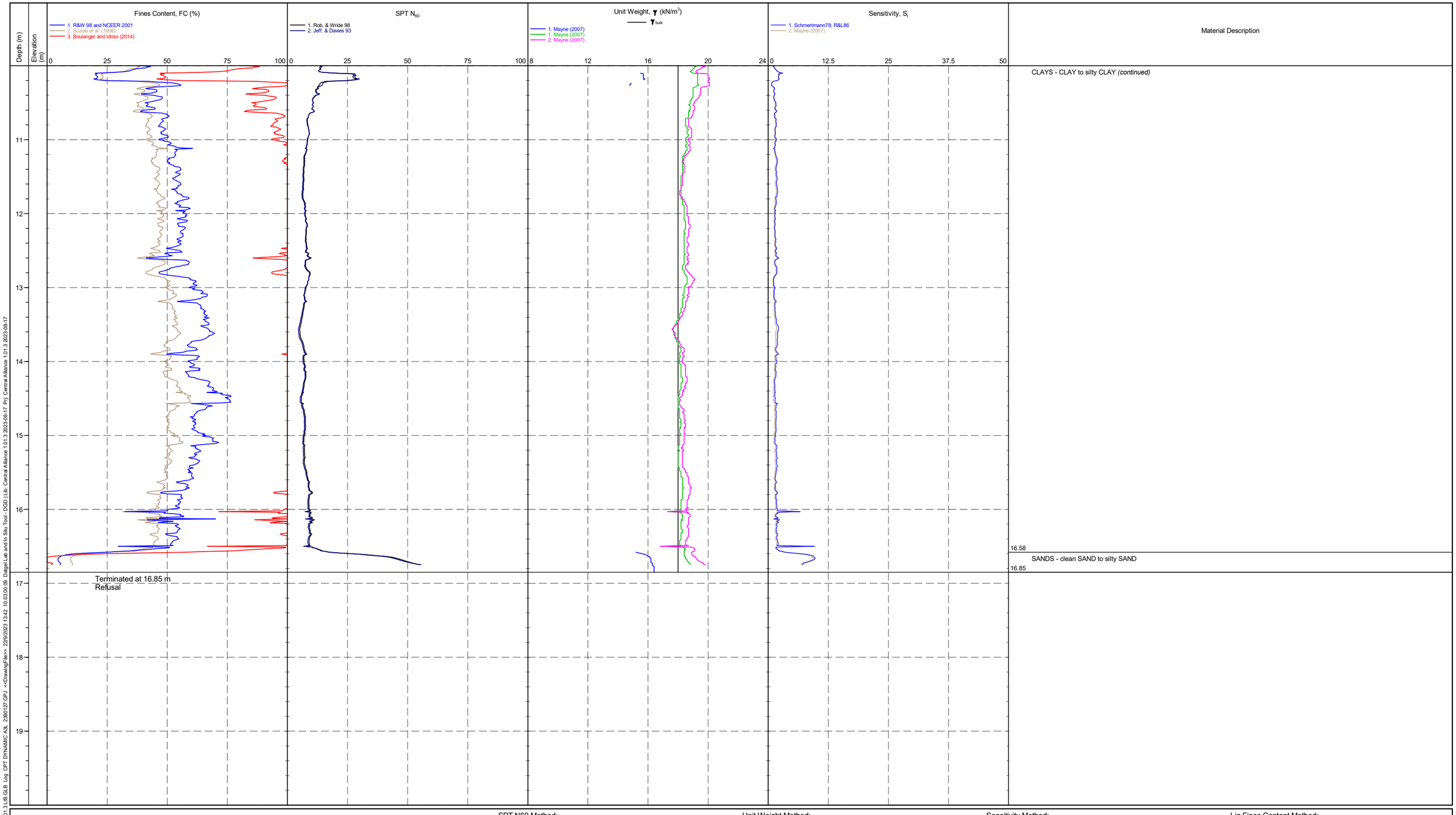
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Plt: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{bul} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

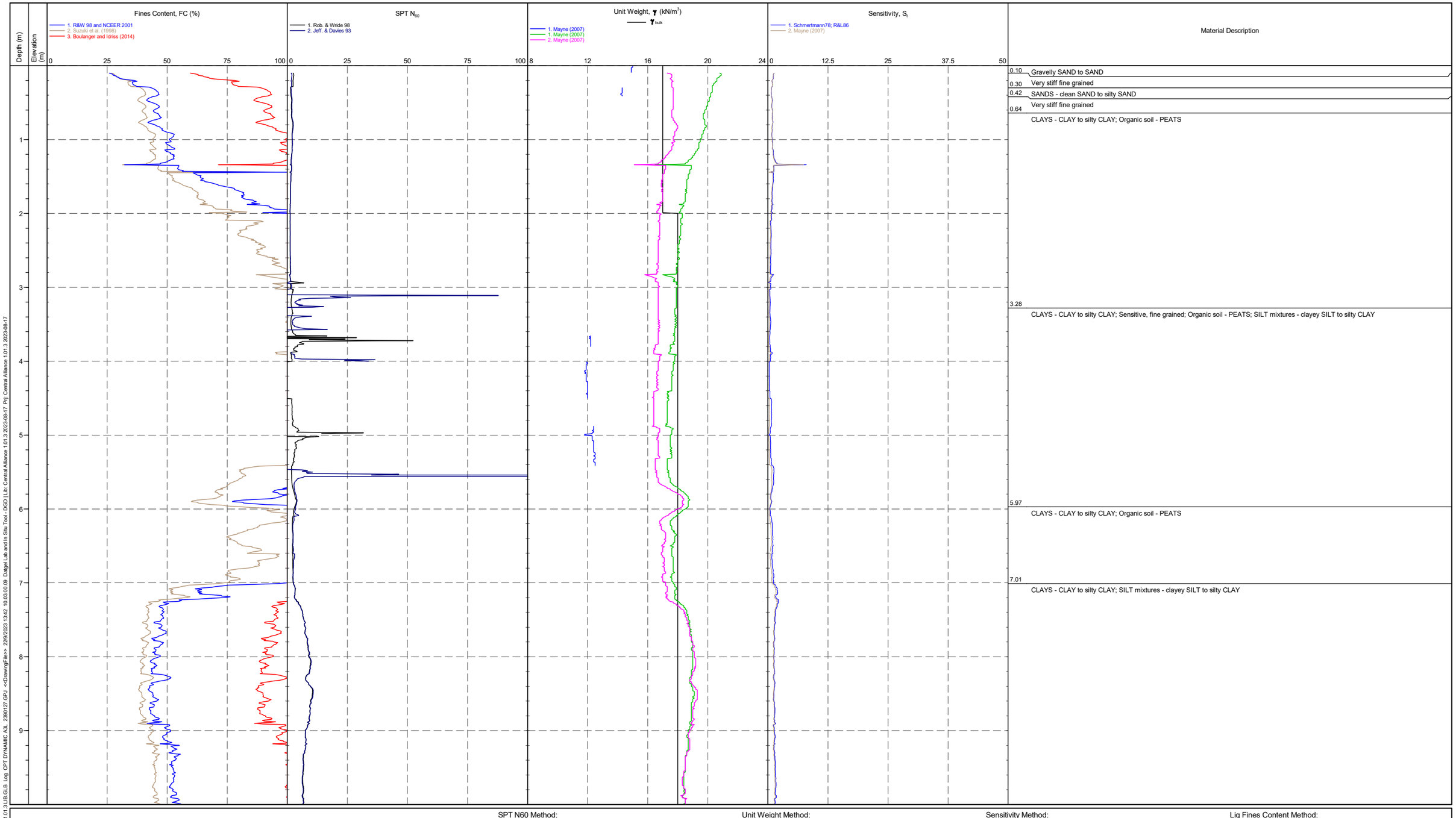
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 1 OF 2
ENGINEER : Ben Bilsbrough	EASTING : 689798.4 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942595.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

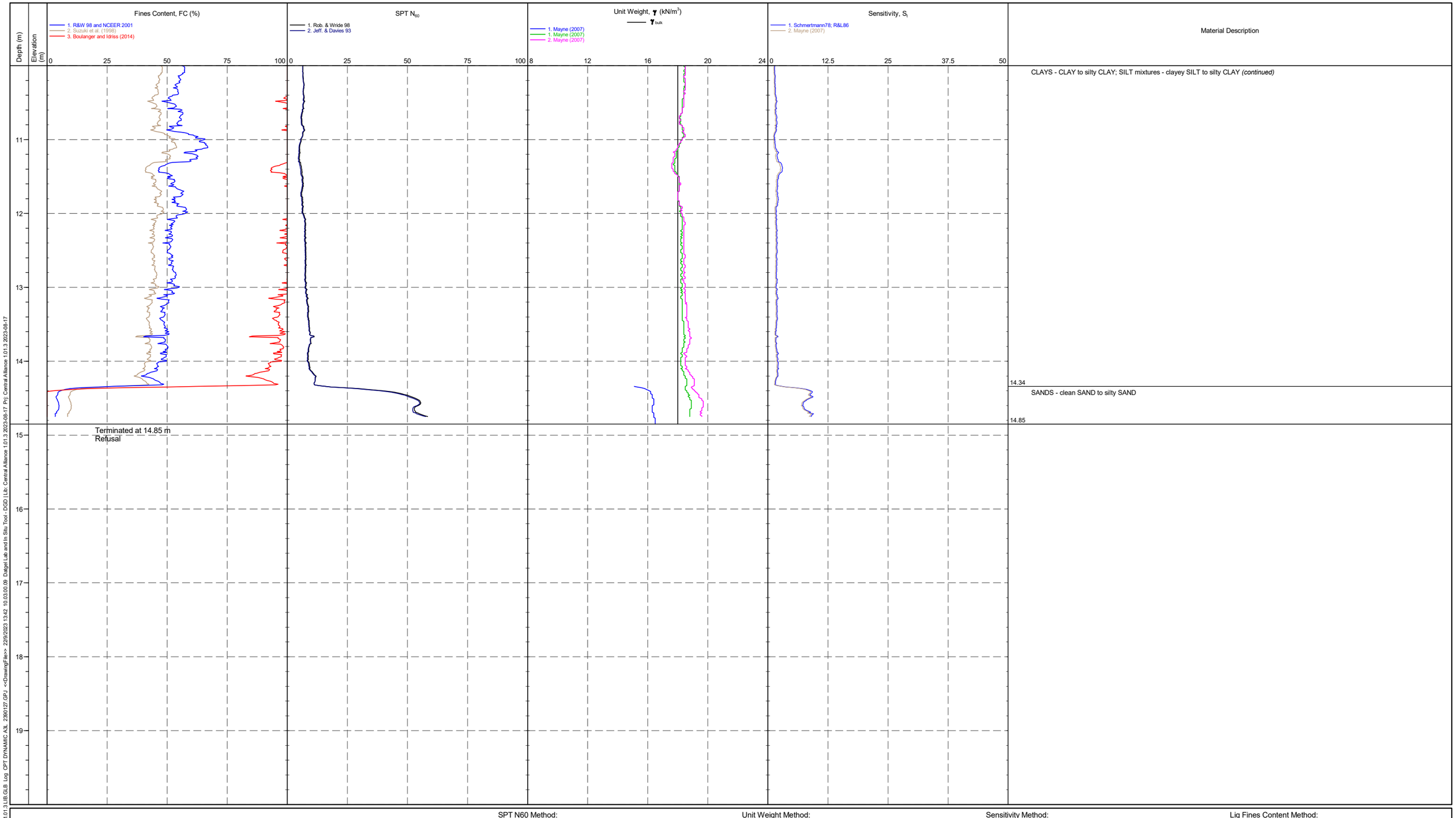
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

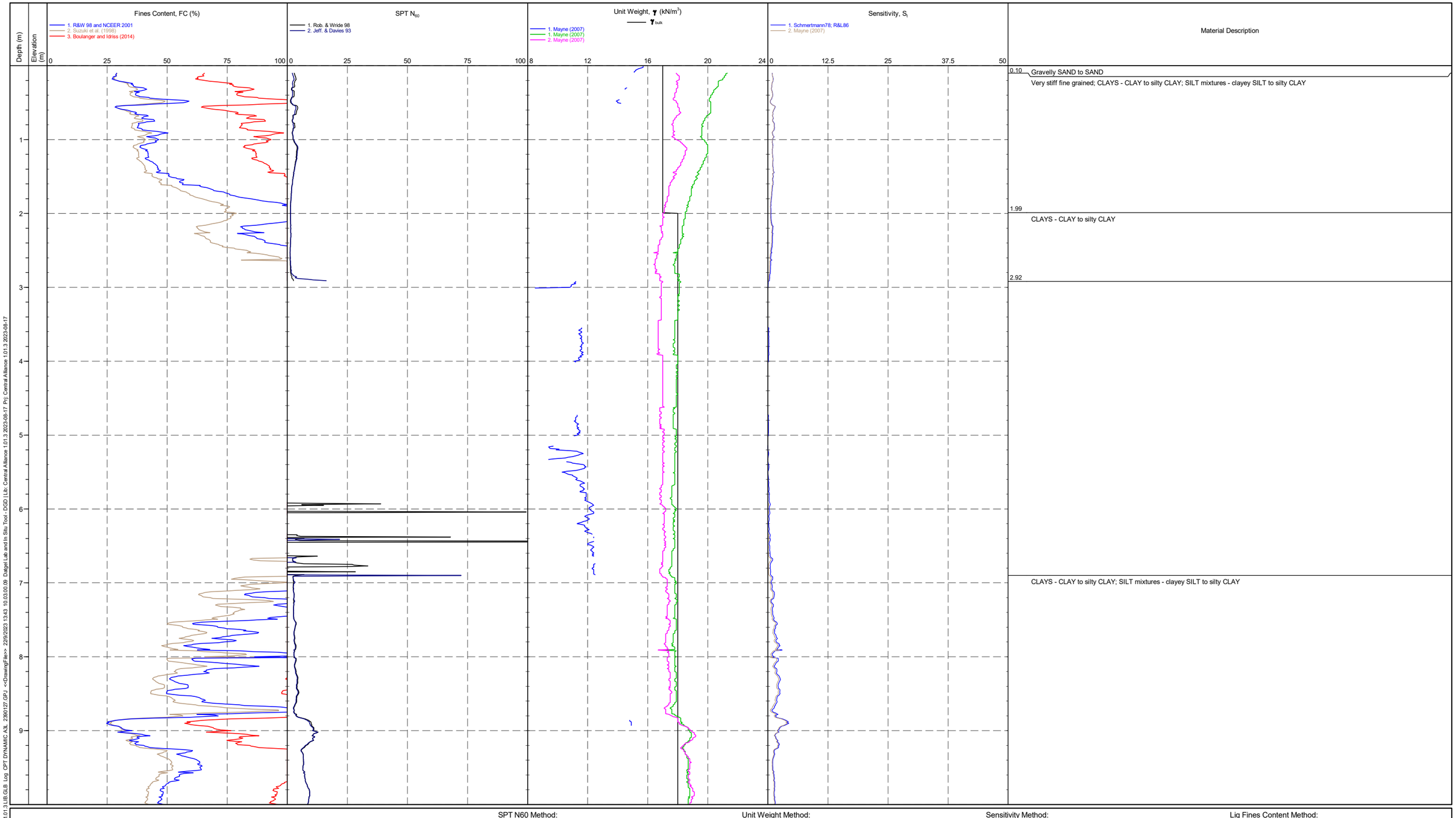
CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:42 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

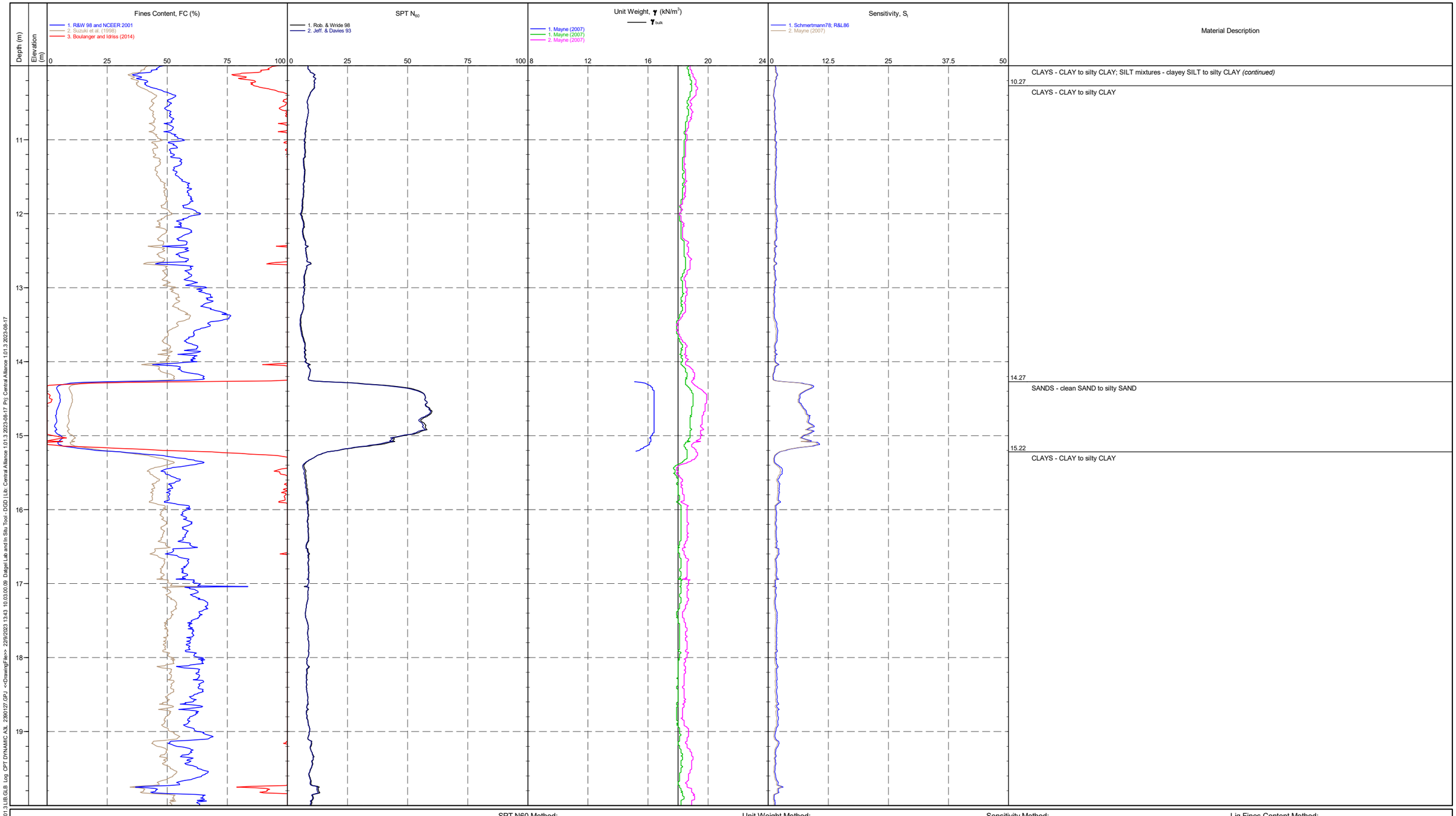
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:43 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 3 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

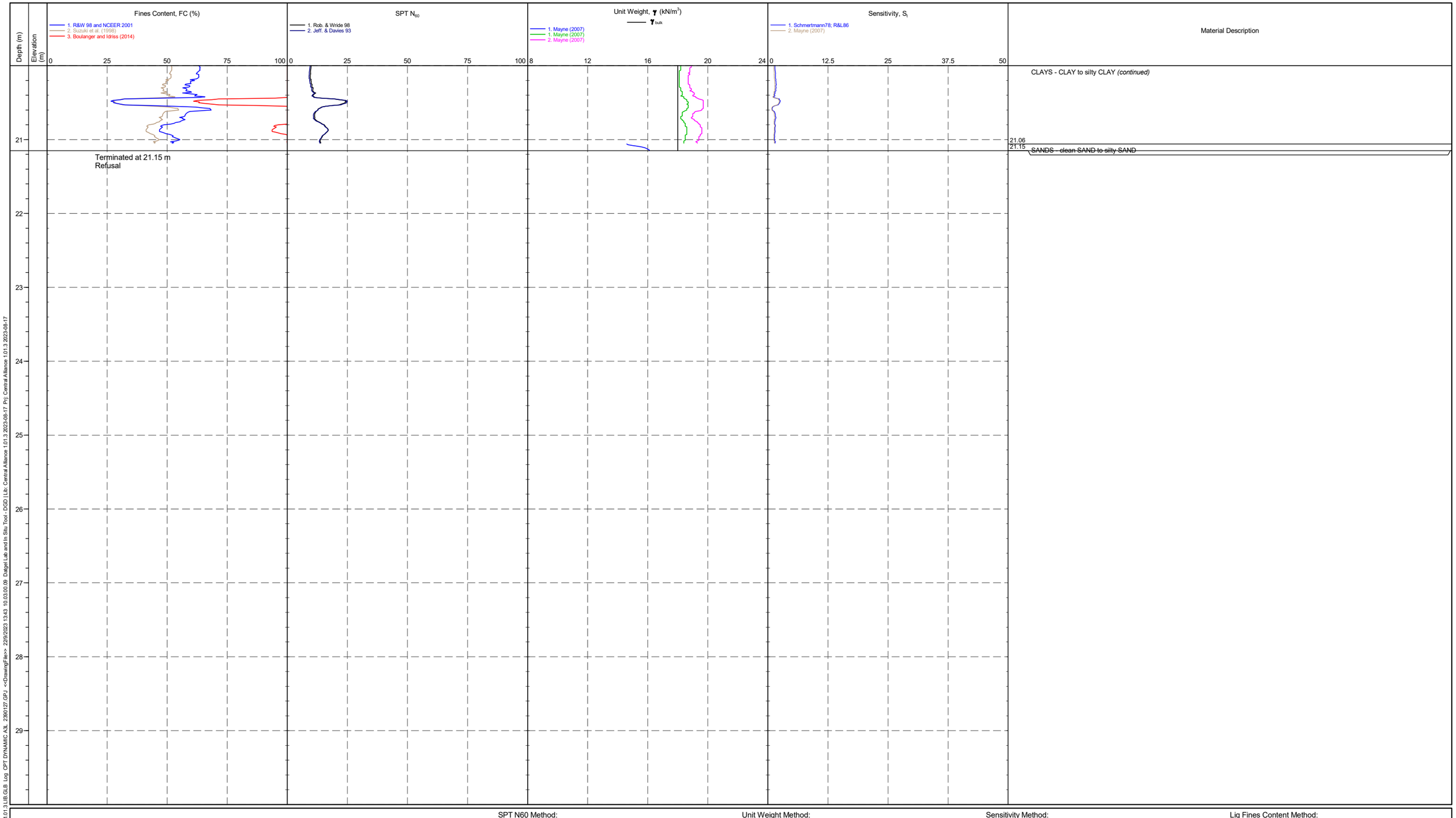
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:43 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

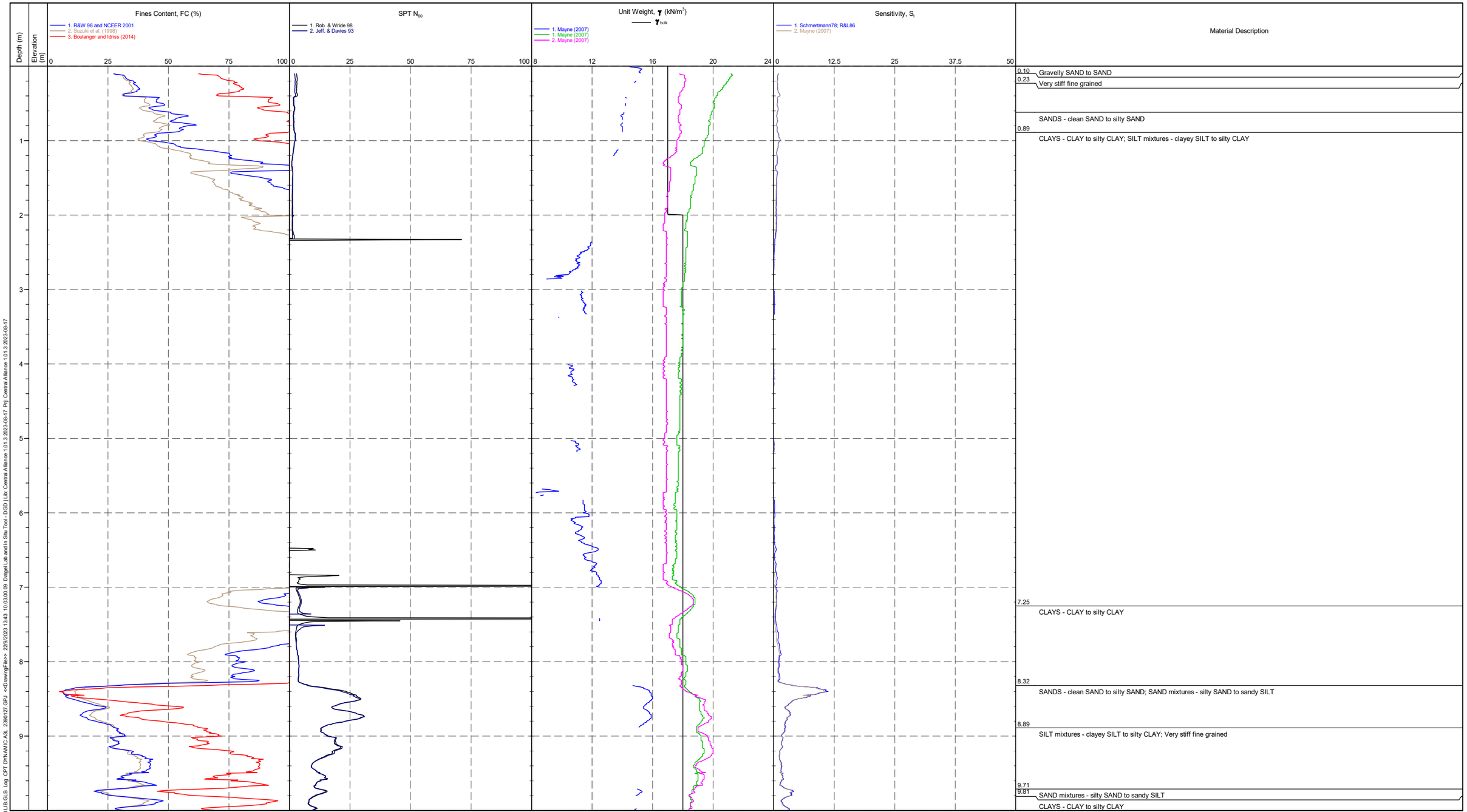
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:43 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

