b. the lateral extension of mineral workings.

- 18.8 Minerals are vital to the economy of the United Kingdom and to Flintshire. It is important that the planning system facilitates the minerals extraction and processing industries to ensure the continued supply of minerals to the marketplace whilst safeguarding high quality mineral resources from use as lower grade material. The Minerals Planning Authority will seek to ensure that mineral resources are extracted and utilised in a sustainable way in order to make an appropriate contribution to the needs of society.
- 18.9 Given the extensive landbank for aggregates, further extensions to existing sites or new extraction sites will not be permitted save in rare and exceptional circumstances. Such a situation could arise where, for example, the supply of an aggregate of a particular specification is clearly demonstrated or where operators are prepared to unilaterally surrender the consents relating to existing permitted reserves through planning agreements or Prohibition Orders. To ensure minerals are used appropriately it will be necessary for proposals to demonstrate that there is a need for the mineral to be extracted. This is a key consideration and proposals which fail to demonstrate need will be refused. To demonstrate need developers should consider the local, regional and national economies, the existing supply of minerals, and the ability of existing supplies to meet current and projected market demand. Where a demand is identified it will be necessary for developers to demonstrate the need for land-won materials instead of secondary and recycled resources. There are limitations to the use of recycled waste materials and the Council recognises that it will not be appropriate for all proposals to consider this potential, for example in those proposals where a high quality mineral is required.
- 18.10 Because of the long term nature of mineral workings it is sometimes more sustainable and environmentally acceptable to permit the deepening or lateral extension of an existing mineral working than to permit a new mineral development. The UDP takes a sequential approach to proposals for new mineral development with preference being given firstly to the use of secondary and recycled materials; secondly to the deepening of existing workings, provided it does not have an unacceptable adverse impact on groundwater or other environmental interests; thirdly to the lateral extension to existing workings, provided the extension does not have an unacceptable adverse impact on existing communities and on other landscape, historic and environmental interests; and lastly to the development of new mineral workings.
- 18.11 In using the sequential approach it will be necessary to assess the impact of each of the preferred options in accordance with the entire minerals policy suite (particularly MIN 2) and the rest of the development plan to ensure the development is of an acceptable standard, the development is appropriately located, and the adverse impacts of the development are mitigated and minimised.

Other key Policies:

GEN5 Environmental Assessment

MIN2 Minerals Development

Proposals for the winning, working, processing and/or recovery of minerals will be assessed with regard to the following criteria:

- a. the development will not have a significant adverse impact upon the following interests of importance:
 - i. the River Dee Estuary;
 - ii. Holywell Common and Halkyn Mountain;
 - iii. sites of international, national, regional or local environmental, nature conservation, landscape and/or heritage importance.

b. Minerals development should not take place in the Clwydian Range AONB save in exceptional circumstances, subject to the most rigorous examination and demonstrated to be in the public interest;

c. the amenity of local people is not significantly affected;

d. the economic viability of the area is not compromised;

e. visual intrusion arising from site working, creation of overburden mounds or the presence of plant and machinery;

- f. the impact of mineral operations on land stability;
- g. satisfactory management and disposal of mineral waste; and

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h. the cumulative effects of mineral operations, involving operational or consented sites, in the locality.

- 18.12 This policy seeks to locate minerals development away from sensitive locations to protect the community and the environment. Minerals development should not take place in the AONB save in exceptional circumstances. All minerals development proposals must be subject to the most rigorous examination and demonstrated to be in the public interest before being allowed to proceed. Consideration will be given to the factors outlined in para 21 of MPPW in assessing proposals. Minerals proposals adjacent to or close to the AONB that might affect its setting will be carefully assessed to determine whether the environmental and amenity impact is acceptable. In exceptional instances where permission is granted the Planning Authority will seek to ensure the highest standards of development and operations are abided to by the operator.
- 18.13 The visual intrusion of minerals development will be assessed in terms of the effects arising from site working, amendments to landform and any associated plant and machinery. Where ground instability is likely to be an issue, a land stability report will be required, setting out the issues relevant to the locality and how they will be overcome. Developers will be required to establish how mineral waste arising from extraction will be managed and disposed of. An assessment of the cumulative impacts of additional proposals will be required having regard to both operational and consented sites in the vicinity. This should seek to identify whether the proposed mitigation measures are sufficient to address the identified impacts and whether additional measures are required. Minerals development will be expected to meet all of the policy requirements as laid out above. If this is done then it will be necessary for the detail of the application to meet the requirements of MIN3.

Other key policies:

- GEN5 Environmental Assessment
- L1 Landscape Character
- L2 Area of Outstanding Natural Beauty
- WB2 Sites of International Importance
- WB3 Statutory Sites of National Importance
- WB4 Local Sites of Wildlife and Geological Importance
- WB5 Undesignated Wildlife Habitats

MIN3 Controlling Minerals Operations

Provided the criteria of Policies MIN1 and MIN2 are met, then mineral workings will be permitted where:

- a. the additional traffic burden can be accommodated by the existing highway network without significant adverse impact;
- b. the movements of vehicles to and from the site do not cause unacceptable harm to the living conditions of nearby residents;
- blasting operations do not cause unacceptable harm to the surrounding area by reason of vibration;
- d. noise from the winning, working, processing and/or recovery of minerals will not cause significant disturbance to noise sensitive locations;
- e. dust, smoke and fumes from processing operations and handling operations will not have an adverse impact on sensitive locations and on the surrounding vegetation; and
- f. it would not result in significant adverse impact on land drainage, groundwater resources or water supplies.
- 18.14 The Mineral Planning Authority is charged with the task of monitoring mineral permissions in the County to ensure the operations of the mineral working are compliant with conditional permissions; conditions are drafted to ensure that the impact of minerals operators is minimised as far as possible. It is important therefore that developers ensure that proposals meet the above operations criteria. To assess the impact of the traffic generated by the development the Minerals Planning Authority will expect developers to submit details of the anticipated number of vehicle movements and the proposed routes of these vehicles. Noise sensitive locations include residential dwellings and gardens, places of worship, educational establishments, hospitals or similar institutions and livestock farms. Sensitive locations are defined in the Town & Country Planning (EIA) (England and Wales) Regs 1991 and include amongst others, areas of special scientific interest, scheduled ancient monuments, AONB's and European Sites.

Other key policies:

GEN5 Environmental Assessment

- AC13 Access and Traffic Impact
- MIN10 Mineral Buffer Zones
- EWP12 Pollution
- EWP13 Nuisance

MIN4 Restoration and Aftercare

The Minerals Planning Authority requires that all minerals development proposals be accompanied by a scheme of restoration and aftercare. Such a scheme will set out the short and long term maintenance and improvement of the site. The scheme should address and make full reference to the following criteria:

- a. the undertaking of works which will limit the impact of the mineral workings operations on the surrounding environment;
- b. a timetable detailing the progressive restoration of the site to the highest most practicable standards;
- c. the proposed afteruse and;
- d. the final landform design taking into consideration the surrounding topography and landscape character.
- 18.15 The restoration of a mineral workings site is a key consideration for the Minerals Planning Authority and applications which lack the necessary detail (as specified in the policy above) will not receive planning permission. Applicants will be encouraged to restore sites with the intention of maximising their use for nature conservation and for informal recreation purposes (i.e. boating lakes, footpaths etc).

Other Key Policy

IMP1 Planning Conditions and Obligations

MIN5 Dormant, Inactive and Interim Development Order Sites

The Minerals Planning Authority will seek to ensure that all dormant, inactive and interim development order minerals sites meet modern planning standards both in their operations and in the restoration of a site.

18.16 Within Flintshire there are many sites which currently hold permission for the extraction of minerals. Some of these permissions date back prior to World War Two (pre-1939). For the Minerals Planning Authority, historic permissions pose a significant problem since they contain grossly inadequate conditions to control their development. Historic permissions may well omit conditions relating to, for example, blasting; the movement of vehicles servicing the site; the restoration of the site; and/or the reuse of the site. Where modern standards are omitted the Minerals Planning Authority will seek to achieve a better standard of development which meets the aims and objectives of this Plan and which complies with its policies. The Council has confirmed prohibition orders on 18 dormant sites and there are only two dormant sites remaining at Grange, Pantasaph and Mount Pool, Buckley.

MIN6 Review of Mineral Permissions

The Minerals Planning Authority will undertake an annual assessment of all dormant mineral sites and sites that have not been worked for 10 years to identify their potential contribution to the landbank and the likelihood of their reopening. Where appropriate, prohibition orders will be served under s.102 of the Town and Country Planning Act 1990.

18.17 Unfortunately in the past the MPA has granted permission for minerals extraction but the expansion of settlements, the growth of new settlements and the recognised importance of other interests, forces the MPA to reconsider some of those permissions. Minerals Planning Authorities have the authority to review existing planning permissions and to modify or revoke planning consent. In such instances where the MPA prejudices the asset value of a minerals site it will be liable to pay compensation to the sites owners. While this route is a costly one it may be necessary to undertake these proceedings where the reopening and resumption of operations presents a real threat to the communities of Flintshire.

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The Minerals Planning Authority will permit exploration works for a temporary period as long as they do not have a significant adverse impact on the environment and the site is fully restored to its former state.

18.18 Proposals for trial excavations, boreholes or any other exploratory development will normally be permitted for a temporary period provided the development does not pose a threat to the environment. Where the pollution of water courses, groundwater or other water resources is a possibility it will be necessary for the Minerals Planning Authority to consult with the Environment Agency prior to permitting the development. Normally it will be expected that permission will be granted for a temporary period of three months, and extensions beyond this period must be negotiated with the Minerals Planning Authority and fully justified by the developer.

MIN8 Protection of Mineral Interests

To ensure that known mineral resources are safeguarded for future use, Mineral Safeguarding Areas (MSA's) have been identified and are shown on the proposals map.

Any non-mineral development within a MSA will require evidence as to what extent it may sterilise or restrict the working of mineral resources. Where the evidence is not forthcoming or demonstrates that there will be an unacceptable impact on mineral resources the application will be refused. However, where it is considered that the proposed development is of overriding importance, consideration will be given to the principle of pre-extraction of the minerals.

- 18.19 Within the County there are significant deposits of important mineral resources. It is important that these mineral resources are safeguarded to ensure their availability in the future. Developments proposed within identified Mineral Safeguarding Areas will be assessed to ensure they do not sterilise mineral resources either by developing over identified deposits or by restricting future mineral extraction. Within the Minerals Safeguarding Area consultation between the Minerals Planning Authority, the minerals industry and others will be undertaken before certain non-mineral planning applications made within the area are determined.
- 18.20 Policy MIN8 seeks to ensure that all mineral interests are adequately safeguarded from unnecessary sterilisation and loss. Whilst the Proposals Map only identifies Minerals Safeguarding Areas for hard rock and sand and gravel deposits, this policy will also apply to the protection of energy minerals. The exploitation of energy minerals such as coal is unlikely to be a significant issue for this Plan period but may have considerable future importance for Flintshire. Areas such as Point of Ayr and the site of the Point of Ayr Colliery are perhaps the best examples of where it will be necessary to consider the protection of deep coal seems from unnecssary development and subsequent sterilisation.

Other Key Policies:

· WB2 Sites of International Importance

MIN9 Borrow Pits

Proposals for the development of borrow pits will be permitted provided that:

- a. there are demonstrable environmental benefits to be gained; and
- b. they can be developed in accordance with mineral planning policies.
- 18.21 Borrow Pits are temporary mineral workings developed to supply a particular construction project. Borrow pits can offer significant environmental benefits over mineral supply from existing reserves. They should be located near to the project and preferably supply material direct without the use of public roads. There need to be clear environmental benefits from the use of a borrow pit and restoration should be to a high standard.

MIN10 Mineral Buffer Zones

Mineral Buffer Zones are identified on the Proposals Maps based on a minimum distance of 100m for sand and gravel workings (and others where no blasting is permitted) and 200m for hard rock quarries. Development within Minerals Buffer Zones for new mineral extraction or sensitive development will not be permitted.

18.22 The principle of Buffer Zones was established in Minerals Planning Policy Wales in order to protect land uses or developments that are most sensitive to the impact of mineral operations by establishing a separation distance between potentially conflicting land uses. Sensitive development is any building occupied by people on a regular basis and includes housing areas, hostels, meeting places schools and

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hospitals, where an acceptable standard of amenity should be expected. Buffer zones will also help to prevent the sterilisation of mineral resources. As such, developments proposed within the Buffer Zones are also likely to be assessed under Policy MIN8 if they fall within the Mineral Safeguarding Area.

18.23 The extent of the Buffer Zones has been defined based on the minimum distances specified in MTAN1. They provide a clear indication of the areas within which there is likely to be conflict between minerals and other forms of development. Within the Buffer Zone, there should be no new mineral extraction or sensitive development. However other developments which are less sensitive to impact from mineral operations, for example industry, offices and some ancillary development related to the mineral working, may be acceptable within the Buffer Zone.

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SECTION 1 MRA

SECTION 1 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 1 of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the development is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (shown in **Appendix 11.1, Volume III**). Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11-5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 1 of the Newbuild Infrastructure Boundary is presented in **Table C-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits are presented on **Figure 11.3.2 (Sheet 1)** in **Annex A**.

Туре	Geological unit and typical description	Distribution	
Superficial	Alluvium: Variable sediment of mud, sand, and gravel, with some peat in places.	Limited exposure in the western most limits of Section 1.	
	Tidal Flat Deposits: Mud and sand.	Eastern / north-eastern parts of Section 1.	
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Central and western parts of Section 1.	
Bedrock	Kinnerton Sandstone Formation: Sandstone	East side of Section 1.	
	Chester Formation: Pebbly gravelly sandstone	Western side of Section 1	

Table C-1 – Anticipated geological sequence for Section 1

BGS MINERAL RESOURCES MAP

A review of the BGS 1:50,000 scale Mineral Resources Map does not highlight any potential mineral resources. However, based on a review of the Mineral Safeguarding Areas (see **Section 5.1** of the main report), the Alluvium located within Section 1 is considered to be a potential resource and therefore exploratory hole records have been reviewed for this area.

Table C-2 – Summary of mineral thickness and overburden for Section1 of the Newbuild Infrastructure Boundary

Borehole Ref:	NGR	Mineral resources of interest	Approximat e overburden thickness (m)	Mineral resourc e thicknes s (m)	Groundwater strike
LB_21_02_ BH (App. I.1)	344537 , 374786	Sand & Gravel	1.5	1.85	20m

HYDROGEOLOGY

Hydrogeological units for Section 1 of the Newbuild Infrastructure Boundary are summarised in **Table C-3**. The superficial deposits are classified as Secondary aquifers by the Environment Agency (EA). As a Secondary A aquifer, the Alluvium is more likely to contain extractable quantities of groundwater in permeable layers. Both bedrock formations are classified as Principal Aquifers, and contain a high potential yield of extractable groundwater through high intergranular and / or fracture permeability. Section 1 of the Newbuild Infrastructure Boundary is not within a groundwater protection zone.

Table C-3 – Aquifer statuses of geological units within Section 1 of the Newbuild Infrastructure Boundary

Туре	Geological Unit	Aquifer Status
Superficial	Alluvium	Secondary A
	Glacial Till	Secondary (undifferentiated)
	Tidal Flat Deposits	Secondary (undifferentiated)
Bedrock	Kinnerton Sandstone Formation	Principal Aquifer
	Chester Formation	Principal Aquifer

HYDROLOGY

Section 1 of the Newbuild Infrastructure Boundary encroaches on two catchment areas. The eastern parts of Section 1 cross the 'Peckmill Brook, Hoolpool Gutter at Ince Marshes' water body, assessed by the EA as having a 'Moderate' ecological status, and a 'Fail' for chemical status¹. The catchment is also protected under the Nitrates Directive. West Central Drain, East Central Drain, and Hornsmill Brook are all intersected by the Newbuild Carbon Dioxide Pipeline route within this catchment.

The western parts of Section 1 cross the 'Gowy (Milton Brook to Mersey)' water body, which is also by the EA as having a 'Moderate' ecological status, and a 'Fail' for chemical status². The catchment is also protected under the Nitrates Directive. This section of the Newbuild Infrastructure Boundary intersects Gale Brook 0.3km east of Thornton le Moors within this catchment.

Review of flood risk mapping for Section 1 reveals that the eastern parts of the Newbuild Infrastructure Boundary east of Elton are within a Flood Zone 3 area, as are the western most limits. These areas have a high probability of flooding and require flood risk assessments. The central parts of Section 1 are within a Flood Zone 1 and have a low probability of flooding.

SENSITIVE LAND USES

No sensitive land uses are recorded within 50m of the Newbuild Carbon Dioxide Pipeline in Section 1.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout Section 1 of the Newbuild Infrastructure Boundary are detailed herein. Where the Newbuild Carbon Dioxide Pipeline route intersects an MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable.

¹ Chemical 'Fail' status attributed to mercury and its compounds, and polybrominated diphenyl ethers.

² Chemical 'Fail' status attributed to mercury and its compounds, Perfluorooctane sulphonate, and polybrominated diphenyl ethers

Safeguarded mineral resources identified in Section 1 are limited to the western-most limits of the section in the small area identified as Alluvium (Figure 11.3.3 Sheet 1, Annex A). Mineral resources here are described as Sand & Gravel in the Cheshire West and Chester Local Plan Part 1 (Ref. 7). The Newbuild Carbon Dioxide Pipeline route intersects this MSA adjacent the southern side of Hill View Way. For the purposes of this assessment, this is termed 'Intersection 1a'.

POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

The MSA associated with Intersection 1a is already partially sterilised by existing development and overhead power lines (**Figure 11.3.3 Sheet 1**, **Annex A**), leaving ~0.43ha of extractable mineral resources which the DCO Proposed Development may influence.

Exploratory hole records associated with this MSA are limited. However, from the geological log available (**Annex J** log LB_21_02BH), mineral resources do not appear to be of a desirable quality. With a mineral resource thickness of only 1.85m, the characteristics for Category A / B deposits are not met. The deposits that would be considered a mineral resource are described as 'slightly clayey SAND', for which the sand is fine and medium.

Without particle size data to further distinguish the proportion of fines, the depositional environment can be consulted to give a general indication as to what properties the mineral resource may possess. The deposits are highlighted as glacial till in the geological logs. Glacial till can comprise a wide variety of particle sizes and can also be spatially variable (**Ref-19**). Based on this, it cannot be said with any certainty that the mineral resources will reflect what is shown in the geological log, and there may be a higher proportion of fines than anticipated.

CONCLUSIONS

Based on **Figure 11.3.3 Sheet 1 Annex A**, the MSA is already partially sterilised by existing development and overhead cables in the areas where the DCO Proposed Development will cross the MSA. Only a small area within the MSA may be sterilised as a result of the DCO Proposed Development. The remaining area is not considered viable for extraction and would likely not be viewed as a mineral prospect. Additionally, the mineral resource does not meet the requirements of what would be considered a quality mineral resource. As a result, it is considered that the remaining mineral resources are not viable for prior extraction and in-line

with policy M2 of Cheshire West and Chester County Council Local Plan Part 2 (**Ref. 8**), no further assessment here is deemed necessary.



SECTION 2 MRA

SECTION 2 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 2 of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the development is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (shown in **Appendix 11.1, Volume III**). Information from exploratory hole records from the BGS (**Ref. 12**) and the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11-5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 2 of the Newbuild Infrastructure Boundary is presented in **Table D-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits is presented in **Figure 11.3.3**, **Sheet 2** in **Annex A**.

Туре	Geological unit and typical Distribution description		
Superficial	Alluvium: Variable sediment of mud, sand, and gravel, with some peat in places.	Limited exposure in the central parts of Section 2	
	Tidal Flat Deposits: Mud and sand.	Limited exposure in the western parts of Section 2	
	Glaciofluvial Deposits: Sand and gravel	Limited exposure in the central and western parts of Section 2	
	Alluvial Fan Deposits: Sand and gravel	Very limited exposure in the central part of Section 2	
	Blown Sand	Eastern side of Section 2	
	Peat*	Eastern side of Section 2	
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Throughout Section 2	
Bedrock	Wilmslow Sandstone Formation: Sandstone	Limited intersection with north- eastern parts of Section 2	
	Chester Formation: Pebbly gravelly sandstone	Throughout Section 2	

 Table D-1 – Anticipated Geological Sequence for Section 2

*an Outline Peat Management Plan (Document Reference: D.6.5.4.4) has been prepared which highlights how peat intersected by the proposed development could be best managed by the contractor responsible for installation of the Newbuild Carbon Dioxide Pipeline.

BGS MINERAL RESOURCES MAPPING

A review of the BGS 1:50,000 scale Mineral Resources Map shows the blown sand, peat, and Glaciofluvial Deposits within Section 2 are all considered as potential resources, therefore exploratory hole records produced as part of the ground investigation for the Newbuild Carbon Dioxide Pipeline, as well as BGS borehole records in these geological units have been reviewed to provide details on approximate mineral and overburden thicknesses (**Table D-2**).

Table D-2 -Summary of mineral and overburden thickness for Section2 of the Newbuild Infrastructure Boundary

Borehole Ref:	NGR	Mineral resources of interest	Approxima te overburde n thickness (m)	Mineral resource thickness (m)	Groundwate r strike
SJ47SW1 34 (App. I.2)	344550E , 373445N	Sand & Gravel	7.3	1.2	8.3m
SJ47SW1 6 (App. I.3)	344490E , 373280N	Sand & Gravel	6.25	10.01	3.96m
SJ47SW1 33 (App. I.4)	343832E , 373060N	Sand & Gravel	2.7	10.9	3.6m
LB_21_07 _BH (App. I5)	344737E , 373406N	Sand & Gravel	0.8	0.85	None
LB_21_08 _BH (App. I.7)	344378E , 373205N	Sand & Gravel	0.6	6.8	None
LB_21_09 _CPT (App. l.8)	344056E , 373056N	Sand & Gravel	0.6	0.5	None

Borehole Ref:	NGR	Mineral resources of interest	Approxima te overburde n thickness (m)	Mineral resource thickness (m)	Groundwate r strike
LB_21_11 4_BH (App. l.9)	344521E , 373302N	Sand & Gravel	0	1.5	1.1
LB_21_11 5_TP (App. I.10)	344631E , 373338N	Sand & Gravel	0.65	0.5	1.2
LB_21_19 _BH (App. I.11)	341454E , 371095N	Sand & Gravel	0.3	9.8	0.9m
SJ47SW1 44 (App. I12)	341810E , 371830N	Sand & Gravel	2.2	3.7	3.3m
SJ47SW1 43 (App. I13)	341830E , 371820N	Sand & Gravel	1.8	>6.3	1.6m
SJ47SW1 46 (App. I14)	341730E , 371850N	Sand & Gravel	0.95	3.95	3m

HYDROGEOLOGY

Hydrogeological units for Section 2 of the Newbuild Infrastructure Boundary are summarised in **Table D-3**. The superficial deposits are classified as Secondary aquifers by the Environment Agency (EA). The units classified as Secondary A aquifers are more likely to contain extractable quantities of groundwater in permeable layers. Both bedrock formations are classified as Principal Aquifers and contain a high potential yield of extractable groundwater through high intergranular and / or fracture permeability. Section 2 of the Newbuild Infrastructure Boundary is not within a groundwater protection zone.

Туре	Geological unit	Aquifer Status	
Superficial	Alluvium	Secondary A	
	Tidal Flat Deposits	Secondary (undifferentiated)	
	Glaciofluvial Deposits	Secondary A	
	Alluvial Fan Deposits	Secondary A	
	Blown Sand	Secondary A	
	Peat	Secondary (undifferentiated)	
	Glacial Till	Secondary (undifferentiated)	
Bedrock	Wilmslow Sandstone Formation	Principal Aquifer	
	Chester Formation	Principal Aquifer	

 Table D-3 - Aquifer statuses of geological units within Section 2 of the

 Newbuild Infrastructure Boundary

HYDROLOGY

Section 2 of the Newbuild Infrastructure Boundary intersects two operational catchment areas – the Gowy catchment, and the Dee catchment.

The eastern and central parts of Section 2 cross the Milton Brook to Mersey reach, and Stanney Mill Brook areas of the Gowy catchment. Moving from east to west, Section 2 first intersects the Milton Brook to Mersey reach, which has achieved 'Moderate' ecological status, but 'Fail' on chemical status. This is due to pollution of mercury and its compounds, perfluorooctane sulphonate, and polybrominated diphenyl ethers. The Stanney Mill Brook water body is then crossed, which also achieved 'Moderate' ecological status, but a 'Fail' for chemical status. This is due to pollution of benzo(g-h-i)perylene, mercury and its compounds, and polybrominated diphenyl ethers. The Gowy operational catchment is also protected under the Nitrates Directive. Several abstraction licences are also noted along the River Gowy approximately 200m north of the M56.

The western-most limits of Section 2 encroach on the Dee operational catchment, specifically the Finchetts Gutter water body. This achieved a 'Poor' ecological status, as well as a 'Fail' on chemical status. 'Poor' ecological status is owed to a 'Poor' classification of invertebrates and phosphate. Chemical status was classified as 'Fail' due to pollution of mercury and its compounds, and polybrominated diphenyl ethers.

Section 2 of the Newbuild Infrastructure Boundary intersects an area of peat in the east moving from east to west, before crossing the River Gowy adjacent the southern side of the M56 motorway. ~500m southwest of this, Mill Brook is then crossed. An unnamed stream is then crossed in the central parts of Section 2, before the Shropshire Grand Union Canal is intersected in the western parts of Section 2. Two more unnamed streams are also intersected in the western-most parts of Section 2.

Section 2 of the Newbuild Infrastructure Boundary is primarily within a Flood Zone 1, with the exception of the area surrounding the River Gowy in the east of the section, which is a Flood Zone 3 and requires a flood risk assessment.

SENSITIVE LAND USES

The following sensitive land uses are recorded within Section 2:

 Several listed buildings in Thornton le Moors, greater than 50m from the Newbuild Carbon Dioxide Pipeline.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout Section 2 of the Newbuild Infrastructure Boundary are detailed herein. Where the Newbuild Carbon Dioxide Pipeline route intersects an MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable.

Safeguarded mineral resources in Section 2 identified within the Cheshire West and Chester Local Plan Part 1 (**Ref. 7**) include:

- An area of Sand & Gravel in the east of the section intersected by the M56 southwest of Thornton le Moors (Intersection 2a; Figure 11.3.3 Sheet 2, Annex A) and,
- An area of Sand & Gravel in central area of the section, west of Wervin (Intersection 2b; Figure 11.3.3 Sheet 3, Annex A).

The MSA associated with Intersection 2a is already partially sterilised by the existing M56 motorway, as well as residential development within the MSA (**Figure 11.3.3 Sheet 2, Annex A**). The area south of the M56 which the Newbuild Carbon Dioxide Pipeline route passes through is approximately 10.2ha in area and is not sterilised by existing development.

Intersection 2b is partially sterilised by the Shropshire Grand Union Canal, existing development, and overhead high voltage electrical cables (**Figure 11.3.3 Sheet 3**, **Annex A**). Despite this, a 3ha area within the MSA remains unsterilised which the Newbuild Carbon Dioxide Pipeline route would intersect.

POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

Intersection 2a

The 10.2ha area south of the M56 associated with Intersection 2a (**Figure 11.3.3 Sheet 2, Annex A**) would be partially sterilised by the Newbuild Carbon Dioxide Pipeline route, leaving 5.8ha of unsterilised mineral resources.

The proximity of Intersection 2a to the M56 may be unsuitable for prior mineral extraction in-line with Policy M3 of Cheshire West and Chester County Council Local Plan Part 2 (**Ref. 8**), as deep earthworks associated with quarrying may destabilise the road, as well as tarnish the landscape observable from the motorway itself.

Exploratory hole records from within this MSA indicate that mineral resources here may not present a quality prospect due to spatial heterogeneity (Annex J logs BH03, unnamed 'Nature of Strata', BH02, LB 21 07 BH, LB 21 08 BH, LB 21 09 CPT, LB 21 114 BH, LB 21 115 TP). Geological logs show that mineral resource thickness is highly variable, with thicknesses ranging from 0.5m to 10.01m with 5 of the 8 records showing mineral resource thickness <2m. Moreover, variability is also observed in the overburden thickness, which ranges from 0m to 6.25m. Record 'SJ47SW134' (Annex J log BH03) displays an overburden thickness much greater than that of the mineral resource, whilst record 'SJ47SW16' (Annex J, log unnamed 'Nature of Strata') is >5m beneath the surface. Groundwater has been encountered as shallow as 1.1m below ground level (bgl). As a result, dewatering of the site and associated discharge would also likely be required should prior extraction be deemed necessary. No particle size distribution data has been provided from Fugro Ltd to further deduce the quality of this sand and gravel resource.