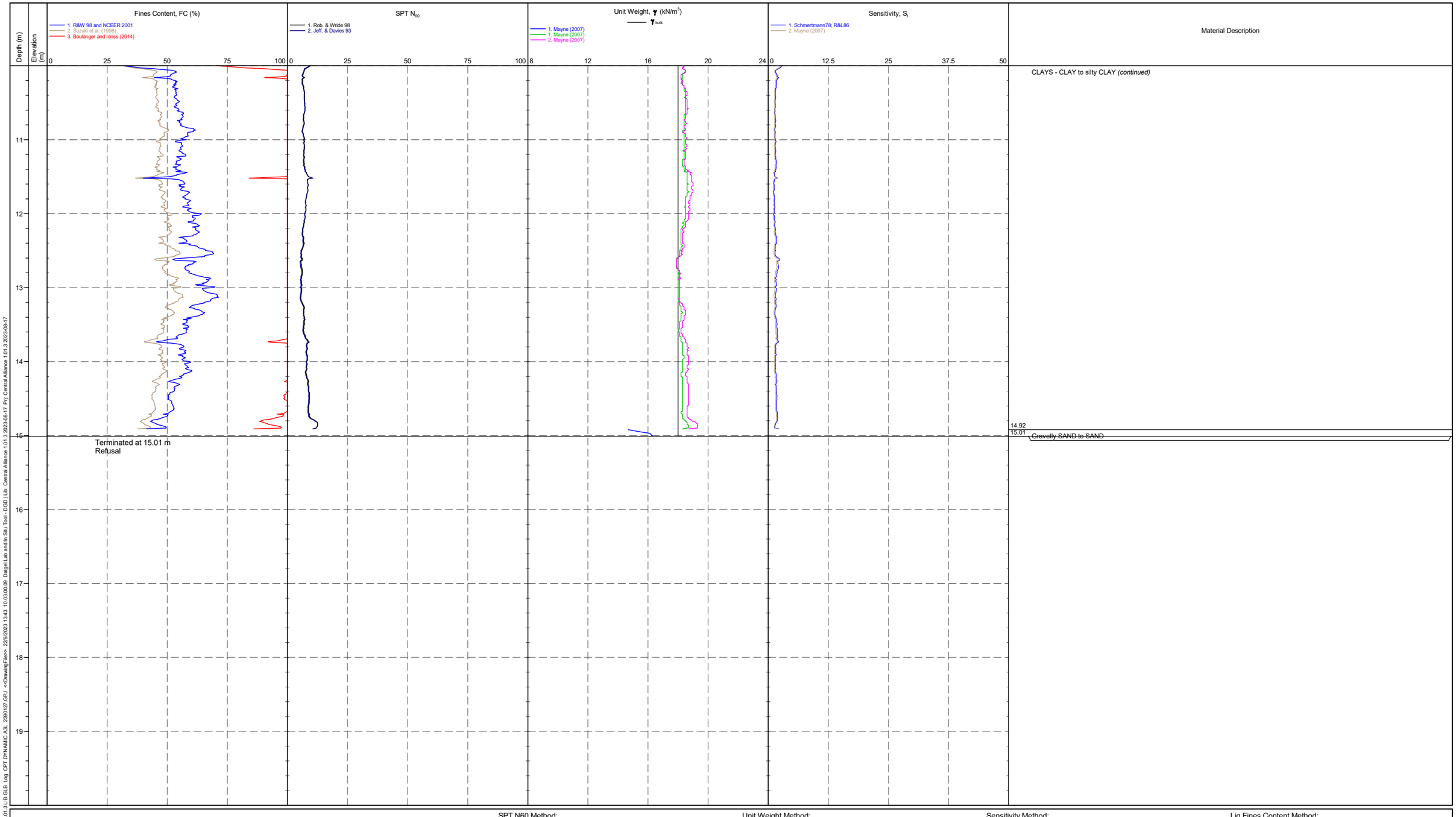
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log_CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 29/9/2023 13:43 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

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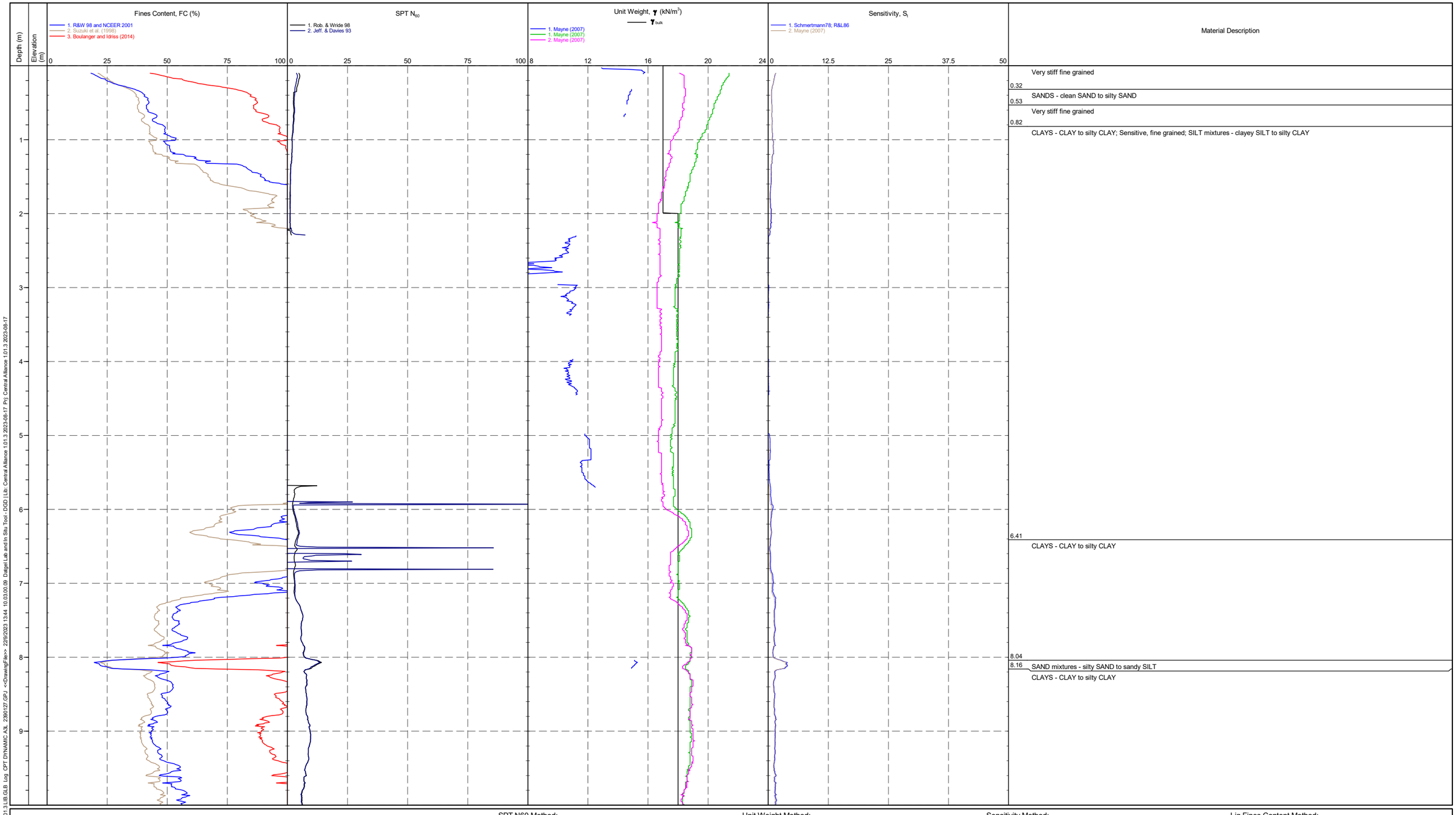
CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

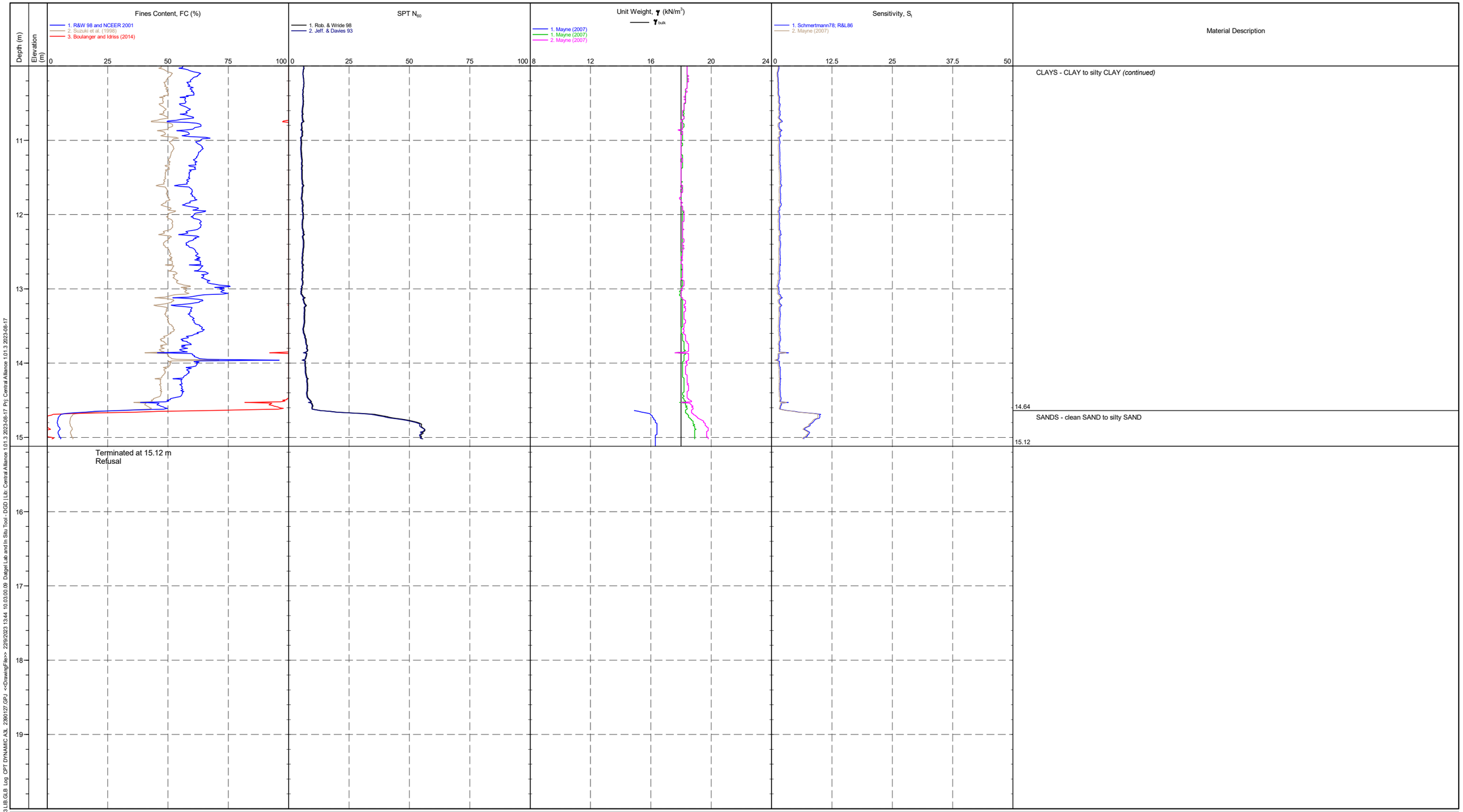
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:44 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Plt: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



SPT N60 Method:
1. Rob. & Wride 98
2. Jeff. & Davies 93

Unit Weight Method:
1. γ_b Applied in Calculation
1. γ_{sat} Mayne (2007)
2. γ_{sat} Mayne (2007)
1. γ_{dry} Mayne (2007)

Sensitivity Method:
1. Schmertmann78; R&L86
2. Mayne (2007)

Liq Fines Content Method:
1. R&W 98 and NCEER 2001
2. Suzuki et al. (1998)
3. Boulanger and Idriss (2014)

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CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

0.13 Gravelly SAND to SAND
Very stiff fine grained

0.87 CLAYS - CLAY to silty CLAY; Organic soil - PEATS

3.00 CLAYS - CLAY to silty CLAY

4.30 CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY; Organic soil - PEATS

7.59 CLAYS - CLAY to silty CLAY

8.93 SAND mixtures - silty SAND to sandy SILT

9.06 SILT mixtures - clayey SILT to silty CLAY

9.17 CLAYS - CLAY to silty CLAY; Organic soil - PEATS

State Parameter, Q
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

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CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 2 OF 3
ENGINEER : Ben Bilsbrough	EASTING : 689832.4 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942525.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY; Organic soil - PEATS *(continued)*

14.60
SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

16.46
16.60 SILT mixtures - clayey SILT to silty CLAY
CLAYS - CLAY to silty CLAY

19.82
SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

State Parameter, I_c
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

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CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT *(continued)*

20.77
20.91 SILT mixtures - clayey SILT to silty CLAY
21.06 SAND mixtures - silty SAND to sandy SILT
21.20 SILT mixtures - clayey SILT to silty CLAY
SAND mixtures - silty SAND to sandy SILT

22.51
22.62 SILT mixtures - clayey SILT to silty CLAY
SAND mixtures - silty SAND to sandy SILT

23.73
SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

24.94
Terminated at 24.94 m
Refusal

State Parameter, ▼
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL_ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:47 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

0.11 SANDS - clean SAND to silty SAND
Very stiff fine grained

0.82 CLAYS - CLAY to silty CLAY; Organic soil - PEATS

2.78 CLAYS - CLAY to silty CLAY; Sensitive, fine grained

6.69 CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

9.84 CLAYS - CLAY to silty CLAY

State Parameter, ▼
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:47 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY *(continued)*

16.58

SANDS - clean SAND to silty SAND

16.85

Terminated at 16.85 m
Refusal

State Parameter, Ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:47 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023

Depth (m)	Elevation (m)	Material Description
0.10		Gravelly SAND to SAND
0.30		Very stiff fine grained
0.42		SANDS - clean SAND to silty SAND
0.64		Very stiff fine grained
		CLAYS - CLAY to silty CLAY; Organic soil - PEATS
3.28		CLAYS - CLAY to silty CLAY; Sensitive, fine grained; Organic soil - PEATS; SILT mixtures - clayey SILT to silty CLAY
5.97		CLAYS - CLAY to silty CLAY; Organic soil - PEATS
7.01		CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

State Parameter, I_B
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 101.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:47 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Plt: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY *(continued)*

14.34

SANDS - clean SAND to silty SAND

14.85

Terminated at 14.85 m
Refusal

State Parameter, ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

0.10 Gravelly SAND to SAND
Very stiff fine grained; CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

1.99 CLAYS - CLAY to silty CLAY

2.92 CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

State Parameter, ▼
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3 LIB:GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY *(continued)*

10.27

CLAYS - CLAY to silty CLAY

14.27

SANDS - clean SAND to silty SAND

15.22

CLAYS - CLAY to silty CLAY

State Parameter, ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

State Parameter, ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

21 — CLAYS - CLAY to silty CLAY *(continued)*

21.06 — 21.15 — SANDS - clean SAND to silty SAND

Terminated at 21.15 m
Refusal

22 23 24 25 26 27 28 29

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

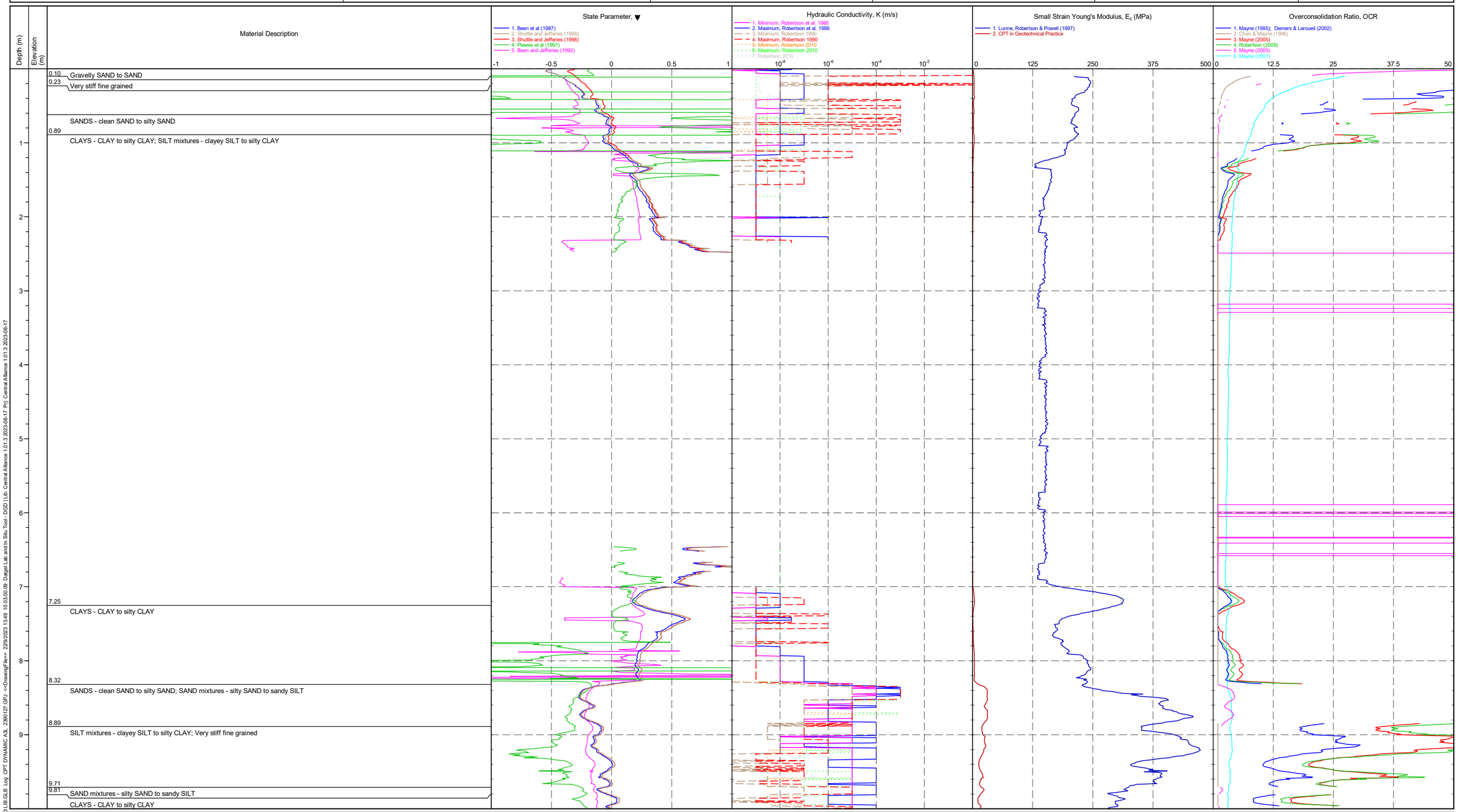
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:48 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 101.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:49 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Prj: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 2 OF 2
ENGINEER : Ben Bilsbrough	EASTING : 689687.1 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942715.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY *(continued)*

14.92
15.01 Gravelly SAND to SAND
Terminated at 15.01 m
Refusal

State Parameter, ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC AGL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:49 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

- 0.32 — Very stiff fine grained
- 0.53 — SANDS - clean SAND to silty SAND
- 0.82 — Very stiff fine grained
- CLAYS - CLAY to silty CLAY; Sensitive, fine grained; SILT mixtures - clayey SILT to silty CLAY
- 6.41 — CLAYS - CLAY to silty CLAY
- 8.04
- 8.16 — SAND mixtures - silty SAND to sandy SILT
- CLAYS - CLAY to silty CLAY

State Parameter, ▼
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Leroueil (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

CENTRAL ALLIANCE 1.01.3 LIB GLB Liq_CPT_DYNAMIC_ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:49 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY *(continued)*

14.64

SANDS - clean SAND to silty SAND

15.12

Terminated at 15.12 m
Refusal

State Parameter, ψ
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)
-1 -0.5 0 0.5 1

Hydraulic Conductivity, K (m/s)
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010
7. Robertson 2010
10^{-8} 10^{-6} 10^{-4} 10^{-2}

Small Strain Young's Modulus, E_0 (MPa)
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice
0 125 250 375 500

Overconsolidation Ratio, OCR
1. Mayne (1995); Demers & Lerouell (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)
0 12.5 25 37.5 50

Liq State Parameter Method:
1. Been et al (1987)
2. Shuttle and Jefferies (1998)
3. Shuttle and Jefferies (1998)
4. Plewes et al (1991)
5. Been and Jefferies (1992)

Hydraulic Conductivity Method:
1. Minimum, Robertson et al. 1986
2. Maximum, Robertson et al. 1986
3. Minimum, Robertson 1990
4. Maximum, Robertson 1990
5. Minimum, Robertson 2010
6. Maximum, Robertson 2010

Youngs Modulus Method:
1. Lunne, Robertson & Powell (1997)
2. CPT in Geotechnical Practice

Overconsolidation Ratio Method:
1. Mayne (1995); Demers & Lerouell (2002)
2. Chen & Mayne (1996)
3. Mayne (2005)
4. Robertson (2009)
5. Mayne (2005)
6. Mayne (2007)

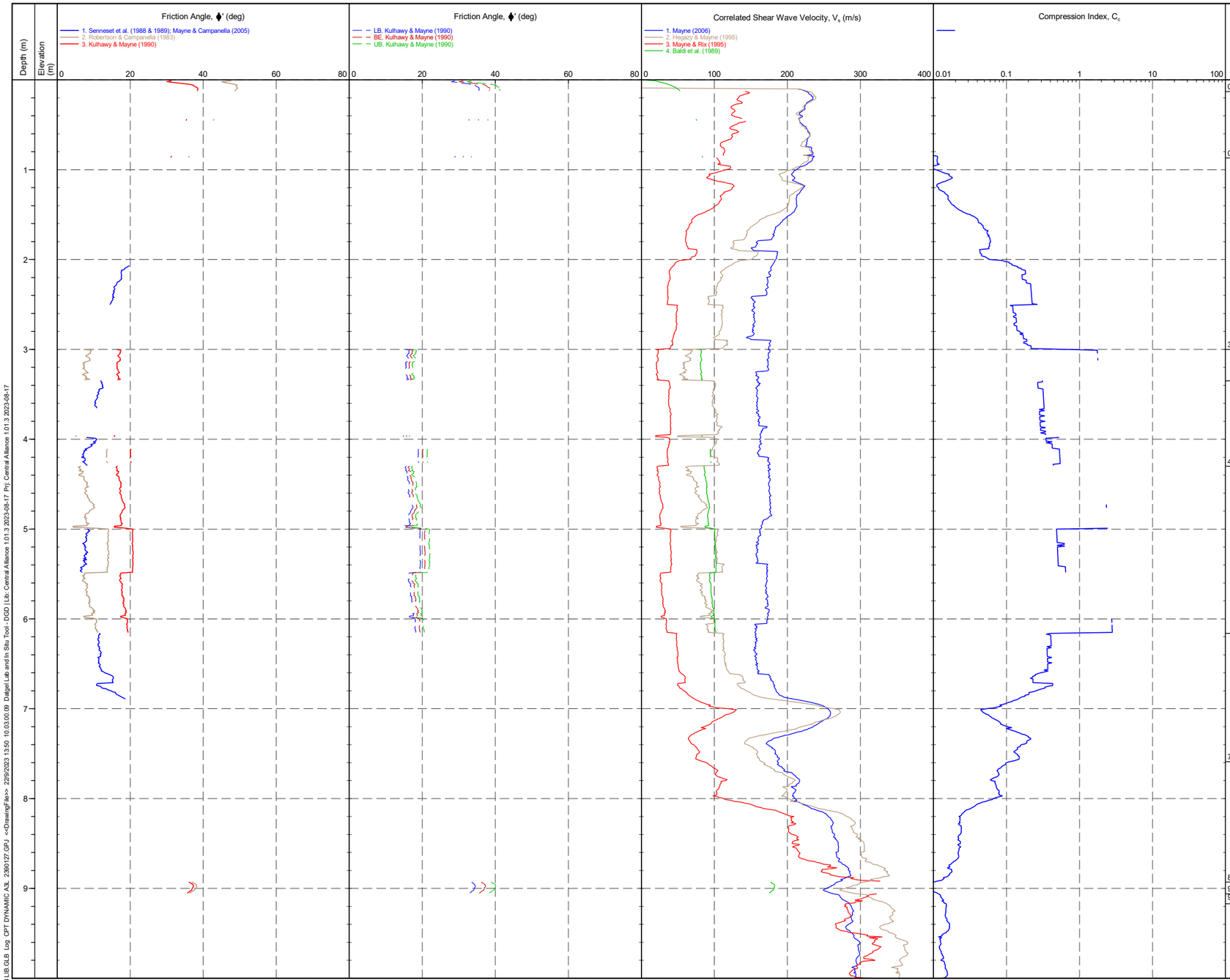
CENTRAL ALLIANCE 1.01.3 LIB:GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:49 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023