With only a small overburden recorded in places (**Table D-2**), incidental extraction of mineral resources will likely occur with open-trench installation of the Newbuild Carbon Dioxide Pipeline. Should this be the case, the mineral resources should be sustainably reused as part of a Materials Management Plan (MMP), which the Construction Contractor should implement (**Chapter 14 – Materials and Waste, Volume II**).

Intersection 2b

The approximately 3ha area of the MSA which the DCO Proposed Development intersects lies between two sets of overhead electrical cables and is constrained by Shropshire Grand Union Canal to the west (**Figure 11.3.3 sheet 3, Annex A**). It is considered that this area would be unlikely to present a viable mineral prospect due to these surrounding sterilisation and constraints, which could potentially be destabilised by the installation of a mineral extraction site. Should mineral extraction occur, it would likely be north of the overhead electrical cables where these constraints are lessened, and mineral resources are unsterilised. The capability for mineral resource infrastructure at surface level however would remain unsterilised after completion of the DCO Proposed Development, and vehicular access of plant could likely be supported through reinforced crossing and similar.

Exploratory hole records are not available where the DCO Proposed Development intersects the MSA associated with Intersection 2b, and so records in the central and northern area of the MSA are utilised to assess potential mineral resource quality (**Annex J** logs LB_21_19_BH, borehole 18, borehole 17, borehole 20). Mineral resources here appear to be of good quality, with shallow overburden and moderately thick mineral resource (generally loose brown fine to coarse SAND). No particle size distribution data is available within these mineral resources to further deduce the quality of the mineral resource. Groundwater strike is as shallow as 0.9m, suggesting that dewatering would likely be required for extraction of mineral resources.

Incidental extraction may occur at this location where open-trench installation of the Newbuild Carbon Dioxide Pipeline is utilised. However, to cross the canal, a trenchless crossing will be used. This method of installation would not result in incidental extraction of mineral resource. Should incidental extraction occur, the mineral resources should be sustainably reused as part of an MMP, which the Construction Contractor should implement (see **Chapter 14 - Materials and Waste, Volume II**).

1.3. CONCLUSIONS

Based on the information above, neither the MSA associated with Intersection 2a or the MSA associated with Intersection 2b are deemed suitable for prior extraction of mineral resources.

INTERSECTION 2A

The MSA associated with Intersection 2a is already partially sterilised and truncated by the M56 Motorway, and only the resources in the southwest of the MSA will be affected by the proposed development. This area hosts what is considered only a small quantity of mineral resources, which are spatially variable in thickness. Their proximity to the M56 motorway would also likely require a substantial development stand-off for mineral extraction. Using the criteria detailed in Policy M2 of Cheshire West and Chester Local Plan (**Ref. 8**), it is considered that these factors combined make the remaining mineral resources that may be influenced by the DCO Proposed Development unsuitable for prior extraction.

Should mineral resources be incidentally extracted during construction of the DCO Proposed Development at this location, these should be reused sustainably as part of an MMP which the contractor should implement.

INTERSECTION 2B

The area of the MSA associated with Intersection 2b is partially sterilised and truncated by the Shropshire Grand Union Canal and overhead electrical cables. It is considered that these constraints make the approximately 3ha area of mineral resource potentially unviable for extraction, as the installation of minerals extraction site could have adverse impacts, including the destabilisation of the canal and the overhead electrical cable infrastructure. Mineral resources to the north of the overhead electrical cables would remain unsterilised after completion of the proposed development. If not permitted on this basis, the overriding need for the proposed development (discussed in **Section 5.5**) should allow development to proceed here, in-line with Policy M2 of Cheshire West and Chester Local Plan (**Ref. 8**).

Should mineral resources be incidentally extracted during construction of the DCO Proposed Development at this location where open-trench methods are utilised, these should be reused sustainably as part of an MMP which the Construction Contractor should implement. Mineral recovery where trenchless crossing installation methods are utilised is thought to be unlikely.



SECTION 3 MRA

1. SECTION 3 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 3 of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the development is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (see **Appendix 11.1**, **Volume III**). Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11.5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 3 of the DCO Proposed Development is presented in **Table E-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits are presented on **Figure 11.3.2**, **Sheet 3** in **Annex A**.

Туре	Geological unit and typical description	Distribution	
Superficial	Glaciofluvial deposits: Sand and gravel	Limited exposure in the eastern most limits of Section 3	
	Tidal Flat Deposits: Mud and sand.	Limited exposure in eastern parts of Section 3. Good exposure in the west of Section 3	
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Present throughout eastern and central parts of Section 3	
Bedrock	Kinnerton Sandstone Formation: Sandstone	Western side of Section 3	
	Chester Formation: Pebbly gravelly sandstone	Eastern side of Section 3	

 Table E-1 - Anticipated Geological Sequence for Section 3

BGS MINERAL RESOURCES MAPPING

A review of the BGS 1:50,000 scale Mineral Resources Map shows the small area of Glaciofluvial Deposits within the far east of Section 3 to be a potential resource, therefore borehole records produced as part of the ground investigation for the DCO Proposed Development, as well as BGS borehole records (**Ref. 12**) in these geological units have been reviewed to provide details on approximate mineral and overburden thicknesses (**Table E-2**).

Borehole Ref:	NGR	Mineral resources of interest	Approximate overburden thickness (m)	Mineral resource thickness (m)	Groundwat er strike
SJ37SE2 8 (App. I.15)	339024E, 371899N	Sand & Gravel	3	8	-
SJ37SE2 9 (App. I.16)	339226E, 371593N	Sand & Gravel	0.3	5.8	-
SJ37SE3 0 (App. I.17)	339369E, 371451N	Sand & Gravel	0.3	5.8	-
SJ37SE3 1 (App. I.18)	339589E, 371239N	Sand & Gravel	0.6	7.3	-
SJ37SE3 2 (App. I.19)	339897E, 371163N	Sand & Gravel	0.3	9.1	-
SJ37SE3 3 (App. I.20)	339954E, 371122N	Sand & Gravel	1.3	6.7	-
SJ37SE3 6 (App. I.21)	339810E, 371174N	Sand & Gravel	11.9	1.8	-
SJ37SE3 7 (App. I.22)	339858E, 371166N	Sand & Gravel	6.3	-	-

Table E-2 – Summary of mineral resources and overburden thickness for Section 3 of the DCO Proposed Development

HYDROGEOLOGY

Hydrogeological units for Section 3 of the DCO Proposed Development design are summarised in **Table E-3**. The superficial deposits are classified as Secondary aquifers by the Environment Agency (EA). The units classified as Secondary A aquifers are more likely to contain extractable quantities of groundwater in permeable layers. Both bedrock formations are classified as Principal Aquifers and contain a high potential yield of extractable groundwater through high intergranular and / or fracture permeability. Section 3 of the DCO Proposed Development is not within a groundwater protection zone. An agricultural abstraction point exists in the central area of Section 3, approximately 1.3km east of central Saughall.

-		
Туре	Geological unit	Aquifer Status
Superficial	Tidal Flat Deposits	Secondary (undifferentiated)
	Glaciofluvial Deposits	Secondary A
	Glacial Till	Secondary (undifferentiated)
Bedrock	Kinnerton Sandstone Formation	Principal Aquifer
	Chester Formation	Principal Aquifer

 Table E-3 - Aquifer statuses of geological units within Section 3 of the

 DCO Proposed Development design

HYDROLOGY

Section 3 of the DCO Proposed Development intersects the Dee Estuary operational catchment. The eastern side of Section 3 is located within the Finchetts Gutter water body, previously discussed for the western-most limits of Section 2. The west of Section 3 lies within the Garden City Drain water body, which has achieved 'Moderate' ecological status, and a 'Fail' for chemical classification. This is due to pollution of mercury and its compounds, and polybrominated diphenyl ethers. The Garden City Drain water body is protected under the Nitrates Directive, and the Shellfish Water Directive.

The eastern-most limits of Section 3 run adjacent to the Shropshire Union Canal, whilst also intersecting the Backford Brook water body. An unnamed stream is intersected in the central area of Section 3. Another unnamed stream is intersected in the western-most limits of Section 3, which runs parallel to the England/Wales border.

Section 3 is primarily within a Flood Zone 1, with a low probability of flooding. A small area in the eastern-most parts of the section adjacent the

Shropshire Union Canal is classified as a Flood Zone 3, as are the westernmost parts of Section 3 associated with the River Dee. These areas have a high probability of flooding a require flood risk assessments.

SENSITIVE LAND USES

No sensitive land uses are evident within 50m of the Newbuild Carbon Dioxide Pipeline within Section 3. The nearest listed building is located ~120m northwest of the Newbuild Carbon Dioxide Pipeline on Hermitage Road south of Saughall.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout the Section 3 of the DCO Proposed Development are detailed herein. Where the Newbuild Carbon Dioxide Pipeline route intersects a MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable.

Safeguarded mineral resources in Section 3 identified within the Cheshire West and Chester Local Plan Part 1 are limited to an area of Sand & Gravel in the eastern-most parts of the Section south of Backford. The Newbuild Infrastructure Boundary slightly encroaches on an MSA in its southernmost limits, termed 'Intersection 3a' (**Figure 11.3.3, Sheet 4 Annex A**). Existing development has sterilised the majority of the southern area of this MSA, and mineral resources here are no longer viable for extraction. The MSA is unsterilised in its central and northern parts and will not be affected by the DCO Proposed Development in these areas.

1.2.1. With only a small overburden recorded in places (

Table E-2), incidental extraction of mineral resources could potentially occur with open-trench installation of the Newbuild Carbon Dioxide Pipeline. Should this be the case, the mineral resources should be sustainably reused as part of a Materials Management Plan (MMP), which the Construction Contractor should implement (**Chapter 14 – Materials and Waste, Volume II**).

1.3. CONCLUSIONS

The safeguarded mineral resources identified within Section 3 of the DCO Proposed Development will be minimally affected by the construction of the Newbuild Carbon Dioxide Pipeline (**Figure 11.3.3, Sheet 4 Annex A**). The southernmost area of the MSA associated with Intersection 3a is sterilised by existing development, leaving the remaining mineral resources in the vicinity of the DCO Proposed Development unsuitable for prior extraction. In accordance with Policy M2 of Cheshire West and Chester County Council Local Plan Part 2 (**Ref. 8**), no further assessment is deemed necessary here as the area within the MSA that may be affected by the DCO Proposed Development is no longer viable for extraction.

Should mineral resources be incidentally extracted during construction of the DCO Proposed Development, mineral resources should be sustainably reused as part of an MMP, which the Construction Contractor should implement.



SECTION 4 MRA

SECTION 4 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 4 of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the Newbuild Carbon Dioxide Pipeline is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (see **Appendix 11.1, Volume III**). Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11-5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 4 of the Newbuild Infrastructure Boundary is presented in **Table F-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits is presented in **Figure 11.3.2 Sheet 4**, **Annex A**.

Туре	Geological unit and typical description	Distribution
Superficial	Tidal Flat Deposits: Mud and sand.	Throughout eastern and central parts of Section 4
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Present throughout western parts of Section 4
Bedrock	Kinnerton Sandstone Formation: Sandstone	Eastern side of Section 4
	Etruria Formation: Mudstone, sandstone, and conglomerate	Exposure in central and western parts of Section 4
	Pennine Middle Coal Measure Formation: Mudstone, siltstone, and sandstone	Exposure in western side of Section 4
	Pennine Lower Coal Measure Formation: Mudstone, siltstone, and sandstone	Limited exposure in western side of Section 4

 Table F-1 - Anticipated Geological Sequence for Section 4

BGS MINERAL RESOURCES MAPPING

The BGS 1:50,000 scale geological mapping shows the eastern half of Section 4 is underlain by Glacial Till deposits that may be considered a resource, therefore borehole records produced as part of the ground investigation for the Newbuild Carbon Dioxide Pipeline, as well as BGS borehole records (**Ref. 12**) in these geological units have been reviewed to provide details on approximate mineral and overburden thicknesses (**Table F-2**).

Borehole Ref:	NGR	Mineral resources of interest	Approximate overburden thickness (m)	Mineral resource thickness (m)	Groundwat er strike
SJ36NW3 1 (App. I.23)	333140E , 365400N	Brick Clay	0.8	39	-
LB_21_49 _BH (App. I.24)	333804E , 366175N	Brick Clay	3.81	>5.64	-
LB_21_50 _TP (App. I.25)	333500E , 366269N	Brick Clay	0.3	2.6	3.4m
LB_21_51 _BH (App. I.26)	333226E , 366612N	Brick Clay	1.55	>8.5	-

Table F-2 - Summary of mineral resources and overburden thickness for Section 4 of the DCO Proposed Development

HYDROGEOLOGY

Hydrogeological units for Section 4 of the DCO Proposed Development design are summarised in **Table F-3**. The superficial deposits are classified as Secondary aquifers by the Environment Agency (EA) and Natural Resources Wales. The Kinnerton Sandstone Formation is classified as a Principal Aquifer and may contain a high potential yield of extractable groundwater through high intergranular and / or fracture permeability. The units classified as Secondary A aquifers are more likely to contain extractable quantities of groundwater in permeable layers. Section 4 of the DCO Proposed Development is not within a groundwater source protection zone, although a groundwater protection zone is located 0.7km southeast of from central parts of Section 4.

Туре	Geological unit	Aquifer Status	
Superficial	Tidal Flat Deposits	Secondary (undifferentiated)	
	Glacial Till	Secondary (undifferentiated)	
Bedrock	Kinnerton Sandstone Formation	Principal Aquifer	
	Eturia Formation	Secondary A	
	Pennine Middle Coal Measure Formation	Secondary A	
	Pennine Lower Coal Measure Formation	Principal Aquifer	

 Table F-3 - Aquifer statuses of geological units within Section 4 of the

 DCO Proposed Development design

HYDROLOGY

The eastern side of Section 4 is located within the Garden City Drain water body catchment, previously discussed for Section 4. The western side of Section 4 lies within the Sandycroft Drain water body catchment, part of the Dee Estuary operational catchment. Natural Resources Wales classifies this water body as having a 'Moderate' ecological status, and a 'Good' chemical status.

Section 4 of the Newbuild Carbon Dioxide Pipeline intersects the following surface water features:

- Afon Dyfrdwy;
- Broughton Brook; and,
- Two unnamed water features in towards within the west of the section

Much of Section 4 is located within a Flood Zone 3 area due to its proximity to the River Dee, and requires a flood risk assessment. This area spans from the eastern boundary to Deeside, leaving only the western-most limits in a Flood Zone 1.

SENSITIVE LAND USES

Section 4 intersects the Afon Dyfrdwy Site of Special Scientific Interest ~800m north of Hawarden Airport. No other sensitive land uses are recorded within 50m of the Newbuild Infrastructure Boundary in Section 4.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout Section 4 of the Newbuild Carbon Dioxide Pipeline route are detailed herein. Where the Newbuild Carbon Dioxide Pipeline route intersects an MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable.

An area of Brick Clay, classified as a safeguarded mineral under the Flintshire UDP, has been identified within Section 4 of the development and is intersected by the Newbuild Carbon Dioxide Pipeline route (Intersection 4a; **Figure 11.3.3, Sheet 5**, **Annex A**). This mineral resource is largely sterilised by existing development, however approximately 26ha in the west of the area remains unsterilised and is intersected by the Newbuild Carbon Dioxide Pipeline route.

Another small area of Brick Clay is intersected by the Newbuild Carbon Dioxide Pipeline route within Section 4; however, this mineral resource is sterilised by existing development (Intersection 4b; **Figure 11.3.3, Sheet 5, Annex A**).

POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

Intersection 4a

The safeguarded brick clay associated with Intersection 4a is already largely sterilised by existing development (**Figure 11.3.3 Sheet 5**, **Annex A**). The 26ha area of unsterilised mineral resources identified southeast of Sandycroft would be partially sterilised by the Newbuild Carbon Dioxide Pipeline route, leaving 21ha of unsterilised workable mineral resources.

Geological data from this location is limited, but available exploratory hole records (**Annex J** logs SJ36NW/31, LB_21_49_BH, LB_21_50_TP, LB_21_51_BH) indicate that the overburden here ranges from 0.8-3.81m, whilst the mineral resource thickness may be at least 39m with no recordings of groundwater. The quality of the mineral resource is difficult to confirm from the geological log shown in **Annex J** log SJ36NW/31 due to poor detail. However, geological logs shown in **Annex J** logs LB_21_49_BH, LB_21_50_TP, LB_21_51_BH indicate the presence of well sorted clays (tidal flat deposits), and sandy gravelly clays (glacial till deposits).

Due to the 39m thickness of the mineral resources, deep earthworks may be required to enable extraction. For such depths, stepping would be required. To extract the minerals intersected by the Newbuild Carbon Dioxide Pipeline route, stepping would encroach on the adjacent road located to the east, compromising local infrastructure. Policy EN23 of Flintshire LDP (**Ref. 3**) states that minerals should only be extracted if it can be done so without affecting existing infrastructure.

Additionally, the proximity of Intersection 4a to the adjacent residential developments in Sandycroft, as well as Hawarden airport may make the site unsuitable for prior mineral extraction in-line with Policy MIN2 of Flintshire UDP (**Ref. 2**) and Policy EN23 of Flintshire LDP (**Ref. 3**). Deep earthworks associated with quarrying may have adverse environmental impacts to residents including noise, dust, and visual pollution, as well as an increase in congestion associated with mineral workings. Restoration of the quarry here may also result in an increased risk of bird strikes associated with the airport.

Some incidental extraction of mineral resources may occur during development, due to the shallow overburden (0.8m) (**Table F-2**). Should this be the case, the mineral resources should be sustainably reused as part of an MMP, which the Construction Contractor should implement (**Chapter 14 – Materials and Waste, Volume II)**).

Intersection 4b

The other small area of Brick Clay intersected by the Newbuild Carbon Dioxide Pipeline route within Section 4 (Intersection 4b) is sterilised by existing development (**Figure 11.3.3 Sheet 5, Annex A**). As such, no further assessment here is deemed necessary.

1.3. CONCLUSIONS

Based on the information above, neither the mineral resources associated with intersection 4a or 4b are deemed suitable for prior extraction.

Deep earthworks associated with the extraction of minerals at Intersection 4a may cause an adverse environmental impact to surrounding residents, whilst quarry restoration may increase the risk of bird strikes at Hawarden Airport (Policy MIN2 of Flintshire UDP (**Ref. 2**) and Policy EN23 of Flintshire LDP (**Ref. 3**)).

Mineral resources associated with Intersection 4b are sterilised by existing development, and thus unsuitable for extraction.

Should incidental extraction of mineral resources at either location occur, mineral resources should be sustainably reused as part of an MMP, which the Construction Contractor should implement.



SECTION 5 MRA

SECTION 5 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 5 of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the DCO Proposed Development is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (**Appendix 11.1, Volume III**). Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11-5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 5 of the Newbuild Infrastructure Boundary is presented in **Table G-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits is presented in **Figure 11.3.2, Sheet 5 Annex A**.

Туре	Geological unit and typical description	al Distribution		
Superficial	Glaciofluvial deposits: Sand and gravel	Eastern and central parts of Section 5		
	Peat*	Limited exposure in east of section		
	Head deposits: Clay, silt, sand and gravel	Limited exposure in central parts of Section 5		
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Present throughout Section 5		
Bedrock	Gwespyr Sandstone: Sandstone and argillaceous rocks, interbedded	Intermittent throughout section		
	Etruria Formation: Mudstone, sandstone, and conglomerate	Limited in west of section		
	Etruria Formation: Sandstone	Limited in central part of section		
	Hollin Rock: Sandstone	Intermittent throughout section		
	Bowland Shale Formation: Mudstone	Limited in east of section		

 Table G-1 - Anticipated Geological Sequence for Section 5

Туре	Geological unit and typical description	Distribution
	Pennine Middle Coal Measure Formation: Mudstone, siltstone, and sandstone	Limited in central and north western parts of section
	Pennine Middle Coal Measure Formation: Sandstone	Limited in central parts of section
	Pennine Lower Coal Measure Formation: Mudstone, siltstone, and sandstone	Intermittent throughout section

*an Outline Peat Management Plan (Document Reference D.6.5.5.4) has been prepared which highlights how peat intersected by the proposed development could be best managed by the Construction Contractor responsible for installation of the pipeline.

BGS MINERAL RESOURCES MAPPING

A review of the BGS 1:50,000 scale Mineral Resources Map shows the Glaciofluvial Deposits in the eastern half of Section 5 as a potential mineral resource. As a result, borehole records produced as part of the ground investigation for the DCO Proposed Development, as well as BGS borehole records (**Ref. 12**) in these geological units have been reviewed to provide details on approximate mineral and overburden thicknesses (**Table G-2**).

Table G-2 - Summary of mineral resources and overburden thicknessfor Section 5 of the Newbuild Infrastructure Boundary

Borehol e Ref (see Annex J:	NGR	Mineral resources of interest	Approximate overburden thickness (m)	Mineral resource thickness (m)	Groundwate r strike
LB_21_5 9_BH	330935E , 366796N	Sand & Gravel	2.15	0.71	-
LB_21_6 0_BH	330671E , 366877N	Sand & Gravel	0.5	10	-
LB_21_6 3_BH	330228E , 366904N	Sand & Gravel	2.8	9.4	-
LB_21_6 5_BH	329901E , 367059N	Sand & Gravel	2.8	13.35	10.2
HYDROGEOLOGY

Hydrogeological units for Section 5 of the Newbuild Carbon Dioxide Pipeline design are summarised in **Table G-3**. All units are classified as Secondary aquifers by Natural Resources Wales. The units classified as Secondary A aquifers are more likely to contain extractable quantities of groundwater in permeable layers. Section 5 of the Newbuild Carbon Dioxide Pipeline is not within a groundwater protection zone.

Table G-3 - Aquifer statuses of geological units within Section 5 of the Newbuild Carbon Dioxide Pipeline design

Туре	Geological unit	Aquifer Status
Superficial	Glaciofluvial deposits	Secondary A
	Glacial Till	Secondary Undifferentiated
	Peat	Secondary Undifferentiated
	Head deposits	Secondary Undifferentiated
Bedrock	Gwespyr Sandstone	Secondary A
	Etruria Formation	Secondary A
	Hollin Rock	Secondary A
	Bowland Shale Formation	Secondary Undifferentiated
	Pennine Middle Coal Measure Formation	Secondary A
	Pennine Lower Coal Measure Formation	Secondary A

HYDROLOGY

The eastern parts of Section 5 are located within the Sandycroft Drain water body, previously discussed for Section 4 in **Annex F**. The western parts of Section 5 are located within the Wepre Brook water body assessment area, belonging to the Dee Estuary operational catchment. This received a 'Moderate' overall classification, with ecological classification as 'Moderate' and chemical classification as 'Good'.

Section 5 of the Newbuild Carbon Dioxide Pipeline intersects the following surface water features:

- An unnamed water body 0.23km west of Ewloe Green which joins the Nant Gwepra;
- Alltami Brook 0.9km southeast of Northop Hall County Primary School;

- An unnamed water body 0.45km southwest of Northop Hall County Primary School which joins the Nant Gwepra; and,
- An unnamed surface water feature towards the western-most limits of Section 5.
- 1.1.1. Almost the entirety of Section 5 is within a Flood Zone 1 and has a low probability of flooding. The Newbuild Carbon Dioxide Pipeline intersects water features listed above, where it is classified as a Flood Zone 3. However, this is likely in reference to the water features, and not the surrounding areas.

SENSITIVE LAND USES

1.1.2. Section 5 of the Newbuild Infrastructure Boundary runs adjacent the Connah's Quay Ponds and Woodlands SSSI approximately 1km northwest of Ewloe. An area of Ancient Woodland occupies the same area and extends south to Ewloe Green. Areas of Ancient Woodland also surround the Newbuild Carbon Dioxide Pipeline in the vicinity of Northop Hall, and one area is intersected by the Newbuild Carbon Dioxide Pipeline approximately 830m southwest of the Northop Hall. The nearest listed building to Section 5 of the Newbuild Carbon Dioxide Pipeline is located approximately 80m north of the pipeline, north of Church Lane, Ewloe.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout Section 5 of the Newbuild Carbon Dioxide Pipeline are detailed herein. Where the Newbuild Carbon Dioxide Pipeline route intersects an MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable.

Safeguarded mineral resources in Section 5 identified within the Flintshire UDP and LDP include the area of Sand & Gravel which spans from Hawarden to the north of Ewloe Green and is intersected by the Newbuild Carbon Dioxide Pipeline route (Intersection 5a; **Figure 11.3.3 Sheet 6 Annex A**). This is largely sterilised by existing development, however a 15.3ha area of unsterilised mineral resources is present to the north of Ewloe Green which the Newbuild Carbon Dioxide Pipeline route intersects. A SSSI associated with Connah's Quay Ponds and Woodland is located immediately west of this area. An area of Brick Clay is also intersected by the Newbuild Carbon Dioxide Pipeline route within Section 5 (Intersection 5b; **Figure 11.3.3 Sheet 7 Annex A**). Only the northernmost parts of this area are intersected by the Newbuild Carbon Dioxide Pipeline route, where existing development has already sterilised the mineral resource.

POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

Intersection 5a

The MSA associated with Intersection 5a is largely sterilised by existing development. As previously stated however, the Newbuild Carbon Dioxide Pipeline route intersects a 15.3ha area of potential mineral resources north of Ewloe Green, which may be up to 20m in thickness (**Annex J** log Borehole 17). This 15.3ha area (termed 'Intersection 5a') however is constrained by its proximity to the SSSI adjacent west, and the overhead power cables which intersect the MSA. The area would be partially sterilised by the Newbuild Carbon Dioxide Pipeline route, leaving 8.9ha of unsterilised mineral resources.

The proximity of the MSA associated with Intersection 5a to the adjacent SSSI to the west may make the area unsuitable for prior extraction of mineral resources under policy MIN2 of Flintshire UDP (**Ref.2**), which seeks to protect areas such as SSSI's from adverse effects of development. Its location within a Green Barrier area reinforces this, as mineral workings would invade the open character and appearance of this area of countryside. The two sets of overhead power cables which constrain the area would present further constraints to minerals working. Additionally, the surrounding settlements of Ewloe and Ewloe Green may incur increased congestion because of minerals workings, as well as the potential for air and noise pollution. The proximity of Hawarden Airport must also be considered, as quarry restoration may increase the risk of bird strikes associated with the airport.

Geological logs from within Intersection 5a are limited, however logs from nearby locations within the MSA (**Annex J** logs: LB_21_59_BH, LB_21_60_BH, LB_21_63_BH, LB_21_65_BH) indicate that mineral resources are of a moderate quality, with the exception of those shown in **Annex J** log LB_21_63_BH, which appear to represent good quality sand & gravel resources. Information from the ground investigation undertaken by Fugro Ltd broadly identified deposits elsewhere within the MSA as 'sandy clay with gravel', 'slightly gravelly silty sand', and 'sand and gravel'. Coal fragments are also indicated within these geological logs (**Annex J** logs: LB_21_59_BH, LB_21_60_BH, LB_21_63_BH, LB_21_65_BH) which would also have an adverse impact on the workability and economic viability of the potential resource.

The moderate quantities of silt and clay that may exist within the mineral resources, as well as the presence of coal fragments (**Annex J** logs: LB_21_59_BH, LB_21_60_BH, LB_21_65_BH App. I.27, 28, 30), could make the mineral resources less economically viable for prior extraction. Particle size distribution data associated with the geological logs displayed in **Annex J** logs: LB_21_59_BH, LB_21_60_BH, suggests that mineral resources here could vary in quality throughout the sequence, although still of good quality (passable as Category B). **Annex J** logs: LB_21_60_BH, displays 93% sand and only 6.9% silt and clay at 1.2m, whilst **Annex J** logs: LB_21_59_BH, displays 80% sand & gravel and 20% silt and clay at 2.15m.