Material Description

0.13 Gravelly SAND to SAND
Very stiff fine grained

0.87 CLAYS - CLAY to silty CLAY; Organic soil - PEATS

3.00 CLAYS - CLAY to silty CLAY

4.30 CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY; Organic soil - PEATS

7.59 CLAYS - CLAY to silty CLAY

8.93 SAND mixtures - silty SAND to sandy SILT

9.06 SILT mixtures - clayey SILT to silty CLAY

9.17 CLAYS - CLAY to silty CLAY; Organic soil - PEATS

Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

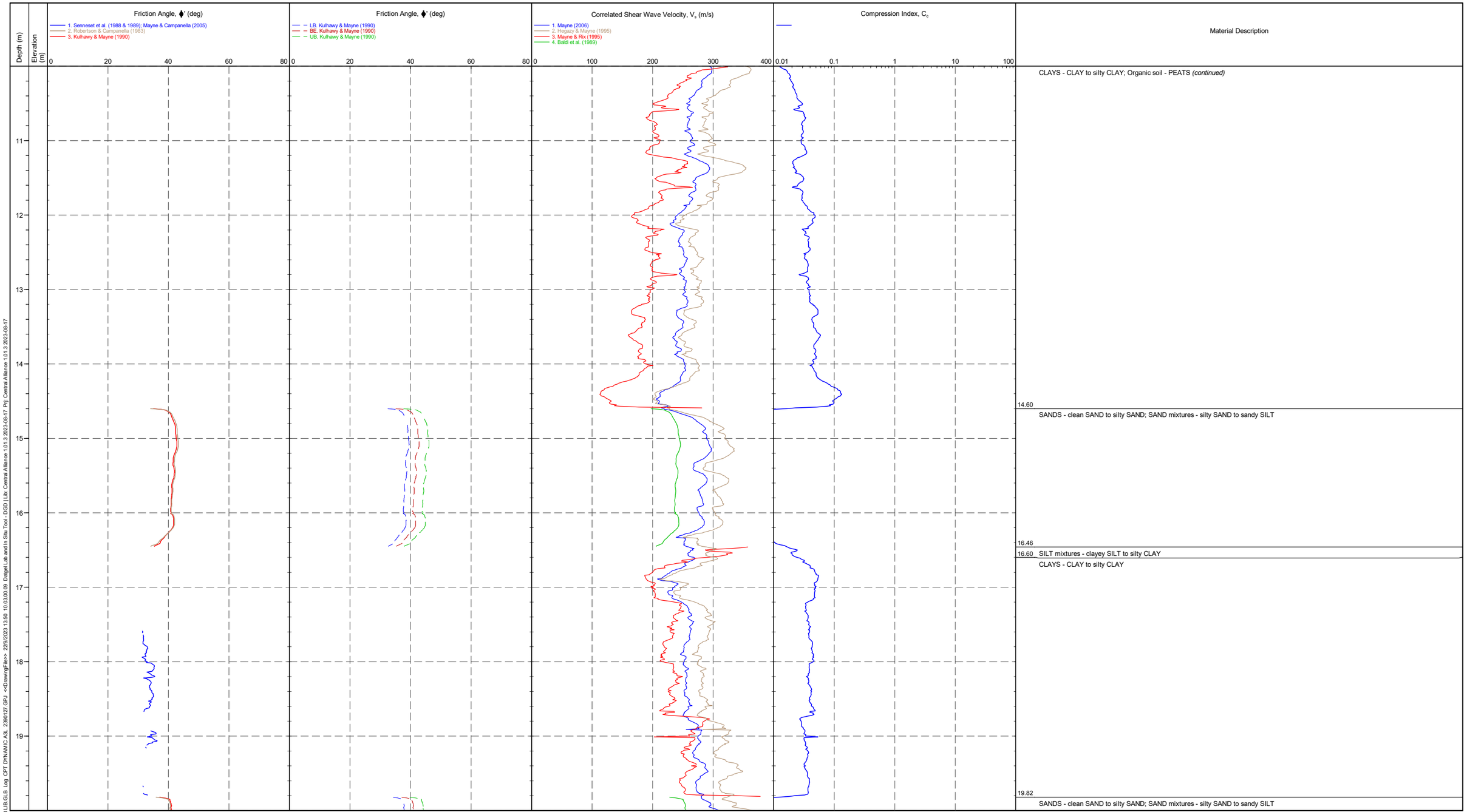
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 29/9/2023 13:50 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Plt: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 3 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

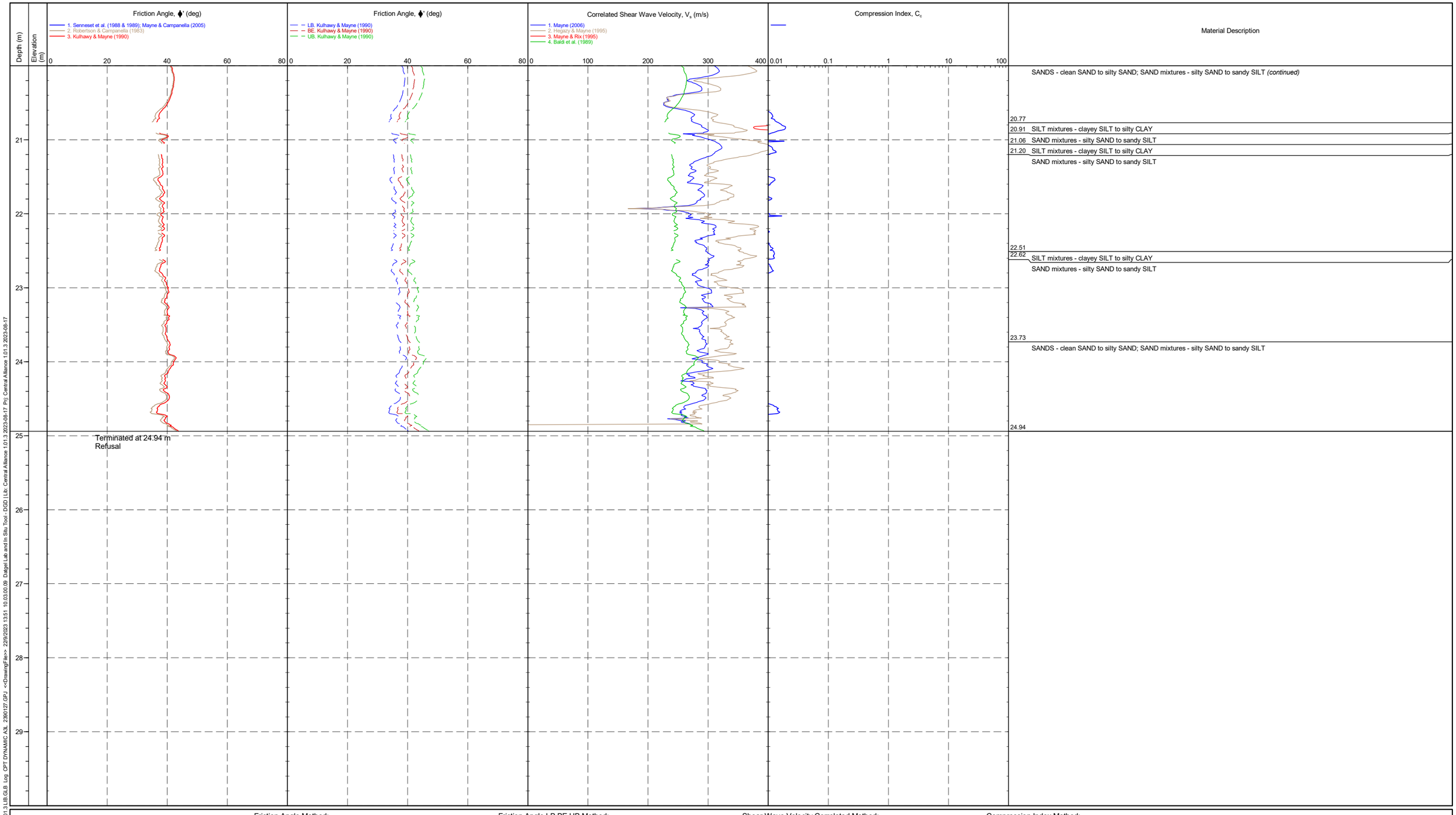
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:50 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

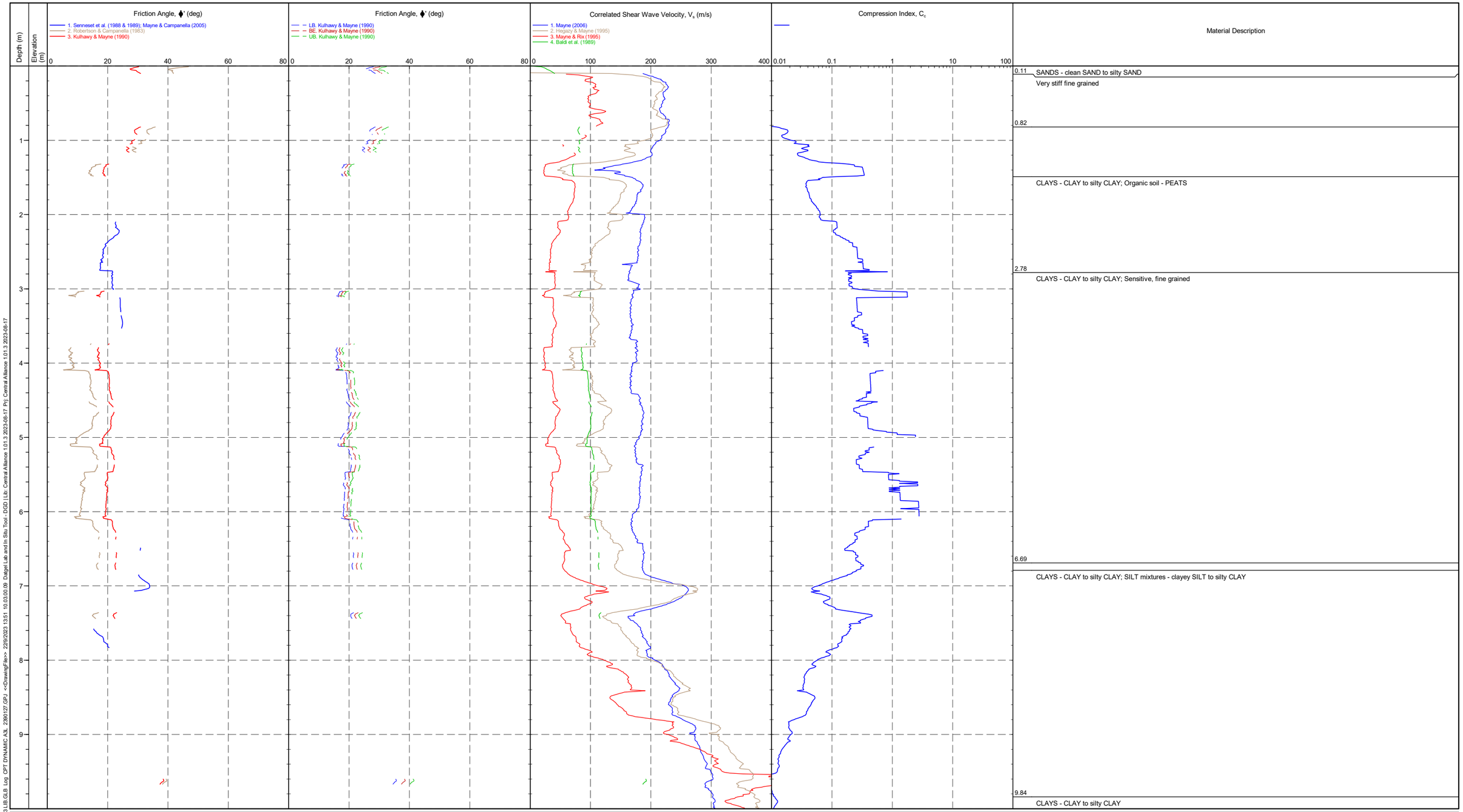
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:51 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

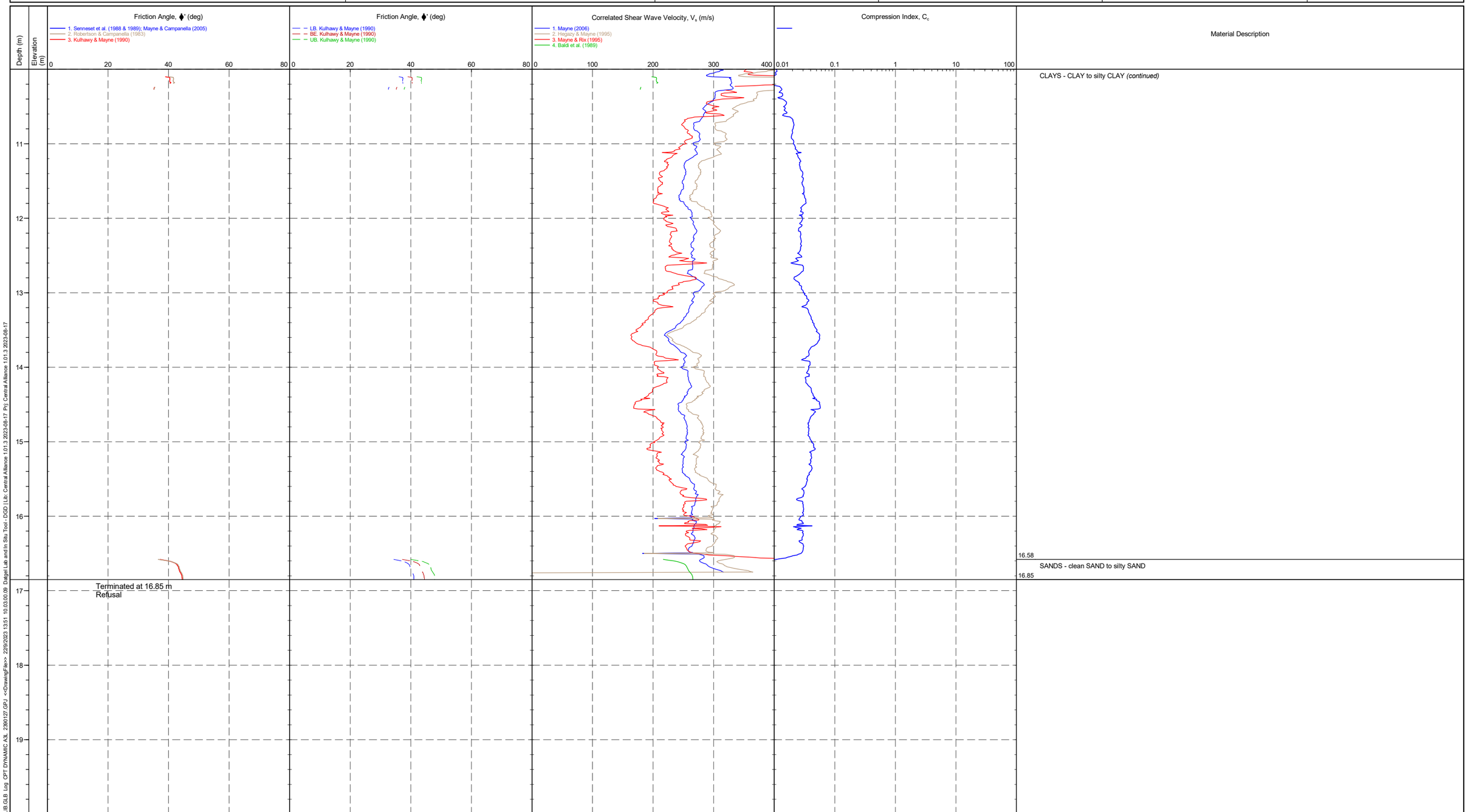
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log_CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:51 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Plt: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

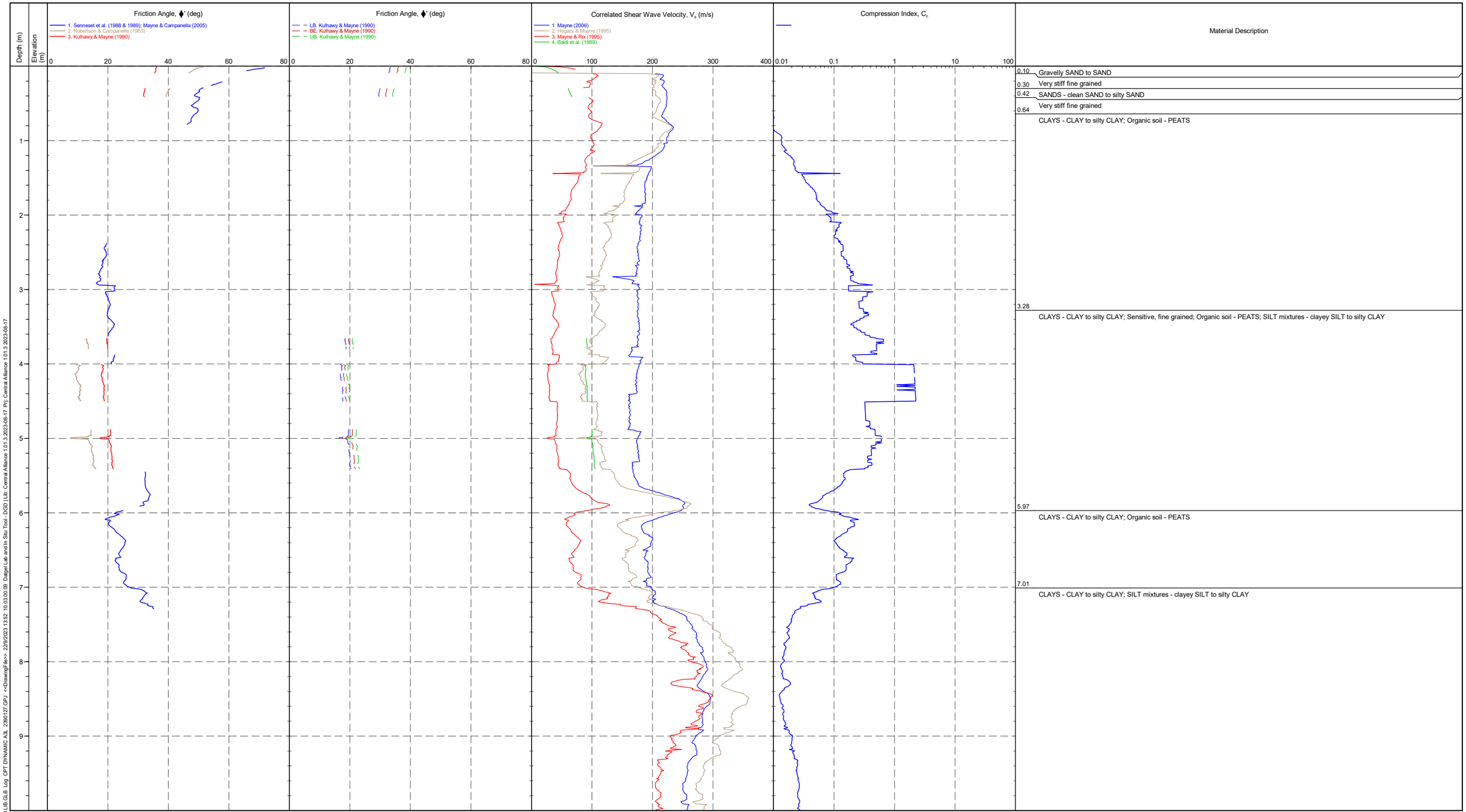
CENTRAL ALLIANCE 101.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:51 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Plt: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

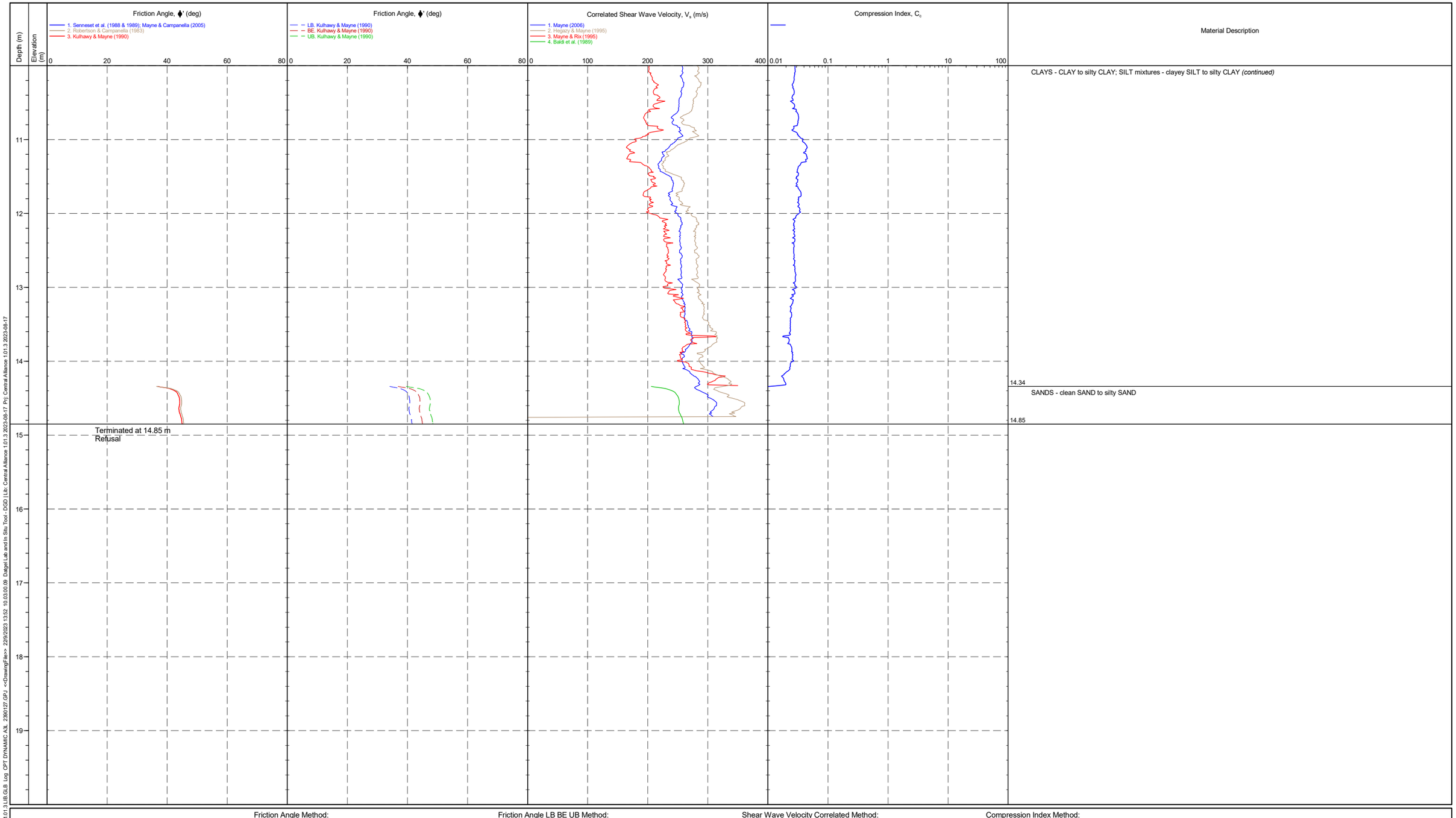
CENTRAL ALLIANCE 101.3 LIB.GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Prj: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

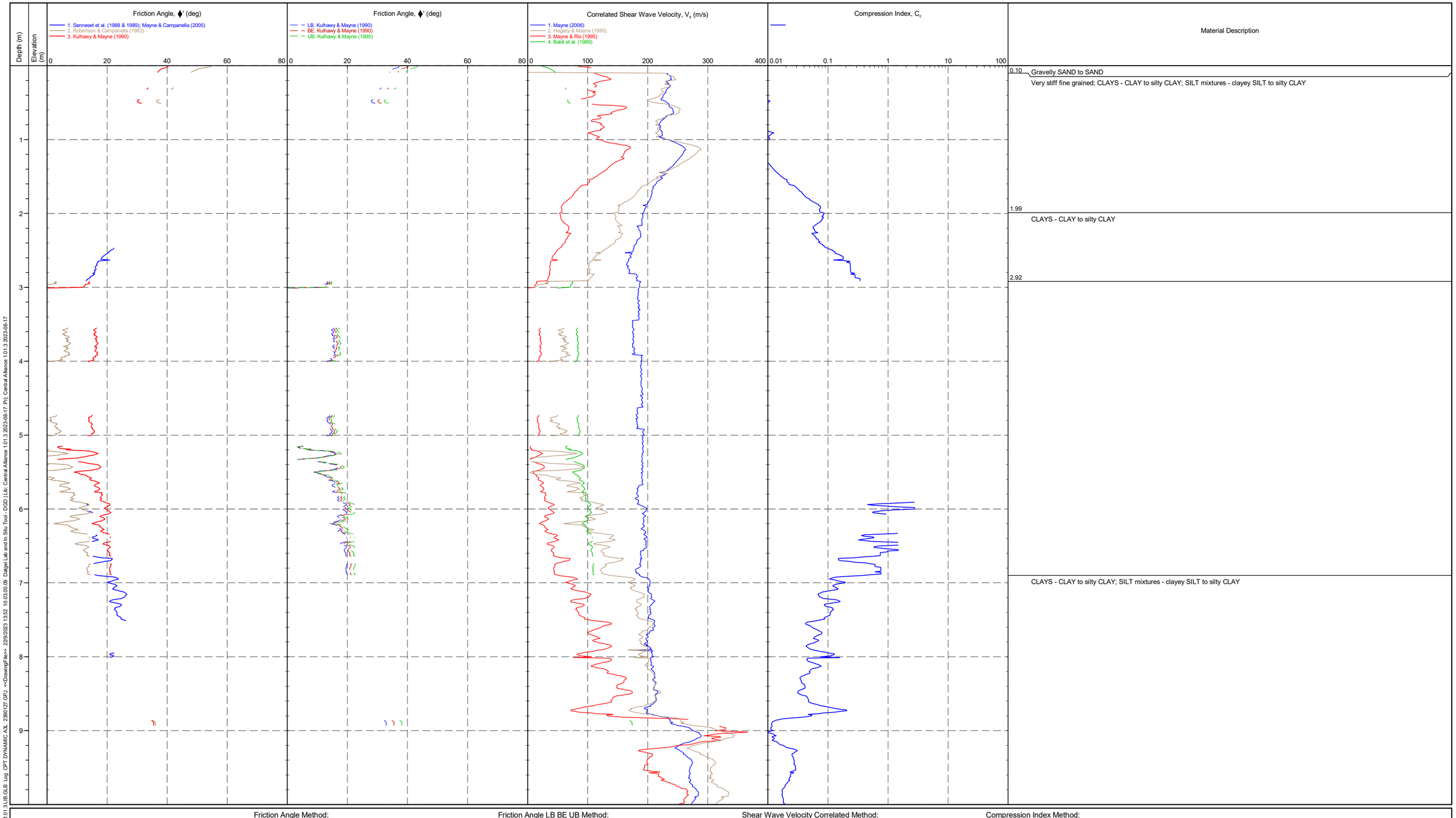
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