An informal consultation with Hanson Aggregate (**Annex K**), for which they were provided all relevant exploratory hole data, revealed that the mineral resources here were perceived as a poor-quality deposit which would not be worth the planning difficulties. Some of the main constraints that were highlighted include: the lack of suitable infrastructure; the proximity to Hawarden airport; the adjacent SSSI; and the network of power lines. In summary, it was stated that significant design, operational, amenity, and environmental challenges would be faced if the mineral resource were to be extracted, and a significant mineral reserve would be required to justify further consideration.

Due to the significant constraints that would be faced as part of mineral extraction at Intersection 5a, as well as the apparent lack of a high quality mineral resource, prior extraction here is not deemed suitable, in-line with Policy EN23 of Flintshire LDP (**Ref. 3**).

Should prior extraction of mineral resources here be deemed necessary, the overburden recorded elsewhere within the MSA is 0.3m, whilst the groundwater was encountered as shallow as 10.2m bgl. Resultantly, much of the mineral resource could potentially be extracted without dewatering of the area.

Incidental extraction would likely occur during construction of the proposed development (**Table G-2**). Should this be the case, the mineral resources should be sustainably reused as part of a Materials Management Plan (MMP), which the Construction Contractor should implement (**Chapter 14 – Materials and Waste (Volume II)**).

Intersection 5b

The area of the safeguarded Brick Clay mineral resource associated with Intersection 5b which is influenced by the DCO Proposed Development is already sterilised by existing development (**Figure 11.3.3 Sheet 7 Annex A**). As a result, this mineral resource is not considered workable, and no further assessment is deemed necessary in this area.

1.3. CONCLUSIONS

Based on the assessment above, prior extraction of the mineral resources located within Section 5 of the DCO Proposed Development is considered unsuitable.

The potentially poor quality of mineral resources (Policy EN23 of Flintshire LDP (**Ref. 3**)) as well as the sensitive land uses (SSSI, Green Barrier, Hawarden Airport) which constrain the area of the MSA influenced by the DCO Proposed Development (Policy MIN2 of Flintshire UDP (**Ref. 2**)) make the mineral resources at Intersection 5a an unattractive prospect for extraction. This was confirmed by consultation with the local operator, Hanson Aggregate.

Existing development already sterilises the mineral resources that would be influenced by the DCO Proposed Development at Intersection 5b, and mineral resources here are not considered workable.

Should mineral resources be incidentally extracted during construction of the DCO Proposed Development at these locations where open-trench methods are utilised, these should be reused sustainably as part of an MMP which the Construction Contractor should implement.



SECTION 6 MRA

SECTION 6 MRA

1.1. SITE CONTEXT

Information deemed pertinent to the Minerals Resource Assessment of Section 6 of the Newbuild Carbon Dioxide Pipeline is reviewed here. Detailed information of the entire length of the Newbuild Carbon Dioxide Pipeline is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report (**Appendix 11.1, Volume III**). Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein (**Appendix 11-5, Volume III**).

GEOLOGICAL MAPPING

A summary of the anticipated geology for Section 6 of the Newbuild Carbon Dioxide Pipeline is presented in **Table H-1**. Extracts from BGS 1:50,000 scale geological mapping displaying bedrock and superficial deposits is presented in **Figure 11.3.2 Sheet 6, Annex A**.

Туре	Geological unit and typical description	Distribution
Superficial	Glaciofluvial deposits: Sand and gravel	East of northern extent of Newbuild Infrastructure Boundary
	Head deposits : Clay, silt, sand and gravel	East of norther extent of Newbuild Infrastructure Boundary
	Glacial Till: Diamicton (unsorted sediment with gravel in a fine mud matrix).	Present throughout Section 6
Bedrock	Gwespyr Sandstone: Sandstone and argillaceous rocks, interbedded	Limited presence at northern- most limits of Newbuild Infrastructure Boundary in Section 6
	Pennine Middle Coal Measure Formation : Mudstone, siltstone, and sandstone	Adjacent southern boundary between Sections 5 and 6.
	Pennine Lower Coal Measure Formation : Mudstone, siltstone, and sandstone	Throughout central parts of Section 6

 Table H-1 - Anticipated Geological Sequence for Section 6

BGS MINERAL RESOURCES MAPPING

A review of the BGS 1:50,000 scale Mineral Resources Map shows Section 6 to be underlain by glaciofluvial sand & gravels in the northern reaches. As a result, borehole records produced as part of the ground investigation for the Newbuild Carbon Dioxide Pipeline, as well as BGS borehole records (**Ref. 12**) in these geological units have been reviewed to provide details on approximate mineral and overburden thicknesses (**Table H-2**).

			,		1
Explorator y hole Ref (Annex J):	NGR	Mineral resources of interest	Approximate overburden thickness (m)	Mineral resource thickness (m)	Groundwat er strike
SJ27SE177	325450E , 370720N	Sand & Gravel	5	12.1	-
SJ27SW24 9	324950E , 370570N	Sand & Gravel	5.4	5.8	-
LB_21_82_ TP	325271E , 370042N	Sand & Gravel	0.7	>1.3	-
LB_21_83B _TP	325080E , 370414N	Sand & Gravel	4.5	-	4.5m
LB_21_88_ BH	325203E , 370857N	Sand & Gravel	14.0	-	-
LB_21_89_ TP	325232E , 370876N	Sand & Gravel	2.8	-	-

Table H-2 - Summary of mineral resources and overburden thickness for Section 6 of the Newbuild Carbon Dioxide Pipeline

HYDROGEOLOGY

Hydrogeological units for Section 6 of the Newbuild Carbon Dioxide Pipeline design are summarised in **Table H-3**. All units are classified as Secondary aquifers by Natural Resources Wales. The units classified as Secondary A aquifers are more likely to contain extractable quantities of groundwater in permeable layers. Section 6 of the Newbuild Infrastructure Boundary is not within a groundwater protection zone.

Table H-3 - Aquifer status of geological units within Section 6 of theNewbuild Carbon Dioxide Pipeline design

Туре	Geological unit	Aquifer Status
Superficial	Glaciofluvial deposits	Secondary A
	Glacial Till	Secondary Undifferentiated
	Head deposits	Secondary Undifferentiated
Bedrock	Gwespyr Sandstone	Secondary A
	Pennine Middle Coal Measure Formation	Secondary A
	Pennine Lower Coal Measure Formation	Secondary A

HYDROLOGY

The southern-most part of Section 6 is located within the Wepre Brook water body assessment area, previously discussed for Section 5 (**Annex G**). The remainder of Section 6 is not located within a water body assessment area.

Section 6 of the Newbuild Carbon Dioxide Pipeline intersects the following surface water features:

- Northop Brook 1km northeast of Northop; and,
- An unnamed stream 1.6km northeast of Northop which joins Lead Brook.

Section 6 is located within a Flood Zone 1, with the exception of its intersection with Northop Brook which is classified as a Flood Zone 3.

SENSITIVE LAND USES

No sensitive land uses are evident within 50m of Section 6 of the Newbuild Carbon Dioxide Pipeline.

1.2. MINERALS RESOURCES ASSESSMENT

POTENTIAL MINERALS RESOURCES

Potential mineral resources identified throughout Section 6 of the Newbuild Carbon Dioxide Pipeline route are detailed herein. Where the proposed pipeline route intersects an MSA, the immediate area is assessed to see whether existing development has already sterilised the mineral resources, or if extraction is viable. Safeguarded minerals resources in Section 6 identified within the Flintshire UDP and LDP include two areas of Sand & Gravel west and east of the northern-most limits of the proposed pipeline route. The order limits of the proposed development intersect the eastern MSA (Intersection 6a; **Figure 11.3.3 Sheet 8 Annex A**). This MSA comprises an approximately 75ha of unsterilised mineral resource. The MSA to the west of the DCO Proposed Development will not be influenced, and so is not assessed any further.

POTENTIAL OPPORTUNITIES FOR MINERAL EXTRACTION, RESOURCE VIABILITY, AND STERILISATION

Intersection 6a

The 75ha MSA associated with Intersection 6a (**Figure 11.3.3 Sheet 8**, **Annex A**) is largely unsterilised. As previously stated, the Newbuild Carbon Dioxide Pipeline route intersects with this MSA and would partially sterilise the underlying resources, leaving 72ha of unsterilised mineral resources. It is worth noting that the Newbuild Carbon Dioxide Pipeline route does not intersect with the MSA outlined within the Flintshire UDP, but only the Flintshire LDP, which appears to apply a buffer to the MSA. Moreover, within the area of unsterilised resources, several surface water features exist (a stream, ponds / lakes).

Geological logs (**Annex J** logs: SJ27SE/177, SJ27SW/249, LB_21_82_TP, LB_21_83B_TP, LB_21_88_BH, LB_21_89_TP) indicate that mineral resources here may not be homogenous nor of desirable quality based on their depositional environment (Glacial Till / Glaciofluvial). Associated PSD information (**Annex J** logs: LB_21_82_TP, LB_21_83B_TP, LB_21_88_BH, LB_21_89_TP) supports this. **Annex J** log LB_21_82_TP displays that the proportion of fines within the mineral resource is 20.3%, satisfying the requirements for a Category B deposit, whilst the proportion of fines in PSDs from **Annex J** logs: LB_21_83B_TP, LB_21_88_BH, LB_21_89_TP all exceed 40%. This suggests a lack of spatial homogeneity within this mineral resource, and a strong indication that mineral resources are of a poor quality due to the amount of processing that may be required. In-line with Policy EN23 of FCC LDP (**Ref. 3**), deposits here would not warrant prior extraction, particularly given the size of the area that will be sterilised by the proposed pipeline route at Intersection 6a.

Should prior extraction of mineral resources here be deemed necessary, the overburden recorded within the MSA ranges from 0.2-5m, whilst groundwater was not encountered. Resultantly, much of the mineral resource could potentially be extracted without dewatering of the area.

Incidental extraction would likely occur during development with an overburden of potentially only 0.2m within this MSA (**Table H-2**). Should mineral resources be incidentally extracted during construction of the DCO Proposed Development at this location where open-trench methods are utilised, these should be reused sustainably as part of a Materials Management Plan (MMP) which the Construction Contractor should implement (**Chapter 14 – Materials and Waste (Volume II)**).

1.3. CONCLUSIONS

The assessment of mineral resources associated with Intersection 6a presented above indicates that extraction here would not be suitable prior to the DCO Proposed Development.

The mineral resources surrounding Intersection 6a are of a potentially poor quality (Policy EN23 of Flintshire LDP (**Ref. 3**)), whilst groundwater may be shallower than indicated by geological logs reviewed. The need for the DCO Proposed Development is also considered to outweigh the need to protect the 3ha of mineral resource that may be sterilised as a result of development, as the HyNet Northwest Project is a nationally significant infrastructure project (discussed in **Needs Case (Document Reference D5.5**)).

Should mineral resources be incidentally extracted during construction of the DCO Proposed Development at this location where open-trench methods are utilised, these should be reused sustainably as part of an MMP which the Construction Contractor should implement.



BLOCK VALVE STATIONS MRA

BLOCK VALVE STATIONS MRA

1.1. SITE DETAILS

Information deemed pertinent to the Minerals Resource Assessment of the three Block Valve Station (BVS) sites along the existing Flint connection of the DCO Proposed Development is reviewed here. Detailed information of the entire length of the DCO Proposed Development is included in the Phase 1 Land and Soil (Contaminated Land) Baseline report **(Appendix 11.1, Volume III).** Information from the ground investigation conducted throughout the length of the Newbuild Carbon Dioxide Pipeline route by Fugro Ltd. on behalf of the Applicant has also been utilised herein **(Appendix 11-5, Volume III)**.

GEOLOGICAL MAPPING

Babell BVS (or BVS1)

Bedrock is Cefn Mawr Limestone Formation which comprises thinly interbedded dark argillaceous limestones and mudstones with units of pale shelly limestone, see **Insert 1** below. The limestone dips approximately 12 degrees east.

Superficial Deposits comprise Glacial Till (boulder clay) in the northwest, Glaciofluvial Ice Contact Deposits (sand and gravel) in the centre, and Head (gravelly and sandy clay) in the southeast. See **Insert 2** below.

There is potential for Made Ground beneath the lane that runs through the area.

Pentre Halkyn BVS (or BVS2)

Bedrock is the Loggerheads Limestone Formation which comprises pale thick bedded massive rubbly pseudo brecciated and mottled limestones. A fault traverses the east of the site in a north south orientation. The limestone dips approximately 5 degrees to the north. See **Insert 1** below.

Superficial Deposits comprise Glacial Till (boulder clay) across site and Glaciofluvial Ice Contact Deposits are present in part of the north, see **Insert 2** below.

Made Ground relating to the roadway or surrounding farm activities may be underlying the site, however significant thicknesses of Made Ground are not expected.





Insert 2 - Babell BVS and Pentre Halkyn BVS bedrock and superficial geology (extract of BGS 1:50k sheet 108)



Cornist Lane BVS (or BVS3)

Bedrock is the Bowland Shale Formation (Formerly Holywell Shale Formation) (Craven Group) in the centre of site comprising dark grey fissile mudstone. The Gwespyr Sandstone Formation (Millstone Grit Group) is present in the east and west of site comprising feldspathic sandstones, see **Insert 3** below. Superficial Deposits comprise Glacial Till (boulder clay) in the northeast, see **Insert 4** below; superficial deposits are absent across the rest of site.

Made Ground relating to the nearby farm may potentially be present, however significant thicknesses of Made Ground are unlikely.

2 Legend Bowland Sa HSh Shale Formation rgan-y BVS3 ingtield orh 82 Gwespyr Hòtel Sandstone Gwp Hafo Formation HSh Plae-is Gwp Ases

Insert 3 - Cornist Lane BVS bedrock geology (extract of BGS 1:50k sheet 108)

Insert 4 - Cornist Lane BVS bedrock and superficial geology (extract of BGS 1:50k sheet 108)



BGS MINERAL RESOURCES MAP

A summary of mineral resources for Babell BVS to Cornist Lane BVS is presented in Error! Reference source not found. below and extracts from the Mineral Resource Map are provided below (**Inserts 5** and **6**).

Table 1 BGS Mineral Resource Map Summary Babell BVS-CornistLane BVS

Location	Mineral Resource
Babell BVS	Superficial: glaciofluvial deposits: sand and gravels
	Bedrock: Limestone (Cefn Mawr Limestone Formation)
Pentre Halkyn BVS	Superficial: glaciofluvial deposits: sand and gravels
	Bedrock: High Purity Limestone (Loggerheads Limestone Formation)
Cornist Lane BVS	None identified

Insert 5 – BGS North East Wales Mineral Resources Map Extract (Babell BVS and Pentre Halkyn BVS)



Insert 6 – BGS North East Wales Mineral Resources Map Extract (Cornist Lane BVS)



BOREHOLE LOGS

There are no BGS borehole records available for the Block Valve Sites. Intrusive ground investigation was carried out at each site by Fugro Ltd on behalf of the Applicant in February 2022 (**Appendix 11-5, Volume III**). Borehole logs have been provided to WSP and are summarised in **Table 22** below. The exploratory hole locations are shown on **Figure 11.3.6, Sheets 1-3**, presented in **Annex A**.

BVS	Trial pit locations	Base of hole (m bgl)	Summary	Pertinent details
Babell BVS	LB_21_309_TP	2.30	Topsoil to 0.30m bgl Clay to 2.30m bgl	N/A
	LB_21_310_TP	1.80	Topsoil to 0.30m bgl Clay top 1.80m bgl	N/A
	LB_21_311_TP	2.00	Topsoil to 0.30m bgl Sand to 2.00m bgl	Sand from 0.30 – 2.00 (unproven final depth) represent glaciofluvial deposits which are identified as a mineral resource.
Pentre Halkyn BVS	LB_21_306_TP	1.90	Topsoil to 0.10m bgl Cobbles to 0.30m bgl Sand to 1.90m bgl	Sand from 0.30 – 1.90 (unproven final depth) represent glaciofluvial deposits which are identified as a mineral resource.
	LB_21_307_TP	2.10	Topsoil to 0.30m bgl A mixture of clay, sand, gravel and silt to 2.10m bgl	N/A
	LB_21_308_TP	1.60	Topsoil to 0.30m bgl Clay to 1.60m bgl	N/A

 Table 2 – Babell BVS-Cornist Lane BVS summary of trial pit logs

BVS	Trial pit locations	Base of hole (m bgl)	Summary	Pertinent details
Cornist Lane	LB_21_303_TP	2.70	Topsoil to 0.40m bgl	N/A
BVS			Sand to 1.20m bgl	
			Clay to 2.70m bgl	
	LB_21_304_TP	1.70	Topsoil to 0.40m bgl	N/A
			Sand to 0.90m bgl	
			Clay to 1.70m bgl	
	LB_21_305_TP	2.70	Topsoil to 0.40m bgl	N/A
			Sand to 0.80m bgl	
			Clay to 2.00m bgl	
			Gravel to 2.70m bgl	

HYDROGEOLOGY

The Environment Agency classifies aquifer status as summarised in **Table** 3**3** below.

BVS	Туре	Geological unit	Aquifer status
Babell BVS	Superficial	Glacial Till	Secondary Undifferentiated Aquifer
		Glaciofluvial Ice Contact Deposits	Secondary A Aquifer
		Head	Secondary Undifferentiated Aquifer
	Bedrock	Cefn Mawr Limestone	Principal Aquifer
Pentre Halkyn	Superficial	Glacial Till	Secondary Undifferentiated Aquifer
BVS		Glaciofluvial Ice Contact Deposits	Secondary A Aquifer
	Bedrock	The Loggerhead Limestone	Principal Aquifer
Cornist Lane	Superficial	Glacial Till	Secondary Undifferentiated Aquifer
BVS	Bedrock	The Bowland Shale	Secondary Undifferentiated Aquifer
		The Gwespyr Sandstone	Secondary A Aquifer

Table 3 – Babell BVS to Cornist Lane BVS hydrogeology units and aquifer designations

The BVS do not lie within, or within 250m of, SPZs.

There was a historical groundwater abstraction 170m northeast of Pentre Halkyn BVS for farming. There are no other records of groundwater abstractions on site or within 500m of the block valve sites.

Groundwater was not encountered in any of the trial pits.

HYDROLOGY

A summary of the hydrology information for Babell BVS-Cornist Lane BVS is presented in **Table 4** below.

BVS	Nearest surface water feature
Babell BVS	The Afon Wys river is located 380m south. Unnamed Land Drain situated approximately 660m east.
Pentre Halkyn BVS	No features within 1km.
Cornist Lane BVS	Small unnamed drain located approximately 110m northeast. Afon Nant-y-Fflint stream is located approximately 150m west, with several small unnamed drains located to the further west. Unnamed pond located approximately 385m to the north.

Table 4 – Babell BVS – Cornist Lane BVS Hydrology summary

There are no surface water abstractions within 500m of the block valve sites.

QUARRYING AND MINERAL EXTRACTION

A review of the Coal Authority Interactive mapping online (**Ref. 20**) indicates Babell BVS - Cornist Lane BVS are outside the Coal Mining Reporting Area.

A summary of quarrying and mineral extraction is presented in **Table 5** below.

Feature	On-site	Within 250m
Brit Pits	None recorded within Newbuild Infrastructure Boundaries of any of the BVS sites.	 Babell BVS - Ceased underground lead working at Bryn-llwyn approximately 250m southeast of Babell BVS. Pentre Halkyn BVS – Gelli-ffowler former lead shaft approximately 25m north Groesffordd Farm former lead shaft approximately 95m south Glanllyn-chaf former lead shaft approximately 230m northwest of Pentre Halkyn BVS.

Table 5 – Quarrying and mineral extraction Babell BVS-Cornist LaneBVS Summary

Feature	On-site	Within 250m
		Cornist Lane BVS - Two pits associated with sandstone extraction from the Windmill site approximately 165m southwest and Cornist Ganol site located approximately 190m southwest of Cornist Lane BVS.
Surface Ground Workings	Babell BVS - 'Old quarry' shown in southwest of site on earliest historical mapping from 1870, after 1870 mapping it is no longer labelled. No other surface ground workings recorded within Newbuild Infrastructure Boundary of any of the other BVS sites.	One unspecified quarry identified approximately 160m southeast of the Babell BVS and numerous unspecified pits/heaps identified within 250m. Former quarry 348m northwest. Numerous ponds, clay pots and unspecified pits, workings and heaps identified within 250m of Pentre Halkyn BVS. There is an unnamed quarry operated by CCP aggregates located 1.1km east, Halkyn Quarry operated by Cemex is 1.4km southeast. Cuttings, ponds and unspecified quarries/pits have also been identified within 250m of Cornist Lane BVS.
Underground Workings	None recorded within Newbuild Infrastructure Boundary of any of the BVS sites.	Two unspecified old shafts identified within 250m of Babell BVS, the closest of which is approximately 230m northwest. The Groundsure report indicates the northwest part of Babell BVS is within an area where localised small scale underground mining is possibly related to a former limestone quarry 348m northwest. Numerous old/disused unspecified and lead shafts identified within 250m of Pentre Halkyn BVS site. Closest recorded is the former lead working located 25m north (Brit Pit Section). Pentre Halkyn BVS is within an area where underground mining is known or likely within close proximity related to the Brit Pits mentioned above.

Feature	On-site	Within 250m
		None recorded within 250m of Cornist Lane BVS. Cornist Lane BVS is within an area where sporadic underground mining of a restricted extent is possible.
Mining Cavities	Mining Cavities None recorded within Newbuild Infrastructure Boundary of any of the BVS sites.	Bryn-Llwyn lead mine located approximately 190m southeast of Babell BVS has been identified as a mining cavity within 250m.
		Two cavities have been identified within 250m of Pentre Halkyn BVS (approximately 110m north and 190m northeast associated with the Gelli Fowler lead workings). None have been recorded within 250m of Cornist Lane BVS.

SENSITIVE LAND USES

The sites are not within an SSSI.

All sites are located within a SSSI Impact Risk Zone (**Appendix 11-1**, **Volume III**). These define zones around SSSIs which reflect the particular sensitivities of the features for which it is notified and indicate the types of development proposal which could have potentially adverse impacts. Certain types of development proposals including airports, farming units and incineration units require consultation however the development proposals for Babell BVS – Cornist Lane BVS do not fall under this requirement.

BGS AGGREGATE SAFEGUARDING MAPS

Extracts from BGS Aggregate Safeguarding Map are presented below (**Inserts 7 and 8**). Category 1 refers to resources considered nationally important, Category 2 refers to resources which are important for serving regional and local markets.

In summary:

- Babell BVS is within a BGS Category 1 sand and gravel safeguarding area and high specification aggregate carboniferous limestone safeguarding area.
- Pentre Halkyn BVS is within BGS Category 1 sand and gravel safeguarding area and high specification aggregate carboniferous limestone safeguarding area.

• Cornist Lane BVS is not within a BGS aggregate safeguarding area.



Insert 7 - Extract from BGS aggregate safeguarding map (Babell BVS and Pentre Halkyn BVS)

Insert 8 - Extract from BGS aggregate safeguarding map (Cornist Lane BVS)



MINERAL SAFEGUARDING AREAS (MSA)

Extracts from the Flintshire LDP proposals map showing the MSA are included below (**Inserts 9 and 10**) and a summary of MSA mapping is presented in **Table 6** below.

BVS	Adopted UDP (2011)	Emerging LDP (2019)
Babell BVS	Entire site within an MSA for glaciofluvial sand and gravel deposits and limestone bedrock on site.	Entire site within an MSA for glaciofluvial sand and gravel deposits and limestone bedrock on site.
Pentre Halkyn BVS	Entire site within an MSA for glaciofluvial sand and gravel deposits and limestone bedrock on site.	Entire site within an MSA for glaciofluvial sand and gravel deposits and limestone bedrock on site.
Cornist Lane BVS	Not within an MSA.	Not within an MSA.

Table 6 – Summary of MSA mapping

It should be noted that as Cornist Lane BVS is not within an MSA and no mineral resources are identified on site, it has not been considered further in the Mineral Resource Assessment sections of this report.

Insert 9 - Extract from LDP proposals map (Babell BVS and Pentre Halkyn BVS)





Insert 10 - Extract from Flintshire LDP proposals map (Cornist Lane BVS)

1.2. MINERAL RESOURCE ASSESSMENT – BABELL BVS

MINERAL RESOURCES IDENTIFIED

The mineral resources identified are Glaciofluvial Deposits (sand and gravels) in part of the northwest half of site, and Limestone (Cefn Mawr Limestone Formation) underlying the entire site. The whole site is within a MSA.

COMMERCIAL VIABILITY

Resource requirement

The LDP states that a minimum 10 year land bank of crushed rock and minimum 7 year land bank of sand and gravel to be maintained throughout the LDP period (**Ref. 3**). Where a land bank can provide for over 20 years of extraction, new allocations will not be necessary and proposals for further extractions should not be permitted apart from in exceptional circumstances (MTAN 1: Aggregates (**Ref. 5**)).

The Flintshire existing land bank for crushed rock is 14.3 years, and for land-won sand and gravel aggregates is 6.1 years (**Ref. 18**).

Extent and viability of resource on site

The sands and gravels are only present in the northwest half of the site (approximately 40% of the total site area, 1.2ha), as indicated on geological mapping and mineral resource maps.

Ground investigation data (**Appendix 11-5, Volume III**) recorded sand and gravels in the northwest half of site from (location LB_21_311_TP) from 0.30 – 2.00 (maximum depth unproven), no other ground investigation data is available within the sand and gravels. Investigation in the southeast half of site did not record sand and gravels.

The depth of superficial overburden is unknown overlying the limestone (greater than 2.3m thickness, bedrock unproven in trial pits).

The existing pipeline already cuts across the site and the maintenance strip easement of the existing pipeline is 30m in width embracing the pipeline, as marked up on **Insert 11** below. Once the Block Valves are installed, the Newbuild Carbon Dioxide Pipeline (and assumed Block Valves) are assumed to have a similar easement. In addition, access improvement works will take place to the farm track cutting across site.

Insert 11 below shows the area of site already sterilised by the Newbuild Carbon Dioxide Pipeline and easement, and additional area that would be sterilised by the DCO Proposed Development.



Insert 11 Babell BVS estimated existing and additional area sterilised

1.2.1. Error! Reference source not found.**7** shows the calculations of; area of mineral resource on site, area of mineral resource already sterilised by pipeline and easement, and additional area of mineral resource that would be sterilised by DCO Proposed Development, based on **Insert 11** above.

Mineral Resource	Total area of mineral resource on site	Area already sterilised by pipeline and easement	Total existing unsterilised area of mineral resource	Additional area that would be sterilised by proposed development
Sand and gravel	1.2ha (40% of site area)	0.29ha (24% of total resource area)	0.91ha (30% of total site area)	0.16ha (13% of total resource area)
Limestone	3.0ha (100% of site area)	0.8ha (26% of total resource area)	2.2ha (74% of total site area)	0.63ha (21% of total resource area)

Table 7 Babell BVS areas sterilised

No particle size distribution data for Babell BVS has been provided as part of the Geoenvironmental Ground Investigation (**Appendix 11-5, Volume III**) to allow assessment of the quality of the sand and gravel resource.

GROUNDWATER

Groundwater was not encountered within the trial pits on site (**Appendix 11-5**, **Volume III**).

PRIOR AND INCIDENTAL EXTRACTION

Prior extraction

The LDP policy EN23 (**Ref. 3**) states that proposals for non-mineral development on sites of 4ha or more in size underlain by Category 1 sand and gravel deposits shall be supported by a prior extraction assessment. The site is 3.0ha in size and therefore would not warrant a prior extraction assessment. Furthermore, due to the limited size of existing unsterilised sand and gravel (0.91ha, or 30% of site area) and limestone (2.2ha, or 74%) mineral deposits on site, prior extraction would not be feasible.

Incidental Extraction

The DCO Proposed Development as indicated on **Figure 11.3.5**, **Annex A** and **Insert 11** above shows the Block Valve Station would be located in the east of the site with road improvement to the existing road cutting across site. This means that excavation within the sand and gravel resource would only take place in the northwest part of site for construction of the road. Incidental extraction would be feasible and materials reused in the DCO Proposed Development if possible. If sand and gravel deposits are encountered during excavation of the Block Valve, then stockpiling and reuse would be feasible.

POLICY SUMMARY

A summary assessing the relevant mineral planning policy in relation to Babell BVS is presented in **Table 8** below.

Policy	Policy detail		Comments
		a) The mineral underlying the site does not merit extraction	The current land-won sand and gravel land bank for Flintshire is 6.1 years (a 7 year land bank is to be maintained throughout the LDP period).
			The site is within an MSA. No data on the quality of mineral resource is available.
EN23: Minerals Safeguarding (LDP)	Non-mineral development within Mineral Safeguarding Areas as defined on the proposals map will only be permitted where it can be demonstrated that:		Due to the small size of the site (3.0ha) and distribution of sand and gravel across parts of the site only (unsterilised sand and gravel across 30% of the total site area only), the mineral resource is unlikely to merit extraction. In terms of the crushed rock aggregate mineral resource, there is a sufficient land bank of crushed rock across Flintshire. Furthermore there is already sterilisation of 26% of the limestone resource on site, therefore the resource is unlikely to merit extraction.
		b) The need for the non-mineral development outweighs the need to protect the resource	The HyNet Northwest Project is a nationally significant infrastructure project.

Table 8 – Babell BVS summary with mineral policy

Policy	Policy detail		Comments
		c) The mineral can be satisfactorily extracted prior to non-mineral development	Due to existing infrastructure sterilising of much of the mineral resources, along with the small size of the site, and distribution of sand and gravels parts of the site only, prior extraction is unlikely to be feasible. Incidental extraction of small amounts of sand and gravel deposits for use in the proposed development would be feasible.
		d) The development is of temporary nature or can be removed within the timescales within which the mineral is likely to be needed	Not applicable, development not temporary.
		e) essential infrastructure that supports the supply of minerals would not be compromised or would be provided elsewhere	Essential infrastructure related to the supply of minerals would not be compromised by the development.
MIN8 Protection of Mineral Interests (UDP)	Any non-mineral of MSA will be require reasonable justific or restriction of mi	development within a red to demonstrate cation for sterilisation ineral resources.	Justification outlined in this section of report.

1.3. MINERAL RESOURCE ASSESSMENT - PENTRE HALKYN BVS

MINERAL RESOURCES IDENTIFIED

There are Glaciofluvial Deposits (sand and gravels) in the north of the Newbuild Infrastructure Boundary, and High Purity Limestone (Loggerheads Limestone Formation) underlying the entire site. The whole site is within an MSA.

COMMERCIAL VIABILITY

Resource requirement

The LDP states that a minimum 10 year land bank of crushed rock and minimum 7 year land bank of sand and gravel to be maintained throughout the LDP period (**Ref. 3**). Where a land bank can provide for over 20 years of extraction, new allocations will not be necessary and proposals for further extractions should not be permitted apart from in exceptional circumstances (MTAN 1: Aggregates (**Ref. 5**)).

The Flintshire existing land bank for crushed rock is 14.3 years, and for land-won sand and gravel aggregates is 6.1 years (**Ref. 18**).

EXTENT AND VIABILITY OF RESOURCE ON SITE

The sands and gravels are present in the northwest of the site and southeast corner, as indicated by geological mapping and mineral resource maps. Ground investigation data (**Appendix 11-5, Volume III**) in the northwest of site recorded sand from 0.30 to 1.90 (maximum depth unproven), no other ground investigation data is available within the sand and gravels. No ground investigation was completed in the south of site. The depth of superficial overburden is unknown overlying the limestone (greater than 2.1m thickness, bedrock unproven in trial pits).

The existing pipeline already cuts across the site and the maintenance strip easement of the existing pipeline is 30m in width embracing the pipeline, as marked up on **Insert 12** below. Once the Block Valves are installed, the pipeline (and assumed Block Valves) are assumed to have a similar easement.

Insert 12 below shows the area of site already sterilised by the pipeline and easement, and additional area that would be sterilised by the DCO Proposed Development.



Insert 12 – Pentre Halkyn BVS estimated existing and additional area sterilised

Table 9 below shows the calculations of; area of mineral resource on site, area of mineral resource already sterilised by pipeline and easement, and additional area of mineral resource that would be sterilised by DCO Proposed Development, based on **Insert 12** above.

Mineral Resource	Total area of mineral resource on site	Area already sterilised by pipeline and easement	Total existing unsterilised area of mineral resource	Additional area that would be sterilised by DCO Proposed Development
Sand and gravel	0.61ha (20% of site area)	0.14ha (22% of total resource area)	0.47ha (14% of total site area)	0.27ha (44% of total resource area)
Limestone	3.18ha (100% of site area)	0.56ha (17% of total resource area)	2.62 (82% of total site area)	0.42ha (13% of total resource area)

Table 9 – Pentre Halkyn BVS areas sterilised

QUALITY OF RESOURCE

Data from the borehole log (**Annex J** log LB_21_306_TP) within the sand and gravel has been assessed regarding the quality of the mineral resource.

A particle size distribution test has been carried out at 1.3m bgl, the test is included in Error! Reference source not found.. The mineral component proportion of Fines <0.063mm is 9.3%. The depth of overburden (topsoil) is 0.3m thickness. The proven thickness of deposit is a minimum of 1.6m thickness, however the trial pit was terminated therefore the deposit thickness was not proven.

The following BGS technical paper (**Ref. 14**) on classification of mineral deposits includes suggested categorisation according to a number of key features including thickness of deposit and ratio of deposit to overburden thickness. Two categories have been devised: Category A which is more favourable, and Category B which includes deposits which are more difficult to work and / or may be less economically viable.

	Category A deposit key characteristics	Category B deposition key characteristics	it S	
Pentre Halkyn BVS Location: LB_21_306_TP	Minimum average 2m deposit thickness <i>Unproven, but likely</i>		Minimum average 2m deposit thickness <i>Unproven, but</i>	✓
Depth: 1.3m bgl	Ratio of overburden to mineral should not exceed 1:1	•	Ratio of verburden to mineral should not exceed 2:1	
	Proportion of fines should be <20%	•	Proportion of fines should be <40%	~
	Deposit should lie within 5m of the surface	~	Deposit should lie within 10m of the surface	~

Table 10 – Comparison to Category A and B deposit characteristics

Table 10 above indicates that the superficial sand and gravels may be a Category A deposit, however the minimum deposit thickness is unproven

GROUNDWATER

Groundwater was not encountered within the trial pits on site (**Appendix 11-5**, **Volume III**).

PRIOR AND INCIDENTAL EXTRACTION

Prior extraction

The LDP policy EN23 (**Ref. 3**) states that proposals for non-mineral development on sites of 4ha or more in size underlain by Category 1 sand and gravel deposits shall be supported by a prior extraction assessment. The site is 3.18ha in size and therefore would not warrant a prior extraction assessment. Furthermore, due to the limited size of existing unsterilised sand and gravel (0.47ha, or 14% of the total site area) and limestone (2.62ha, or 82% of the total site area) mineral deposits on site, prior extraction is unlikely to be feasible.

Incidental Extraction

1.3.1. The DCO Proposed Development as indicated on Figure 11.3.5 Sheet 3, Annex A shows the Block Valve Station would be in the north of site, and access road in the northwest. This means that excavation for the access road, and potentially the block valve, may take place within the glaciofluvial sand and gravel deposits, therefore incidental extraction would be feasible. This material could be stockpiled on site and reused in the proposed development where suitable.

SUMMARY

1.3.2. A summary assessing the relevant mineral planning policy in relation to Pentre Halkyn BVS is presented in below.

Policy	Policy detail		Comments
		a) The mineral underlying the site does not merit extraction	The current land-won sand and gravel land bank for Flintshire is 6.1 years (a 7 year land bank is to be maintained throughout the LDP period).
			The site is within an MSA. Based on the available PSD data the material would be classified as a Category A deposits which

Table 11 – Pentre Halkyn BVS summary with mineral policy

Policy	Policy detail		Comments
EN23: Minerals Safeguarding (LDP) Non-mineral development within Mineral Safeguarding Areas as defined on the proposals map will only be permitted where it can be demonstrated that:		are more favourable for mineral working. However, due to the small size of the site (3.18ha) and distribution of sand and gravel across parts of the site only and existing sterilisation (unsterilised sand and gravel deposits only cover 0.47ha, or 14% of total site area), the mineral resource is unlikely to merit extraction. In terms of the limestone crushed rock mineral resource, there is a sufficient land bank of crushed rock across Flintshire. Furthermore there is existing sterilisation of 17% of the limestone resource, therefore the resource on site is unlikely to merit extraction.	
		b) The need for the non-mineral development outweighs the need to protect the resource	The HyNet Northwest Project is a nationally significant infrastructure project.
		c) The mineral can be satisfactorily extracted prior to non-mineral development	Due to existing infrastructure sterilising much of the mineral resources, the small size of the site, and distribution of sand and gravels in a small part of the site only, prior extraction is unlikely to be feasible.

Policy	Policy detail		Comments
			Incidental extraction of small amounts of sand and gravel deposits for use in the proposed development would be feasible.
		d) The development is of temporary nature or can be removed within the timescales within which the mineral is likely to be needed	Not applicable, development not temporary.
		e) essential infrastructure that supports the supply of minerals would not be compromised or would be provided elsewhere	Essential infrastructure related to the supply of minerals would not be compromised.
MIN8 Protection of Mineral Interests (UDP)	Any non-miner within a MSA w demonstrate re justification for restriction of m	al development vill be required to asonable sterilisation or ineral resources.	Justification outlined in this section of report.

1.4. CONCLUSIONS

The conclusions of the mineral resource assessment are outlined in **Table 12**.
Table 12 - Conclusions

Site	Summary of mineral resources	Conclusions
Babell BVS	Sand and gravel resource across part of site and limestone mineral resources identified across entire site; and the site is within an	The potential for working the sand and gravel mineral resource is limited by the presence of sand and gravel across a small part of the site only and sterilisation from existing pipeline (existing unsterilised sand and gravel deposits only cover 0.91ha, or 30% of total site area), and significance of non-mineral development.
	of sand and gravel is unproven.	Incidental extraction of sand and gravel and reuse within the Newbuild Infrastructure Boundary is considered feasible during groundworks.
		The potential for working the limestone mineral resource is limited by the existing pipeline which sterilises 26% of the site area; combined with the small size of site, and sufficient land bank of crushed rock resource in Flintshire.
Pentre Halkyn BVS	Sand and gravel resource across part of site and limestone mineral resources identified across entire site; and the site is within an	The potential for working the sand and gravel mineral resource is limited by the presence of sand and gravel across a small part of the site only and sterilisation from existing pipeline (existing unsterilised sand and gravel deposits only cover 0.47ha, or 14% of total site area), and significance of non-mineral development.
	MSA. Thicknesses of sand and gravel is unproven.	Incidental extraction of sand and gravel and reuse within the Newbuild Infrastructure Boundary is considered feasible during groundworks.
		The potential for working the limestone mineral resource is limited by the existing pipeline which sterilises 17% of the site area; combined with the small size of site, and sufficient land bank of crushed rock resource in Flintshire.
Cornist Lane BVS	No mineral resource identified and not within an MSA.	Not considered further.



EXPLORATORY HOLE LOG

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0.20 - 0.30	D	2						:	and medium.		0.30)	9 60		
0.50 - 0.90	В	3						-	[TOPSOIL] [CLAY] Stiff light brown mottled orange sandy gravelly CLA	Y .	0.55	3.00		
0.50	TCon	Ŭ	1.71 W/m.K					-	Sand is fine and medium. Gravel is subangular and	" ,				
0.50 0.80 - 0.90	TCon ES	4	1.82 W/m.K					-	subrounded fine and medium of mixed lithologies	(0.90)			
0.80	PID	5	0.1 ppm					1-	[GLACIAL TILL DEPOSITS] [CLAY]					
1.20 - 1.50	B	7			+		-	-	Stiff light brown mottled orange sandy gravelly CLA	Y. ,	1.20	8.70		
1.20 - 1.05 1.20 - 1.65	SPT	6	N = 23 (S)	100	N/A	N/A		_	Sand is fine and medium. Gravel is subangular and	(0.30)	8 40		
1.20 - 1.50	В	8		Γ	T	Γ	1		subrounded fine and medium of mixed lithologies including sandstone, mudstone and flint.	Λ	1.00	0.40		
1.50	TCon	Ŭ	0.76 W/m.K					-		_/				
1.50	TCon		3.65 W/m.K					2 -	Light brownish red slightly clayey SAND. Sand is tin	ie				
2.20 - 2.25	D	9		100	N/A	N/A		-	[GLACIAL TILL DEPOSITS] [SAND]					
2.25 - 3.00 1.50 - 3.00	Ь	10						_	-	(1.85)			
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- 3.00 - 3.45	D	11	50/045 mm (P)	-	+		-	3 -	3.00m to 3.35m; very dense. Assumed zone of core loss.					
3.00 - 3.40 3.00 - 3.50	581		50/245 mm (ə)	30	N/A	N/A		-			_ [
3.35 - 3.50	В	12						-	Firm reddish brown slightly gravelly sandy CLAY.		3.35 0.15)	6.55 6.40		
					\square			1 -	Sand is fine to medium. Gravel is subangular and		3.50	0.40		
									GLACIAL TILL DEPOSITS] [CLAY]	1				
3.50 - 4.35							NK	4	ASSUMED ZONE OF CORE LOSS.	- (0.85)			
3.50 - 5.00				43	17	17		-						
4.35 - 4.50							NI		Very weak reddish brown fine and medium grained		4.35	5.55		
4.50 - 4.57 4 57 - 4.76							-	1 -	micaceous SANDSTONE. Bedding fractures are 0					
4.76 - 4.94	с	13					70	-	degrees, possibly very closely spaced (10/40/400), planar, rough, tight with black speckling, locally oper	n			:::::	
476 540				\vdash	–	<u> </u>	NI 15	5 —	infilled (<1mm) with very soft sandy clay. Partially	(1 40)			
5.19 - 5.28	с	14					-	-	weathered. ICHESTER FORMATION]	ì	,			
5 40 - 5.51							430 NI		4.35m to 4.50m; non intact. Recovered as angular to					
5.51 - 5.75							25	1 -	 subrounded fragments (<10mm x 30mm x 30mm) or very weak reddish brown sandstone. 					
5.00 - 6.50				50	37	24	30	-	4.57m to 4.76m; non intact. Recovered as angular to subrounded fragments (<5mm x 25mm x 35mm) of very		5.75	4.15		
							55	6 -	weak reddish brown sandstone.					
5.75 - 6.50							NR	-	5.29m to 5.40m; joint 90 degrees planar, rough, open,	(0.75)			
								-	5.40m to 5.51m; non intact. Recovered as slightly clayey					
								1 -	sandy gravel. Sand is fine and medium. Gravel is angular to subrounded fine and medium of extremely weak		6.50	3.40	: : : : :	
6.71 - 6.84 6.50 - 7.11	С	15					60	-	reddish brown sandstone. Possibly moderately					
							75 265	7 -	5.51m to 5.62m; joint 90 degrees planar, rough, open,		1 12)			
7.20 - 7.62	в	16		75	41	37	200	1 -	infilled (<1mm) with very soft reddish brown sandy clay.	(1.12)		:::::	
6.50 - 8.00 7.11 - 7.62					··		NA	-	5.66m to 5.75m; non intact. Recovered as angular and subangular fragments (<10mm x 25mm x 40mm) of very					
									weak reddish brown sandstone with occasional soft clay.		7.62	2.28		
7.00 0.45									ASSUMED ZONE OF CORE LOSS.		0			
7.62 - 8.15					—	<u> </u>	NK	8	Very weak reddish brown fine and medium grained	" "	0.53)			
									micaceous SANDSTONE. Bedding fractures are 0		8.15	1.75		
8.15 - 8.53							NI		tight with black speckling. Partially weathered.				::::	
							-	-	[CHESTER FORMATION]					
8.00 - 9.50				90	65	48			black speckling.	- (1.05)		:::::	
8.78 - 8.98 - 8.53 - 9.20		17					60 70	9 —	6.95m to 7.10m; light grey. 7.11m to 7.62m; medium bed of gravelly sand. Sand is					
							205		fine and medium. Gravel is angular to subrounded fine	- -	9.20	0.70		
									sandstone. Possibly moderately weathered.			-		
9.55 - 9.77	с	18				-	1	-	INO RECOVERYI				:::::	
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9.50 - 11.00 -		Ī		71	67	56			degrees, closely spaced (60/70/205), planar, rough, tight with black speckling or micaceous on fracture surface. Partially weathered. [CHESTER FORMATION]					
- - 10.56 - 11.00 - -							NR	- 11 -	subangular fragments (<10mm x 25mm x 60mm) of very weak and weak sandstone. 8.60m to 9.10m; rare light grey reduction spots (<10mm x 25mm).	(3	J.50)			
11.61 - 11.79 11.00 - 12.35 11.00 - 12.50	С	19		100	88	73	40 130 290		Very weak and weak reddish brown tine and meutur grained micaceous SANDSTONE with rare voids (<2mm). Bedding fractures are 0-20 degrees, predominantly closely spaced (40/130/290), planar and undulating, rough, very tight and clean. Partially weathered. [CHESTER FORMATION] 9.75m to 9.78m; joint 45 degrees, undulating, rough, very tight and clean.	n /				
12.35 - 12.50 12.50 - 12.70				\vdash		+			fragments (<5mm x 10mm x 15mm) of very weak		ļ		:::: ?	
- 12.50 - 12.70 -							INFX		sandstone. 9.78m to 9.83m; joint 45 degrees, undulating, rough, very	12	2.70	-2.80	<u> :::</u> ,	
- - - - 12.50 - 14.00 - 13.48 - 13.61	с	20		87	87	79		13 -	tight and clean. 10.31m to 10.33m; joint 45 degrees, undulating, rough, very tight and clean. 11.95m to 12.10m; extremely weak to very weak. 12.14m to 12.20m; light grey. 12.19m to 12.22m; non intact. Recovered as angular fragments (<10mm x 10mm x 80mm) of very weak					
								-	sandstone. 12.35m to 12.50m; non intact. Recovered as angular and subangular fragments (<10mm x 30mm x 80mm) of very					
12.70 - 15.45 14.00 - 15.50 14.87 - 15.13	С	21		97	97	94	45 255 505	14 — - - - - - - - - - - - - - - - - - - -	weak sandstorie. 12.50m to 12.70m; assumed zone of core loss. Very weak and weak, locally extremely weak reddis' brown fine and medium grained micaceous SANDSTONE with rare voids (<2mm). Bedding fractures are 0-20 degrees, closely and medium spaced (25/230/605), planar, rarely undulating, rough, very tight and clean or tight and micaceous, locally moderately wide infilled (<3mm) with soft reddish brown clay. Partially weathered.	h				· · · · · ·
- - - 15 45 - 15.80				\vdash		-		-	[CHESTER FORMATION] 12.70m to 12.78m; non intact (assumed drilling induced). Recovered as angular to subrounded fragments (<20mm)	(5.	.58)			
-							1	16 -	x 35mm x 55mm) of weak sandstone. 13.58m to 13.61m; very thin bed of light grey weak sandstone. 14.00m to 14.30m; rare lenses (<10mm x 80mm) of light grey weak sandstone.					
15.50 - 17.00 - 16.65 - 16.94	с	22		80	80	69		-	upper location 14.50m to 14.65m; thinly laminated. Laminae are extremely closely spaced of dark reddish brown mudstone. 15.45m to 15.80m; assumed zone of core loss.					•
								. 17 –	15.97m to 16.15m; 4 No. very closely spaced thin laminae of grey sandstone. 16.25m to 16.60m; thinly laminated. Laminae are		ļ			:
15.80 - 18.∠o - 17.21 - 17.37 -	с	23			T		65 175 605	-	extremely closely and very closely spaced of very weak dark reddish brown mudstone. At 16.51m; subangular nodule (10mm x 20mm) of very weak reddish brown mudstone.		ļ			
_ _ 17.00 - 18.50 				97	88	74		- - - 18 -	 At 17.12m; subangular module (comm x 20mm), s. c., weak reddish brown mudstone. 17.18m to 17.21m; light grey. 17.30m to 17.45m; extremely weak to very weak. At 17.46m; 3 No. nodules (<10mm x 10mm) of very weak 		ļ			
. 18.17 - 18.31	с	24					\vdash		dark reddish brown mudstone. 17.56m to 17.62m; non intact. Recovered sandy gravel. Sand is fine and medium. Gravel is angular fine to coarse	18	3.28	-8.38		
_ 18.28 - 18.85 -					+		10 70	-	of extremely weak sandstone. 17.65m to 17.90m; thinly laminated. Laminae are black and dark reddish brown extremely closely and very	(0.	.57)			· · ·
19.05 - 19.23 18.50 - 20.00 18.85 - 20.00	С	25		100	96	79	10 50 360	19	closely spaced. 17.87m to 17.90m; very thin bed of light grey weak sandstone. 17.90m to 17.97m; non intact. Recovered as angular fragments (<2mm x 10mm x 10mm) of extremely weak dark reddish brown mudstone and sandstone with occasional very soft clay. 17.90m to 18.17m; interbedded very weak grey sandstone and extremely weak dark reddish brown mudstone.	(1.	.85 .15)	-8.95		· · · · · ·
								'	Continued next page			10.10	<u> </u>	
Notes - Abbreviations	and	resulf	ts data defined on 'N	Votes	on Ex	plorat	ory Po	osition	ı Records'					

Template: FGSL/HBSI/FGSL Rotary If.hbt/Config Fugro Rev5/23/12/2019/TS+AW

21/04/2022

Print Date

		С	Contract Name	LBA CCS Transport and Storage Project Ground Investigations										
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		F	ugro Reference	F	1900	89								
•		С	coordinates (m)	E	3445	13.07	7 N37	4742	.05 Ground Elevation (m Datum) 9.90	She	et 3 of 3	3		
		H	lole Type	S	Sonic	Core	Drilli	ng to	Rotary Coring	Stat	tus	Dr	aft	
Depth	Sa	mpli	ng and In Situ Testing	Со	ore Re	ecove	ery		Strata Details					Backfill /
(m)	Туре	No.	Test Results	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions		Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
Notes								21	Extremely weak and very weak yellowish grey fine and medium grained SANDSTONE. Bedding fractures are 5 degrees, predominantly closely spaced (10/70/200), planar, rough, tight with black speckling, locally open infilled (<1mm) with very sof clay. Partially weathered. [CHESTER FORMATION] 18.45m to 18.50m; assumed zone of core loss. 18.75m to 18.75m; non intact. Recovered as angular fragments (<10mm x 10mm x 20mm) of very weak and extremely weak sandstone. Very weak reddish brown fine and medium grained micaceous SANDSTONE. Bedding fractures are 0- degrees, predominantly very closely spaced (10/50/360), planar, rough, very tight and clean. Partially weathered. [CHESTER FORMATION] 19.00m to 19.11m; joint 45 degrees, planar, rough, tight with clay veneer. End of Borehole at 20.00 m	t 5				
- Abbreviations	and re	esulte	s data defined on 'N	otes	on Exi	olorate	orv Pr	sition	Records'					
eviduui)S פועערי		Jouit	שמומ עכוווופע טון N	0162		501 at(JIY FC	JonuOII	TCOOLDS					
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		Contrac	ct Name		LBA CC	3 Transpo	ort and S	torage Project Ground Investigations	Locatio	on ID			
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		Fugro F	Reference	e	F190089	,			 -		—`	·	
•		Coordir	nates (m))	E344513	.07 N374	742.05	Ground Elevation (m Datum) 9.90	Sheet	1 of 3			
		Hole Ty	/pe		Disconti	nuity Log			Status		D	raft	
					I	Discontinu	uity Deta	ils			Dis In	contir forma	nuity tion
Depth (m)	Туре	Dip (°)	Aperture (mm)	Apertu Observa	ation Roughr	m Small Sca Roughne	ale Set ss Referen	_{ce} Remarks		Dep (m	pth Dis n)	continuity Log	Legend
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3.50 - 4.35	NR							Assumed zone of core loss.			_		
											-		
											-		
										4	1-		
											-		
4.35 - 4.50	NI							Non intact.			_	I	
4.57 - 4.76	NI							Non intact.				T	
												I	
										5	5-		
5.19	BF	0		Т	PI	Ro		Micaceous.			ł	- 0 °	<u> </u> ::::::
5.36	BF	0		Ť	PI	Ro		Black speckling.			F	: 0° 0°	
5.40 5.40 - 5.51	BF NI	0				RU De		Black speckling. Non intact, possibly moderately weathered.				90° 0°	
5.51 - 5.02 5.59	BF	0 90			PI	Ro		Infilled (<1mm) with very sort sanuy day. Black speckling.			-	o° 9	
5.62 5.64	B⊦ BF	0		Τ	PI PI	Ro Ro		Black speckling. Black speckling.		e	3 —		
5.66 - 5.75 5.75 - 6.50	NI NR							Non intact. Assumed zone of core loss.			-		
											-		
													:::::
6.71 6.84 - 7.11	BF J	0 90		Т	PI PI	Ro Ro		Black speckling. Black speckling.			t	- 0° 90°	
7.05	BF	0		Ι _τ	PI	Ro		Black speckling		7	1	- 0. ~	
7.11	BF	ŏ		Ť	PI	Ro		Black specking.			1	- ŏ. — `	1:::::
1.11 - 1.02								INA, graveny sanu.			-		
7.62 - 8.15	NR							Assumed zone of core loss.			-		:::::
1.02 2.													
										8	8		
8.15 - 8.53	NI							Non intact.					<u> </u>
8.60	BF	0		Т	PI	Ro		Black speckling.			1	- 0° —	
8.78	BF	0		т	PI	Ro		Micaceous.				- 0°	
8.98 - 8.99	BF	5		т	PI	Ro		Micaceous.		ç	<u> </u>	- 5° —	
9.04 - 9.05	BF	5		Т	PI PI	Ro		Micaceous.		-	Έ	· 5 ·	
9.25 - 9.26	BF	5		VT T	PI	Ro		Clean.			F	5°.	
9.30 - 9.32 9.34	BF	0		VT	PI	Ro		Black speckling. Clean.			-	0 °	
9.75 - 9.78	J	45		VT	Un	Ro		Clean.]_	- 45 °	_:::::::::::::::::::::::::::::::::::::
9.77 - 9.83 9.83 - 10.26	NI J	90		т	PI	Ro		Non intact. Black speckling.			\geq	- ⁹⁰ ° —	
9.91	BF	0		Т	PI	Ro		Black speckling.				`	
Notes													
- Abbreviations	and res	ults data c	Jefined on	۱ 'Notes	s on Explo	ratory Pos	ition Rec	ords'					
Template: ECSI /HE		iscontinuity h	ht/Config Eu	aro Rev5	/18/02/2019/	(S			Print Date		21	04/2022	