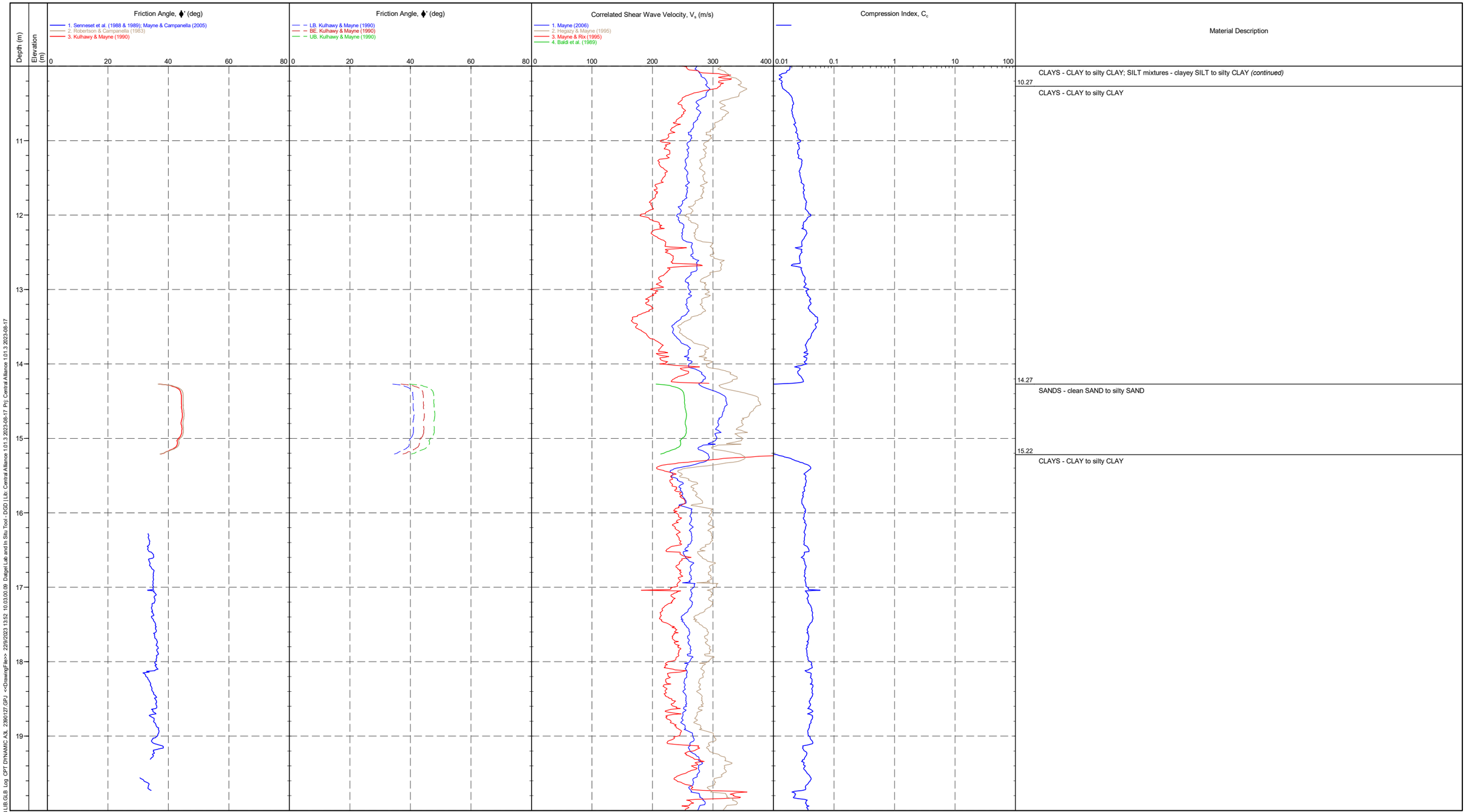
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 3 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

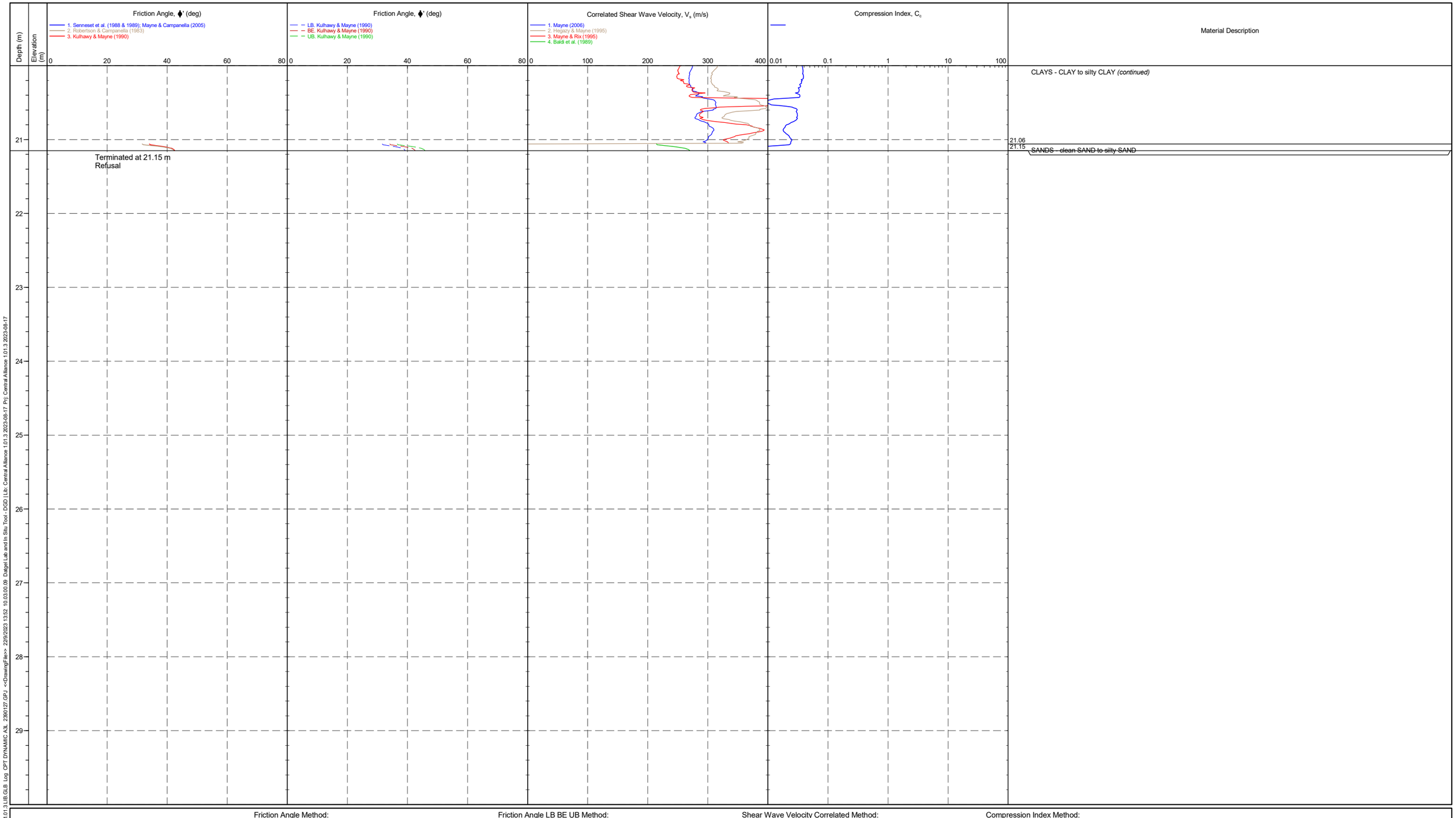
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

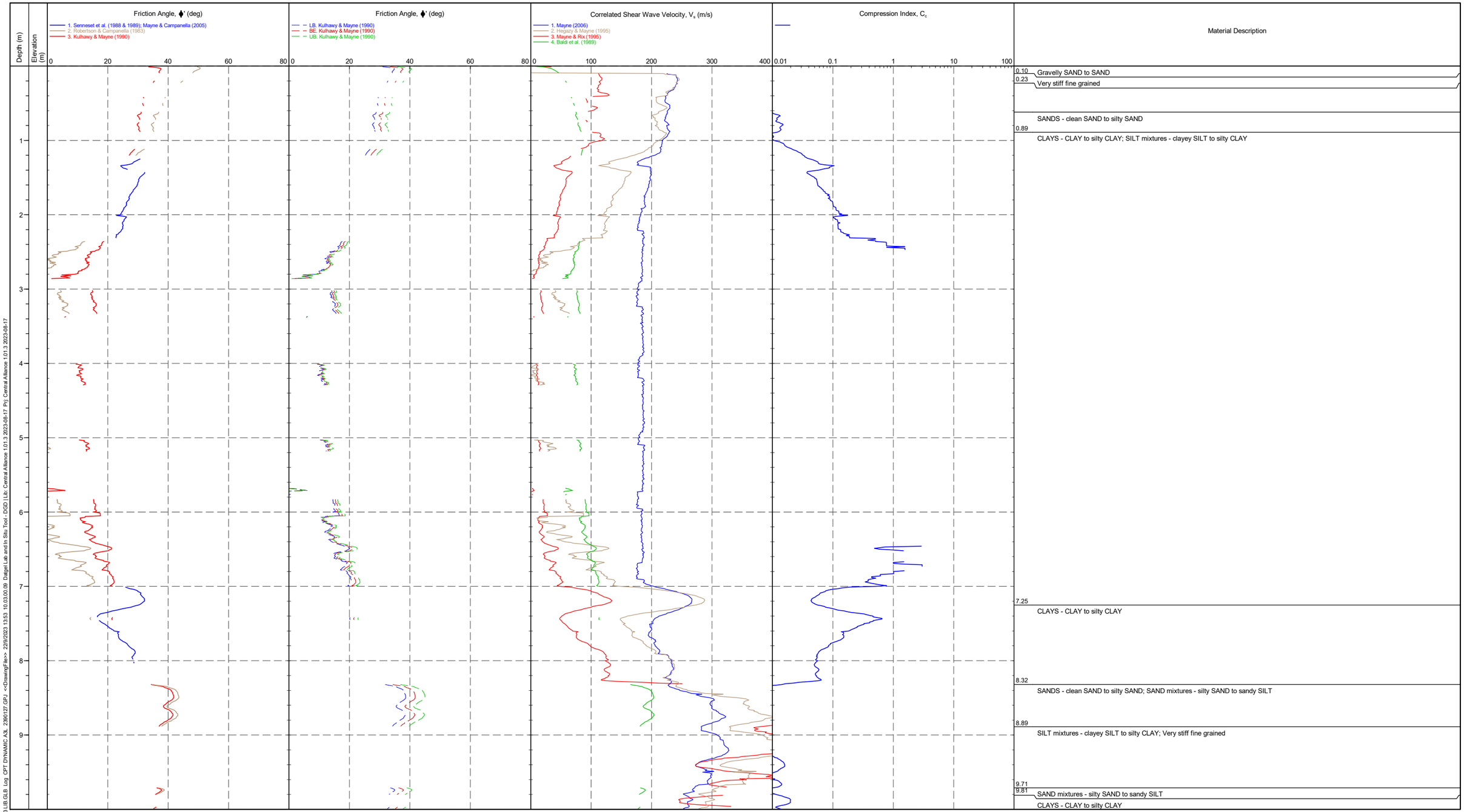
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:52 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

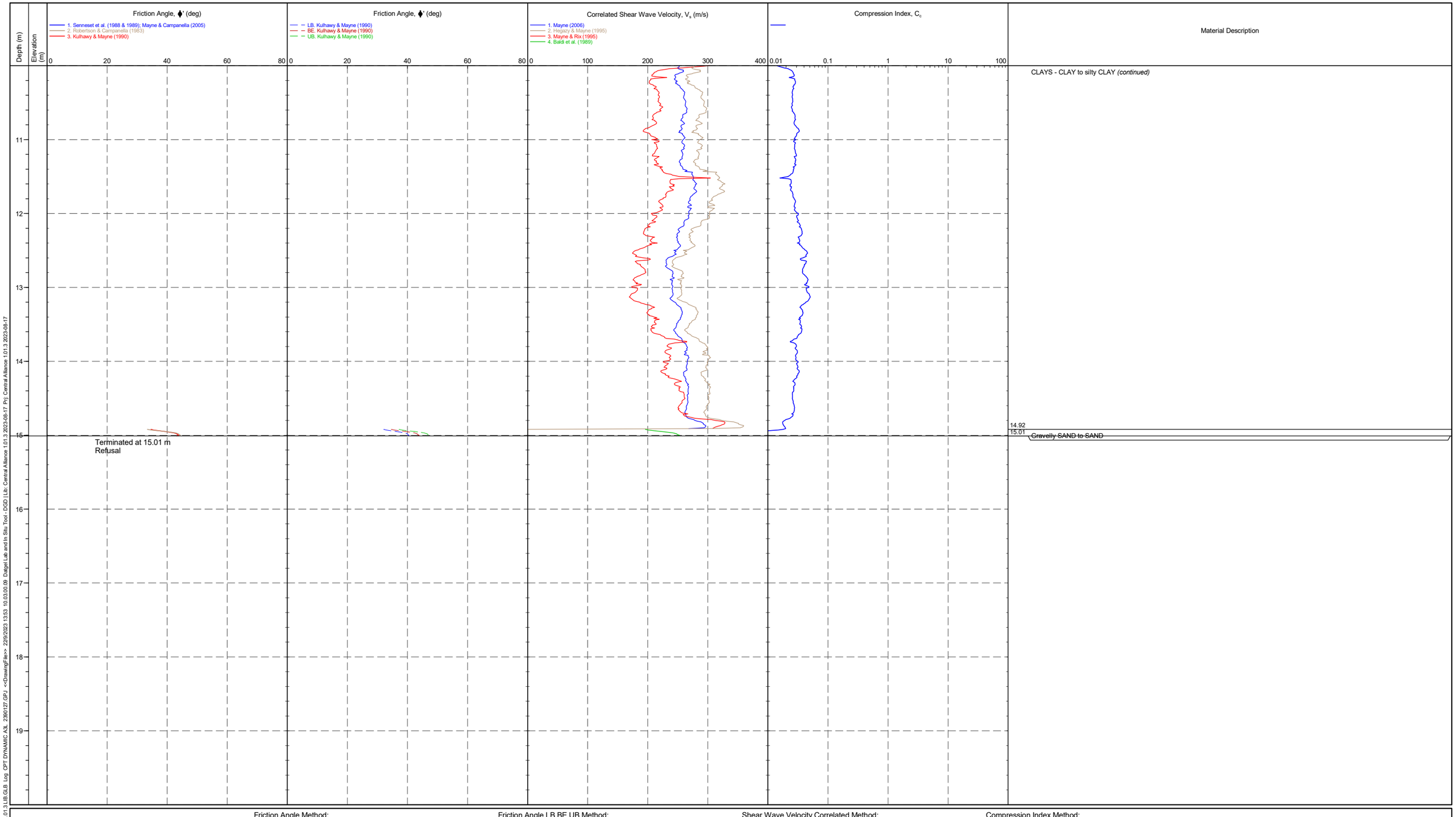
CENTRAL_ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:53 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

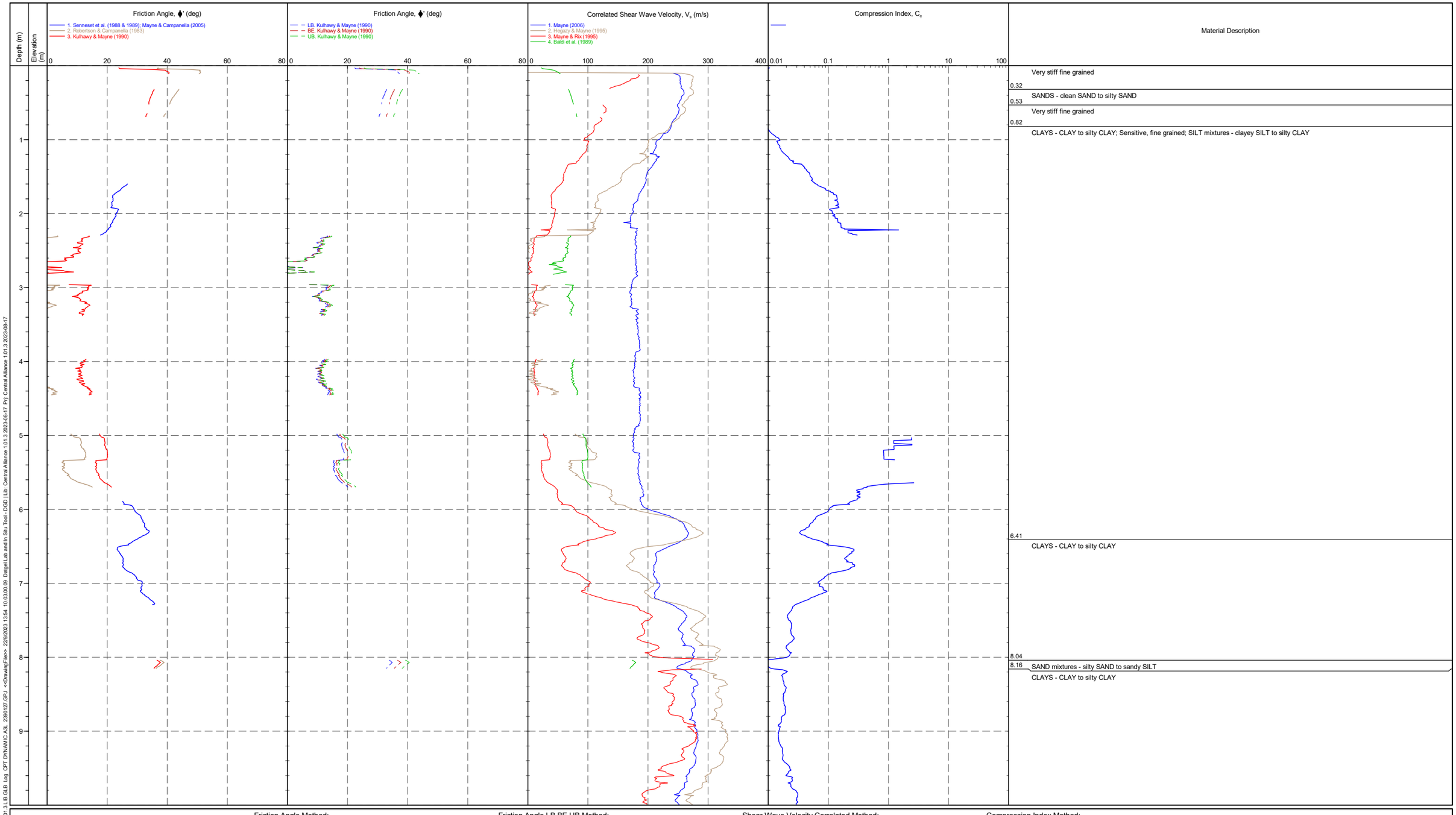
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:53 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

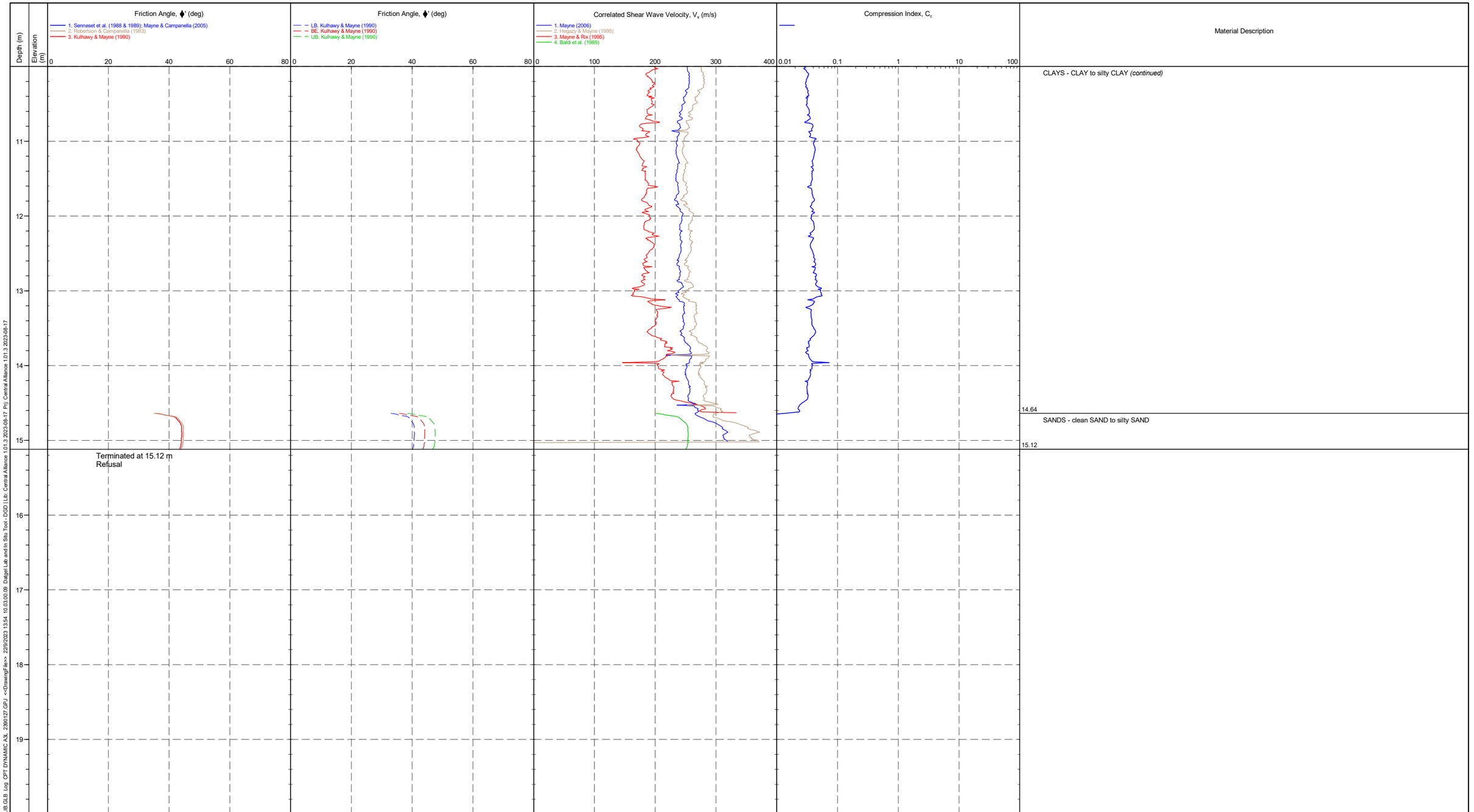
CENTRAL ALLIANCE 1.01.3 LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:54 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



Friction Angle Method:
1. Senneset et al. (1988 & 1989); Mayne & Campanella (2005)
2. Robertson & Campanella (1983)
3. Kulhawy & Mayne (1990)

Friction Angle LB BE UB Method:
LB. Kulhawy & Mayne (1990)
BE. Kulhawy & Mayne (1990)
UB. Kulhawy & Mayne (1990)

Shear Wave Velocity Correlated Method:

Compression Index Method:
1. Derived from Kulhawy & Mayne (1990)

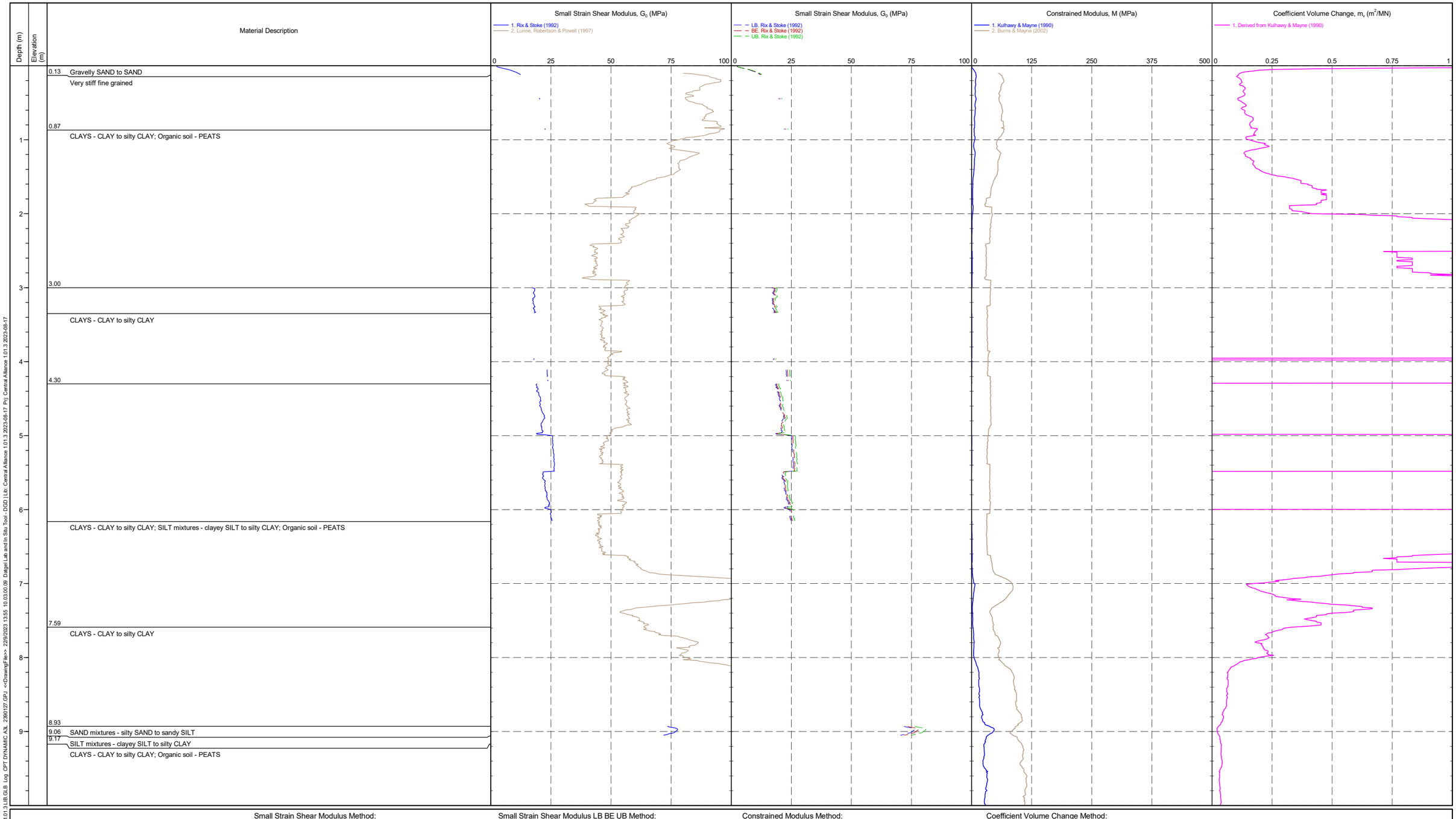
CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:54 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023



Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC A3i 2390127.GPJ <<DrawingFile>> 22/9/2023 13:55 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY; Organic soil - PEATS *(continued)*

14.60 SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

16.46

16.60 SILT mixtures - clayey SILT to silty CLAY

CLAYS - CLAY to silty CLAY

19.82 SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 25 50 75 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 0.25 0.5 0.75 1

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3.UB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:55 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT01**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689832.4 m NORTHING : 5942525.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 3 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT *(continued)*

20.77
20.91 SILT mixtures - clayey SILT to silty CLAY
21.06 SAND mixtures - silty SAND to sandy SILT
21.20 SILT mixtures - clayey SILT to silty CLAY
SAND mixtures - silty SAND to sandy SILT

22.51
22.62 SILT mixtures - clayey SILT to silty CLAY
SAND mixtures - silty SAND to sandy SILT

23.73
SANDS - clean SAND to silty SAND; SAND mixtures - silty SAND to sandy SILT

24.94
Terminated at 24.94 m
Refusal

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 25 50 75 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 0.25 0.5 0.75 1

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

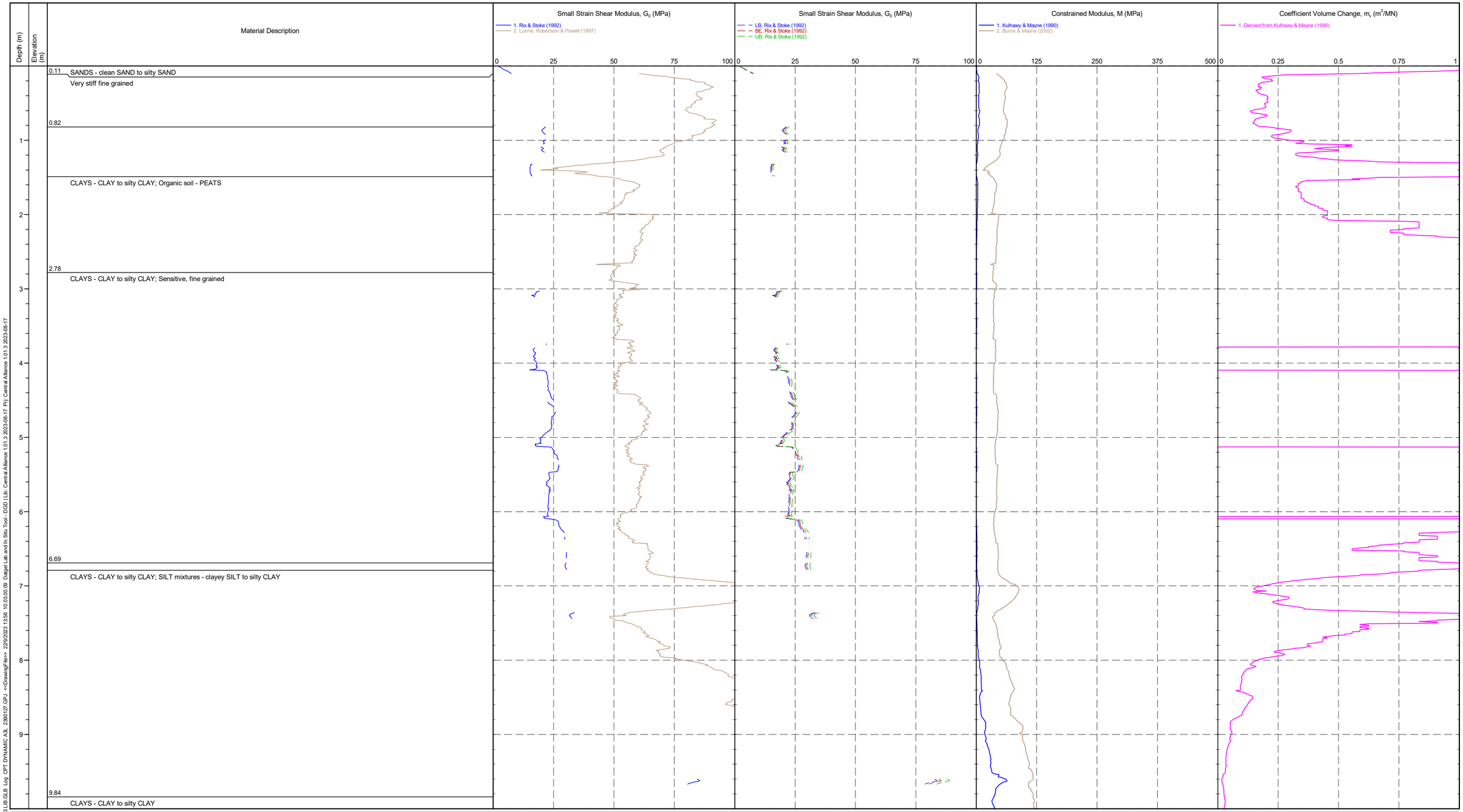
CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC AJL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:55 10.03.00.09 Datgel Lab and In Situ Tool - DGD] Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023



Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

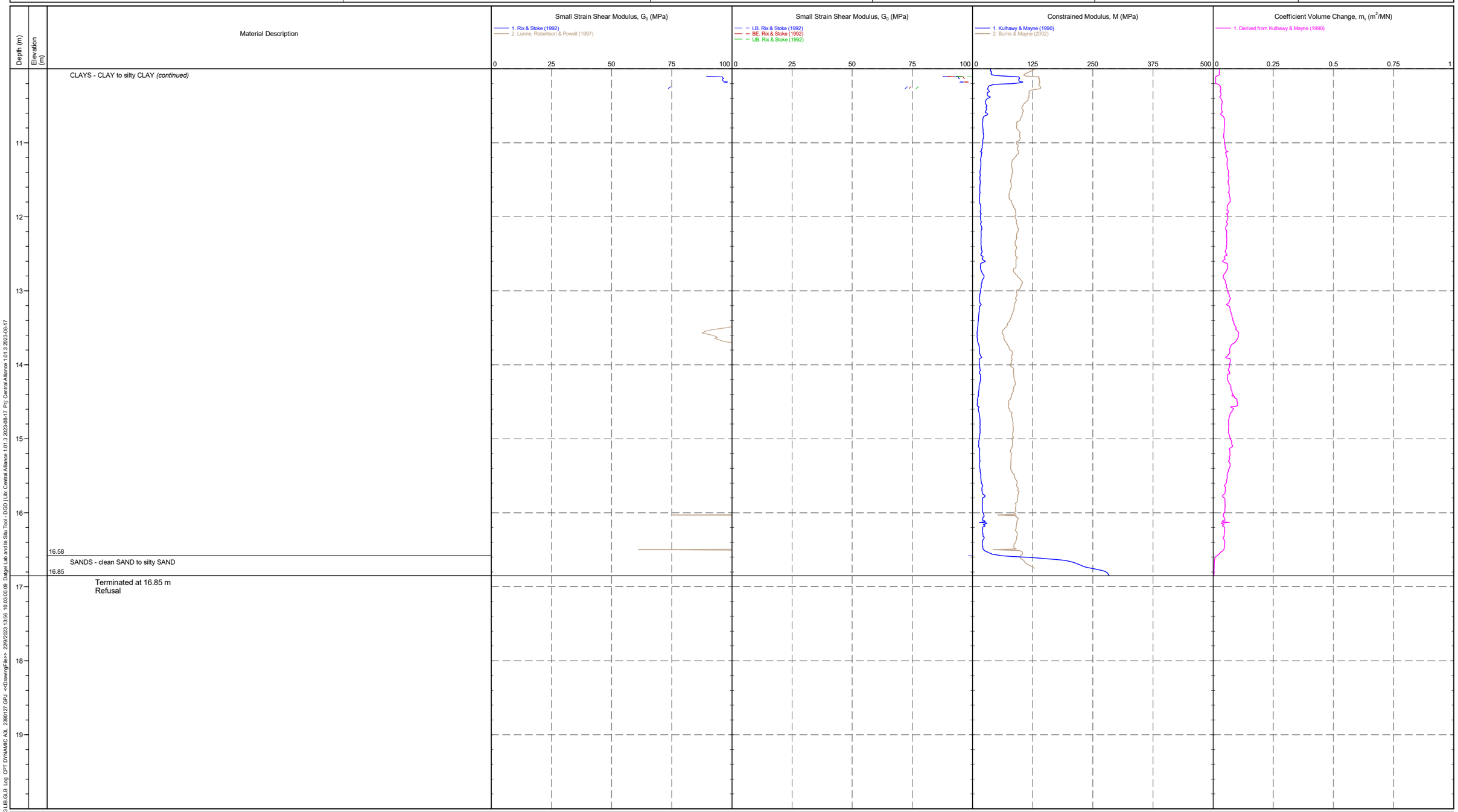
CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:58 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT02**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689838.6 m NORTHING : 5942597.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023



Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 101.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:58 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 101.3 2023-08-17 Plt: Central Alliance 101.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689798.4 m NORTHING : 5942595.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 2 STATUS : DATE : 13/9/2023

Depth (m)	Elevation (m)	Material Description
0.10		Gravelly SAND to SAND
0.30		Very stiff fine grained
0.42		SANDS - clean SAND to silty SAND
0.64		Very stiff fine grained
		CLAYS - CLAY to silty CLAY; Organic soil - PEATS
3.28		CLAYS - CLAY to silty CLAY; Sensitive, fine grained; Organic soil - PEATS; SILT mixtures - clayey SILT to silty CLAY
5.97		CLAYS - CLAY to silty CLAY; Organic soil - PEATS
7.01		CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 25 50 75 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 0.25 0.5 0.75 1

Depth (m) 0 1 2 3 4 5 6 7 8 9

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:56 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT03**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 2 OF 2
ENGINEER : Ben Bilsbrough	EASTING : 689798.4 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942595.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				

Depth (m) | Elevation (m) | Material Description

Small Strain Shear Modulus, G_0 (MPa) — 1. Rix & Stoke (1992); 2. Lunne, Robertson & Powell (1997) — 0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa) — LB. Rix & Stoke (1992); BE. Rix & Stoke (1992); UB. Rix & Stoke (1992) — 0 25 50 75 100

Constrained Modulus, M (MPa) — 1. Kulhawy & Mayne (1990); 2. Burns & Mayne (2002) — 0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN) — 1. Derived from Kulhawy & Mayne (1990) — 0 0.25 0.5 0.75 1

CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY *(continued)*

14.34

SANDS - clean SAND to silty SAND

14.85

Terminated at 14.85 m
Refusal

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC AJL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:56 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689688.9 m NORTHING : 5942719.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 1 OF 3 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

0.10 Gravelly SAND to SAND
Very stiff fine grained; CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

1.99 CLAYS - CLAY to silty CLAY

2.92 CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 25 50 75 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 0.25 0.5 0.75 1

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 2/9/2023 13:56 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 2 OF 3
ENGINEER : Ben Bilsbrough	EASTING : 689688.9 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942719.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY; SILT mixtures - clayey SILT to silty CLAY *(continued)*

10.27
CLAYS - CLAY to silty CLAY

14.27
SANDS - clean SAND to silty SAND

15.22
CLAYS - CLAY to silty CLAY

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 | 25 | 50 | 75 | 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 | 25 | 50 | 75 | 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 | 125 | 250 | 375 | 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 | 0.25 | 0.5 | 0.75 | 1

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 29/9/2023 13:58 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT04**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 3 OF 3
ENGINEER : Ben Bilsbrough	EASTING : 689688.9 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942719.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				

Depth (m) | Elevation (m) | Material Description

Small Strain Shear Modulus, G_0 (MPa) — 1. Rix & Stoke (1992); 2. Lunne, Robertson & Powell (1997) — 0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa) — LB. Rix & Stoke (1992); BE. Rix & Stoke (1992); UB. Rix & Stoke (1992) — 0 25 50 75 100

Constrained Modulus, M (MPa) — 1. Kulhawy & Mayne (1990); 2. Burns & Mayne (2002) — 0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN) — 1. Derived from Kulhawy & Mayne (1990) — 0 0.25 0.5 0.75 1

CLAYS - CLAY to silty CLAY *(continued)*

21.06
21.15 SANDS - clean SAND to silty SAND
Terminated at 21.15 m
Refusal

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

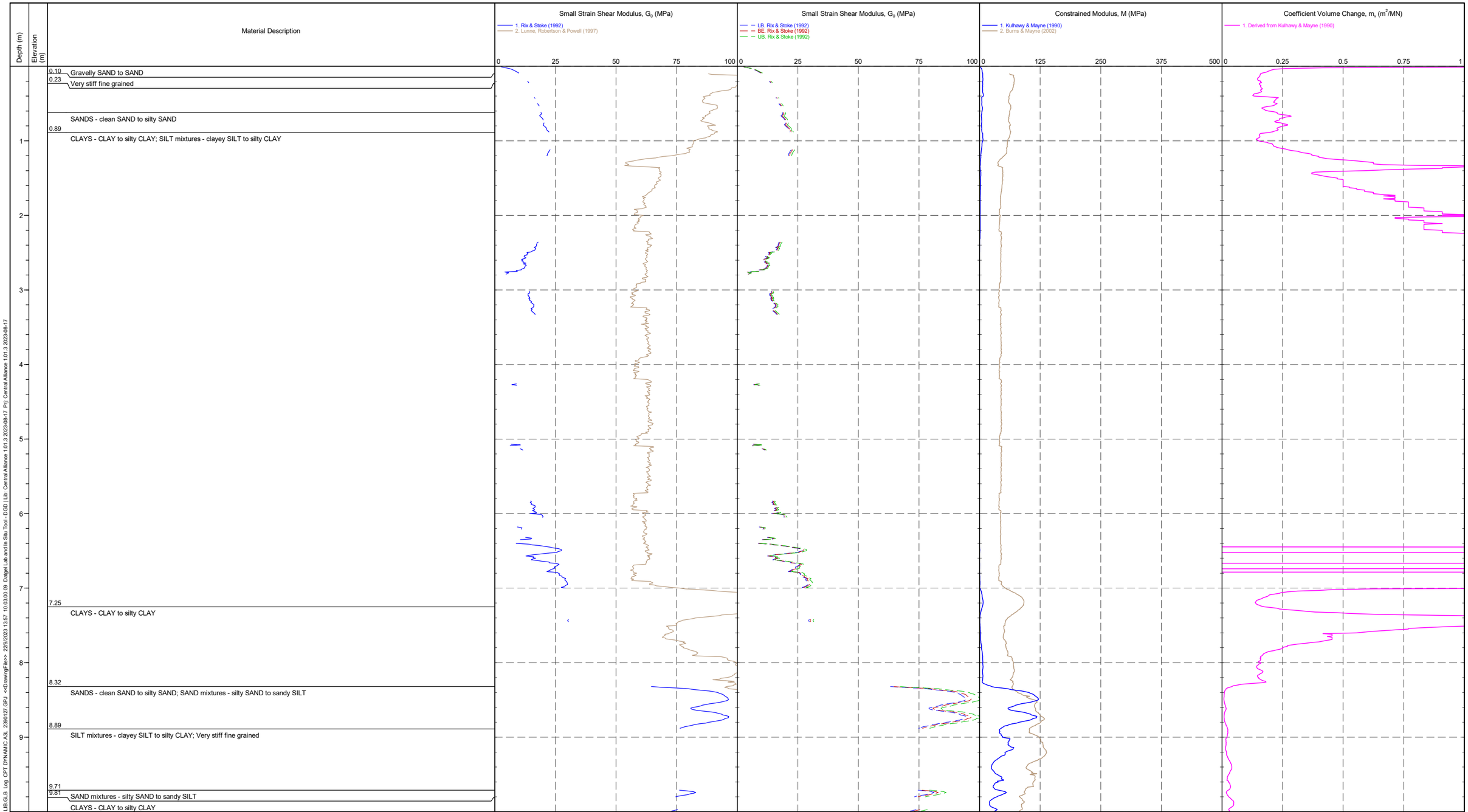
CENTRAL ALLIANCE 1.01.3.LIB.GLB Log CPT DYNAMIC ASL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:56 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 1 OF 2
ENGINEER : Ben Bilsbrough	EASTING : 689687.1 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942715.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				



Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:57 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT05**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689687.1 m NORTHING : 5942715.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

CLAYS - CLAY to silty CLAY *(continued)*

14.92
15.01 Gravelly SAND to SAND
Terminated at 15.01 m
Refusal

Small Strain Shear Modulus, G_0 (MPa)
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)
0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa)
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)
0 25 50 75 100

Constrained Modulus, M (MPa)
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)
0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN)
1. Derived from Kulhawy & Mayne (1990)
0 0.25 0.5 0.75 1

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

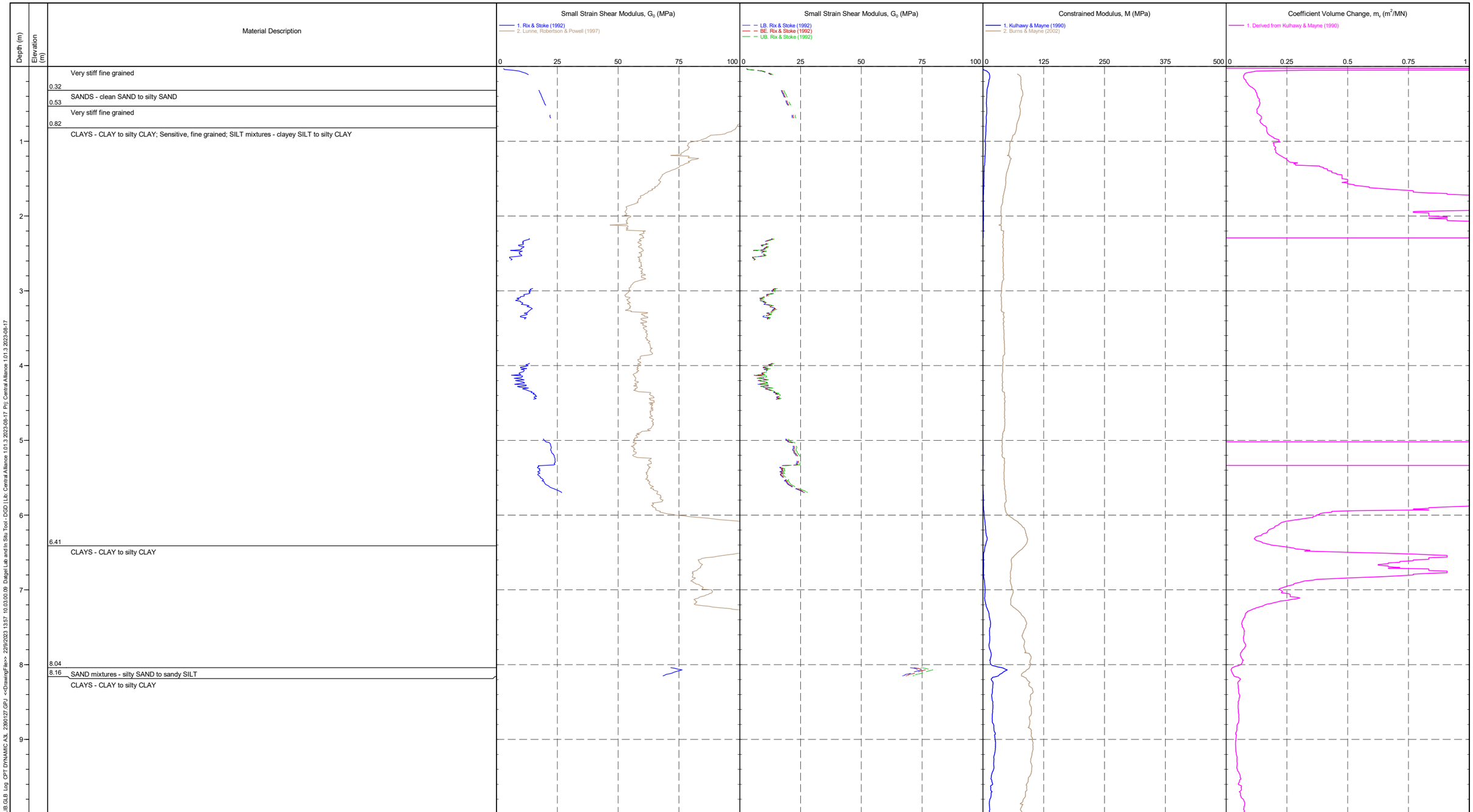
CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC ADL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:57 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer	AREA :	RIG : ; Crawler based20 Ton;	CHECKED BY : BB	REMARK	SHEET : 1 OF 2
ENGINEER : Ben Bilsbrough	EASTING : 689770.5 m	CONE TYPE : C+F+W2	CHECKED DATE : 20/9/2023		STATUS :
PROJECT : Grimsby CPT	NORTHING : 5942502.0 m	CONE ID : DP15-CFPTxy.71175	APPROVED BY : BB		DATE : 13/9/2023
LOCATION : Grimsby	COORD. SYS. :	OPERATOR : Central Alliance	APPROVED DATE : 20/9/2023		
PROJECT No. : 2390127	ELEVATION :				



Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3 LIB GLB Log CPT DYNAMIC AJL 2390127.GPJ <<DrawingFile>> 22/9/2023 13:57 10.03.00.09 Dagel Lab and In Situ Tool - DGD | Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

CENTRAL ALLIANCE
GROUND ENGINEERING TECHNICAL SERVICES

CPT LOG

PointID **CPT06**

CLIENT : Mayer ENGINEER : Ben Bilsbrough PROJECT : Grimsby CPT LOCATION : Grimsby PROJECT No. : 2390127	AREA : EASTING : 689770.5 m NORTHING : 5942502.0 m COORD. SYS. : ELEVATION :	RIG : ; Crawler based20 Ton; CONE TYPE : C+F+W2 CONE ID : DP15-CFPTxy.71175 OPERATOR : Central Alliance	CHECKED BY : BB CHECKED DATE : 20/9/2023 APPROVED BY : BB APPROVED DATE : 20/9/2023	REMARK	SHEET : 2 OF 2 STATUS : DATE : 13/9/2023

Depth (m) | Elevation (m) | Material Description

Small Strain Shear Modulus, G_0 (MPa) — 1. Rix & Stoke (1992); 2. Lunne, Robertson & Powell (1997) — 0 25 50 75 100

Small Strain Shear Modulus, G_0 (MPa) — LB. Rix & Stoke (1992); BE. Rix & Stoke (1992); UB. Rix & Stoke (1992) — 0 25 50 75 100

Constrained Modulus, M (MPa) — 1. Kulhawy & Mayne (1990); 2. Burns & Mayne (2002) — 0 125 250 375 500

Coefficient Volume Change, m_v (m^2/MN) — 1. Derived from Kulhawy & Mayne (1990) — 0 0.25 0.5 0.75 1

CLAYS - CLAY to silty CLAY *(continued)*

14.64

SANDS - clean SAND to silty SAND

15.12

Terminated at 15.12 m
Refusal

Small Strain Shear Modulus Method:
1. Rix & Stoke (1992)
2. Lunne, Robertson & Powell (1997)

Small Strain Shear Modulus LB BE UB Method:
LB. Rix & Stoke (1992)
BE. Rix & Stoke (1992)
UB. Rix & Stoke (1992)

Constrained Modulus Method:
1. Kulhawy & Mayne (1990)
2. Burns & Mayne (2002)

Coefficient Volume Change Method:
1. Derived from Kulhawy & Mayne (1990)

CENTRAL ALLIANCE 1.01.3.LIB.GLB Log_CPT DYNAMIC A3L 2390127.GPJ <<DrawingFile>> 22/9/2023 13:57 10.03.00.09 Datgel Lab and In Situ Tool - DGD [Lib: Central Alliance 1.01.3 2023-08-17 Prj: Central Alliance 1.01.3 2023-08-17

8 APPENDIX C – CONE CALIBRATION

Gouda Geo-Equipment B.V.
Satellietbaan 8
2181 MH Hillegom
The Netherlands

Tel. + 31 (0)715.318.475
E-mail: info@gouda-geo.com

WWW.GOUDAGEO.COM
Down to Earth

Certificate of Calibration

Certificate No. CMI 23.01.5270

Instrument

Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified	
Manufacturer:	Gouda Geo-Equipment B.V		
Model No.:	DP15-CFPTxy	Date Calibrated:	20-1-2023
Serial No.:	71175	Next Due Date:	20-7-2023
Cone area factor:	0,75		
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)	

Customer

Central Alliance

Calibration Instruments

Instrument Type: CPT Logger	Instrument Type: CPT Logger	Instrument Type: Load-cell + amplifier
Manufacturer: Gouda Geo Equipment	Manufacturer: Gouda Geo Equipment	Manufacturer: Futek
Model No.: A	Model No.: A	Model No.: LCF500 + IAA100
Serial No.: 3010	Serial No.: 3129	Serial No.: 668966 + 695054
Accuracy: 0.01% + 2 Counts	Accuracy: 0.01% + 2 Counts	Accuracy: 0.1%
Date Calibrated: 23 December, 2022	Date Calibrated: 23 December, 2022	Date Calibrated: 1 November, 2022
Next Due Date: 23 June, 2023	Next Due Date: 23 June, 2023	Next Due Date: 1 November, 2023
Calibrated By: Manufacturer	Calibrated By: Manufacturer	Calibrated By: Futek
Traceability: CMI 22.12.5177	Traceability: CMI 22.12.5176	Traceability: 2211030065

Calibration Conditions

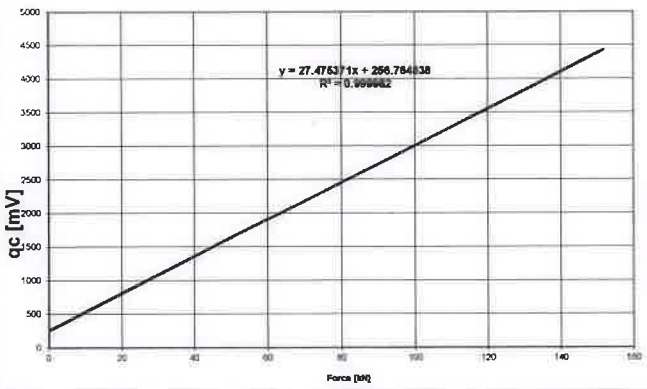
Environmental conditions whilst performing the calibration:

Ambient Tempera 21.4 °C
Relative Humidity: 31.7 %

Condition of Calibrated Apparatus when Received: Fair

Measurement Parameters

zero value	251 mV	zero value	251 mV
Full scale	4121 @ 150 kN	Full scale	4111 @ 150 kN



Remarks

Data "As Received" = "As Left" unless otherwise noted. Calibration data for this item was derived from one or more of the following sources: the Nederlands Meetinstituut (NMI) or other national laboratory, a natural physical constant, or a ratio technique. The data is on file at the NMI. This calibration is compliant with Gouda Geo-Equipment's internal quality system, internal calibration procedure and meets the requirements of standard ISO22476.
The Calibration Interval will vary from customer use and different conditions. All calibrations are verified at a moment in time; and confirmed within controlled temperature and humidity specified standards. Gouda Geo-Equipment is not responsible for future calibrations. Improper use of the apparatus (e.g. dropping) may cause loss of calibration.

Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

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Gouda Geo-Equipment B.V.
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E-mail: info@gouda-geo.com

Down to Earth

Certificate of Calibration

Certificate No. CMI 23.01.5270

Instrument

Instrument Type:	Electrical Subtraction Cone
Manufacturer:	Gouda Geo-Equipment B.V
Model No.:	DP15-CFPTxy
Serial No.:	71175
Cone area factor:	0,75

Calibration Result: Certified

Date Calibrated: 20-1-2023
Next Due Date: 20-7-2023

Used Calibration Procedure: GGECP004, ISO22476

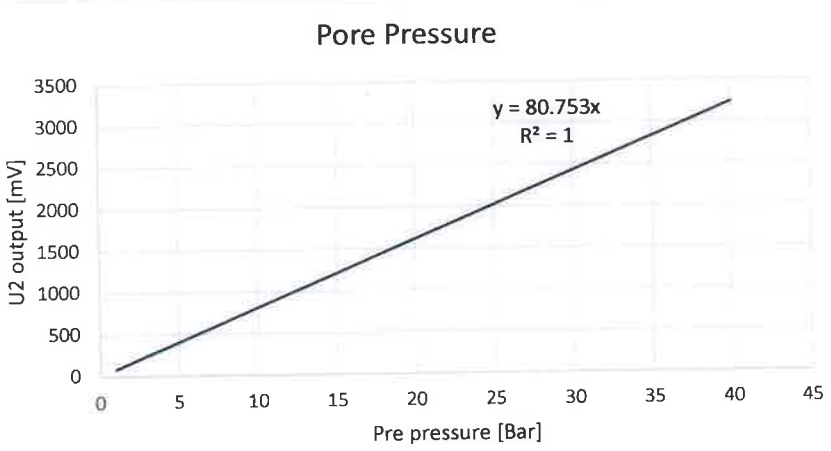
Location: Hillegom (The Netherlands)

Calibration Instruments

Instrument Type: HP Kalibrator
Manufacturer: Keller Druckmesstechnik
Model No.: HPX - 200bar - 80139.31
Serial No.: 5208
Date Calibrated: 17 May, 2022
Next Due Date: 17 May, 2023
Calibrated By: Manufacturer

Pore pressure

AMB =+/-1Bar = 360 Mv	
U2 [bar]	U2 [mV]
1	75
5	399
10	807
15	1211
20	1615
25	2020
30	2424
35	2826
40	3229



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Certificate No. CMI 23.01.5270

Instrument

Instrument Type:	Electrical Subtraction Cone	Calibration Result: Certified	
Manufacturer:	Gouda Geo-Equipment B.V		
Model No.:	DP15-CFPTxy	Date Calibrated:	20-1-2023
Serial No.:	71175	Next Due Date:	20-7-2023
Cone area factor:	0,75		
Used Calibration Procedure: GGECP004, ISO22476		Location: Hillegom (The Netherlands)	

Inclinometer

Degrees	Ix [mV]
20	2856
19	2822
18	2783
17	2744
16	2700
15	2652
14	2612
13	2564
12	2524
11	2481
10	2442
9	2393
8	2348
7	2305
6	2256
5	2217
4	2174
3	2139
2	2086
1	2047
0	1998
-1	1954
-2	1910
-3	1866
-4	1832
-5	1783
-6	1739
-7	1694
-8	1651
-9	1602
-10	1563
-11	1529
-12	1485
-13	1441
-14	1392
-15	1353
-16	1305
-17	1270
-18	1231
-19	1193
-20	1148

Degrees	Iy [mV]
20	3320
19	3272
18	3228
17	3179
16	3135
15	3096
14	3052
13	2998
12	2954
11	2906
10	2857
9	2813
8	2769
7	2725
6	2671
5	2627
4	2574
3	2525
2	2486
1	2437
0	2393
-1	2335
-2	2296
-3	2242
-4	2198
-5	2154
-6	2110
-7	2057
-8	2008
-9	1964
-10	1910
-11	1871
-12	1827
-13	1783
-14	1729
-15	1691
-16	1637
-17	1593
-18	1554
-19	1510
-20	1471

Gouda Geo-Equipment B.V. Down to Earth The Netherlands

Calibration performed by:

Vincent Vermeer
(Engineer)

Approved by:

Rogier Tijm
(Senior Engineer)

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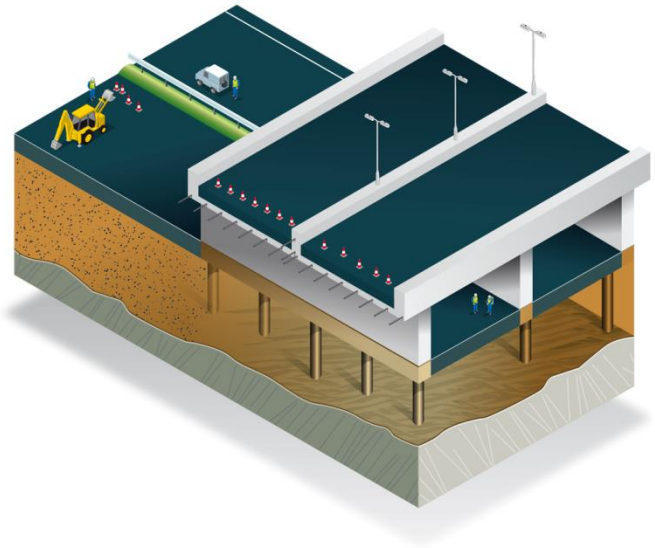
Appendix L

Downhole Seismic Survey Report

zetica



engineering

Title:	**Downhole Seismic Survey: BH02**
Client:	Mayer Environmental
Site:	Grimsby
Ref:	P13272-23-R1-A
Date:	01 November 2023

Zetica Limited
Zetica House, Southfield Road
Eynsham, OX29 4JB
United Kingdom
Tel: 01993-886682 Fax: 01993-886683
Email: projects@zetica.com
Website: www.zetica.com

chartered ices

EUROPEAN GPR ASSOCIATION

ISO 9001 REGISTERED FIRM Certificate No.GB2001316

INTERNATIONAL ACCREDITATION BOARD Registration No. 0044/1

Executive Summary

Zetica Ltd was commissioned by Mayer Environmental to conduct a downhole seismic survey in a borehole (BH02) located on disused land behind an industrial complex ~4 km north-west of Grimsby.

The objectives of the survey were to determine the geotechnical properties of the encountered geology by measuring the compressional (P) and shear (S) wave seismic velocities.

An inclined hammer source was used at 2 no. surface locations 3 m from the borehole in orthogonal directions. The P-wave and S-wave components of the generated waves were measured by 2 no. 7-component receivers spaced 2 m apart and clamped at 1 m intervals for the full borehole depth range.

Measurements of borehole verticality were also made. These were used to determine seismic wave pathlengths at each receiver location.

Data quality was excellent, with clear P-wave and S-wave arrivals observed at all receiver locations. P-wave and S-wave velocities were calculated from the identified arrival times and pathlengths. The resulting velocity profiles were compared to the logged geology.

P-wave velocity was observed to increase through varying clays, peat and silt up to ~1600 m/s at ~13.5 m depth. P-wave velocity was then observed to remain at ~1500 m/s to the maximum borehole depth, consistent with that of water and implying highly saturated material.

Low S-wave velocity (<100 m/s) was observed through sandy, silty clay until ~7 m depth before increasing to >325 m/s at ~9.5 m depth, concurrent with a logged silt layer. S-wave velocities then decreased through silty, gravelly clays to ~200 m/s at ~16 m depth, before increasing again towards the end of the borehole.

The calculated P-wave and S-wave velocities and derived geotechnical parameters are summarised in the accompanying Zetica spreadsheet P13272-23-XLS01-A.

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Table 1: Approximate P-wave and S-wave velocity ranges for the expected lithologies. 8

Table 2: Borehole and source locations in OSGB and elevation in metres above ordnance datum (mAOD). 10

1. Introduction

Zetica Ltd was commissioned by Mayer Environmental (the Client) to carry out a downhole seismic survey on Grimsby, located on undeveloped land behind an industrial estate (the Site) off Energy Park Way, ~4 km north-west of Grimsby.

The objective of the survey was to measure the geotechnical properties of the different geological units intersected by the borehole through measurements of seismic velocity.

The survey included measurement of the deviation of the borehole from vertical and was undertaken on the 3rd October 2023.

1.1. Site Description

A Site location map is shown in Figure 1, with an aerial image of the Site shown in Figure 2. Surface vegetation and shallow topsoil had been removed within the working area surrounding the borehole. A period of rainfall before the survey works caused standing water and mud to be present at the time of survey (Figure 3). No rainfall occurred during data collection. Low levels of ambient seismic noise were identified, likely originating from nearby industrial activity, however this did not affect the survey.

Borehole BH02 was drilled to a depth of 23 m and lined using a 90 mm PVC casing and grouted using a bentonite-based cement. The grout material had reached the surface and was observed to be dry and solid with no evidence of voiding around the top of the borehole. The casing head was 0.27 m above ground level.

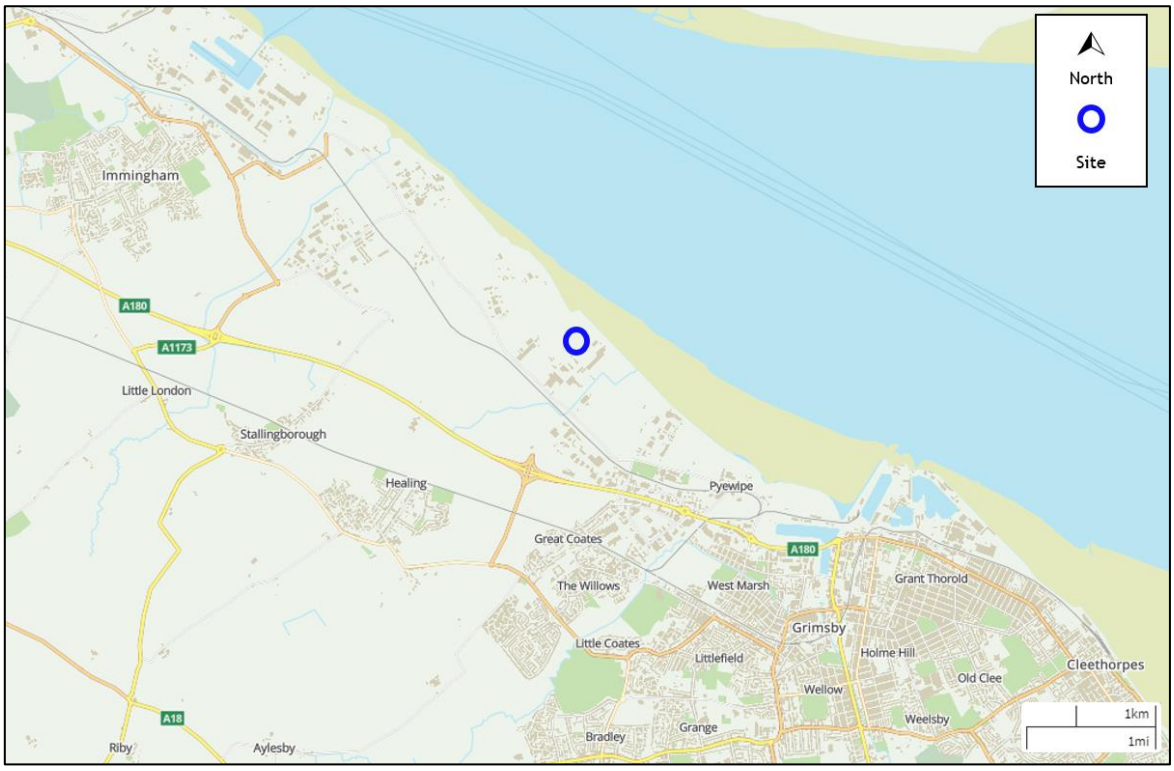

Figure 1: Site location map (Basemap source: OS maps).

Figure 2: Aerial image of the Site showing the location of borehole BH02. Source: Google Earth (2021).

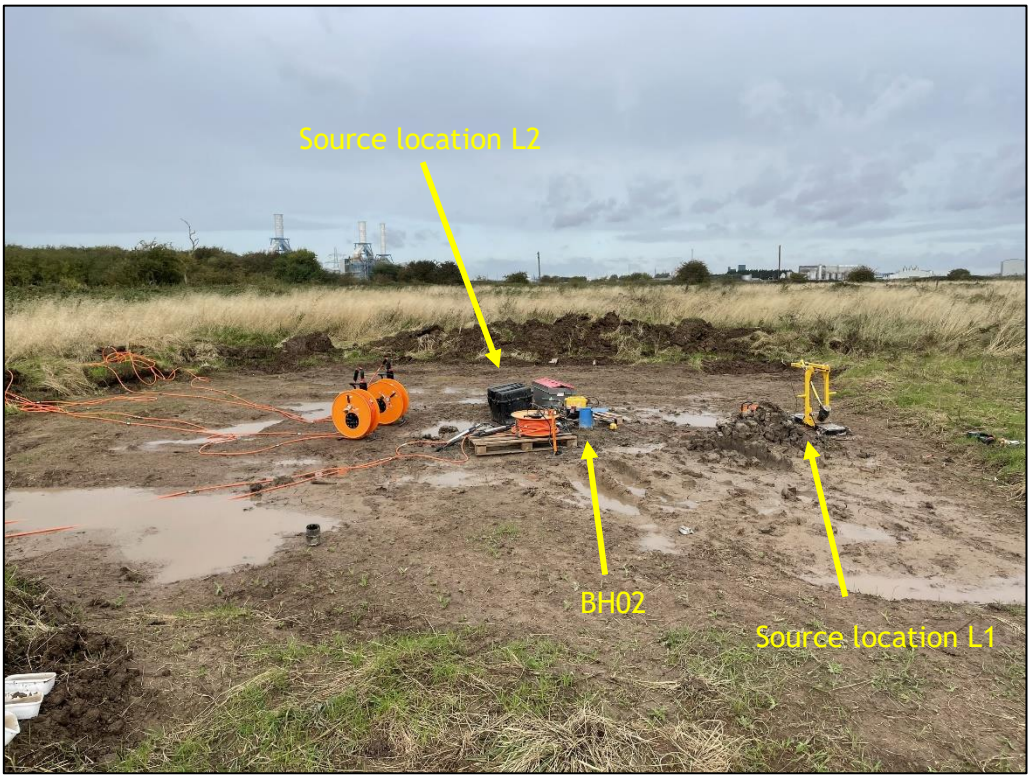

Figure 3: Photograph of the Site during the survey works.

1.2. Geological Background

British Geological Survey (BGS) maps show the Site to be situated on tidal flat deposits of clay and silt overlying Devensian Till. The underlying bedrock is recorded as the Flamborough Chalk Formation.

The Client provided the drillers' log from BH02, which is summarised in Figure 5. The log shows a sandy clay to 7 m depth, above a gravelly clay that extends to 21 m depth. A thin (0.5 m thick) layer of peat defines the boundary between these contrasting clays. Notable layers within the deeper clay include a 0.8 m thick layer of firm silt at 9 m depth and a 2.5 m thick layer of dense sand at 16 m depth. The anticipated chalk bedrock is encountered at 21 m depth and is described as silty/clayey.

Water was logged in the borehole throughout drilling, remaining relatively constant at depths of between 1.3 m and 2.0 m, though was settled at 0.7 m before survey works commenced.

Approximate P-wave and S-wave velocity ranges for materials anticipated from the borehole log are listed in Table 1.

Peat has low expected P- and S-wave velocity ranges but, as the peat layer is thin (0.5 m) and the geophone interval is 2 m, the recorded peat layer is not likely to be resolved by the survey.

Clay layers have a wide range of potential P-wave and S-wave velocities. It is expected that increasing granular content (sand and gravel) of any clay materials encountered is likely to increase the observed velocities.

Chalk layers tend to have significantly higher P-wave and S-wave velocities, except where they are weathered. The upper boundary of the chalk occurs close to the base of the borehole at 21 m depth, and is therefore unlikely to be detectable by the survey.

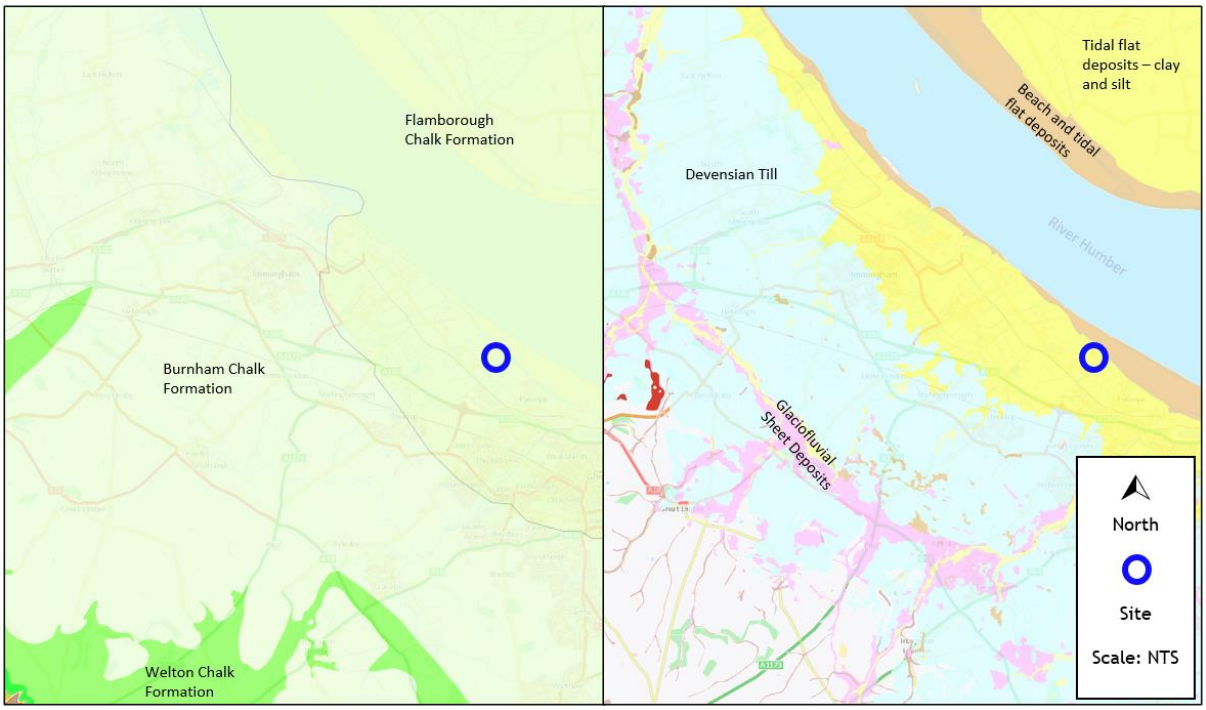

Figure 4: Geological maps of the Site and surrounding areas showing bedrock (left) and superficial sediments (right). Source – BGS.

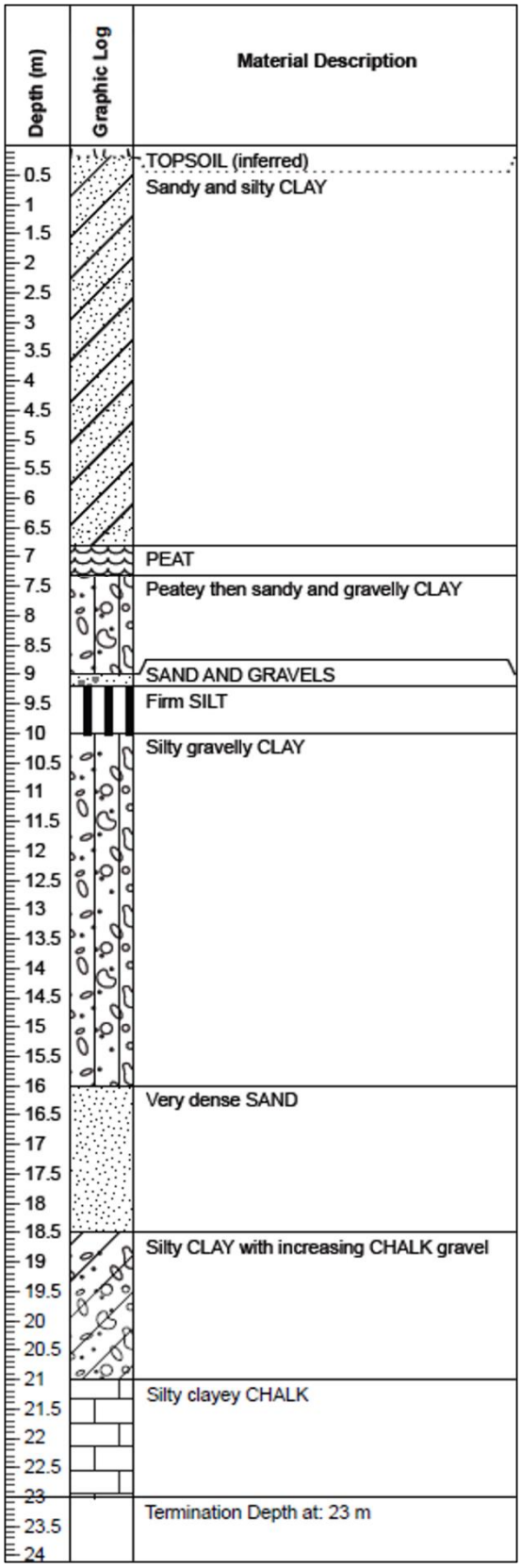

Figure 5: Simplified borehole log derived from the BH02 drillers' log provided by the Client.

Rock / soil / material type	*P-wave velocity (m/s)*	*S-wave velocity (m/s)*
Water	*1500*	*NA*
Topsoil	*300 - 800*	*100 - 400*
Peat	*300 - 1000*	*100 - 250*
Wet Sand	*1500 - 2000*	*400 - 600*
Gravel	*1000 - 2500*	*200 - 750*
Sand & gravel	*400 - 2300*	*250 - 500*
Clay	*1000 - 2500*	*200 - 800*
Weathered Chalk	*1000 - 3000*	*500 - 1100*
Competent Chalk	*2000 - 4000*	*1100 - 1300*

Table 1: Approximate P-wave and S-wave velocity ranges for the expected lithologies.

2. Methodology

The downhole seismic survey was carried out in general accordance with the procedures outlined in ASTM D7400-19; Standard Test Methods for Downhole Seismic Testing.

P-waves and S-waves were recorded at 1 m intervals to the full depth permitted by the boreholes, using a pair of clamping borehole geophones separated by 2 m. The geophones used were 7-component sensors, with 1 no. vertical component and 6 no. horizontal components.

Source events (seismic shots) were made at a distance of 3 m from the borehole in 2 no. orthogonal directions, at source locations labelled L1 and L2. A summary of the borehole and source locations is provided in Table 2.

Seismic energy was imparted into the ground using an integrated hammer and inclined (45°) strike plate, which produces energy rich in P-waves and S-waves (Figure 6). The source was coupled to the ground using metal pins. The interchangeable swing direction and dual strike plate of the source system means recordings can be taken with reversed polarisation directions at a point source location. Each recorded shot was assessed in the field to confirm the presence of P-wave and S-wave arrivals. Where needed, additional shots were stacked to improve the signal-to-noise ratio.

The data were recorded as individual files for each shot direction at each receiver depth with a ~20 µs sample interval over a record length of 0.3 s. The files were concatenated to produce a seismogram over the full borehole depth. Shots from either polarisation direction can be used to identify P-wave events, while the combination of oppositely polarised events is useful for identifying S-wave events.

Interval travel times were measured between the pair of geophones to calculate interval velocities. Additionally, gradient velocities were established by linear regression over a rolling 3 m depth range, which was used as quality control for the interval velocity estimates.

Depths were measured relative to the borehole casing head (0.27 m above ground level) and subsequently corrected to present results with depth below ground surface. Depth accuracies are estimated as +/-40 mm.

Appendix A presents a summary of the downhole seismic interpretation method including the definition of geotechnical moduli in terms of seismic velocities.

In addition to the downhole seismic data collection, borehole verticality data were acquired. A tool was lowered down the borehole, measuring tilt and azimuth in degrees at depth increments of 0.01 m. The borehole deviation from vertical was calculated from the tilt and azimuth data, for use in establishing the direct pathlengths between the source and each receiver location.

Figure 6: Downhole seismic equipment in use on Site.

Location	*Easting OSGB (m)*	*Northing OSGB (m)*	*Elevation (mAOD)*
BH02	*523731.67*	*412820.96*	*2.07*
L1	*523733.25*	*412823.49*	*2.02*
L2	*523729.18*	*412822.57*	*2.01*

Table 2: Borehole and source locations in OSGB and elevation in metres above ordnance datum (mAOD).

2.1. Survey Limitations

The following clarifies some of the limitations relevant to the survey.

- The collection of robust data relies on good coupling of the borehole with the surrounding ground, with no voids present. This can sometimes be evaluated by use of a sonic bond log. No sonic bond logs have been provided to Zetica.
- Geotechnical moduli derived from borehole geophysical surveys must be treated as low strain properties. The results can sometimes be reduced to operational strains using softening factors, based on an assumption of material independent stress-strain ratios.