		Contrac	ct Name		LBA CCS 1	Fransport	t and Sto	brage Project Ground Investigations	Location	ID		
-fig		Client		\rightarrow	 Fni UK Lin	nited				71	∩2	RH
		Fuero F	Referenc		F190089	Incu			⊣Ľ Ľ_ ′	_۲_	_02_	
V		Coordir	nates (m)	<u>,</u>	F344513.0	7 N3747	42 05	Ground Elevation (m Datum) 9.90	− Sheet 2 c	of 3		I
			/ne	<u></u>	Discontinu	ity Log	42.00		Status	<u> </u>	Draft	
		11010 . ,	<u>po</u>	<u>1</u>	Discontinue	scontinuit	ty Details	s	Olalas		Discontir	uity
Depth	Туре	Dip	Aperture (mm)	Apertu Observa	Ire Scale	Small Scale Roughness	Set	Remarks		Depth (m)	Discontinuity Log	Legend
10.12	BF	0		VT	PI	Ro		Clean.				
10.31 - 10.33 10.36 - 10.37 10.56 - 11.00	J BF NR	45 5		VT VT	Un Pl	Ro Ro		Clean. Clean. Assumed zone of core loss.		-	45° 	
11.27 - 11.31 11.41 - 11.43 11.61	BF BF BF	20 20 0		VT VT VT	PI PI PI	Ro Ro Ro		Clean. Clean. Clean,			20 ° 20 ° 0 °	
11.83 11.87 - 11.88 11.96 - 11.97 12.00 - 12.01 12.06 - 12.07 12.11 - 12.14 12.19 - 12.22 12.35 - 12.50	BF BF BF BF NI NI	0 5 5 10 20		マイ マイ マイ マイ マイ マイ マイ マイ	Un Pl Un Un Un Un	Ro Ro Ro Ro Ro		Clean. Clean. Clean. Clean. Clean. Clean. Non intact.		12 -	- - - - - - - - - - - - - - - - - - -	
13.16 13.23 - 13.24	BF	0			PI	Ro Ro		Assumed zone of core loss. Clean. Clean		13 -	- I 	
13.37 - 13.38 13.48 13.61	BF BF BF	10 0 0		VT VT VT	Un Pl Pl	Ro Ro Ro		Clean. Clean. Clean.		-		
13.94 - 13.95	B⊦	5		MVv	PI	Ro		Infilled (<3mm) with soft reddish brown clay.		14 -	5° —	
14.32 - 14.33	BF	5		VT	PI	Ro		Clean.		-		
14.83 14.87 - 14.88 15.13 15.45 - 15.80	BF BF BF	05		VT VT VT	PI Un PI	Ro Ro Ro		Clean. Clean. Assumed zone of core loss.		15 -	0°	
15.97 - 15.98 16.20 - 16.21 16.26 - 16.28 16 33 - 16.35	BF BF BF BF	15 5 20 20		VT	PI PI PI PI	Ro Ro Ro Ro		Clean. Micaceous. Micaceous.		16 -		
16.94 - 16.95	BF	5		VT	Un	Ro		Clean.		17 -	- - - - - - - -	
17.46 - 17.47 17.56 - 17.62 17.73 - 17.74 17.90 - 17.97	BF NI BF NI	5		vт 0	PI	Ro Ro		Clean. Non intact. Infilled (<1mm) with clayey sand. Non intact.		- 18 -		
18.31 - 18.32 18.40 - 18.41 18.45 - 18.50 18.56 - 18.57 18.75 - 18.78 18.81 - 18.84	BF BF NR BF NI NI	555		T O	PI PI PI	Ro Ro		Black speckling. Black speckling. Assumed zone of core loss. Infilled (<1mm) with very soft clay. Non intact. Non intact.		-		
18.93 18.94 18.95 19.00 19.00 - 19.11 19.05 19.07 19.23 - 19.24 19.59 - 19.60 19.55 - 19.60 19.70 19.74	BF BF BF BF BF BF BF BF BF BF	0 0 45 0 5 5 5 0 0		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PI PI PI PI PI PI PI PI PI PI PI	Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro Ro		Clean. Clean. Clean. Clay veneer. Clean. Clean. Clean. Clean. Clean. Clean. Clean. Clean.		-		
Notes - Abbreviations	and resu	ults data d	Jefined on	I 'Notes	on Explorat	tory Positi	on Record	ds'				

		Contrac	t Name	L	LBA CCS T	BA CCS Transport and Storage Project Ground Investigations								
-Fue	RO	Client		E	Eni UK Lim	ited				1	02	RH		
		Fuaro R	eference	e F	F190089					·	.02_	ןייט.		
•		Coordin	ates (m)	E	E344513.0 ⁻	7 N37474	42.05	Ground Elevation (m Datum) 9.90	Sheet 3 of	3				
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					Dis	continuit	y Details	i			Discontin Informat	uity ion		
Depth (m)	Туре	Dip	Aperture (mm)	Aperture Observati	e Medium ion Roughness	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend		
19.77	BF	0	. ,	VT	Pl	Ro		Clean.		_				
(m) 19.77 19.82 19.87 - 19.88	Iype BF BF BF				ion Scale Roughness PI PI PI PI	Roughness Ro Ro Ro Ro	Reference	Clean. Clean. Clean.		21 21 21 22 23 23 23 23 23 23 23 23 23		Legend		
NI-4-														
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4.00

5.00

6.00

7.50

ALLIED EXPLORATION & GEOTECHNICS LTD Status:-FINAL BOREHOLE RECORD Date:- 07/03/96 BOREHOLE No NMCS2 Communications System In Cheshire - MS2 Cantilever Sites - M56 Client: Location: 55 44550 53/7 +60B BH-03 73445 The Highways Agency 14 JSU 1 Method & Equipment: Ground Level (m(AOD)): Date: Sheet: Cable Percussion using a Pilcon Wavfarer 1500 7.64 18-12-95 1 of 2 SAMPLES & TESTS STRATA ŝ Depth Туре No Test educed Hat Depth DESCRIPTION (Thickaend Result Level ness) (1) TOPSOIL. (0.30)7.34 n MADE GROUND (Yellow brown and grey brown silty fine to medium sand. Occasional rootlets). (1.20)0.80-1.20 **B1** 1.50-1.95 N5 Soft occasionally thinly laminated brown CLAY with occasional lenses SJ2 (0.50) 1.51-1.90 B3 of orange brown coarse sand. 5.64 2.00 (Glacio-lacustrine) Firm to stiff brown sandy CLAY with some gravel. Gravel is fine to medium subangular to subrounded and consists of sandstone and basalt. 2.50-2.95 U4 (67) (Glacial Till) JŞ 3.01-3.40 B6 3.50-3.95 U7 (55) J8 4.01-4.40 **B**9 (60) 4.50-4.95 U10 (5.30)J11 5.10-5.50 B12 Secloaical Survey 5.50-5.95 (70) U13 J14 6.40-6.80 B15 7.00-7.45 U16 (100)0.34 (0.20) 7.30-7.60 B18 Red brown slightly clayey fine to medium SAND with occasional pockets and bands of soft thinly laminated clay. (Fluvio-glacial) 0.14 J17 50 for 7.60-7.90 SJ19 (As sheet 2 of 2) 56mm 7.61-7.90 a B20 001 т 347-1-- 4-1-1-1

j boli	ig ning	ress and	vvaler C	Joservau	ons (Chisellin	ıg	i vvater	Aqaeq	GENERAL
Date		Depth	Casing	Casing Dia	Water Depth	From	То	Hours	From	То	REMARKS
18.12.95 18.12.95 19.12.95 19.12.95		0.00 2.00 2.00 9.00	0.00 1.65 1.65 9.00	150mm 150mm 150mm	dry Geodry 8.30	7.90 8.30 8.50	8.20 8.50 8.80	0.75 0.50 1.00	7.30	9.00 British Geold	1) Description derived from driller's daily report. tal Surrey
All dime	ensions Scale 1	in metre :50	\$	For Expl Abbrev	anation of fations set	of Symbo ee Key S	ols and heets		d By:	Logg	ed By: Contract No. atimer 1568
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ate Printed: 08/03/96



ALLIED EXPLORATION & GEOTECHNICS LTD

69						ROK	EHOLE	: REC	ORD			Date:-	07/03	/9(
Project:	NMCS	2 Com	mun	ication	us Sveti	em in Cl	heshire - M	IS2 Car	ntilever Site	as - M56		BO	REHOLE	N
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Method & E	I NO auiomer	Highw nt:	ays /	Agency	y		53/7 +6				Date	Sheet		y
Cał	ble Per	cussion	ı uslı	ng a Pi	ilcon W	/ayfarer	1500		7.64		18-12-95	GIRAL	2 of 2	
SAMPLE	S& T	ESTS	Ĺ		,			STR/	ATA					ļ
Depth	Туре No	Test Result	Wati	Reduced Level	Legend	Depth (Thick- ness)			DESCF	RIPTIÓN				Thet
				-0.86	0,0 0,0	8.50	Very dens GRAVEL v and basal	e slightly vith some t.	medium to cobbles. G	coarse san ravel and	dy fine to co cobbles con	carse suit sist of sa	angular ndstone	ł
8.50-8.70	SJ21 822	50 for 53mm	[1	(0.50)	(Fluvio-gla	acial)			4	d allaht		K
8.90-9.00	C23	50 for		-1.36		9.00	weathered	SANDS	n medium gr TONE weak.	ained poo	rly cemente	a siignay	,	ļ
		47mm					Borehole	andstone complete) at 9.00m B0	ìL				Ί
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18.12.95		0.00		0.00	Dia	Depth	7.90	8,20	0.75	7.30	9.00	1) Decer	otion deri	
18.12.95		2.00	1	.65 1	50mm	dry	8.30	8.50	0.50		0.00	from dril	er's daily	re
19.12.95		2.00		1.65 1 9.00 1	50mm 50mm	0 dry 8,30	8.50	8.80	1.00		British Geoleg			
		0.00	`			0.00								
All dimer	nsions	in metr	es	F	or Exp	lanation	of Symbo	ols and	Ct	By:	Logge	ed By:	Contrac	at
S	cale 1:	50			Abbrev	riations	see Key S	heets			A. La	timer	156	8
Date Printed:	- 08/03/	/96											Form AE	G

	NATURE OF STRATA	Тніс	KNESS	De	PTH		
OF SURVEY USE ONLY) GEOLOGICAL CLASSIFICATION	If measurements start below ground surface, state how far	Feet	Inches 	Feet	Inches	NET	RES
British Genlonical St	Ritish Genlonical Survey		Britis	Genlonical 9	K Z		
	Sandy Top Soil	1.	6	1	6	046	0-46
AP	Brown Sand	2	0	3	6	0-61	1-07
1 16	Boulder Clay	2	0	5	6	6-61	1-68
	Brown Clay		0	12	6	2-13	3-8
	- Brown Sendy Clay & Pobbles	20-				6.25	10-01
	Sandstone	32		65	a	975	19-8
	Sandstone with Bands of Sandy Cla	y 11	0.0	1.75	a	33-53	53-3
British Genlonical St	Red Maril		0	1.79		1.22	54.51
	Séndatone	50	0	229	a	1-5-24	69.90
	Sandstone with Bands of Sandy Cla	17 3F	0	261	0	10-67	80.4
	Sandstone & Pebbles with Bands			61			
	of Shady Clay		0	208	0	10.86	90-83
1. 영화 문화	Sandstone with Bands of Sandy Cl	av Oh		200		1.32	98-15
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ALLIED EXPLORATION & GEOTECHNICS LTD Surten 1133

BOREHOLE RECORD

Status-FINAL Date: 07/03/96 BOREHOLE No F750 BH-02

Silvin.	The	Highwa	ays A	gency	,		54/6 +70	BZI	3832	4306C	554	75W	611-02	13:
Method & Ca	Equipme Ible Per	nt: rcussior	n usin	g a Pi	lcon W	/ayfarer	1500	Grou	und Level (m 7.18	(AOD)):	Date: 15-12-9	Sheet:	1 of 2	
SAMPL	ES & T	ESTS	5					STR/	ATA					ļ
Depth	Type No	Test Result	Hat B	educed Level	Legend	Depth (Thick- ness)	9 		DESC	RIPTION				Instr
						(1.10)	(1) MADE (ROUNE) (Topsoil ar	nd hardcor	e filt).			
1.10-1.50	81			6.08		<u> </u>	MADE GRO	UND (L	oose grey b	rown grave	ally medium	n to coarse	sand lav with	ł
1.50-1.95	CB2	N7					occasional to subroun	gravel. (ded and	Gravel is fine consists of	a to mediu sandstone	m occasion , limestone	ally coarse and basait	angular	P
2.00-2.40	B3					n Seologica	Occasional	rootiets).					
2.50-2.95	CB4	N25		4.48	×××	2.70	Medium de pockets of subangular	nse orai firm thin to roun	nge brown g ly laminated ded and cor	ravelly con I clay. Gran Isists of sa	arse SAND vel is fine to ndstone, b	with occasi o medium asalt and q	onal uartzite.	
3.50-3.95	CB5	N11			р 	(1.40)	(Fluvio-glad	sial)						
4.10-4.50	Bő			3.08		- 4.10	Stiff occasi	onally th	inly laminat	ed red bro	wn sandy (CLAY with		ł
4.50-4.95	07	(45)				(0.90)	coarse sand consists of	d. Grave sandsto	l is fine to m ne and basa	iedium sub ilt.	pangular to	subrounde	wn ed and	
5.00	JB			2.18		5.00 (0.50)	Firm thinly brown fine	aminate sand an	ed brown CL d silt.	AY with o	casional ti	iin laminae	of	ł
5.50-5.95	8J9	50 for 275mm		1.68	× Niji ×	5.50	(Glacio-lace Very dense (Fluvio-glace	red bron ial)	wn silty fine	SAND.	British Gaala	giral Sunay		
6.30-6.70	B10				× × × ×									
7.00-7.45	SJ11	50 for 210mm			× ×	_(3.00)								
7.80-8.10	B12													K
Borin	g Prog	ress and	d Wat	er Ob	servati	ions		hisellir	ng	Water	Added	GE	NERAL	
Date		Depth	Cas	ing (Casing Dia	Water Depth	From	То	Hours	From	To	RE	MARKS	;
15/12/95 15/12/95 18/12/95 18/12/95		0.00 8.50 8.50 15.00	0. 8. 8. 15.	.00 .50 18 .50 19	50mm 50mm 50mm	5.10 4.30 3.60				5.00	8.50 British Geold	1) Descrip from drille 2) Inspect prior to de x 1.2m).	ntion deriv er's daily i ion pit du illing (1.0	/ec rep ig) x
			1											



ALLIED EXPLORATION & GEOTECHNICS LTD

چي				•		ROK	EHOLE	RECO	ORD			Date:-	07/03	/96
Project:	NMC	S2 Com	munica	ation	is Svst	em in Ci	heshire - MS	2 Canti	lever Sit	es - M56		BO	REHOLE	No
Client:	The	Highwa	ays Ag	ency	y	n Goologies	Location: 54/6 +70E		8)	47s	\mathbb{W}	ie I Survey	BH-02	130
Method & Ca	Equipme Ible Pei	nt: rcussior	using	a Pi	licon W	/ayfarer	1500	Groun	d Level(m 7.18	(AOD)):	Date: 15-12-9	Sheet; 5	2 of 2	
SAMPL	ES&T	ESTS	Ľ.					STRAT	Γ Α					<u>F</u>
Depth	Туре No	Test Result	Hate Nate	duceo evel	Legend	Depth (Thick- ness)			DESCI	RIPTION				Instr
				-1 33	× ×	850	(As sheet 1 d	of 2)						
8.50-8.95	SJ13	50 for 216mm					Very dense r (Fluvio-glaci	ed brown al)	n fine to m	edium SA	ND.	_		
9.40-9.80	B14													
eological Survey 10.00-10.45	SJ15	50 for 177mm			Britas	h Geologica	Survey							
10.80-11.20	B16					-(5.20)								
11.50-11.95	\$J17	50 for 164mm					below c.11,5	0m BGL	becomi	ng mediur	n to coarse			
12.40-12.80	B18													
13.00-13.45	SJ19	50 for 150mm			n.ás	la Pooloniae	5 Dummu							Ø
eulugical ourvey	Dec.			6.53	, i µi	13.70	l aurrey				DHUAH VEUIUG	icai ouivey		V
14.00-14.45	CB21	50 for 107mm			 	(1.30)	Very dense n coarse subar and quartzite (Fluvio-glacia	ed browr Igular to I. Il)	t very grav subround	elly coarsi ed and co	SAND. Grandstand Same Same Same Same Same Same Same Same	avel is fine ndstone, t	asalt	
14.60-15.00	822			7.83	o o	- 15.00	below c.14.6 cobbles.	Dm BGL	becomi	ng sandy (gravel with (occasiona	l basalt	V
							Borehole cor	nplete at	15.00m E	GL				
Borin	g Prog	ress and	d Wate	r Ob	servati	ons	Ch	iselling	1	Water	Added	G	ENERAL	
Date		Depth	Casin	g	Casing Dia	Water Depth	From	то	Hours	From	То	RI	MARKS	5
15/12/95 15/12/95 18/12/95 18/12/95		0.00 8.50 8.50 15.00	0.0 8.5 8.5 15.0	0 0 1 0 1 0 1	50mm 50mm 50mm	5.10 4.30 3.60	liturey			5.00	8.50 British Geoli	1) Descri from drill 2) inspec prior to d x 1.2m).	ption deriv er's daily tion pit du rilling (1.0	ved repoi ug) x 1.(
All dime	nsions	in metre		F	or Evol	anation		and		B, "		ad Rue	Control	NT NJ
Date Printed	Cale 1:	:50		,	Abbrev	iations s	ee Key She	ets		~-y.	A. La	timer	156 Form AE	621

		Contract Name LBA CCS Transport and Storage Project C												nd Inv	vesti	gation	s	Locati	on IE	0		
-6	IGD	Π	Clien	t		=ni Ul	K I imite	d										IR		21	07	RH
			Fuar	Refere	ence [=1900)89	u													_07.	
			Coor	dinates	(m) E	E3447	34.73 N	137340	06.32	2 G	Groun	d Elev	ation	(m D	atun	n) 11.	90	Sheet	1 of	1		
			Hole	Туре		Sonic	Core D	rilling								, .		Status	5		Draft	
				••				<u> </u>	E	quip	men	t										
Depth From (m)	Depth To (m)	Hole 1	Type D	ate From	Date To	E	quipment	Cor	re Barr	el C	ore Bit	Drillin	g Crew	Logge	ed By	Remarks						
0.00 1.20	1.20 9.29	IP SN	2 3 IC 3	0/11/2021 0/11/2021	30/11/2021 01/12/2021	Han Eijelk	d excavate amp CRS	d XL			PCD	LT LM, I	, LM DM, LD		r r							
							MAX															
					ĺ																	
					<u> </u>																	
Dett			Hole D.	Progre	3SS					Dent	D**	To	Ro	otary I	Deta	ails		D		C	ore De	tails
Uate (dd/mm/yyyy 30/11/2024) (hh:mn	1)	(m)	(m)	(m)	Weath	er			From (m)	Uepth (m)	F	Flush Ty	pe	(1	%) F	Brown	IF (hh:m	nne nm) F	From (m)	(m)	Diameter (mm)
30/11/2021			6.00 6.00	6.00	1.60	Dry	irs			1.50	3.00		Water			00	Brown	00:0)5)5	1.50	3.00	100
01/12/2021	17:30		9.29	7.50	1.80	Showe				4.50	6.00		Water			00	Brown	00:0	05	4.50	6.00 7.50	100
						1				7.50	9.00		Water			00	Red	00:0	05	7.50	9.00	100
						1				0.00	5.28				'	~		30.0		0.00	5.23	100
						1																
						1																
						1																
						1																
						1																
						1																
						1																
			Н	le and 0	_⊥ Casinα	1																
Depth	To (m)	Hole	Diamete	er (mm)	Depth To (m)	Casing Di	ameter (n	nm)													
9.3	29		150		9.29			175														
		C	Chisell	ing / Slo	w Progre	SS																
Depth F	rom (m)	C	Depth To	(m)	Duration (hh:	:mm)	Tool /	Remark														
									_													
ļ,		Wa	ater St	trike			Wate	r Adde	d													
Strike At (m)	Rise To (m)	(m	iins)	Casing Depth	(m) Depth Se	aled (m)	(m)	(m)														
		W/at	er Stri	ke Rom	arke		μ							Gr	ner	al Rem	arke					
Groundwate	er not encour	tered d	during exc	cavation.				1. Prior to	excav	ation, a	Cable A	voidance	Tool (C/	AT) surv	/ey wa	s carried o	out. An ins	pection pit	t was h	and-dug	to 1.20m	lepth and
								rescanned	d using	the CAT	T to che	ck for ser	vices. S	ervices	were r	not located	i.					
		Ins	stallati	on						Pip	e							E	Backf	fill		
Туре	Tip Depth / Distance (m) Res	ponse Zon Top (m)	e Response Base (n	Zone Installation	n Date	ID	Top Depth	(m) E	Base Dept	h (m) 🛛)iameter (m	m)	Туре	De	pth From (r	n) Depth	To (m)	Bad	ckfill Mat	erial	Date
	,															0.00	9.2	29		Bentonit	e	01/12/2021
Notes																						
- Abbrevi	ations an	d resu	ults dat	a defined	l in 'Explora	atory L	ocation	Record	s Ke	ysheet	s'											
Checked By	r	С	к			E	levation Da	tum		Ordnar	nce Dat	um			Gr	id Coordir	nate Syster	m O	SGB			
Template: F	GSL/HBSI/F	GSL B⊦	- Summa	ry.hbt/Confi	g Fugro Rev5/	26/06/20)19/TS+AW											Print Date	е		21/04/202	2

		(Contract Name	,	LBA C	CS T	Frans	port a	and Storage Project Ground Investigations	Location IC)		ł
-fiig	Qſ		Client	\rightarrow	Fni U′	K l₋im	nited			IR (21 (17 /	RH'
		a 🕴	Eugro Reference	\rightarrow	=1900	189	lice			┤┖┕_╸	<u> </u>	<u>''-</u>	D 1.,
		7	Coordinates (m)	+	F344	734.7	/3 N3	7340	6.32 Ground Elevation (m Datum) 11.90	Sheet 1 of	/ o		'
		F	Hole Type		Sonic	Core	• Drilli	ing		Status	Dr	raft	
	Sa	amp'	ling and In Situ	$\overline{}$	<u> </u>	<u> </u>						<u> </u>	
Depth			Testing		ore K	ecove	ery		Strata Details		<u> </u>	·'	Backfill /
(m)	Туре	No.	Test Results	TCR (%)	₹ SCR) (%)	RQD (%)	lf (mm)) Depth	Strata Descriptions	Depth (Thickness) (m)) Level (m Datum)) Legend	Instance
- 0.10 - 0.30 - 0.20 - 0.30	B D	1						-	MADE GROUND. Dark brown slightly gravelly sand CLAY. Sand is fine and medium. Gravel is angular fine and medium of sandstone and flint, occasional fragments of medium gravel sized brick and	iy			
- 0.50 - 0.80 0.50 0.50	B TCon TCon	3	1.34 W/m.K 1.89 W/m.K					-	[MADE GROUND] [CLAY]	(0.80)			
0.60 - 0.76 0.70 - 0.80 0.70 0.70	ES PID B	4 5 6	< 0.1 ppm					-	Light reddish brown slightly clayey SAND. Sand is fine and medium.	0.80	11.10		
1.10 - 1.20	D	7						1-	ן (WIND BLOWN DEPOSITIS) נאוועטן - -	(0.40)			
1.20 - 1.65 1.20 - 1.65 1.20 - 1.50	B SPT	8	N = 11 (S)	100) N/A	. N/A		-	Medium dense light reddish brown slightly clayey SAND. Sand is fine and medium. IWIND BLOWN DEPOSITS] [SAND]	1.20	10.70		
- 1.50 1.50	TCon TCon		1.16 W/m.K 1.40 W/m.K	-		+	-	-		(0.45)			
1.65 - 2.20	В	9							Stiff light brown slightly sandy slightly gravelly CLAY Sand is fine and medium. Gravel is subrounded and subangular fine and medium of mixed lithologies including sandstone, mudstone and flint. [GLACIAL TILL DEPOSITS] [CLAY]	<u>ζ.</u> 1.65 d	10.25		
- 2.20 - 2.25 2.25 - 3.00 1.50 - 3.00	D B	10 11		100	N/A	N/A		-	- - - -				
- 2.50 2.50	TCon TCon		1.22 W/m.K 1.44 W/m.K					-	- - - -				
- 3.00 - 3.45 	U	12	0/450 mm						-				
3.45 - 3.60 - 3.50 3.50 3.60 - 4.00 - 3.00 - 4.50	B TCon TCon B	13 14	1.17 W/m.K 1.63 W/m.K	100) N/A	. N/A		-	- - - -				
- - 4.00 - 4.05 4.05 - 4.50 -	D B	15 16						4 —	-				
- 4.50 - 4.95 4.50 - 5.20 4.50 - 4.95 4.50 4.50	D B SPT TCon TCon	17 18	N = 21 (S) 1.19 W/m.K 1.39 W/m.K				-	-	-	(6.15)			
 -								-	Continued next page				
Notes	<u> </u>			<u> </u>		<u> </u>							<u> </u>
- Abbreviations	s and re	esult	s data defined on 'N	lotes	on Exp	plorate	ory Po	osition	I Records'				
Template: FGSL/H/	BSI/FGS	LRota	arv If.hbt/Config Fugro Rev	v5/23/1	12/2019/7	ſS+AW				Print Date	21/	/04/2022	