- Materials with strong fabrics (such as bedding plains) may exhibit strong seismic velocity anisotropy based on the propagation direction being parallel to or perpendicular to the fabric plane. In the case of S-wave measurements, the anisotropy may also arise between polarisation direction parallel to and perpendicular to the material fabric. Downhole surveys involve vertical signal propagation, which is often perpendicular to bedding plains, resulting in lower velocities compared with horizontal propagation.
- High velocity contrasts in near surface materials can result in refracted propagation paths, which may introduce over or underestimates of velocity at depths comparable to source offset.
- Unfavourable ground conditions such as high attenuation rates and ground heterogeneity can have a detrimental effect on signal quality.
- Interval velocities were calculated over the sensor separation of 2 m. Layers thinner than 2 m will have an influence on measured velocities proportional to their velocity contrast and the layer thickness, and may not be detectable.

3. Data

3.1. Data Presentation

Seismograms showing interpreted P-wave and S-wave arrivals from each source location are presented in this report section.

The downhole seismic survey results are presented as plots of calculated P-wave and S-wave velocity and Poisson's Ratio in Section 4. All calculated geotechnical parameters resulting from these velocity profiles (with assumed values of density) are presented in the accompanying Zetica spreadsheet P13272-23-XLS01-A (Downhole Geotechnical Parameters). Further information on the calculation of these parameters is presented in Appendix A.

It should be noted that whilst the drillers' log detailed borehole information to 23 m depth, both the downhole seismic and borehole verticality data collection reached a maximum depth of 20 m. The cause of the difference between the logs and this survey is not clear, however there may have been some collapse or filling of material at the base of the borehole during or after the drilling and grouting process.

3.2. Data Quality

P-wave and S-wave data from both source locations were of excellent quality. Figure 7 to Figure 10 show the picked P-wave and S-wave arrivals for the lower geophone from shots at the L1 and L2 shot locations. First arrivals were easily identifiable for the entire borehole depth. The upper geophone recorded data of equivalent quality.

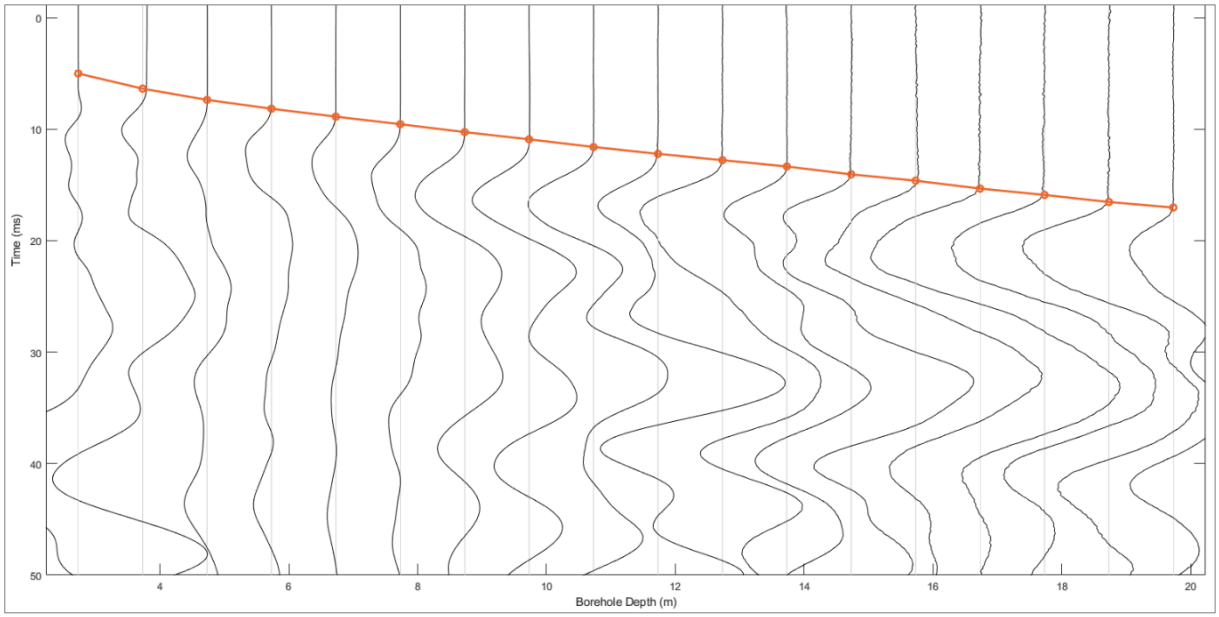

Figure 7: P-wave arrivals at the lower geophone from shot location L1.

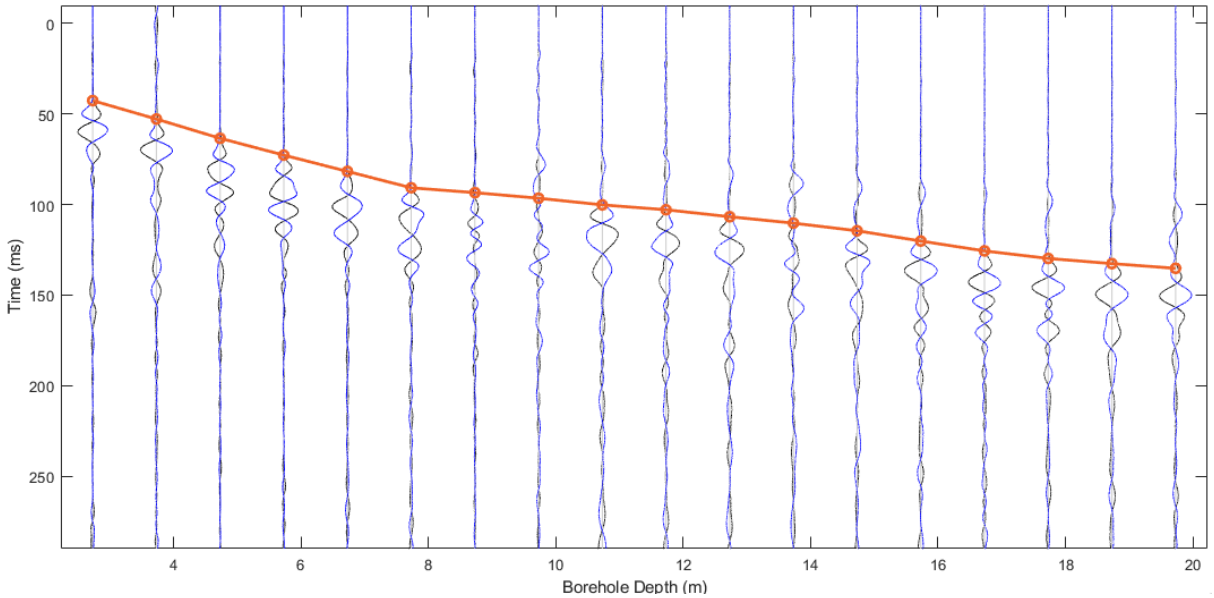

Figure 8: S-wave arrivals at the lower geophone from shot location L1.

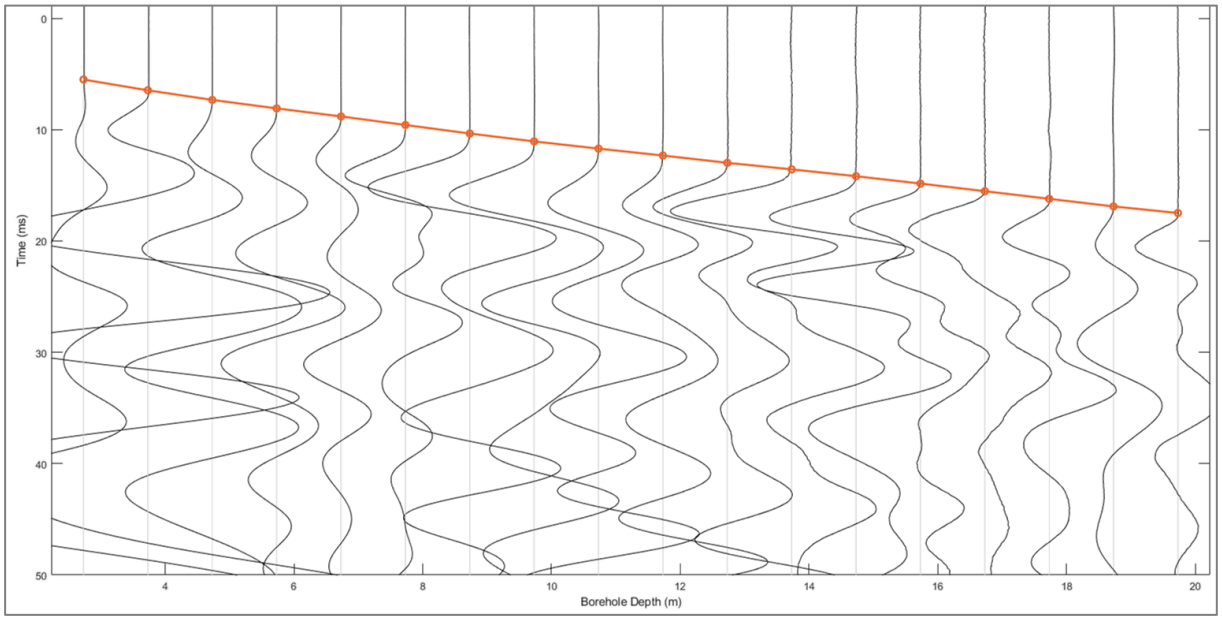

Figure 9: P-wave arrivals at the lower geophone from shot location L2.

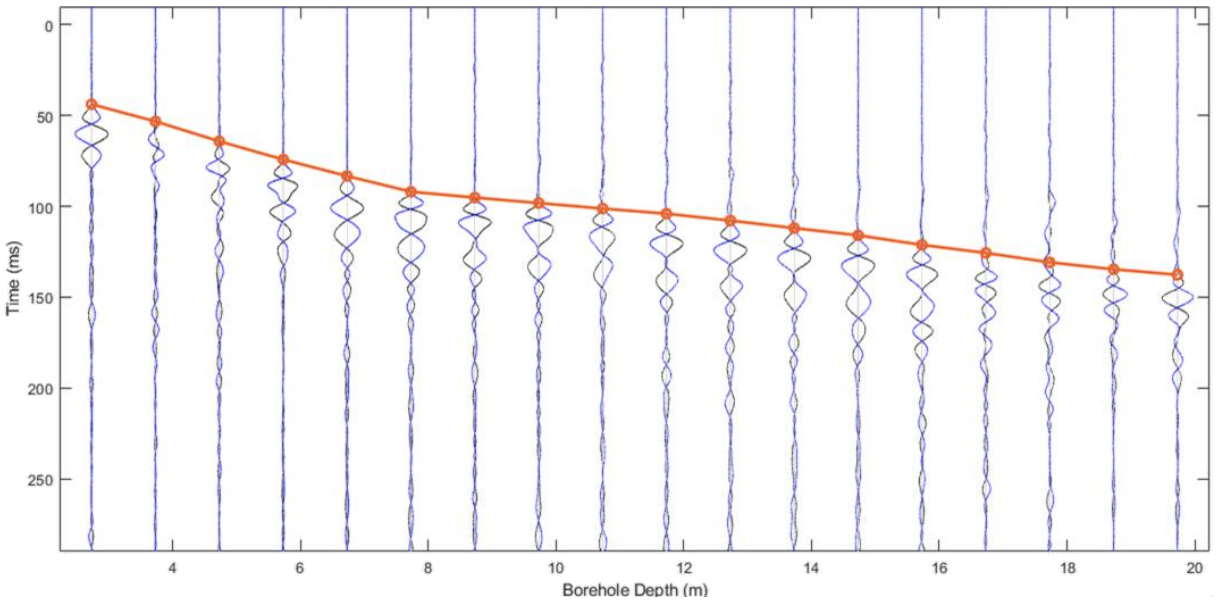

Figure 10: S-wave arrivals at the lower geophone from shot location L2.

4. Results

4.1. Borehole Verticality

Figure 11 shows the deviation of BH02 from vertical. Over the full ~20 m of measured borehole depth there was a lateral deviation of ~0.5 m to the east. This deviation has been factored into the calculation of seismic wave paths and resulting P-wave and S-wave velocities.

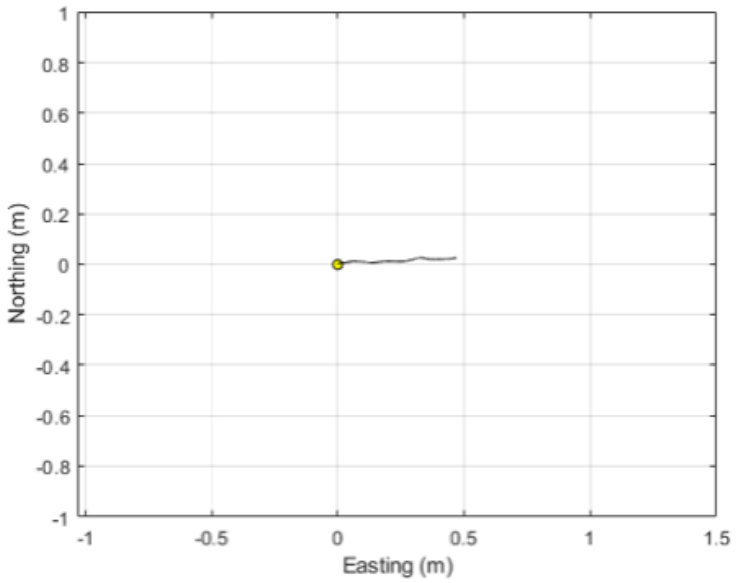

Figure 11: Plan view of BH02 deviation from vertical (top of BH02 set at coordinates 0,0 as identified by yellow circle).

4.2. P-wave

Figure 12 shows the interpreted P-wave arrival times against borehole depth from L1 and L2. Steeper gradients represent lower velocities whilst shallower gradients represent higher velocity material (except in the upper most 3 to 5 m where signal pathways are sub-horizontal).

The arrivals from L1 and L2 show excellent agreement with the similar arrival times and gradients. A slight change from a steeper gradient G1 to a shallower gradient G2 is observed at ~7.5 m depth, inferring an increase in P-wave velocity at that depth.

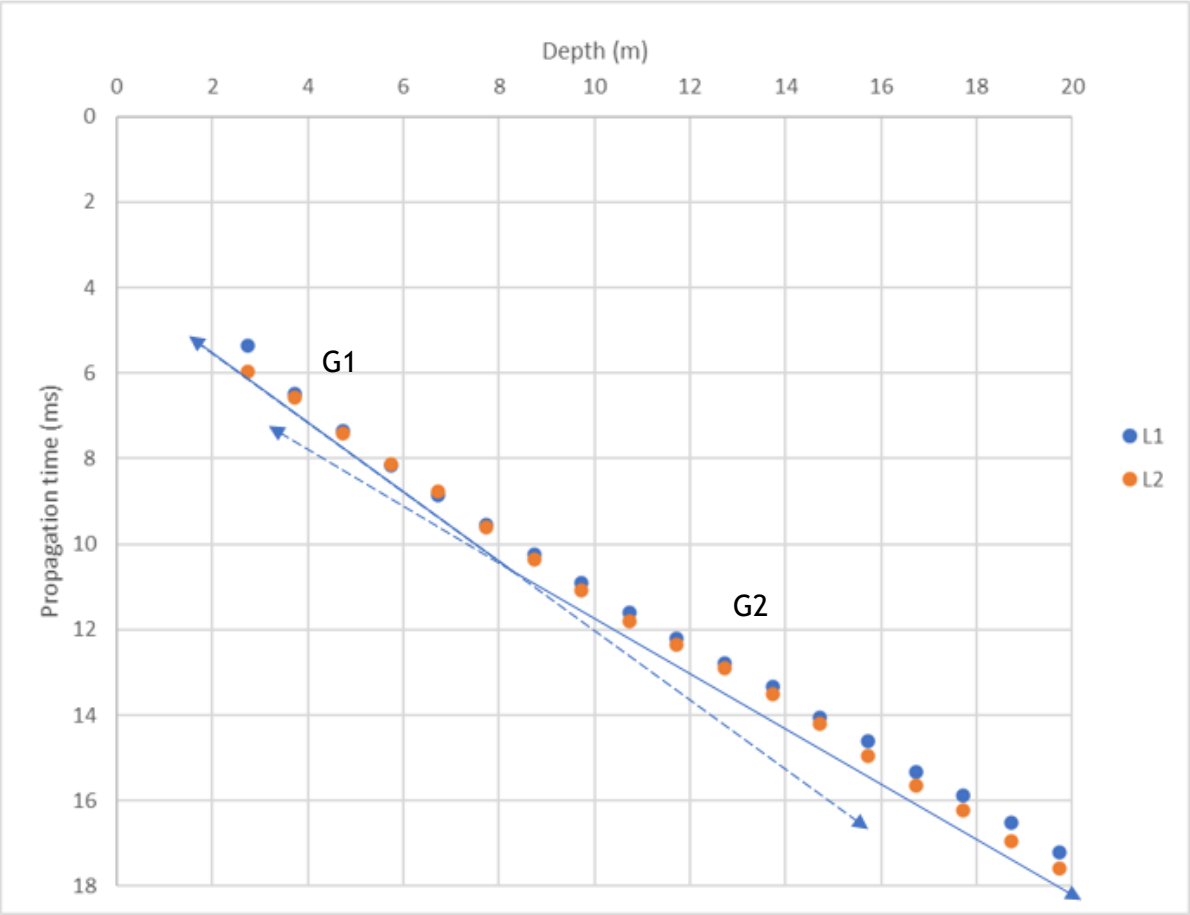

Figure 12: Comparison of L1 and L2 P-wave arrival times.

Figure 13 shows the calculated P-wave velocity profiles from L1 and L2, with information from the borehole log overlaid. Interval and gradient velocities from both shot locations are in excellent agreement with each other. Velocities differ at ~3 m depth (L1 = ~~700 m/s, L2 = ~1100 m/s) but are in agreement (~1200 m/s) by 6 m depth. They then steadily increase (through the thin peat and silt layers) to ~1600 m/s at ~13 m depth. Velocities remain constant (~1500 m/s) down to the deepest measurement at ~20 m depth. It should be noted that this matches the P-wave velocity of water, likely indicating the clay and sand layers are saturated and that this has a dominant effect on the bulk P-wave velocity of these layers.

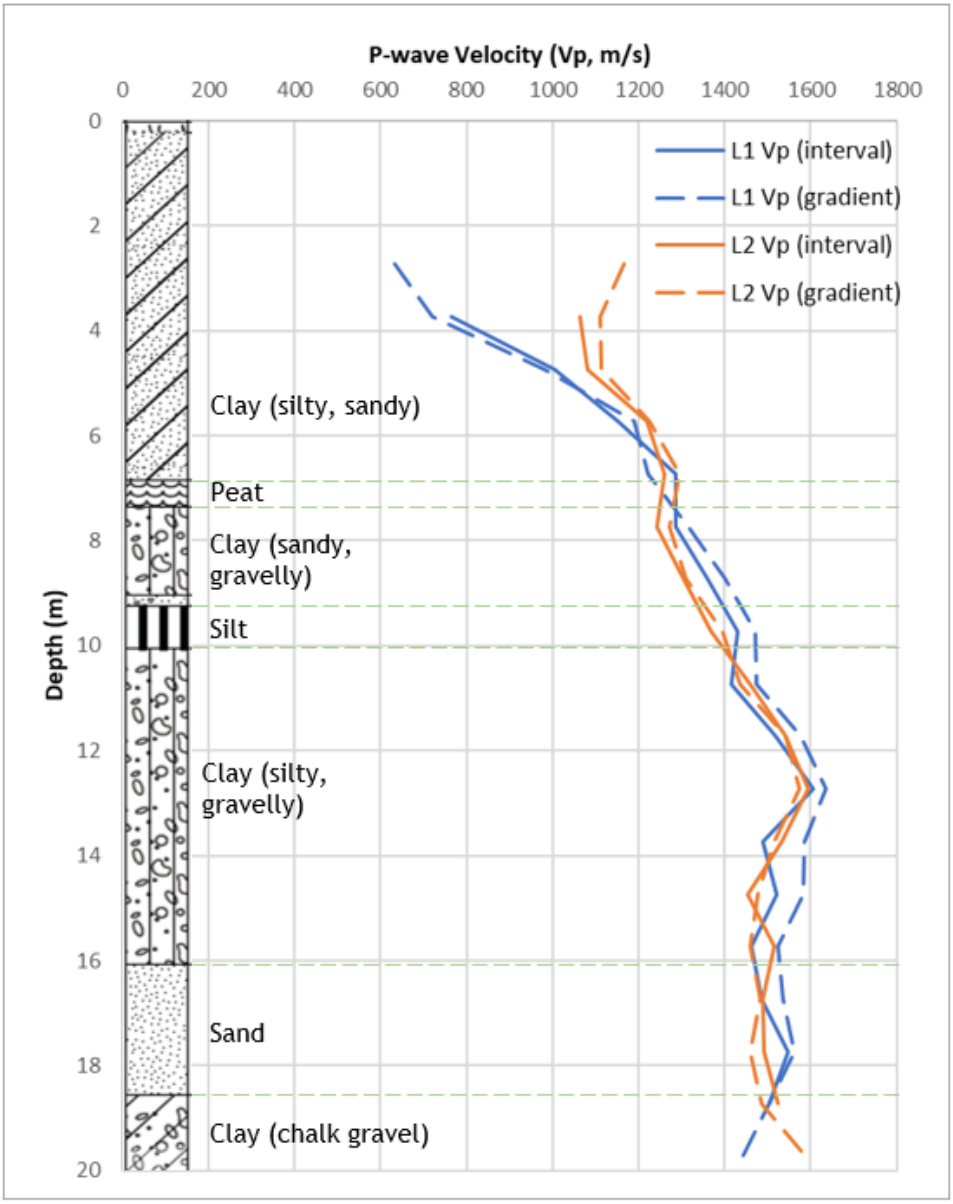

Figure 13: Calculated P-wave velocity profiles from L1 and L2. Borehole log information is overlaid.

4.3. S-wave

Figure 14 shows the interpreted S-wave arrival times against borehole depth from L1 and L2.

The arrival times show excellent agreement between L1 and L2 from surface to ~17 m depth, below which L1 arrival times are slightly (up to 5 ms) earlier than those from L2. This may indicate some anisotropy in the materials at this depth.

2 no. changes in gradient are observed. The first is from G3 (steeper) to G4 (shallower) at ~7 m depth, implying a significant velocity increase. The second is from G4 to a marginally steeper G5, implying a slight reduction in velocity below ~13 m depth.

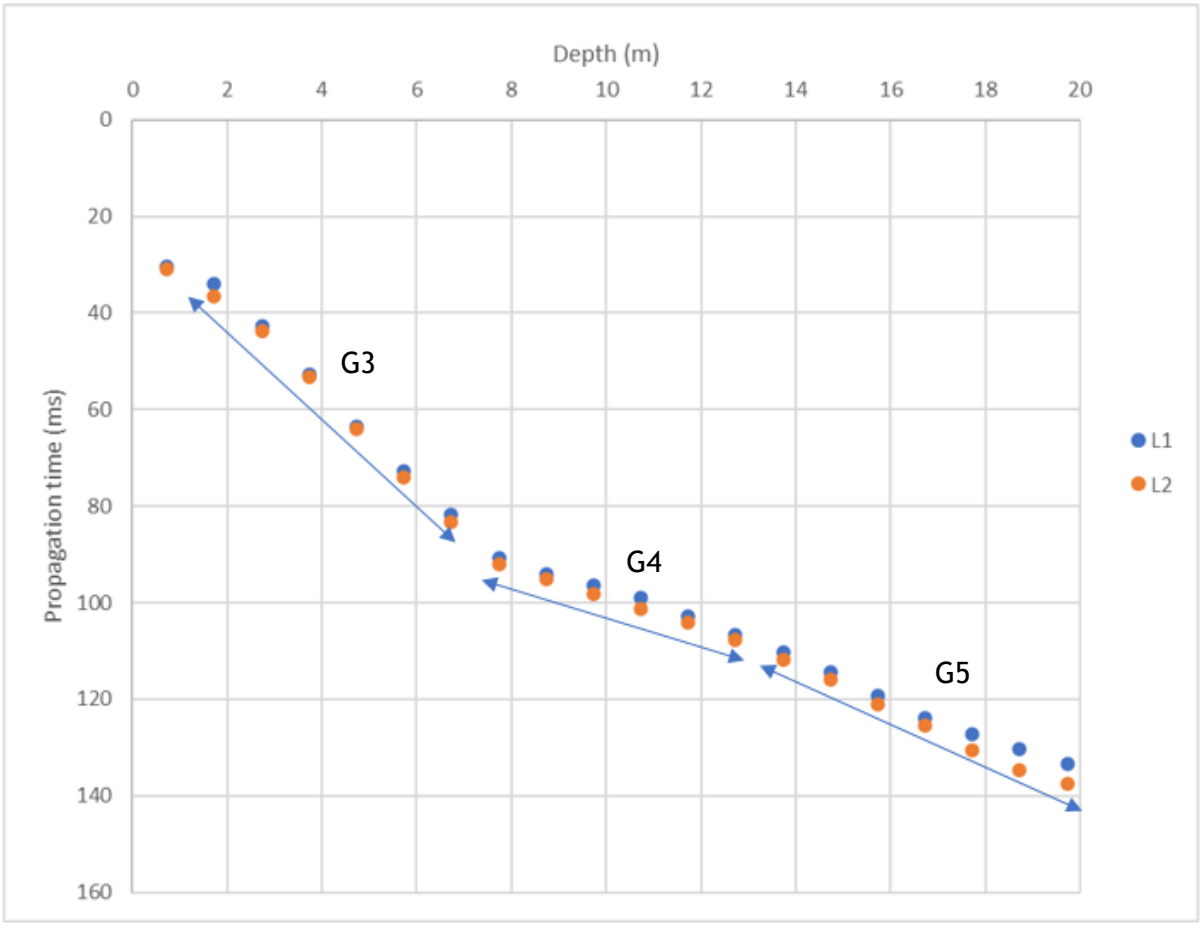

Figure 14: Comparison of L1 and L2 S-wave arrival times.

Figure 15 shows the calculated S-wave velocity profiles from L1 and L2, with information from the borehole log overlaid. Interval and gradient velocities from both shot locations are in excellent agreement with each other.

S-wave velocity is very low (<100 m/s) over the upper clay unit. Velocity then increases through the sandy gravelly clay to peak at ~350 m/s (from L2, ~9.5 m depth) in the logged layer of silt. Velocities then decrease steadily through the silty gravelly clay to ~200 m/s at ~16 m depth, before increasing through the sand and chalk gravel clay to >300 m/s.

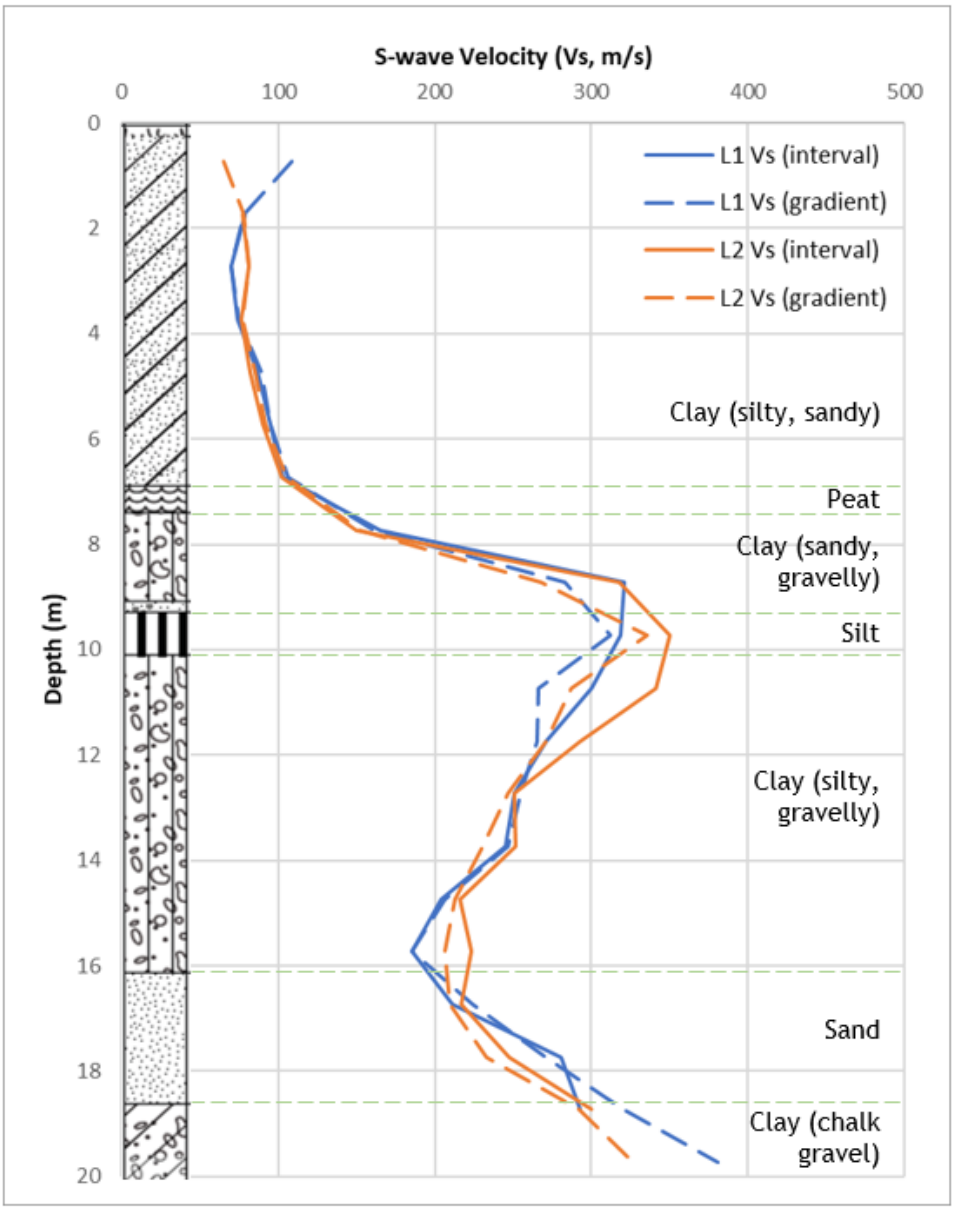

Figure 15: Calculated S-wave velocity profiles from L1 and L2. Borehole log information is overlaid.

5. Discussion

The measured P-wave and S-wave velocities have been compared to the lithological boundaries recorded in the borehole log. The geotechnical properties derived from these velocities have also been reviewed with reference to the lithological units and are presented in the accompanying Zetica spreadsheet P13272-23-XLS01-A.

The silty, sandy clay unit logged from surface to -4.6 mAOD was characterised by a wide P-wave velocity range (600-1200 m/s) and low (<100 m/s) S-wave velocity. Using assumed density values of 1800 kg/m^3, the Poisson's Ratio of this material is >0.49 (Figure 16).

The peat layer at -5.0 mAOD was not thick enough to have its velocities and resulting geotechnical parameters resolved by the downhole seismic survey.

The sandy, gravelly clay logged below -5.5 mAOD was characterised by increasing P-wave (1250 to 1400 m/s) and S-wave (~150 to ~300 m/s) velocities, with the resulting Poisson's Ratio dropping from 0.49 to 0.47.

The silt layer logged at ~-8.0 mAOD exhibited a P-wave velocity of 1300-1500 m/s and an S-wave velocity range of 300-350 m/s. The resulting Poisson's Ratio of between 0.465 (observed from L2 only) was the lowest Poisson's Ratio encountered.

The silty, gravelly clay between -8.0 and -14.0 mAOD was characterised by relatively constant P-wave velocity of 1500 m/s (consistent with that of water) and decreasing S-wave velocity from >325 to ~210 m/s. The Poisson's Ratio in this unit returns to and remains greater than 0.485.

The steady P-wave (~1500 m/s) and increasing (from 200 to 300 m/s) S-wave velocities of the sand layer (-14.0 to -16.5 mAOD) result in a Poisson's Ratio decreasing with depth from 0.49 to 0.48 through this layer.

Poisson's Ratio in the chalk-gravel clay and underlying chalk has not been resolved by the survey.

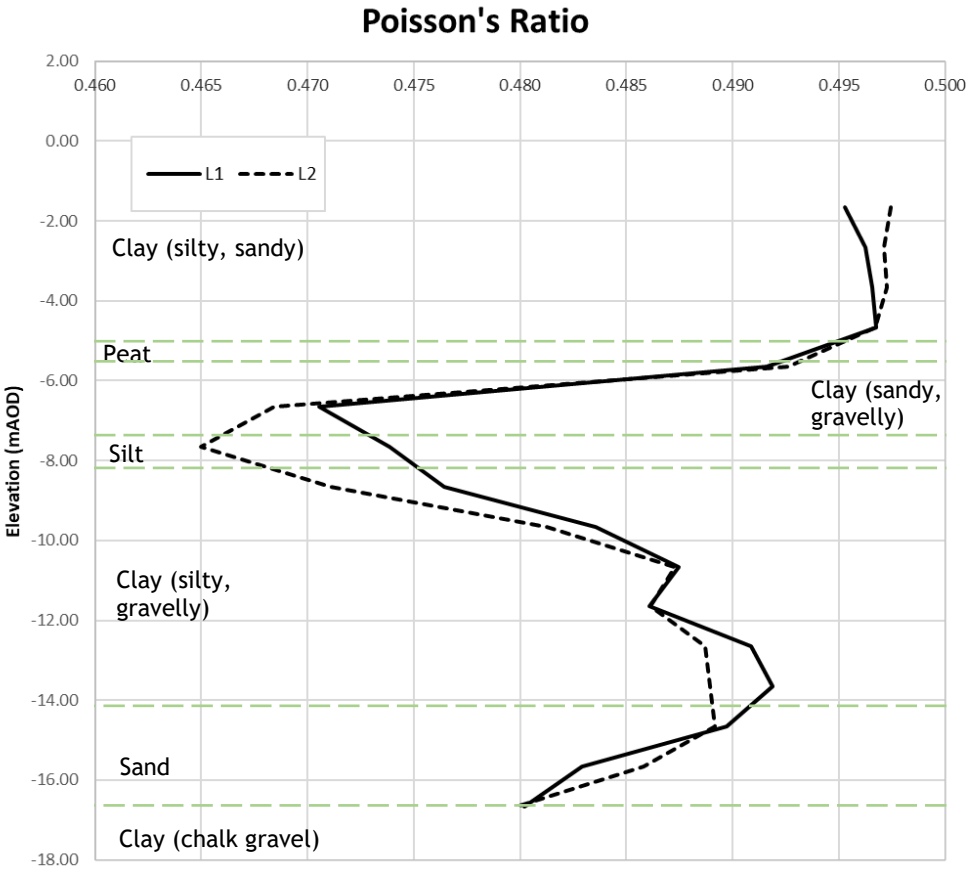

Figure 16: Poisson's Ratio calculated from the velocities derived from the L1 and L2 source locations, varying with elevation (mAOD).

6. Summary

P-wave and S-wave data quality was excellent from the downhole seismic survey at BH02.

P-wave velocity was observed to increase through the logged geology (varying clays, peat and silt) up to ~1600 m/s at ~13 m depth. P-wave velocity was then observed to decrease to and remain at ~1500 m/s, consistent with that of water, for the remainder of the surveyed depth range. This implies that the clays and sand below this point are highly saturated, and that this water saturation dominates the bulk P-wave velocity.

Low S-wave velocity (<100 m/s) was observed through clays until ~7 m depth before increasing to >325 m/s at ~9.5 m depth, peaking within the logged silt layer. The silt exhibited the lowest Poisson's Ratio (0.465) of the units encountered. S-wave velocities then decreased through silty, gravelly clays to ~200 m/s at ~16 m depth, before increasing again through sand and chalk-gravel clay towards the end of the borehole (maximum surveyed depth of ~20 m).

Appendix A Downhole Seismic Analysis

The interpretation methodology used was in line with the ASTM standard: D7400-19; Standard Test Methods for Downhole Seismic Testing.

P waves and S-waves were identified. P waves are typically the first departure of the static horizontal receiver trace after time T=0 (assuming coherent noise or other seismic wave phenomena are not present).

When P and S-waves are displayed simultaneously on the records, the S-waves can be typically identified by a sudden increase in amplitude and an abrupt change in frequency coinciding with the amplitude change. S-wave first arrivals were identified using combined records of positive and negative polarised S-waves for each depth.

Arrival times for P and S-waves were determined from the records as the lapsed time between time zero (activation of the seismic source) and the arrival of the respective wave trains at each of the receiver depths.

P and S-waves gradient velocities were calculated by linear regression of pathlength vs travel time data, over a 2.5 m pathlength window. Incremental (interval) velocities were obtained by dividing the measured distance between receivers R1 and R2 by the difference in arrival times at the two receivers.

Geotechnical parameter equations (CIRIA C562 - 2002; Geophysics in Engineering Investigations):

Shear modulus: $\mu = \rho(Vs)^2$

Young's modulus: $\mathrm{E} = \frac{\rho(Vs)^2\,(3Vp^2-4Vs^2)}{(Vp^2-Vs^2)}$

Poisson's Ratio: $\upsilon = \frac{(\frac{Vp}{Vs})^2-2}{2\,((Vp/Vs)^2-1)}$

Bulk modulus: $K = \frac{E}{3(1-2\upsilon)}$

ρ = density

Vp = P-wave velocity

Vs = S-wave velocity

Appendix B Notes

1. This report has been prepared in relation to the specific requirement of the contract or commission. The report should not be used by third parties without prior consultation with Zetica Ltd. Any advice, recommendations, or statements within the report should be addressed only in the context of the report as a whole.
2. The copyright for this report remains with Zetica Ltd. No part of this report may be reproduced, published or amended without prior written consent from Zetica Ltd.
3. The report refers to the conditions of the property at the time of investigation. Zetica Ltd cannot accept liability for subsequent changes of Property conditions.
4. Zetica Ltd may have relied on externally provided information. Under no circumstances does Zetica Ltd accept responsibility for the accuracy of such information or data supplied.
5. By their nature, exploratory points, such as boreholes or trial pits, can only provide information on a relatively limited area or volume of a Property. In general, the conditions encountered may vary between exploratory points.
6. It should be noted that the detection performance is dependent on a measurable physical contrast between the item for detection and host materials. Where significant noise is present sufficient detection may not be possible.
7. Interpretation relies largely on experience of similar conditions. Site-specific conditions can create variations that may not be detectable by non-intrusive investigation techniques. It should be noted that the detail of an interpretation might vary from that identified by later intrusive investigation, although the general identification of a feature should not vary.
8. The report has been written in Line with relevant guidance and legislation in use at the time of report compilation. Subsequent improvement in techniques, changes in legislation, or changes in Site conditions, may render parts of this report obsolete. After a significant period (i.e. a year) it may be prudent to discuss the report and findings with us.

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- Intrusive ground investigations

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Appendix M

Groundwater Monitoring Records

Client	GRG	Client Ref	-							
Job Name	Grimsby HTI	Mayer Ref	129-002870							
Job Details	Groundwater Monitoring	Suite	Groundwater							
		Date of field test		16.10.23	30.10.23	09.11.23	16.11.23			
Determinand		Units	Method	LOD	BH01	BH01	BH01	BH01			
Groundwater Level		m		0.01	0.22	0.05	Above GL	Above GL			
Depth of well		m		0.01	6.14	6.23	5.89	-			
Comments		-		-	Close to Low Tide. Tide level falling	Tide level rising. Water dark grey in colour	Tide Level Rising	Tide Level Falling			
Sample Taken		-		-	N	Y	N	N			
Quantity of Groundwater Purged Before Sampling		litres		-	-	16.3	-	-			
Method of Purging		-		-	-	Bailer	-	-			

LOD limit of detection

Client	GRG	Client Ref	-							
Job Name	Grimsby HTI	Mayer Ref	129-002870							
Job Details	Groundwater Monitoring	Suite	Groundwater							
		Date of field test		16.10.23	30.10.23	09.11.23	16.11.23			
Determinand		Units	Method	LOD	BH03	BH03	BH03	BH03		
Groundwater Level		m		0.01	0.79	0.44	-	1.15		
Depth of well		m		0.01	6.54	5.89	-	5.37		
Comments		-		-	Close to Low Tide. Tide level falling	Tide level rising. Water dark brown in colour	Tide Level Rising	Tide Level Falling		
Sample Taken		-		-	N	Y	N	N		
Quantity of Groundwater Purged Before Sampling		litres		-	-	24	-	-		
Method of Purging		-		-	-	Bailer	-	-		

LOD limit of detection

Client	GRG	Client Ref	-							
Job Name	Grimsby HTI	Mayer Ref	129-002870							
Job Details	Groundwater Monitoring	Suite	Groundwater							
		Date of field test		16.10.23	30.10.23	09.11.23	16.11.23			
Determinand		Units	Method	LOD	BH03	BH03	BH03	BH03			
Groundwater Level		m		0.01	1.12	0.67	-	1.70			
Depth of well		m		0.01	10.09	9.32	9.77	8.70			
Comments		-		-	Close to Low Tide. Tide level falling	Tide level rising. Water dark brown in colour	Tide Level Rising	Tide Level Falling			
Sample Taken		-		-	N	Y	N	N			
Quantity of Groundwater Purged Before Sampling		litres		-	-	12	-	-			
Method of Purging		-		-	-	Bailer	-	-			

LOD limit of detection

Appendix N

Gas Monitoring Records

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**16/10/2023**	**Page**	:	**2 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**DD**

Date Monitored:

Parameter	Units	Method	LOD	BH01		BH03		BH05					
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1		x		x		x				
Methane (LEL)	% v/v	ANALOX	1		x		x		x				
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1		x		x		x				
Oxygen (O2)	% v/v	ANALOX	0.1		x		x		x				
Hydrogen Sulfide (H2S)	ppm	ANALOX	1		x		x		x				
Carbon Monoxide (CO)	ppm	ANALOX	1		x		x		x				
Flow Rate	l/h	ANALOX	0.1		x		x		x				
Atmospheric Pressure	mb	ANALOX	1.0		x		x		x				
TVOC	ppm	PID	0.1		x		x		x				
Depth to Groundwater	metres	-	0.1	0.22		0.79		1.12					
Depth to Base of Well	metres	-	0.1	6.14		6.54		10.09					
Time:				10:14:00		11:10:00		11:49:00					
Tide:				Nearing low tide		Nearing low tide		Nearing low tide					
Notes:				Very silty at base									

Weather Observations:	Dry, cold (6 - 8 deg. C)
Pressure Trend:	Steady
Ground Conditions:	Wet
Remarks:	**No bungs present in wells so no gas monitoring done**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise
LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**16/10/2023**	**Page**	:	**1 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**DD**

Date Monitored:

Parameter	Units	Method	LOD	WS01		WS02		WS03		WS04			
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1		<0.1		1.9		<0.1		<0.1		
Methane (LEL)	% v/v	ANALOX	1		<0.1		44.1		<0.1		<0.1		
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1		3.6		2.1		0.9		0.9		
Oxygen (O2)	% v/v	ANALOX	0.1		12.7		15.4		18.2		16.5		
Hydrogen Sulfide (H2S)	ppm	ANALOX	1		<1		<1		<1		x		
Carbon Monoxide (CO)	ppm	ANALOX	1		<1		<1		<1		x		
Flow Rate	l/h	ANALOX	0.1	25.6	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Atmospheric Pressure	mb	ANALOX	1.0		1021		1021		1021		1021		
TVOC	ppm	PID	0.1		<0.1		<0.1		<0.1		<0.1		
Depth to Groundwater	metres	-	0.1	0.54		0.79		DRY		0.54			
Depth to Base of Well	metres	-	0.1	3.54		3.52		3.18		3.54			
Time:				10:40		10.46		11:15		10:29			
Tide:				Nearing low tide		Nearing low tide		Nearing low tide		Nearing low tide			
Notes:				Silt on dip meter									

Weather Observations:	Dry, cold (6 - 8 deg. C)
Pressure Trend:	Steady
Ground Conditions:	Wet
Remarks:	**TideLevel Falling**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise
LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**30/10/2023**	**Page**	:	**2 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	BH01		BH03		BH05					
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	39.9	16.0	71.9	71.9	37.1	36.9				
Methane (LEL)	% v/v	ANALOX	1	-	-	-	-	-	-				
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	2.8	1.2	2.4	3.5	2.1	2.1				
Oxygen (O2)	% v/v	ANALOX	0.1	15.9	15.9	3.8	3.5	25.3	8.9				
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1				
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	11.0	11.0				
Flow Rate	l/h	ANALOX	0.1	-	-	-	-	-	-				
Atmospheric Pressure	mb	ANALOX	1.0	995.0		995.0		995					
TVOC	ppm	PID	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Depth to Groundwater	metres	-	0.1	0.05		0.44		0.67					
Depth to Base of Well	metres	-	0.1	6.23		5.89		9.32					
Time:				14:50:00		15:10:00		15:22:00					
Tide:				Mid point L to H Tide		Mid point L to H Tide		Mid point L to H Tide					
Notes:				Ground waterlogged		Bung popped off well on own accord							

Weather Observations:	Overcast, showers (8 deg. C)
Pressure Trend:	Rising
Ground Conditions:	Wet
Remarks:	**Tide Level Rising**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise

LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**30/10/2023**	**Page**	:	**2 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	WS01		WS02		WS03		WS04			
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	7.4	2.3	12.7	8.0	<0.1	<0.1	6.6	<0.1		
Methane (LEL)	% v/v	ANALOX	1	93.4	52.0	-	-	-	-	-	-		
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	2.3	0.7	2.5	1.5	1.6	1.6	1.8	0.8		
Oxygen (O2)	% v/v	ANALOX	0.1	20.2	19.4	26.2	14.8	25.1	15.8	18.7	18.7		
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Flow Rate	l/h	ANALOX	0.1	-	-	-	-	-	-	-	-		
Atmospheric Pressure	mb	ANALOX	1.0	995		995		995		995			
TVOC	ppm	PID	0.1	5.2	2.3	5.2	2.3	0.9	1.0	1.1	1.0		
Depth to Groundwater	metres	-	0.1	-		-		-		-			
Depth to Base of Well	metres	-	0.1	-		-		-		-			
Time:				15:56		15:49:00		16:02		16:15			
Tide:				Mid point L to H Tide		Mid point L to H Tide		Mid point L to H Tide		Mid point L to H Tide			
Notes:													

Weather Observations:	Dry, cold (6 - 8 deg. C)
Pressure Trend:	Steady
Ground Conditions:	Wet
Remarks:	**Tide Level Rising**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise
LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**09/11/2023**	**Page**	:	**1 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	BH01		BH03		BH05					
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	12.8	<0.1	<0.1	<0.1	<0.1	<0.1				
Methane (LEL)	% v/v	ANALOX	1	<<<	<<<	<1	<1	<1	<1				
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	3.4	<0.1	<0.1	<0.1	<0.1	<0.1				
Oxygen (O2)	% v/v	ANALOX	0.1	20.4	20.4	20.5	20.4	20.5	20.5				
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1				
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1				
Flow Rate	l/h	ANALOX	0.1	-	-	-	-	-	-				
Atmospheric Pressure	mb	ANALOX	1.0	991.0		991.0		991					
TVOC	ppm	PID	0.1	2.0	1.0	1.0	1.0	1.0	0.9				
Depth to Groundwater	metres	-	0.1	Above GL		-		-					
Depth to Base of Well	metres	-	0.1	5.89		-		9.77					
Time:				12:03:00		12:20:00		; 12:50:00					
Tide:				Mid point L to H Tide		Mid point L to H Tide		Mid point L to H Tide					
Notes:				Ground waterlogged									

Weather Observations:	Dry, cold (11 deg. C)
Pressure Trend:	Falling
Ground Conditions:	Wet
Remarks:	**Tide Level Rising**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise

LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**09/11/2023**	**Page**	:	**2 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	WS01		WS02		WS03		WS04			
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.5	<0.1		
Methane (LEL)	% v/v	ANALOX	1	<1	<1	<1	<1	-	-	-	-		
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1		
Oxygen (O2)	% v/v	ANALOX	0.1	20.4	20.4	20.3	20.3	20.5	20.5	20.6	20.5		
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Flow Rate	l/h	ANALOX	0.1	-	-	-	-	0.8	<0.1	-	-		
Atmospheric Pressure	mb	ANALOX	1.0	995		995		995		995			
TVOC	ppm	PID	0.1	1.0	1.0	1.0	1.0	1.0	0.9	1.0	1.0		
Depth to Groundwater	metres	-	0.1	-		GL		GL		-			
Depth to Base of Well	metres	-	0.1	-		-		-		-			
Time:				13:05		13:20:00		13:05		13:45			
Tide:				Approaching high tide		Approaching high tide		Approaching high tide		Approaching high tide			
Notes:													

Weather Observations:	Dry, cold (11 deg. C)
Pressure Trend:	Falling
Ground Conditions:	Wet
Remarks:	**Tide Level Rising**

GFM Gas Analyser (Model GFM 436); Serial No. 13729; Last Calibrated 21/08/2023 (Certificate No. 124471).

* Reading did not stabilise
LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**16/11/2023**	**Page**	:	**1 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	BH01		BH03		BH05					
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	4.7	3.2	88.0	87.9	42.6	42.6				
Methane (LEL)	% v/v	ANALOX	1	74.1	74.1	>>>	>>>	>>>	>>>				
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	4.3	2.2	4.0	4.0	5.4	5.4				
Oxygen (O2)	% v/v	ANALOX	0.1	20.5	17.7	20.4	0.1	14.0	0.1				
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1				
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1				
Flow Rate	l/h	ANALOX	0.1	<0.1	<0.1	3.0	3.0	3.0	3.0				
Atmospheric Pressure	mb	ANALOX	1.0	1013.0		1012.0		1012					
TVOC	ppm	PID	0.1	4.5	3.5	<0.1	<0.1	<0.1	<0.1				
Depth to Groundwater	metres	-	0.1	Above GL		1.15		1.7					
Depth to Base of Well	metres	-	0.1	-		5.37		8.70					
Time:				10:08:00		10:17:00		; 10:45:00					
Tide:				Mid point H to L Tide		Mid point H to L Tide		Approaching Low Tide					
Notes:				Ground waterlogged									

Weather Observations:	Dry, cold (9 deg. C)
Pressure Trend:	Rising
Ground Conditions:	Wet
Remarks:	**Tide Level Falling**

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* Reading did not stabilise

LOD limit of detection

SUMMARY OF GROUND GAS MONITORING RESULTS

Client	:	**GRG**	**Our Ref**	:	**129-002870**
Report Date	:	**16/01/2023**	**Page**	:	**2 of 2**
Job Details	:	**Grimsby HTI**	**Engineer**	:	**CF**

Date Monitored:

Parameter	Units	Method	LOD	WS01		WS02		WS03		WS04			
Infra Red Gas Analyser:				Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady
Methane (CH4)	% v/v	ANALOX	0.1	6.5	5.0	9.6	9.6	13.5	<0.1	<0.1	<0.1		
Methane (LEL)	% v/v	ANALOX	1	76.2	<1	<1	<1	34.6	<1	<1	<1		
Carbon Dioxide (CO2)	% v/v	ANALOX	0.1	4.4	3.6	2.7	2.7	2.3	2.3	1.8	1.8		
Oxygen (O2)	% v/v	ANALOX	0.1	176.0	16.5	20.1	13.7	16.4	16.4	20.3	18.9		
Hydrogen Sulfide (H2S)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Carbon Monoxide (CO)	ppm	ANALOX	1	<1	<1	<1	<1	<1	<1	<1	<1		
Flow Rate	l/h	ANALOX	0.1	<0.1	<0.1	-1.5	<0.1	-	-	-2.1	-1.9		
Atmospheric Pressure	mb	ANALOX	1.0	1012		1012		1011		1012			
TVOC	ppm	PID	0.1	5.1	3.9	8.5	8.5	1.0	1.0	1.0	1.0		
Depth to Groundwater	metres	-	0.1	-		-		-		-			
Depth to Base of Well	metres	-	0.1	-		-		-		-			
Time:				12:05		12:20:00		11:35		12:20			
Tide:				Approaching Low Tide		Approaching Low Tide		Approaching Low Tide		Approaching Low Tide			
Notes:													

Weather Observations:	Dry, cold (9 deg. C)
Pressure Trend:	Falling
Ground Conditions:	Wet
Remarks:	**Tide Level Falling**

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LOD limit of detection