		C	Contract Name	l	_BA C	CS T	rans	oort a	nd Storage Project Ground Investigations	Locati	on ID			
-fua	R		Client	1	Eni Uł	< Lim	ited			LB	3_2	21_0	7_I	BH
		F	ugro Reference		=1900 =3447	89 734 7	3 N3	73406	32 Ground Elevation (m Datum) 11.00	Shoot	2 of 2	, —		
		F	lole Type		Sonic	Core	Drilli	ng		Status	3	Dra	aft	
	S	ampl	ing and In Situ	c	ore R	ecov	ery		Strata Details					
Depth (m)	Type	No	Test	TCF	SCR	RQD	lf	Depth	Strata Descriptions	C (Thi	Depth ickness)	Level	Legend	Backfill / Installation
	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Results	(%)	(%)	(%)	(mm)	(m)		`	(m) [′]	(m Datum)		
- 5.20 - 5.25	D	19												
5.25 - 6.00 4.50 - 6.00	В	20		100	N/A	N/A								
								-						
													<u> </u>	
								-						
								-					<u> </u>	
- 6.00 - 6.45	U	21	0/450 mm				-	6 —					E_ <u>-</u> _	
6.00 - 6.70	В	23						-					<u> </u>	
-								-						
		22												
-		~~~						-					<u> </u>	
- 6.70 - 6.75	D	24												
6.75 - 7.50 6.00 - 7.50	В	25		100	N/A	N/A		-					<u> </u>	
								- 7					<u> </u>	
								· -						
								-						
- 7.50 - 7.80	В	27		<u> </u>			-	-						
7.50 - 7.95 7.50 - 7.87	SPT	26	50/220 mm (S)					-						
- - 7.80 - 8.20	в	28						-			7.80	4.10		
-								-	clayey SAND. Sand is fine and medium.					
-								8 -						
- 8.20 - 8.25	D	29												
8.25 - 9.00 7.50 - 9.00	В	30		100	N/A	N/A		-						
-								-						
										(1	1.49)			
-														
									-					
- 9.00 - 9.29	D	31	50/140 mm (S)	<u> </u>			-	9 —						
9.00 - 9.29	551		50/140 mm (5)					-						
				<u> </u>			-		End of Borehole at 9.29 m	g	9.29	2.61		
								-						
-								-						
								-						
-								-						
Notes	<u> </u>		1	1		<u> </u>	<u> </u>							
- Abbreviations	s and i	esult	s data defined on 'l	Votes	on Ex	plorat	ory Po	osition	Records'					
												I		
Template: FGSL/H	BSI/FGS	L Rota	ry If.hbt/Config Fugro Rev	/5/23/1	2/2019/T	S+AW				Print Date	e	21/0	4/2022	

			Cont	ract Nan	ne I	LBA C	CS Tra	nsport a	nd Stora	ige F	Project G	round In	vestig	ations	L	ocation	ID		
-6	GD		Clien	t		Fni Ul	K I imite	d								I R	21	08	BH
			Fuar	n Refere	nce l	E1900	189	iu iii							'	LD_	~ '-	_00	
•			Coor	dinates	(m)	= 3443	30 96 1	1373056	52 0	rour	nd Elevat	ion (m F)atum)	8 4 1		Sheet 1 (of 1		
			Hole	Type		Cable	Percus	sion	.02 0	noui			/atam)	0.41		Status		Draft	
<u> </u>			. 1010	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		2 2010	. 5,543		Eauin	men	t							Lian	
Depth From	Depth To (m)	Hole	Type [Date From	Date To	E	auipment	Core I	Barrel C	ore Bit	Drilling (Crew Loga	ed By Re	emarks					
(m) 0.00	1.20		P 1	0/12/2021	10/12/2021	Han	id excavate	d			EA, KM	SD E	A						
1.20	7.81		:P 1	0/12/2021	14/12/2021		ando 3000				KM, S	D E	A						
				Progre								Rotary	Detail	e			6		taile
Date	Time		Hole Depth	Casing Dep	oth Water Depth	Weath	er		Depth	Depth	To Flus	sh Type	Flush Re	eturn Flus	h Colour	Run Time	Depth	Depth To	Diameter (mm)
(dd/mm/yyyy 10/12/2021) (hh:mr I 07:3	n))	(m) 0.00	(m) 0.00	(m) Dry	Light S	showers		From (m)	(m)	1100		(%)	1.40		(hh:mm)	From (m)	(m)	
10/12/2021 13/12/2021	I 17:0 I 06:0)	1.65 1.65	1.20 1.20	Dry Dry	Rain													
13/12/2021 14/12/2021	16:30 07:30))	5.48 5.48	5.00 5.00	Dry 3.60	Overca	ast												
14/12/2021	16:3)	7.81	5.00	Dry														
									_										
			H	ole and (Casing				_										
Depth	To (m)	Hole	e Diamete	er (mm)	Depth To (m)	Casing D	iameter (mm)										
7.0	01		250		7.01			250											
		(Chisell	ing / Slo	w Progre	SS													
Depth F	rom (m)		Depth To	(m)	Duration (hh	:mm)	Tool	Remark											
		10	lator S	triko			Wata	r Addod	_										
Christian Add (mm)	Pice To (m)	Time	Elapsed	Casing Danit	(m) Death S		Depth From	n Depth To	_										
Suike AL (M)	11) UI 96171	(r	mins)	Jasing Depth	Depth Se	aieu (M)	(m)	(m)	-										
				. –			L,										<u> </u>		
Groundwate	ar not encorr	Wa	ter Stri	IKe Rem	arks			1		0		G	eneral	Rema	rks				d
Sioundwate	a not encou	nered	aaning ex	oavallUII.				 Prior to ex rescanned u 	cavation, a sing the CA	Cable A	voidance To eck for service	oı (CAT) sur es. Services	vey was o were not	carried out	. An inspe	ection pit wa	s nand-dug	g to 1.20m	depth and
L																			
		In	stallati	on					Pip	e						Bac	kfill		
Туре	Tip Depth Distance (m	Res	sponse Zon Top (m)	Response Base (n	Zone n) Installatio	n Date	ID	Top Depth (m) Base Dept	h (m) I	Diameter (mm)	Туре	Depth	n From (m)	Depth To	o (m) I	Backfill Mat	terial	Date
	(·		/											0.00	7.81		Bentonit	te	14/12/2021
Niat-																			
NOTES	- 41 -					- . .		D											
- Abbrevi	ations an	d res	uits dat	a defined	In Explora	atory L	ocation	Records	Acception of the second sec	S									
									-										
Checked By	r	(СК			E	levation Da	itum	Ordna	nce Da	tum		Grid	Coordinat	e System	OSGE	3		
Template: F	GSL/HBSI/F	GSL B	H Summa	ary.hbt/Config	g Fugro Rev5/	26/06/20)19/TS+AW	1							P	rint Date		21/04/202	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni l	JK Limited	LB	21	08	3	BH
		Fug	ro Reference	F190	0089				_	
·		Coo	rdinates (m)	E344	330.96 N373056.52 Ground Elevation (m Datum) 8.41	Sheet	1 of 1			
		Hole	эТуре	Cabl	e Percussion	Status		Draf		
Samp	ling and	d In Si	tu Testing		Strata Details		1	1	Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 0.10 - 0.35 0.10	D B TCon	1 2	0.97 W/m.K	-	TOPSOIL. Firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of flint.	(0.35) 0.35	8.06			
0.10 0.40 0.40 - 0.60 0.65	D B D	3 4 5	1.30 W/III.K	-	[TOPSOIL] [CLAY] Brown slightly gravelly very clayey SAND. Sand is fine and medium. Gravel is fine.	(0.25) 0.60	7.81			
- 0.65 - 0.65 - 0.95 - 0.65	ES B PID	6 7	< 0.1 ppm	1-	[WIND BLOWN DEPOSITS] [SAND] Light brown and brown SAND. Sand is fine and medium. [WIND BLOWN DEPOSITS] [SAND]	(0.60)	7 21			
0.65 0.65 1.00	TCon TCon D	8	0.97 W/m.K 0.99 W/m.K	-	1.10m to 1.20m; becomes brown. Medium dense brown SAND. Sand is fine and medium. [WIND BLOWN DEPOSITSI [SAND]	(0.60)	1.21			
1.15 1.20 - 1.65 1.20 - 1.65	D D SPT	9 10	N = 18 (S)	-	Medium dense reddish brown silty SAND. Sand is fine and	1.80	6.61	× × ×		
- 1.80 - 1.80 - 2.20 - 2.20 - 2.65 - 2.20 - 2.65	B B SPT	12 13	N = 11 (S)	2	medium becoming fine to coarse. Completely weathered. [CHESTER FORMATION] [SAND] 1.80m to 2.20m; with rare fine gravel.			× × × × × ×		
- 2.70	D	14		-				× × × × × ×		
2.70 - 3.20	в	15		3-				× × × × × × × ×		
- 3.20 - 3.65 - 3.20 - 3.65	SPT	10	N = 13 (S)	-				× × × × × × × ×		
3.70 3.70 - 4.20	D B	17 18		4				× × × × × ×		
- 4.20 - 4.65 4.20 - 4.65	D SPT	19	N = 12 (S)	-				~ × × × × ×		
- - - 4.70 - 4.70 - 5.00	D B	20 21		-		(5.60)		× × × × × ×		
- 5.00 - 5.48 5.00 - 5.45	D SPT	22	N = 14 (S)	5				× × × × × × × ×		
- - -				-				× × × × × ×		
- 5.70 - 5.80 - 6.30 -	B	23 24		6-				× × × × × ×		
		05		-				× × × × × × × × ×		
- 0.50 - 0.95 - 6.50 - 6.95 -	SPT	25	N = 31 (S)	-	6.50m to 6.95m; dense. 6.80m to 7.40m: becoming fine to coarse.			× × × × × ×		
- 7.00 - 7.40 -	В	26		7				× × × × × ×		
- 7.40 - 7.40 - 7.81 - 7.40 - 7.80 	D D SPT	27 28	50/255 mm (S)		Extremely weak to very weak reddish brown SANDSTONE. Recovered as reddish brown sandy gravel. Sand is fine to coarse. Gravel is angular and subangular fine to coarse of sandstone. Partially to moderately weathered. [CHESTER FORMATION] End of Borehole at 7.81 m	7.40 (0.41) 7.81	1.01 0.60	×:////////////////////////////////////		
- - -				-						
- - 				9-						
- - -				-						
- - -										
				-						
Notes										
- Abbreviations	and res	sults da	ata defined on 'Note	es on E	exploratory Position Records'					
Template: FGSL/HI	3SI/FGSL 0	Cable Per	rcussion.hbt/Config Fugro	Rev5/24	4/01/2020/TS+AW	Print Dat	9	21/04/2	2022	

			Cont	ract Nar	ne	LBA C	CS Tra	nsport an	d Stora	ge Pr	oject Grou	und Inv	vesti	gations	3	Locatior	n ID		
-6	IGR		Clier	nt		Eni Ul	K Limite	d								IB	21	08	CPT
			Fugr	o Refere	ence	F1900)89											· · · ·	
•			Coor	dinates	(m)	E3443	329.23 N	1373059.	11 G	round	l Elevation	ו (m D	atum	n) 8.3	2	Sheet 1	of 1		
			Hole	Туре		Inspe	ction Pit									Status		Draft	
									Equipr	nent									
Depth From (m)	Depth To (m)	Hole	Туре	Date From	Date To	E	quipment	Core Ba	arrel Co	ore Bit	Drilling Crew	v Logge	ed By F	Remarks					
0.00	1.20		IP (08/12/2021	08/12/2021	Har	id excavate	d			MR, MW, CO	G MF	R						
-				Progr	ess						R	otary l	Deta	ils			(Core De	etails
Date (dd/mm/yyyy	(hh:m	n)	Hole Dept (m)	h Casing De (m)	pth Water Dept (m)	1 Weath	er		Depth From (m)	Depth To (m)	Flush T	уре	Flush I	Return %)	lush Colou	r Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
08/12/2021	1 10:2	0	0.00		Dry Dry	Rain													
	1		Н	ole and	Casing														
Depth	To (m)	Hol	le Diamet	er (mm)	Depth To	(m)	Casing Di	iameter (mm)											
			Chisel	ling / Slo	w Progre	SS													
Depth F	rom (m)		Depth To	(m)	Duration (hh	:mm)	Tool	Remark											
									-										
		N	/ater S	trike			Wate	r Added											
Strike At (m)	Rise To (m	Time (e Elapsed mins)	Casing Dept	h (m) Depth S	ealed (m)	Depth From (m)	Depth To	1										
		<u> </u>	.,						1										
		Wa	ter Str	ike Rem	arks		·		•			Ge	enera	al Rem	arks				
Groundwate	er not encou	ntered	during ex	cavation.				1. Prior to exc	avation, a C	able Av	oidance Tool (C	CAT) surv	/ey was	s carried o	out. An insp	pection pit wa	as hand-du	g to 1.20m	depth and
							ľ	usi usi	ng ule CAI	to crieci	NUT BELVICES. S	CCI VICES	were n	or iocaled					
		In	stallat	ion					Pip	е						Ba	ckfill		
Туре	Tip Depth Distance (n	/ Re 1)	sponse Zor Top (m)	ne Response Base (i	Zone Installation	n Date	ID	Top Depth (m)	Base Depth	(m) Dia	ameter (mm)	Туре	Dep	pth From (r	n) Depth	To (m)	Backfill Ma	terial	Date
				Ì										0.00	1.2	20	Arising	s	08/12/2021
Notes											I					1			
- Abbrevi	ations ar	d res	sults da	ta defined	d in 'Explor	atory L	ocation	Records K	eysheets	;'									
Checked By	/		СК			E	levation Da	tum	Ordnan	ce Datu	m		Gri	id Coordir	nate Syster	m OSG	iВ		
Template: F	GSL/HBSI/F	GSLE	3H Summa	ary.hbt/Conf	ig Fugro Rev5	/26/06/20)19/TS+AW	,								Print Date		21/04/202	22

		Cont	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clier	nt	Eni l	JK Limited	LB	21	08	С	PT
		Fugr	o Reference	F190	0089			-	_	
		Cool	rdinates (m)	E344	I329.23 N373059.11 Ground Elevation (m Datum) 8.32	Sheet	1 of 1	Draf	•	
			Type	пэр		Otatus	,	Diai		
Samp	ling and	I In Sit	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
- 0.20 - 0.30 0.20 - 0.30 0.20 - 0.30 0.40 - 0.60 0.50 - 0.60 0.50 - 0.60 - 0.50 - 0.60 - 0.50 - 1.00 - 1.10 1.00 - 1.20	B D ES PID ES PID D B	3 2 1 5 4 6 7 8	< 0.1 ppm 0.2 ppm		to coarse. [TOPSOIL] [CLAY] Light brown clayey SAND. Sand is fine to coarse. [WIND BLOWN DEPOSITS] [SAND] Brown clayey SAND. Sand is fine to coarse. [WIND BLOWN DEPOSITS] [SAND] End of Inspection Pit at 1.20 m	(0.30) 0.30 (0.70) 1.00 (0.20) 1.20	8.02 7.32 7.12			
-				_						
Notes					Pit Stability	Plan				
- Abbreviatior	is and r	esults	data defined on	Note	s on Exploratory Position Records' Stable		0.3	0 m		
						0.30 m			 	0°
Template: FGSL/HE	SI/FGSL T	rial Pit.ht	ot/Config Fugro Rev5/05/1	2/2019	TS-AW	Print Dat	e	21/04/2	2022	

			Conti	ract Nar	ne	LBA C	CS Tra	nsport an	d Stora	ge Pr	oject Gr	ound In	vestig	ations	l	_ocation	ID		
-6	IGP		Clien	t		Eni Ul	K I imite	d								IR	21	09	CPT
			Fuar	Refere	ence	F1900	089	-										<u> </u>	
•			Coor	dinates	(m)	E3440)56.52 N	373056.	48 G	rounc	l Elevati	on (m D	atum) 7.35		Sheet 1	of 1		
			Hole	Туре		Inspe	ction Pit							-		Status		Draft	
									Equipn	nent									
Depth From (m)	Depth To (m)	Hole 1	Гуре С	ate From	Date To	E	Equipment	Core Ba	arrel Co	ore Bit	Drilling C	rew Logge	ed By R	emarks					
0.00	1.20	IP	0	8/12/2021	08/12/2021	Har	nd excavate	d			MR, CG,	MW M	R						
				Progre	ess							Rotary	Detai	ls			(Core De	etails
Date (dd/mm/yyyy) (hh:mm	i) I	Hole Depth (m)	(m)	pth Water Depti (m)	¹ Weath	er		From (m)	Depth Ic (m)	Flus	h Type	Flush F) Flue	sh Colour	(hh:mm)	Depth From (m)	Depth Io (m)	Diameter (mm)
08/12/2021	11:15		1.20		Dry	Rain													
																	1		
																	1		
																	1		
																	1		
																	1		
																	1		
			Ho	ole and	Casing		1												
Depth	To (m)	Hole	Diamete	er (mm)	Depth To	(m)	Casing Di	ameter (mm)											
		<u> </u>	hisell	ing / Slo	w Progre	SS													
Depth F	rom (m)	C	Depth To	(m)	Duration (hh	i:mm)	Tool /	Remark	_										
		14/	- + 01				10/-+-	. A .l	-										
0.1.4.4.4.4	Diag Ta (m)	VVa Time E	Elapsed		(Depth From	Depth To											
Suike At (m)	11158 10 (M)	(m	ins)	Casing Depth	(III) Depth S	ealed (m)	(m)	(m)	-								1		
																	1		
																	1		
		W/3+	er Stri	ke Rom	arke		I	1	1			C.	 enero	l Remo	rke		1	1	
Groundwate	er not encoun	itered d	luring exc	cavation.				1. Prior to exc	avation, a C	able Av	oidance Too	ol (CAT) sur	vey was	carried ou	t. An insp	ection pit wa	s hand-du	g to 1.20m	depth and
								rescanned us	ing the CAT	to chec	k for service	s. Services	were no	ot located.					
		Ins	stallati	on					Pipe	э						Bac	kfill		
Туре	Tip Depth / Distance (m)	Res	ponse Zon Top (m)	e Response Base (r	Zone Installatio	on Date	ID	Top Depth (m)	Base Depth	(m) Dia	ameter (mm)	Туре	Dep	th From (m)	Depth T	o (m)	Backfill Ma	terial	Date
			/		-									0.00	1.20	D C	Arising	s	08/12/2021
Notes																			
- Abbrevi	ations and	d resu	ults dat	a defined	in 'Explor	atory L	ocation	Records K	eysheets	;'									
Checked By		С	к			E	levation Da	tum	Ordnan	ce Datu	m		Grio	d Coordina	te System	n OSG	3		
Template: F	GSL/HBSI/FO	GSL BH	I Summa	ry.hbt/Confi	g Fugro Rev5	/26/06/20	019/TS+AW		•						F	Print Date		21/04/202	22

Difference En UK Limited LB_211_09_CCPT Stangling and II Stur Testing Exampling and II Stur Testing Strata Details Strata Details General Elevation (m Datum) [7:35] Dipt/1 Type No. Test Results TopPSOIL General Elevation (m Datum) [7:35] Strata Details General Elevation (m Datum) [7:36] General Elevation (m Datum) [7:36] Strata Details General Elevation (m Datum) [7:36]			Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
Fugs Reference FlyDol	-fug	RO	Clier	nt	Eni l	JK Limited		21	09	C	PT
Conductates (m) EX44065 52 N373056 49 Ground Elevation (m Datum) [7.35 Strata Deals Conclusion Sampling and in Stu Testing Strata Details Strata Details Screen 2000			Fugr	o Reference	F190	0089			_00	-`	•••
Hele Type Inspection Pit Strata Details Orante over Strata Details Inspection Pit Orante over Strata Details Inspection Pit Orante over Pit Inspection Pit Orante over Pit Inspection Pit Orante over Pit Inspection Pit Orante over Pit Inspection Pit Pit <td>•</td> <td></td> <td>Coo</td> <td>rdinates (m)</td> <td>E344</td> <td>1056.52 N373056.48 Ground Elevation (m Datum) 7.35</td> <td>Sheet</td> <td>1 of 1</td> <td></td> <td></td> <td></td>	•		Coo	rdinates (m)	E344	1056.52 N373056.48 Ground Elevation (m Datum) 7.35	Sheet	1 of 1			
Sample survey Stata Deals Contract Partial Deals Partis Deals Partis Deals			Hole	туре	Insp	ection Pit	Status		Draf	t	
Deptin(m) Type No. Test Results open Strata Descriptions open Strata Description Strata Description Descrad Description Descrad Desc	Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
U 7 Image: Second Control of Control	Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.30.0.00 B 3 0.00 B 0.00 <td< td=""><td>()</td><td></td><td></td><td></td><td></td><td>TOPSOIL. Cut crops over soft dark grey sandy CLAY. Sand is fine</td><td>()</td><td></td><td></td><td></td><td></td></td<>	()					TOPSOIL. Cut crops over soft dark grey sandy CLAY. Sand is fine	()				
0.30-0.00 B 3 0 0.00 0.7 0.404-0.20 D 2 0 0.00 0.7 0.404-0.20 D 2 0 0.00 0.7 0.404-0.20 D 2 0 0.00 0.7 0.404-0.20 D 5 0 0.00 0.7 0.404-0.20 D 5 0 0.00 0.7 0.404-0.20 D 5 0 0.00 0.7 0.5 0.00 D 5 0 0.00 0.7 1.30-1.20 D 7 1 1 0 0.5 0.7 1.30-1.20 D 7 1 1 0 0.7 0.7 0.7 1.30-1.20 D 7 1 1 0 0.7 0.7 0.7 0.7 0.7 1.30-1.20 D 7 1 1 0.7 0.7 0.7 0.7 0.7 0.7 1.30-1.20 D 7 1 1 0.7 0.7	-				-	to coarse. ITOPSOILLICLAYI					
1.33:00 B 3 0.00 6.75 4.41:030 B 2 0.00 6.75 970:030 B 5 0.00 6.75 900:000 B 7 0.00 6.75 110:120 B 7 7 1 1 110:120 B 7 7 1 1 1 110:120 B 7 1		_			-		<i>(</i> - - -)				
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	- 0.30 - 0.50	В	3		-		(0.60)				
Lad Pub Dospen Brown daysy SAND. Sand is fine to coarse. 0.00 6.75 Pub 1.72-0.00 8 6 5 0.25 pp 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 6.75 0.00 0.00 6.75 0.00 6.75 0.00 0.00 6.75 0.00 0.00 6.75 0.00 0.00 6.75 0.00	0.40 - 0.50	ES	1								
070-030 8 6 5 6 7 8 6 7 </td <td>0.40</td> <td>PID</td> <td></td> <td>0.5 ppm</td> <td></td> <td></td> <td>0.60</td> <td>6.75</td> <td></td> <td></td> <td></td>	0.40	PID		0.5 ppm			0.60	6.75			
0.800 0.000 0.2 ppm 1 1.10 1.0 0.2 ppm 1 1.10 0.2 ppm 1 1 1.10 1 1 1 1 1.10 1 1 1	- 0.70 - 0.90	в	6			Brown clayey SAND. Sand is fine to coarse. IWIND BLOWN DEPOSITSI ISANDI	0.00	0.10			
0.00 0.00 PB 4 0.20 µm 1 1.10 1.0 0.20 0 10 0.20 1.10 1.0 0.20 0 10 0.20 1.10 1.0 0.20 0 10 0.20 1.10 1.0 0.20 0 10 0.20 1.10 1.0 0.20 0 10 0.20 1.10 0.20 0.10 0.00 0.00 0.00 1.10 0.20 0.10 0.00 0.00 0.00 0.00 1.10 0.20 0.10 0.00 <t< td=""><td>- 0.80 - 0.90</td><td>D</td><td>5</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	- 0.80 - 0.90	D	5		-						
Notes Pit Stability Pit Stability Pit and find on "Notes on Exploratory Position Records" Pit Stability Pit and find on "Notes on Exploratory Position Records"	0.80 - 0.90	ES PID	4	0.2 ppm	-		(0.50)				
1:10::120 B 8 7 Firm rediable bown slightly growthy andry CLW. Gravel is fire to more address and reducts of a reducts. 1:10::120 0:25 0:15 0:10 0:25 0:10 0:25 0:15 0:10 0:25 0:15	-			0.2 pp	1-						
1.10-120 D 7	1.10 - 1.20	в	8		-	Firm reddish brown slightly gravelly sandy CLAY Gravel is fine to	1.10	6.25			
Notes Pit Stability Pian Abbreviations and results data defined on 'Notes on Exploratory Position Records' Stable 0.30 m	1.10 - 1.20	D	7		-	coarse subrounded and rounded of quartzite.	(0.10) 1.20	6.15			UNX//
Notes Pit Stability Plan Notes Pit Stability Plan Notes 0.30 m 0.30 m					-	\[WIND BLOWN DEPOSITS] [CLAY] / End of Inspection Pit at 1.20 m					
Notes Pit Stability Plan Abbreviations and results data defined on "Notes on Exploratory Position Records" Stability Plan					-						
Notes Pit Stability Plan Abbreviations and results data defined on "Notes on Exploratory Position Records" Stable 0.30 m	-				-						
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Image: Second state defined on 'Notes on Exploratory Position Records' Pit Stability Plan - Abbreviations and results data defined on 'Notes on Exploratory Position Records' Stable 0.30 m 0.30 m 0°					•						
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0.30 m 0°	 Abbreviatior 	ns and i	results	data defined on	'Note	s on Exploratory Position Records' Stable		0.3	0 m		
$0.30 \text{ m} \longrightarrow 0^{\circ}$							0.07]	
							0.30 m				0°
Template: FGSL/HBSI/FGSL Trial Pit.hbt/Config Fugro Rev5/05/12/2019/TS-AW Print Date 21/04/2022	Template: FGSL/HF	3SI/FGSL T	rial Pit.hh	ot/Config Fugro Rev5/05/1	2/2019	TS-AW	Print Date	e	21/04/2	2022	

			Contr	act Nam	ne l	BAC	CS Trai	nsport an	nd Stora	age P	roject Gi	round In	vestig	ations	l	ocation	ID		
-Fi	IGR		Client	t	E	-ni Ul	< Limite	h								IR	21	114	BH
			Fugro	- o Refere	nce f	=1900	89										<u> </u>		
•			Coord	dinates (m) E	E3445	21.86 N	1373302.	51 (Groun	d Elevat	ion (m E	Datum) 6.43		Sheet 1	of 1		
			Hole	Туре		Sonic	Core Di	rilling							Ş	Status		Draft	
									Equip	men	t								
Depth From (m)	Depth To (m)	Hole 1	ype D	ate From	Date To	E	quipment	Core Ba	arrel (Core Bit	Drilling C	Crew Logg	ed By R	emarks					
0.00 1.20	1.20 9.00	IP SN	C 2	5/11/2021 5/11/2021	25/11/2021 26/11/2021	Han Eijelk	d excavated amp CRS >	ł KL		PCD	LT, LI LM, L		T T						
							MAX												
				Progre	ss							Rotary	Detai	ls			(Core De	etails
Date (dd/mm/yyyy) (hh:mm)	lole Depth (m)	Casing Dep (m)	th Water Depth (m)	Weath	er		Depth From (m)	Depth (m)	To Flue	sh Type	Flush R (%) Flush	Colour	Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
25/11/2021 25/11/2021	07:00 17:30		0.00 7.50	0.00 7.50	Dry 1.20	Sunny Dry			1.20 1.50	1.50 3.00	V	Vater Vater	10	D Br D Br	own	00:05 00:05	1.20 1.50	1.50 3.00	101 101
26/11/2021 26/11/2021	07:00 17:30		7.50 9.00	7.50 7.50	0.30				3.00 4.50	4.50 6.00	V	Vater Vater	10	D Br D Br	own	00:05 00:05	3.00 4.50	4.50 6.00	101 101
									6.00 7.50	7.50 9.00	v v	Vater Vater	10	D F D F	Red Red	00:05 00:05	6.00 7.50	7.50 9.00	101 101
			Ho	ble and (Casing				1										
Depth	To (m)	Hole	Diamete	r (mm)	Depth To (m)	Casing Dia	ameter (mm)											
9.0	00		175		9.00			175											
		C	hiselli	ing / Slo	w Progre	ss			1										
Depth F	rom (m)	D	epth To ((m)	Duration (hh:	mm)	Tool /	Remark											
		Wa	ater St	rike			Water	Added	1										
Strike At (m)	Rise To (m)	Time E (mi	lapsed ins)	Casing Depth	(m) Depth Se	aled (m)	Depth From (m)	Depth To (m)]										
1.10	0.86	2	0						1										
			_																
		Wat	er Stri	ke Rem	arks							G	enera	Remar	ks				
At 1.10m; w	ater seepage	was o	bserved.				1	. Prior to exc escanned us	avation, a	Cable A	voidance To ck for service	ol (CAT) sur	vey was were no	carried out. t located.	An insp	ection pit wa	as hand-dug	g to 1.20m	depth and
							ľ	us	.g 1.10 OF										
		Ins	tallatio	on					Pi	be		_				Bao	ckfill		
Туре	Tip Depth / Distance (m)	Resp	oonse Zone Fop (m)	e Response 2 Base (m	Zone I) Installation	n Date	ID	Top Depth (m)	Base Dep	th (m) 🛛	Diameter (mm)	Туре	Dept	h From (m)	Depth T	o (m)	Backfill Ma	terial	Date
GMP	9.00		5.50	8.50	26/11/2	:021	1 1	0.50 6.00	6.00 8.00)	50 50	Plain Slotted		-0.30 0.00	0.00 0.30	0 L	Upstanding Concret	Cover	26/11/2021 26/11/2021
														0.30 5.50	5.50 8.50	0	Bentoni Grave	te	26/11/2021 26/11/2021
														8.50	9.00	0	Bentoni	te	26/11/2021
Notes																			
- Abbrevi	ations and	l resu	ilts data	a defined	in 'Explora	atory L	ocation I	Records K	leyshee	ts'									
Checked By		С	к			E	levation Dat	tum	Ordna	ince Dat	um		Grid	Coordinate	System	n OSG	в		
Template: F	GSL/HBSI/FO	SSL BH	I Summa	ry.hbt/Config	Fugro Rev5/	26/06/20	19/TS+AW								F	Print Date		21/04/202	2

		C	Contract Name	I	LBA C	CS T	ransp	oort a	nd Storage Project Ground Investigations	Location	D		
-fire	RI		Client		Eni Uł	(Lim	ited			IR	21 1 [.]	14	RН
			uaro Reference		F1900	89				LD_/	-'-'	· –	
•			Coordinates (m)		F3//5	21.8	3 N37	73302	2.51 Ground Elevation (m Datum) 6.43	Sheet 1 o	f 2		
					Sonic		Drilli	nd		Status		oft	
	6	moli	ing and In Situ		Conne	0010	Driiii			Otatus		an	
Depth	58	ampi	Testing	С	ore R	ecove	ery		Strata Details				Backfill /
(m)	Туре	No.	Test Results	TCF (%)	R SCR) (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	Depth (Thicknes (m)	is) Level (m Datum)	Legend	
0 10 - 0 30	в	1						-	Dark brown clayey SAND. Sand is fine and medium	I.			
0.20 - 0.30		2						-		(0.30)		-	
- 0.20 0.00		2						_		0.30	6 13		
_								_	Light brown slightly clayey SAND. Sand is fine and	0.50	0.15		
- 0.50 - 0.80	в	з						_	[WIND BLOWN DEPOSITS] [SAND]				
- 0.00 0.00		0						-					
-													
- 0.80 - 0.90	ES	4						-		(0.90)			
0.80	PID	-	< 0.1 ppm					-					
_								1					
1 10 - 1 20	П	5						· .					
1 20 - 1 65	В	7						-		1 20	5 23		
1.20 - 1.65	D	6						-	Loose light brown slightly clayey SAND. Sand is fine and medium	e	0.20	<u> </u>	
1.20 - 1.65	571		N = 5 (S)	100	N/A	N/A		-	[WIND BLOWN DEPOSITS] [SAND]	(0.30)			
_								_		1.50	4.93		
-								-	Stiff and very stiff light reddish brown slightly sandy slightly gravelly CLAY. Sand is fine and medium.			F	
1.65 - 2.00	В	8						-	Gravel is subangular and subrounded fine and				
								-	medium of mixed lithologies including sandstone, mudstone and flint			<u> </u>	
-								-	[GLACIAL TILL DEPOSITS] [CLAY]			L	
- 2.00 - 2.20	ES	9						2 —				[- <u>-</u>	
2.00	PID		< 0.1 ppm					-				E	
- 2.20 - 2.25	D	10						-					
2.25 - 3.00	В	11		100	N/A	N/A		-				F	
-								-					
-								-				<u> </u>	
								-				<u> </u>	
æ								-				E	
								-				E	
-								-					
- 3.00 - 3.45	UT	12	1/450 mm					3 —				F	
								-					
								-					
-								-				<u> </u>	
3 45 3 60		13						-				<u>[</u>	
- 3.45 - 3.60	D	2						-				L	
3.60 - 4.00	в	14						-				<u> </u>	
3.00 - 4 50				100	N/A	N/A		-		(4 50)		F	
-								-		(4.50)		E_=	
								-				<u>E_</u>	
- 4.00 - 4.05 4.05 - 4.50	D R	15 16						4 —				<u>⊢</u>	
		10						-				F	
ŀ								-				E	
								-				E	
												F	
- 4.50 - 4.95 4.50 - 5.20	D B	17 18						-					
4.50 - 4.95	SPT		N = 10 (S)									E	
-								-				<u>⊢−−</u> −	
ŀ								-				[
i i								-				E	
F								-	Continued next page				
Notes					-1						1		·
- Abbreviations	and r	esult	s data defined on 'N	lotes	on Ex	plorat	ory Po	osition	Records'				
Template: FGSL/HE	SI/FGS	L Rota	ry If.hbt/Config Fugro Rev	5/23/1	2/2019/T	S+AW				Print Date	21/0	4/2022	

	Contract Name		_BA C	CS T	rans	oort a	nd Storage Project Ground Investigations	Locat	tion ID			
-fugro	Client		Eni Uł	(Limi	ited			LB	3_2	1_1′	14_	BH
	Fugro Reference Coordinates (m)		-1900 E3445	89 21.86	5 N37	73302	2.51 Ground Elevation (m Datum) 6.43	Shee	t 2 of 2	2		
	Hole Type		Sonic	Core	Drilli	ng		Statu	S	Dra	aft	
Depth	Testing	C	ore R	ecove	ery		Strata Details				-	Backfill /
(m) Type N	lo. Test Results	тсғ (%)	R SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	(ТІ	Depth hickness) (m)	Level (m Datum)	Legend	Installation
- 5.20 - 5.25 D 5.25 - 6.00 B 2 5.25 - 6.00 B 2 4.50 - 6.00	19 20	100	N/A	N/A		-						
- 6.00 - 6.50 UT# 2 6.00 - 6.70 B 	21 1/0 mm 22 1/0 mm 23 24 1/0 mm	100	N/A	N/A		6 — - - - - - - - - - - - - - - - - - - -	Dense light brown slightly gravelly SAND. Sand is fine and medium. Gravel is subangular and subrounded fine and medium of mixed lithologies including sandstone, mudstone and flint. [GLACIAL TILL DEPOSITS] [SAND]		6.00	0.43		
- 7.50 - 7.95 D 2 7.50 - 8.20 B 2 7.50 - 7.95 SPT - 	25 N = 37 (S) 27 28	100	N/A	N/A					(3.00)			
Notes	sults data defined on 'N	Notes	on Ex	plorato	Dory Po	9 — - - - - - - - - - - - - - - - - - - -	End of Borehole at 9.00 m		9.00	-2.57	4/2022	G

			Cont	ract Nar	ne	LBA C	CS Tra	nsport a	nd Sto	rage	Proj	ect Grou	ind In	vest	igatior	ns	Locatio	on ID)		
-6	IGR		Clien	t		Eni Ul	K Limite	ed									I R	2	1	114	ТР
		-	Fugro	o Refere	ence	F1900)89												• •		
			Coor	dinates	(m) I	E3445	520.20 N	1373308	8.51	Grou	ind E	Elevation	ı (m D)atur	m) 6.3	35	Sheet	1 of	1		
			Hole	Туре		Trial F	Pit										Status	;		Draft	
									Equi	pmei	nt										
Depth From (m)	Depth To (m)	Hole [·]	Type D	Date From	Date To	E	quipment	Core	Barrel	Core B	Bit	Drilling Crew	/ Logge	ed By	Remarks	5					
0.00	2.50	TI	P 2	2/11/2021	22/11/2021	Machi	ne excavat JCB 3CX	ed :				MR, RB	M	R							
-				Progre	ess					-		R	otary	Deta	ails				С	ore De	tails
Date (dd/mm/yyyy) (hh:mm	I)	Hole Depth (m)	n Casing De (m)	pth Water Deptr (m)	Weath	er		Depth From (r	Dept ו) (ח	th To n)	Flush Ty	уре	Flush	h Return (%)	Flush Colou	r Run Ti (hh:m	ime im) F	Depth From (m)	Depth To (m)	Diameter (mm)
22/11/2021 22/11/2021	11:15		0.00 2.50		1.20	Sunny															
									_												
			Ho	ole and	Casing		1														
Depth	To (m)	Hole	Diamete	er (mm)	Depth To (m)	Casing D	iameter (mn	1)												
		(Chisell	ing / Slo	w Progre	SS															
Depth F	rom (m)	[Depth To	(m)	Duration (hh	:mm)	Tool	/ Remark													
		W	ater S	trike			Wate	r Added													
Strike At (m)	Rise To (m)	Time I (m	Elapsed nins)	Casing Dept	n (m) Depth Se	aled (m)	Depth From (m)	n Depth To (m)													
1.20	1.20	2	20																		
							L														
At 1 20	ater coore	Wat	ter Stri	ike Rem	arks								Ge	ener	al Rer	narks					
At 1.20m; W	ater seepage	, was c	weerved.					1. Prior to e: 2. Trial pit re	cavation, mained ur	a Cable	Avoid	ance Tool [C excavation.	AT] surv	/ey wa	as carried	out. Service	es were no	ot locat	ed.		
								 Trial pit te 	rminated a	at 2.50m	n due t	to the collaps	e of pit s	sides.							
	_	Ins	stallati	on					P	ipe							E	Backf	ill		
Туре	Tip Depth / Distance (m)	Res	ponse Zon Top (m)	e Response Base (r	ID	Top Depth (n	i) Base D	epth (m)	Diame	eter (mm)	Туре	D	epth From	(m) Depth	To (m)	Bac	ckfill Mate	erial	Date		
															0.00	2.5	bU		Arisings		22/11/2021
				1																	
Notes																					
- Abbrevi	ations and	d resu	ults dat	a defined	in 'Explor	atory L	ocation	Records	Keyshe	ets'											
Checked By		J	R/SAF			E	levation Da	itum	Ord	ance D	atum			G	rid Coord	inate Syste	m O	SGB			
Template: F	GSL/HBSI/FO	GSL BH	- Summa	arv.hbt/Confi	a Fuaro Rev5	26/06/20)19/TS+AV	1	- 1								Print Date	9		21/04/202	2

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fua	RO	Clier	nt	Eni l	JK Limited		21	11	4	TP
		Fugi	ro Reference	F190	1089		4 - 5 4	-		
		Hole	Type	E344	Pit / Trench	Status		Draf	•	
Samn	ling and	l In Si	tu Testing		Strata Details	- Clara			Grou	ndwater
- Samp					Strata Details				Grou	uwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
Depth (m) 0.30 - 0.50 0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.50 - 0.70 0.50 - 0.70 0.50 0.60 - 0.70 - 1.20 - 1.30 1.20 - 1.30 1.20 - 1.30 1.20 - 1.30 1.20 - 1.30 2.10 - 1.60 1.60 1.60 1.60 1.60 1.60 1.60 1.60 2.00 - 2.20 2.20 2.20 2.20 2.50 2.	Type B D ES PID B Tcon Tcon D B D HVane HVane HVane HVane HVane HVane HVane HVane HVane	No.	 Test Results < 0.1 ppm 0.04 W/m.K 0.05 W/m.K 0.16 W/m.K 0.16 W/m.K 0.16 W/m.K 0.04 W/m.K 0.05 W/m.K 0.03 W/m.K 0.03 W/m.K 0.08 W/m.K 	Depth (m) 	Strata Descriptions TOPSOIL, Soft dark grey sandy CLAY. Sand is fine to coarse. [TOPSOIL] [CLAY] Light brown clayey SAND. Sand is fine to coarse. [WIND BLOWN DEPOSITS] [SAND] 0.50m to 0.70m; slightly clayey. Som to 0.70m; slightly clayey. [TIDAL FLAT DEPOSITS] Soft bluish grey sandy CLAY. Sand is fine to coarse. [TIDAL FLAT DEPOSITS] [CLAY] Soft and firm reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse, Gravel is angular to rounded of mixed lithologies including mudstone, film and sandstone. [GLACIAL TILL DEPOSITS] [CLAY] End of Trial Pit / Trench at 2.50 m	Depth (Thickness) (m) (0.50) (0.50) (0.70) (0.70) (0.70) (0.70) (0.70) (0.70) (0.70) (0.50) (0.50) (0.50) (0.50)	Level (m Datum) 5.85 5.15 5.05 4.35 3.85		¥ater Strike	Bactfil / Installation
					Т	 				
Notes					Pit Stability	Plan				
- Abbreviatior	ns and i	results	data defined on	'Note	s on Exploratory Position Records' Pit sides collapsed on excavation below 2.50m.	0.60 m	3.7	0 m]	135°
Template: FGSL/HE	SI/FGSL T	rial Pit.ht	ot/Config Fugro Rev5/05/	12/2019/	TS-AW	Print Dat	e	29/04/2	2022	

			Cor	ntract Na	me	LBA C	CS Tra	nsport an	d Stora	ge Pr	oject Grou	Ind Inv	vest	igation	s	Locatior	n ID		
-6	IG	2 6		ent		Eni Ul	K Limite	d								IR	21	115	; ТР
			Fug	ro Refer	ence	F1900	089										- ' -		<u> </u>
			Coc	, ordinates	(m) I	E3446	31.55 N	373338.	14 G	round	Elevation	ı (m D	atu	m) 9.5	6	Sheet 1	of 1		
			Hole	е Туре		Trial F	Pit							,		Status		Draft	
									Equipn	nent									
Depth From (m)	Depth To	m) Ho	ole Type	Date From	Date To	E	quipment	Core Ba	arrel Co	ore Bit	Drilling Crew	/ Logge	ed By	Remarks					
0.00	4.50		TP	19/11/2021	19/11/2021	Machi	ne excavate	ed :			MR, RB	MF	R						
							000 00X												
				Progr	ess						R	otary l	Deta	ails			(Core De	etails
Date (dd/mm/yyyy	/) (hh	me mm)	Hole De (m)	pth Casing De (m)	epth Water Depth (m)	1 Weath	er		Depth From (m)	Depth To (m)	Flush T	уре	Flus	h Return (%)	lush Colou	r Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
19/11/202 ² 19/11/202 ²	1 08 1 11	:50 :30	0.00 4.50		1.20 1.20	Sunny													
			ŀ	Hole and	Casing														
Depth	To (m)	ŀ	Hole Diame	eter (mm)	Depth To ((m)	Casing Di	ameter (mm)											
			Chise	ellina / Sl	ow Proare	SS	1												
Depth F	rom (m)		Depth T	To (m)	Duration (hh	:mm)	Tool /	Remark											
	. ,																		
			Watar	Strike			Wata	r Addad	-										
01.11.01.()	Dian Ta (Ti	ime Elapsed				Depth From	Depth To	-										
Strike At (m)	1.20	m)	(mins) 20	Casing Dep	th (m) Depth Se	ealed (m)	(m)	(m)	-										
				1															
			1-1 -				I					~							
At 1 20m 14	/ater seen	N age w	vater St	trike Ren	narks			Driester	ovoti · · ·	'ob!- *	oidonaa Taalaa	Ge	ener	al Rem	arks		looot		
z viii, W		-90 W					2	2. Trial pit rem	avauon, a C iained stable	able Av e during	excavation.	/AI) SULA	rey Wa	as carried	JUL. SERVICE	es were not	iocated.		
			Installa	ition				Pipe	e _						Ва	ckfill			
Туре	Tip Dep Distance	in / (m)	Response Z Top (m)	one Response Base	e ∠one (m) Installatio	n Date	ID	Top Depth (m)	Base Depth	(m) Di	ameter (mm)	Туре	D	epth From (m) Depth 1	To (m)	Backfill Ma	terial	Date
														0.00	4.5	50	Arising	s	19/11/2021
Notes					1					I					1				
- Abbrevi	iations a	and r	esults d	ata define	d in 'Explor	atory L	ocation I	Records K	eysheets	;'									
					·														
Checked By	/		JR			F	levation Da	tum	Ordnan	ce Datu	m		G	irid Coordi	nate Svster	m osc	B		
Template: F	GSL/HBS	I/FGSI	L BH Sumr	narv.hbt/Con	fia Fuaro Rev5	26/06/20)19/TS+AW							220.01		Print Date		21/04/202	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fua	RO	Clie	nt	Eni l	JK Limited	LB	21	11	5	TP
		Fug	ro Reference	F190	0089	Shoot	1 of 1	_		•
		Hole	Type	Trial	Pit / Trench	Status		Draf	t	
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
()					TOPSOIL. Grass over dark grey clayey SAND. Sand is fine to	()				
					coarse. [TOPSOIL] [SAND]					
- 0.30 - 0.40	ES	1				(0.50)				
0.30 - 0.50	PID D	2	< 0.1 ppm	-		0.50	0.00			
0.50 - 0.70	B Tcon	6	0.01 W/m.K		Light brown clayey SAND. Sand is fine to coarse. [TIDAL FLAT DEPOSITS] [SAND]	0.50	9.06			
0.50 0.50	Tcon Tcon		0.03 W/m.K 0.09 W/m.K	-	0.50m to 0.70m; with rare fine gravel.	(0.50)				
0.60 - 0.70	ES BID	5 4	0.1 ppm	-		()				
- 1.00 - 1.20	В	8		1-	Soft bluich grow clightly growelly condy CLAV with rare pockate	1.00	8.56			
- 1.10 - 1.20 1 10 - 1 20	D FS	7 9		-	(<5mm x 25mm) of plastic amorphous dark brown peat. Sand is				v	
1.10 1.20	PID HVane	0	< 0.1 ppm 30 kPa (<i>10 kPa</i>)	-	and mudstone. Slight organic odour.				L	
1.20 - 1.20	HVane HVane		35 kPa (<i>15 kPa</i>) 35 kPa (9 <i>kPa</i>)							
- 1.50 - 1.70	в	12		-		(1.00)				
- 1.60 - 1.70 - 1.70	D HVane	10	45 kPa (<i>10 kPa</i>)	-						
1.70 1.70	HVane HVane		47 kPa (16 <i>kPa</i>) 48 kPa (18 <i>kPa</i>)	-						
1.70 1.70	Tcon Tcon		0.05 W/m.K 0.19 W/m.K	-						
- 1.70 2.00 - 2.20 2.10 - 2.20	B	14	0.22 W/m.K	2-	Firm and stiff grey gravelly CLAY with rare shell fragments (<2mm x 2mm). Gravel is angular to rounded fine to coarse of flint and	2.00	7.56	· · · ·		
- 2.20	HVane	15	45 kPa (<i>18 kPa</i>)		mudstone. ITIDAL FLAT DEPOSITSI ICLAYI					
2.20	HVane		58 kPa (<i>20 kPa</i>)					· · · ·		
- 2.50 - 2.70	в	16		-						
- 2.60 - 2.70	D	15						· _ , ,		
2.70 2.70	HVane HVane		58 kPa (20 kPa) 66 kPa (18 kPa)	-		(1.40)				
2.70 2.70 2.70	HVane Tcon Tcon		0.02 W/m.K							
- 2.70 3.00 - 3.20	Tcon B	18	0.04 W/m.K	3 —	3.00m to 3.20m; slightly gravelly sandy clay. Sand is fine to coarse.					
3.10 - 3.20 - 3.20	D HVane	17	106 kPa (28 <i>kPa</i>)					· · · · ·		
3.20 3.20	HVane HVane		76 kPa (22 <i>kPa</i>) [′] 88 kPa (27 <i>kPa</i>)							
		20		-	Stiff and very stiff reddish brown slightly sandy gravelly CLAY.	3.40	6.16	· · · ·		
- 3.50 - 3.70 - 3.60 - 3.70	D	20 19			Sand is tine to coarse. Gravel is angular to rounded tine to coarse of mudstone.			· · · ·		
- 3.70	HVane HVane		102 kPa (22 <i>kPa</i>)		[GLACIAL TILL DEPOSITS] [CLAY]					
3.70 3.70 3.70	HVane Tcon		120 kPa (<i>28 kPa</i>) 0.02 W/m.K					<u> </u>		
3.70 - 3.70	Tcon Tcon		0.03 W/m.K 0.03 W/m.K	4		(1.10)				
4.00 - 4.20 4.10 - 4.20	BD	22 21		-						
- 4.20 4.20	HVane HVane		100 kPa (<i>25 kPa</i>) 105 kPa (<i>23 kPa</i>)							
4.20	Hvane		120 KPa (30 KPa)	-				· _ · · _ ·		
-				-	End of Trial Pit / Trench at 4.50 m	4.50	5.06	• <u>•</u> •'		
-				-						
Notes					Dit Stability	Plan				
- Abbreviatior	ns and r	results	data defined on	'Note	s on Exploratory Position Records' Localised collapse of		3.7	0 m		
					FACE B between 1.20r and 2.20m.	1			l .	000
						0.60 m				θ0,
Template: FGSL/HE	BSI/FGSL T	rial Pit.hl	bt/Config Fugro Rev5/05/	12/2019	TS-AW	Print Dat	е	29/04/2	2022	

			Cor	ntract Na	me	LBA C	CS Trar	nsport an	nd Stor	age	Pro	ject Grou	nd Inv	vesti	gatior	าร	Locatio	on ID		
-6	I G E		Clie	nt		Eni Uł	< Limite	d									I R	21	19	BH
			Fug	ro Refere	ence	E1900	89	u											_15	
			Coc	ordinates	(m)	E3414	54.37 N	1371095.	10	Grou	und	Elevation	(m D	atun	n) 11	.98	Sheet	1 of 1		
			Hole	е Туре		Sonic	Core Dr	rilling to F	Rotary	Cor	ing				, , ,		Status		Draft	
					I			č	Equi	ome	ent									
Depth From (m)	Depth To (n	n) Hol	е Туре	Date From	Date To	E	quipment	Core Ba	arrel	Core I	Bit	Drilling Crew	Logge	ed By	Remarks	5				
0.00	1.20 9.20	5	IP SNC	15/03/2022 16/03/2022	15/03/2022 17/03/2022	Han Eiielk	d excavated amp CRS X	J (L				JB, AF, MW TS, AF	JE	B C						
9.20	17.60		RC	17/03/2022	17/03/2022	Eiielk	MAX amp CRS X	L Geobo	or-S	PCE		TS, AF	M	c						
						,	MAX													
				Progr	ess							Ro	otary	Deta	ails				Core De	etails
Date (dd/mm/yyyy) (hh:r	ne nm)	Hole Dep (m)	pth Casing De (m)	epth Water Depti (m)	Weath	er		Depth From (m	Dep I) (I	pth To (m)	Flush Ty	ре	Flush (Return %)	Flush Colou	ur Run Ti (hh:m	me Depth m) From (n	Depth To n) (m)	Diameter (mm)
15/03/2022 15/03/2022	2 09: 2 09:	15 28	0.00		0.90	Clear			1.20 3.00	3. 4.	.00	Water Water			95 95	Brown Brown	00:1 00:2	5 1.20 0 3.00	3.00 4.50	101 101
16/03/2022 16/03/2022	2 07: 2 18:	30 00	1.20 4.50	0.00 3.00	0.60	Rain			4.50 6.00	6. 7.	.00 .50	Water			95 95	Brown Brown	00:1 00:1	5 4.50 5 6.00	6.00 7.50	101 101
17/03/2022 17/03/2022	2 07: 2 18:	30 00	4.50 17.60	9.00	0.60	Fair			7.50 9.00	9. 9.	.00 .20	Water Water			95 95	Brown Brown	00:1 00:1	5 7.50 5 9.00	9.00 9.20	101 101
									9.20 10.10	10 10	0.10 0.60	Water			95 95	Brown Brown	00:1 00:1	5 9.20 5 10.10	10.10 10.60	101 101
									10.60 11.60	11 13	1.60 3.10	Water Water			95 95	Brown Red	00:3 00:3	0 10.60 0 11.60	11.60 13.10	101 101
									13.10 14.60	14 16	4.60 5.10	Water Water			95 95	Red Red	00:3 00:3	0 13.10 0 14.60	14.60 16.10	101 101
									16.10	17	7.60	Water		6	95	Red	00:3	0 16.10	17.60	101
									1											
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			l .						4											
	T = ()			Hole and	Casing	()	0		-											
Depth 17	10 (m) .60	Ho	Die Diame	ster (mm)	Depth To 17.60	(n)	Casing Dia	ameter (mm) 175	-											
			Chise	lling / Sk		~~			-											
Depth F	rom (m)		Denth T	ining / Sic	Duration (ht		Tool /	Remark	-											
Bopun		+	Bopari	o (,	Bulaton (in)	10017	- toman												
									1											
		V	Vater \$	Strike			Water	Added	1											
Strike At (m)	Rise To (n	n) Tim	e Elapsed (mins)	Casing Dept	th (m) Depth S	ealed (m)	Depth From	Depth To (m)	1											
0.90	0.90	1	20					()	1											
									1											
									1											
		Wa	ater St	trike Rem	narks		·	•					Ge	enera	al Rer	marks	-			
At 0.90m; w	ater ingres	iS.					1	. Prior to exc	avation, a	a Cable	e Avoi	dance Tool (C	AT) surv	vey wa	s carried	l out. An ins	pection pit	was hand-d	ug to 1.20m	depth.
							8	Services Were	5 11UL 10CA	ied.										
		lı	nstalla	tion					P	ipe							В	ackfill		
Туре	Tip Depti Distance	n / R (m)	esponse Z Top (m)	one Response Base (zone m) Installatio	n Date	ID	Top Depth (m)	Base De	pth (m)	Diam	neter (mm)	Туре	De	pth From	(m) Depth	To (m)	Backfill N	laterial	Date
GMP	9.00		2.00	8.00	17/03/	2022	1	0.00 2.00	2.0 8.0	00		50 50	Plain Slotted		-0.50 0.00	0.0 0.5	00 50	Upstandin Concr	g Cover ete	17/03/2022 17/03/2022
							1	8.00	9.0	00		50	Plain		0.50 1.50	1.5	50 00	Bento Grav	nite el	17/03/2022 17/03/2022
															8.00	17.	.60	Bento	nite	17/03/2022
Notes								_												
- Abbrevi	ations a	nd re	sults da	ata define	d in 'Explor	atory L	ocation F	Records K	eyshee	ets'										
L																				
Checked By	r		СК			E	levation Dat	tum	Ordn	ance [Datum			Gr	id Coord	linate Syste	m O	SGB		
Template: F	GSL/HBSI	FGSL	BH Sumr	nary.hbt/Conf	fig Fugro Rev5	26/06/20	19/TS+AW										Print Date		28/04/20	22

		C	Contract Name	I	LBA C	CS T	ransp	port a	nd Storage Project Ground Investigations	Location ID			
-fug	RI		Client		Eni Uł	(Lim	ited			LB 2	21 1	9	BH
		F	ugro Reference		F1900	89					· · – ·	· - ·	
•		C	Coordinates (m)		E3414	54.3	7 N37	71095	5.10 Ground Elevation (m Datum) 11.98	Sheet 1 of 4	1		
		F	lole Type		Sonic	Core	Drilli	ng to	Rotary Coring	Status	Dr	aft	
Depth	Sa	ampli	ing and In Situ Testing	С	ore R	ecov	ery		Strata Details				Rockfill /
(m)	Туре	No.	Test Results	TCF (%)	R SCR	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
									TOPSOIL. Grass over dark brown silty SAND with				
- 0.10 - 0.30	В	2						-	frequent rootlets (<1mm x 8mm). Sand is fine to coarse	(0.30)			
- 0.20 - 0.25 0.25	ES	1						-	[TOPSOIL] [SAND]				
0.25	PID B	5	0.2 ppm					-	Light orangish brown very clayey SAND with	0.30	11.68		
0.40 - 0.45	D	4						-	medium.	(0.30)			
		7						_	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]	11 20	<u> </u>	
0.65 - 0.70	D	6						-	Yellowish light brown silty SAND with occasional rootlets (<3mm x 100mm). Sand is fine and mediun	n.	11.30	× × × × ×	
								-	UUTWASH GLACIO-FLUVIAL DEPOSITS [SAND	1		×××	
- 0.90 - 1.20	В	9						-		(0.60)		x × ,>	
- 1.00 - 1.05	D	8						1-				××^,	
								-				×××,	
- 1.20 - 1.65 1.20 - 1.65	SPT	10	N = 8 (S)					-	Loose light brown mottled orangish brown SAND w	ith 1.20	10.78		
								-	rare rootlets (<1mm x 25mm). [OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND	1			
- 150 170		16						_	1.20m to 1.50m; assumed zone of core loss.	(0.60)			
- 1.50 - 1.70		10								(0.00)			
								_					
								-		1.80	10.18		
								-	Loose brown slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded fine and				
- 2.00 - 2.10	D	17						2 —	medium of sandstone and mudstone.				
- 1.20 - 3.00				100	N/A	N/A		-	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND	1			
								-					
								-					
								-		(1.20)			
- 2.50 - 3.00	в	18						-					
								-					
								-					
								-					
								-					
- 3.00 - 3.45 3.00 - 3.45	D SPT	11	N = 5 (S)				1	3 —	Loose brown SAND. Sand is fine to coarse.	3.00	8.98		
	_							-	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]			
- 3.20 - 3.30		19						-					
								-					
- 350-440	в	20						_					
-		20						-					
								-					
3.00 - 4.50				87	N/A	N/A		-		(1.50)			
								-					
-								4 —					
								-					
								-					
								-					
4.40 - 4.50	D	21						-					
- 4.50 - 4.95 4.50 - 4.95	D# SPT	12	N = 4 (S)				1	-	ASSUMED ZONE OF CORE LOSS.	4.50	7.48		
1 100			,					-	[NO RECOVERY] 4.50m to 6.00m; drillers description: extremely loose				
								-	sand.				
[-					
_								_					
									Continued next page				
Notes													
 Abbreviations 	and I	esult	s data defined on 'N	lotes	on Ex	plorat	ory Po	osition	Records'				
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		(Contract Name		LBA C	CS T	rans	port a	and Storage Project Ground Investigations	Location ID			
-fug	RI		Client	\dashv	Eni Ul	K Lim	ited			LB 2	21 1	19	BH
		F	-ugro Reference		F190C	089]	╺╸╾╺╴╴	· • — ·	~	
•		۲	Coordinates (m)		E3414	154.3	7 N3	7109'	5.10 Ground Elevation (m Datum) 11.98	Sheet 2 of	4		
		ŀ	lole Type		Sonic	Core	Drilli	ing to	Rotary Coring	Status	Dra	aft	
Depth	Sa	ampli	ing and In Situ Testing	С	Core R	ecov	ery		Strata Details				Rackfill /
(m)	Туре	No.	Test Results	TCF (%	R SCR	RQD (%)	lf (mm)) Depth	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
	 	\vdash	-	+	+	<u> </u>	Ì –	+'				+	
i i	'							-	1		1		
4.50 - 6.00	'			0	N/A	N/A		7	1	(1.50)	1		
i I	'								1		1		
i I	'							'		'	1		
	'							'		'	1		
	'							'		'	1		
	'							'		-	1		
Ĺ	/							'		'	1		
6.00 - 6.20	D	22			<u> </u>	<u> </u>	1	6 -		6.00	5.98		<u> </u> : ∃:!
6.00 - 6.45	D# SPT	13	N - 1 (S)					'	 Very loose reddish brown becoming loose prown SAND with rare gravel. Sand is fine and medium. 		1		
6.00 - 0 . .	5		N = 1 (3)					'	Gravel is angular to subrounded fine to coarse of	'	1		
l '	'							'	sandstone and mudstone.	,	1		·
l '	'							'		'	1		1日!
- 6.50 - 7.40	в	23						-	4	'	1		
ŀ	'								-	'	1		
7.50	'			100	21/0				-	'	1		- -
6.00 - 7.50 -	'			100	N/A	N/A			-	'	1		
ŀ	'								-	'	1		
Ĺ '	'							7 –	-	'	1		- ·
ŀ	1 '								-	-	1		日日
ŀ	1 '								-	'	1		
ł '	'								-	'	1		
7.40 - 7.50	D	24							-	(2.80)	1		
- 7.50 - 7.95	D#	14		\vdash	<u> </u>		-	-		'	1		
7.50 - 7.95	SPT		N = 7 (S)							'	1		
ŀ	1 '								-	'	1		日
7.80 - 8.00	D	25							-	'	1		
ŀ	'								-	'	1		
- 8.00 - 8.80	в	26						8 -	4	'	1		
ł	'								-	'	1		
	1 '			1.00	21/0				-	'	1		
7.50 - 9.00	1 '			100	/ N/A	N/A			4	'	1		
ł	1 '								4	'	1		i 🛛 📲
ŀ	1 '								-	'	1		
ł	'								-	'	1		
ł	'								-	'	1		
8.80 - 9.00	D	27							Reddish brown slightly gravelly SAND. Sand is fine '	to 8.80	3.18		
ł	'								- coarse. Gravel is angular to subrounded fine to		1		
9.00 - 9.20	<u>p</u> /	28		\vdash	+		-	9 —		(0.40)	1		G
9.00 - 9.25 9.00 - 9.24	D SPT	15	100/105 mm (S)	100) N/A	N/A		.'		'	1		
9.00 - 9.20	1 7			\vdash	+		–		Reddich brown GRAVFL and COBBLES of very	9.20	2.78		-
ł	1 '								weak reddish brown fine to medium grained	'	1		
9.20 - 9.65	1 '						NA		sandstone. Gravel is angular and subangular fine to	(0.45)	1		
ł	1 '						ľ		subangular. Destructured.	- ` · ' !	1		
0.05 0.05	_ '	20		100						0.65	2 22		
9.65 - 9.95 9.20 - 10.10	^D /	29		100	/ N/A	N/A	\vdash	1 .	Reddish brown slightly gravelly SAND. Sand is fine.	9.00	2.33		
9.65 - 9.95	1 '						NA	.	Gravel is subangular and subrounded line and medium of sandstone. Residual soil.	(0.30)	1		:
- 10 10	_ '	20							[CHESTER FORMATION] [SAND]	0.05	2.02		
9.95 - 10.10	' '	30						-	Continued next page	9.90	2.05	1.	1
11-100	لللل	<u> </u>			<u> </u>	<u> </u>		·					<u> </u>
Notes		- oult	- to defined on !	1-ta		Inraf		-itio					
- ADDIEviauono	anu	esun	3 data denned on	10ເຮວ	; 011 E.A.	ρισιαι	Jry i C	JSILION	, Records				
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		(Contract Name	1	LBAC	CS -	Trans	sport a	and Storage Project Ground Investigations	Loc	ation ID)		l
-fug		.	Client		Fni U	KLin	nited			╡╻	R (21 1	19	RH'
		i [Fuoro Reference	F	F1900	<u>.</u> 189	<u></u>				Ľ		· · - ·	L
V		- i	Coordinates (m)	F	F3414	454.3	37 N3	×7109	5 10 Ground Elevation (m Datum) 11.98	She	eet 3 of	4		1
		Ī	Hole Type	ŗ	Sonic	Core	- Dril'	ling to	Rotary Coring	Sta	tus	Dr	raft	
Donth	S	amp	ling and In Situ Testing	с	ore F	lecov	/ery		Strata Details	<u></u>		<u>I</u>		
(m)	Туре	∍ No.	Test	TCR (%)	₹ SCR	RQD (%)) If (mm	Depth	Strata Descriptions		Depth (Thickness) (m)) Level (m Datum)	Legenc	Backtill / Installation
9.95 - 10.10	<u> </u>	–		· · · ·	1	<u> </u>	NA	<u>, .</u>	Reddish brown aravelly SAND with low cobble	\rightarrow	(0.15)	v		
10.10 - 10.60				90	76	32			content. Sand is fine to medium. Gravel is angular t subrounded fine to coarse of greenish grey sandstone. Cobbles (15mm x 70mm x 85mm) are subrounded of greenish grey sandstone. Residual soil. [[CHESTER FORMATION] [SAND] Moderately weak to medium strong locally very we	to ak	10.10	1.88		
10.85 - 10.99	С	31		100	Ча <u>5</u>	42	-	- - - 11 -	Very thinly and minity bedget reducts for white any medium grained micaceous SANDSTONE. Bedding fractures are inclined 10 to 30 degrees, very closely and closely spaced, planar, smooth and rough partially open and open, clean with occasional fine sand and clay infill. Distinctly weathered becoming partially weathered. [CHESTER FORMATION]	d g y				
11.11 - 11.26	С	32			50	42		-	10.10m to 10.23m; very weak greenish grey fine grained sandstone. Distinctly weathered. 10.60m to 10 65m; assumed zone of core loss.					
10.10 - 13.18 11.71 - 11.82	С	33					20 90 190	-	11.68m to 11.70m; 1 No. subrounded clast (10mm x 20mm x 50mm) of green mudstone.		(3.08)			
- - - 12.31	C C	34						12 —	 11.96m to 12.03m; very weak with honeycomb weathering. 					
12.11 - 12.0.		J.						-	-		Í			
11.60 - 13.10 - -				100	100	65			12.58m to 13.15m; joint 80 degrees, planar, smooth, open with fine sandy clay infill (<1mm).					
. 13.18 - 13.61 - - - 13.70 - 13.88 - 13.10 - 14.60 - -	с	35		100	100	81			13.15m to 13.18m; greenish grey sandstone. Moderately weak to medium strong thickly laminate and cross-laminated to thinly bedded reddish brown fine to coarse grained micaceous SANDSTONE wil widely spaced thin greenish grey laminations. Bedding fractures are inclined 10 to 30 degrees, ve closely to widely spaced, planar, smooth and rough partially open and open, clean with occasional fine sand and clay infill. Joints are inclined 80 to 85 degrees, planar, smooth, open to moderately wide with clay infill (<10mm). Partially weathered. [CHESTER FORMATION] 13.85m to 14.95m; 2 No. joints 80 to 85 degrees spaced 40mm to 20mm apart.	id n th xry 1,	13.18	-1.20		
-						 	_	-	- 14.37m to 14.40m; soft brown mottled black clay. -					
- - -								-	14.78m to 14.87m; greenish grey sandstone.				· · · · · · · · · · · · · · · · · · · ·	• • • •
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Notes - Abbreviations	and I	result	s data defined on 'N	Votes	on Ex	∷plorat	tory P	osition	ı Records'	Print	+ Date	28/	/04/2022	

		C	Contract Name	L	.BA C	CS T	ransp	port a	nd Storage Project Ground Investigations	Loc	ation ID			
-fug	RI		Client	E	Eni Uk	(Lim	ited			ΊL	B 2	21 1	9 1	BH
		F	ugro Reference	F	1900	89							· ·	
•		C	Coordinates (m)	E	3414	54.3	7 N37	71095	5.10 Ground Elevation (m Datum) 11.98	She	eet 4 of 4	1		
		F	Hole Type	S	Sonic	Core	Drilli	ng to	Rotary Coring	Sta	tus	Dra	aft	
Depth	Sa	ampl	ing and In Situ Testing	Co	ore R	ecove	ery		Strata Details					Dealifill /
(m)	Туре	No.	Test Results	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions		Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
				. ,	. ,									
15.16 - 15.35	с	37						-						
14.60 - 16.10 13.18 - 17.60				100	98	93	40	-			(4.42)			
-							740	-						
15.72 - 16.10	С	38						-						
-								16 —						
-								-	16.10m to 16.37m; joint inclined 80 degrees.					
-								-	16.35m to 16.46m; greenish grey.					
								-						
16.83 - 17.15 16.10 - 17.60	с	39		100	100	69		-					· · · · · ·	
-								17 —						
								-					· · · · · ·	
- 17.40 - 17.50 -	С	40						-						
									End of Borehole at 17.60 m		17.60	-5.62		
								- 18						
								-						
								-						
								-						
								-						
_								19 —						
								-						
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Notes - Abbreviations	and r	esult	s data defined on 'N	lotes	on Ex	olorate	ory Po	osition	Records'					
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		Contrac	t Name	L	.BA CCS T	ransport	and Sto	rage Project Ground Investigations	Location I	D		
-fire	DU	Client		F	ni UK I im	ited				71	10	RН
		Fuaro R	eference	e F	190089				LD	<u> </u>		יייט-
•		Coordin	ates (m)	F	341454 3	7 N3710	95 10	Ground Elevation (m Datum) 11.98	Sheet 1 o	f 4		
		Hole Tv	pe		Discontinui	tv Loa			Status		Draft	
					Dis	continuit	y Details	;			Discontir	uity
Depth	Type	Dip	Aperture	Aperture	Medium	Small Scale	Set	Remarks		Depth	Discontinuity	Legend
(m)	турс	(°)	(mm)	Observatio	on Roughness	Roughness	Reference			(m)	Log	20g0nu
Depth (m)	Type	Dip (°)	Aperture (mm)	Aperture	Medium Scale Roughness	Small Scale Roughness	Set Reference	Remarks		2		Legend
										4		
Notes - Abbreviations	and resu	llts data d	efined on	'Notes	on Explorat	l ory Positi	on Record	ds'			<u> </u>	
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		Contrac	t Name	I	LBA CCS	rage Project Ground Investigations	Location ID)				
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-fire	RN	Client			Eni UK Lii	nited				1	19	RH
		Fugro R	eference	> i	F190089				רע_ ג	· -		ייט.
•		Coordin	ates (m)	E	E341454.3	37 N3710	95.10	Ground Elevation (m Datum) 11.98	Sheet 2 of	4		
		Hole Ty	be (1)	1	Discontinu	ity Log			Status		Draft	
		,			Di	scontinuit	y Details		,		Discontin Informat	uity ion
Depth (m)	Туре	Dip	Aperture (mm)	Apertur Observat	re Scale	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend
(''')		()	,		riougrines							
										. . .		
Nata-												
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		Contrac	t Name		LBA C	CST	ransport	and Sto	rage Project Ground Investigations	Location	۱D			
-fuc	RO	Client			Eni Ul	K Lim	ited			IR	21		19	RН
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•		Coordin	ates (m)	-	F3414	154 3	7 N3710	95 10	Ground Elevation (m Datum) 11.98	Sheet 3	of 4			
			ne (11)		Disco	ntinui	tylog			Statue			Draft	
		THOIC TY	pe		DISCO	Dis	continuit	v Details		Otatus		[Discontir	uity
													Informat	ion
Depth (m)	Туре	Dip (°)	Aperture (mm)	Aperta Observa	ure S ation Rou	edium Scale Ighness	Small Scale Roughness	Set Reference	Remarks		D	epth (m)	Discontinuity Log	Legend
10.10 - 10.44	J	90				PI	Sm		Black staining on surface			_	90°	
10.12 10.14	BF BF	0		PC PC)	PI PI	Sm Sm					_	102	
10.23 10.30	BF BF	0		0		Pl Un	Sm Ro		Incipient			-		
												_		
10.44 - 10.45	BF	10		0		PI	Sm					_	10 °	::::::
												-		· · · · · · ·
10.68 - 10.70	BF	20				PI	Sm					-	20 °	:::::
10.75 - 10.77	BF	20		0		PI	Ro					-	20 °	· · · · · · ·
10.84 - 10.86	BF	20				Ы	RO					-	20 *	••••
10.98 - 11.00	BF	20		0		PI	Ro					11 —	20 °	· · · · · · ·
11.09 - 11.11	BF	20		0		PI	Ro					-	20 °	:::::
11 04 44 07	DE	20				DI	Dr					-	9 n ¢	
11.24 - 11.27 11.30 - 11.32	BF	20		0		PI	Sm					-		· · · · · · ·
11.37 - 11.39	BF	20		0		PI	Ro					-	20 °	: : : : : :
11.45 - 11.47	BF	20)	Ы	Sm					_	20 °	· · · · · · ·
11 64 11 65	BE	10				Lin	Po					-	10 °	
11.71 - 11.73	BF	20		0		Un	Ro					-	20 °	· · · · · · ·
11.82 - 11.83	BF	10		0		PI	Ro					-	10 °	:::::
												-		· · · · · · ·
12.01 - 12.03	BF	10		PC)	PI	Ro					12 —	10 °	
12.14	BF	10		0		PI	Sm		Incipient			-	10 °	: : : : : :
12.17 - 12.18	BF	10		Ō		PI	Sm					-	10 °	· · · · · · ·
12.31 - 12.34	BF	30		PC)	PI	Sm					-	30 °	
12.40 - 12.42	BF	20		0		PI	Sm					-	20 °	· · · · · · ·
12.48 - 13.15	J	80		0		PI	Sm					-	80 °	:::::
12.66	BE	0				PI	Sm					-		::::::
12.00	55											-		· · · · · · ·
12.78 - 12.79	BF	10		0		РI 	Ro		Terminating on subvertical joint			-	10 °	: : : : : :
12.88 - 12.89	BF	10		0		Un	Sm _					-	10 -	· · · · · · ·
12.99 - 13.00 13.03	BF	10		0		PI	Ro					13 —		· · · · · · ·
13.05 - 13.07 13.17 - 13.18	BF BF	20		PC	,	PI PI	Sm Sm						10 °	
13.85 - 14.60 13.87 - 13.89	J BF	80 20		MV	v	PI PI	Sm Ro					-	80° 20°	
												14 —		••••
14.13 - 14.15	BF	20		0		PI	Ro					-	20 •	
14.24., 14.25	RE	10				PI	Sm					-	10.0	· · · · · · ·
14.32 - 14.33	BF	10		0		PI	Sm					-	10°	
14.32 - 14.96	J 	80		MM	v	PI	Sm					-	80°	
14.47 - 14.49	BF	20				PI	Sm					_	20 °	· · · · · · ·
14.56	BF	10				rı						-	10, 1	
												-		· · · · · · ·
14.78 - 14.79	BF	10		0		PI	Ro					-	10 °	
14.95 - 14.97 15.00	BF BF	10 0		PC O)	PI PI	Sm Sm					_	10 ° 0 °	· · · · · · · · · · · · · · · · · · ·
Abbreviations	and resu	ults data c	lefined on	'Note:	s on Ex	plorat 19/TS	ory Positi	on Record	is'	Print Date			28/04/2022	

Pursue	Contract Name LBA CCS Transport and Storage Project Ground Investigations												
Note: Fundamental effection of Formation Form	-fua	RO	Client			Eni UK Lim	ited			∐LB 2	21	19	BH
Coordinates (m) EVALUAT Security (lastic) Status Draft Image: Security (lastic) Discontinuity Details Image: Security (lastic) Discontinuity Details Image: Security (lastic) Image: Security (lasti			Fugro F	Reference	e	F190089					. –		-
Image: Type Display			Coordin	iates (m)		E341454.3	7 N3710	95.10	Ground Elevation (m Datum) 11.98	Sheet 4 of	4	Dueft	
Depth Type Dia Name Name <th< td=""><td></td><td></td><td>Hole Ty</td><td>pe</td><td></td><td>Discontinui</td><td></td><td></td><td></td><td>Status</td><td></td><td>Draπ Discontir</td><td>uity</td></th<>			Hole Ty	pe		Discontinui				Status		Draπ Discontir	uity
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1538-1541 Br 30 0 P1 an 1739-1741 Br 30 0 P1 Bn 1739-1741 Br 30 0 P1 Bn 1739-1741 Br 30 0 P1 Bn 16 1 1 1 1 1 1 16	(m)	Туре	(°)	Aperture (mm)	Apertur Observat	re Scale Roughness	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend
13.3 - 13.41 BF 30 0 P Sm 13.3 - 13.41 BF 30 0 P Sm 13.3 - 13.41 BF 10 0 P Sm 13.3 - 13.41 BF 10 0 P Sm 13.3 - 13.41 BF 20 0 P Sm 13.61 - 42.71 BF 20 0 P Sm 13.72 - 77.33 BF 10 0 P Sm 17.59 - 77.33 BF 10 0 P Ro 10 0 P Ro 0 P Ro 10 0 P Ro 0 P P 10 0 P Ro 0 P P </td <td>15.06 - 15.09 15.06 - 15.09</td> <td>J</td> <td>30</td> <td></td> <td>0</td> <td>PI</td> <td>Sm</td> <td></td> <td></td> <td></td> <td></td> <td>15° 30°</td> <td></td>	15.06 - 15.09 15.06 - 15.09	J	30		0	PI	Sm					15° 30°	
18.0 0	15.38 - 15.41	BF	30		0	PI	Sm				- - - - - - - - - - - - - - - - - - -	30 °	
14.37.16.38 BP 10 PO PI Ba 16.68.16.71 BF 30 O PI Re 11.68.16.71 BF 20 O PI Re 11.739.17.41 BF 20 O PI Re 117.39.17.41 BF 20 O PI Re 117.22.17.23 BF 10 O PI Re 118 III IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	16.10 - 16.40 16.12 - 16.14 16.19 - 16.21	J BF BF	90 20 20		O O PO	PI PI PI	Ro Sm Sm					90° 20° 20°	
16.29 · 16.71 BF 30 0 PI Re 10.77 BF 10 0 PI Re 17.39 · 17.41 BF 20 0 PI Re 17.22 · 17.23 BF 10 0 PI Re 18 19 10 10 10 10 19 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	16.37 - 16.38 16.39 - 16.41 16.48 - 16.49 16.52	BF BF BF BF	10 10 10 0		PO PO 0 0	PI PI PI PI	Sm Sm Ro Ro				-	10° 10° 10° 0°	
17.39-17.41 BF 20 0 PI Sm 17.52-17.53 BF 10 0 PI Ro 18 19 10 10 10 10 19 10 10 10 10 10 19 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 <td< td=""><td>16.68 - 16.71 16.77</td><td>BF BF</td><td>30 10</td><td></td><td>0</td><td>PI PI</td><td>Ro Ro</td><td></td><td></td><td></td><td></td><td> 30 ° 10 °</td><td></td></td<>	16.68 - 16.71 16.77	BF BF	30 10		0	PI PI	Ro Ro					30 ° 10 °	
17.52 - 17.53 BF 10 0 Pi Ro 18 1 1 1 1 1 1 19 1 1 1 1 1 1 10 1 1 1 1 1 1 1 17.52 - 17.53 BF 10 0 Pi Ro 1 1 1 10 1 <	17.39 - 17.41	BF	20		0	PI	Sm				17 -	- - 20 °	
Notes - Abbreviations and results data defined on "Notes on Exploratory Position Records'	17.52 - 17.53	BF	10		0	PI	Ro				-	10 °	· · · · · · · · · · · · · · · · · · ·
Notes - Abbreviations and results data defined on 'Notes on Exploratory Position Records'											18	-	
Notes - Abbreviations and results data defined on 'Notes on Exploratory Position Records'											19 —		
Notes - Abbreviations and results data defined on 'Notes on Exploratory Position Records'											-		
Notes - Abbreviations and results data defined on 'Notes on Exploratory Position Records'											.		
	Notes - Abbreviations	and resu	ults data d	lefined on	'Notes	on Explorat	ory Positi	on Record	ds'				
Template: FGSL/HBSI/FGSL Discontinuity.hbt/Config Fugro Rev5/18/02/2019/TS Print Date 28/04/2022	Template: FGSL/HB	SI/FGSL Di	scontinuity.ht	ot/Config Fug	ro Rev5/	18/02/2019/TS				Print Date		28/04/2022	

Norwest Holst So	vil Epo	inea	ring	Ltd	STAT	s,)		BORE	HOLE	Boreh	ole I
		,	ang	Lu.	0247.	200)G		8
Location 750mm Mickle Trafford to	Method	Cabi	le Percus	sion	51		1	15	1479	siJ/	19
Deeside Pipeline	Boreho	le Diam	(mm)15	0	C	boot	9 1 U			,	
Client British Gas						41	\$1	7183			
Sh G Dog Consultant	Date 0	8/10/9	2 08/10	/92	G	oun	d Lev	el British (Geological Si	uney	
Description of Strata			Legand	Depth Below G.L.(m)	O.D. Level	San () apth	& Insitu (m)	Testing ()&N	Ground Water	Piazo 6ta
TOPSOIL						T		100	SCR NUD		
Firm bleck brown elightly silty CLAY with some rootlet	le.		<u> </u>	0.30							
			x			в	.50	1.00	1 1		
Firm brown elightly sandy silty CLAY with some rootle	te.		<u></u>	1.10		ווי	.00	1.60	(9)	i	
			xx	1.60							
Soft to firm brownish grey sandy very silty CLAY			<u>×</u> ×		1	J	.60				
			<u>x - x</u>			J	-80	2.50	(e)		
Loose brown very silty fine SAND.	•		x' x	2.20				2.00			
			× · · ×								
			*			J	.60				
h Guirghelew 2.00m becoming slightly silty		ological S	×.`			8	.00	3.45	eolegical S	urvey	
		İ	×			w	.30			71	
			* * *			8	.50	4.00			
Loose brown silty fins SAND,			* x	3.80							
			× · · ·			5	.00	4.45	-e-	1->	
			. × ·								
			×.								
Soft brown very sandy silty CLAY.			<u>× ×</u>	4,80		з 4	.90				
			x - x			s s	.00	5.45	·"		
			÷								
			<u> </u>	5.80							
Loose brown silty fine SAND.			x,			8	.80	6.30			
			×								
Soft brown pandy SILT,			x ·x ·	6.50		sle	50	6.95	-15-		
sh Geological Survey	British Geo	ological S	× Č× Č	6 90		Ī		British (eological 3	uney	
Brown very sitty sandy fine to coarse subangular GRAN	VEL.		• • × •	0.00		B	.90	7.40			
			¢, o ,×	7.40							
Brownish brown moderately weathered fine to medium SANDSTONE very weak.	n gravel of					s	.40	7.70	78/50mm		
				8.20		s s	.00	8,20	50/40mm		
Barchale Complete at 8.20m.											
Della Davia											
Data Final Depth (m) of:	Hard Depth(m)	Strate	Time	Borehola	Com	nen 00-	ts		Logged	ьү:	
08/10/92 8.20 3.30 7.50 7	70-8,00	du tal S	0116)	Doleucie u	10101 drug 2.	JUM.					
		""									
J Small Disturbed Samula S Symuthetic Pro-	tration Tart Sea		- 54	Casing r	naintaine	id ju	st ab	ove base	of boreh	ole unles Piezomo	s st
Sample 8 this Disturbed Sample C Core Personal	on Teat C.I.	T. 300mm	pervitietion		un -		1-)	Fast Weter	Strike	R Lipper \$	ani Ani
Test W Were Salada) ees	NO Forgev	on porrottation	1.C.R. 166 S.C.R. Sali	a Core Recove id Core Noocvo	iy (%) iy (%)	1	sin/pin Stan	water Strike ding Lavel	Sand C	al Nor Tie
N.CY N.R. Na Recovery II Down to drive 1	U100 R.P.	No Pen	et ation	II. Q.D. Ree	K Caucity Denig	retion	0	Lavat 20mm Centry Dept	a after strike h	Giour S	ieal .

.

	Norwest Hols	t Soil Engine	ering	Ltd.	S7478	jh)	BORE	HOLE)G	Boreh	ole No. 7
	Contract No. F9626 Location 750mm Mickle Trafford	Method Cab Ito	le Percus	noia	Sh	eet	L of 1 5.	Ju7S	~J	(43
	Decside Pipeline Client British Gas	Borehole Dian	n (mm)15	10	Co	107ds 1418]	3 718	2.		
Brittish Ge	Consultant	Date 09/10/	92 09/10	/92 Depth	G	ound	Level British C	Testing	rey	
	Description of St	rata	Legend	Below G.L.(m)	Level (m)	De	pth(m) _{TCR}	()& N SCR RQD	Water	Plazomator/ Standpipe
	Soft brown organic CLAY with abundant root	ota.		0.20						-
						B 0.6	0 1.00			-
				1.20		U 1.0	0 1.50	(7)		-
	Firm grey very silty CLAY with some rootlets.								<u>77</u> 1	
			××	1.80		J 1.6	0		17	-
	Loose brown silty rine to medium SAND,		×			5 2.0	0 2.45	*6+		
			× · · · ×			B 2.5	50 3.00			-
British Ge	Loose reddish brown silty fine to medium SAN	i o. British Geological S	×	2.80		\$ 10	xo 3.45	kolonieni Sur	/ev	
Lineir ea			× *						1	
			* ×			W 3.8	50			
			× · · · ×			J 3.8 5 4.0	so xo 4.45	*10*		
			× × × ×							
			· · ×			в 4.7	80 8.00			-
			× ×			s 6.0	5.45	-112		
			× · · ×			ļ				-
			* ×			в 6.8	50 5.30			
			×··×							
	Soft to firm brown thinly laminated silty CLAY	with some fine sand	× ×	6,50		SB 6.9	50 6.95	-23"		-
British Ge	iogical Survey	British Geological S		6.90			British (iological Str	ley	
	Brown sity sendy fine to course subangular G	RAVEL.	9 ° × °	7.20			70 7 60	89/4E		1.1
	Weight providences weathered added	TONE VBIY WBak.				5 /	20 7.50	83/40mm		-
						J 7.3	70			
	Barehale Complete et 8.10m.			8,10		\$ 7.6	30 \$,10	50/40mm N.R.		
			1							
	Daily Progress	Hard Strat	a a		Com	nent:	3	Logged I	ογ:	
British Ge	Date Final Depth (m) of: Borehole Water Cas 09/10/92 8,10 1.60 7.20	Depth(m) ing 7.50-7.90 1 h	Time Unity r							
	J Smell Disturbed Semple 8 Star	stard Paratistion Tart S.P.T. ''N I	lor full	Casing I	maintaine Inv Core Run	d jus	Ground W	of boreho ater	Piezom	s stated ster
	Sample 8 But Disturbed Sample C Con and V Instituted U100 Sample V Instit	e Penetration Tast u Vana Tast /200 For gi	m p aras tration vers ponatration	T.C.R. Te	al Cute Recovo	Y (%)	1→ Fluet Water 1→ Subsequent	Strike Weter Strike	Sand Co	ian) eli
	Koy W Water Sample K Peri M.R. No Recovery 0 110	neebility Test/26* South we to drive UTCO N.P. No Pe	nationalism	A.Q.D.Ro	ea Core Hecove ok Quelity Deep	v (%) netion ()	 am/pm Star SZ Level 20mil Cosing Dep 	sang tevel nuniter strike lli	Fieturn Lower S Grout	nter Tip Inel

	Norwest He	olst So	oil Ei	nginee	ering	Ltd.	S747:	ŝN	BORE	HOLE DG	Boret	ole No. 20
British Ge	Contract No. F9626 Lecation 750mm Mickle Tra Deeside Pipeline Client British Gas Consultant	fford to	Meti Bore Date	hod Cab hole Dian 08/10/9	le Percus n (mm)15 12 08/10	3ion 10 /92	SI	neet 1 pords 417 round	of 1 5 3 7181 Level	Geological :	suvey	H-6
	Description (of Strata			Legend	Depth Below G.L.(m)	O,D, Ləvəl (m)	Samp De	ling & Insitu pth(m) _{TCR}	() & N SCR ROD	Ground Water	Piezomater/ Standpipo
	TOPSOIL Firm gray mottled brown alightly sity CL	AY with som	e rootlets.			0.10		J 0.1 U 0.4	0 0 0.85	(42)		
	Firm brownish gray silty CLAY with occublack arganic silt. Black arganic silt. Madium dense brownish gray vary silty i	isional small ; ine to mediur	grevel eize m SAND.	enses of	* ×	0.95		J 0.8 J 0.8 U 1.0	5 5 1.45 0	(22)		-
	Medium dense reddish brown fine and n	nedium SAND			* *	1.45		J 1.4 68 1.5	5 2.00	38 N.R.		
			•					J 2.2 SB 2.6	15 10 2.95	-2-		
British G					uno)			J 3.2	British	Geological	08/10em 3.00	
	Loose brownish grey fine and medium 6	AND.				4,00		SB 3.6	0 3.95	-3.		
	below 4.45m becoming slightly silty below 4.80m becoming fine SAND.							ο ρ -+, 1			1→	
						5.60		5 6.1	io 5.55	-8- N.R.		
	Firm brown clayey very sandy SILT.				× × × ×	6.20		J 6.0	80 75 6.20	*7*		-
British Gr	RAVEL. Reddish brown slightly weathered SAN	OSTONE mod	orately wea Britis	k. I Geological	<u></u> (• × (• 110)	6.50 6.90		SB 6.1	50 6.62 British	80/*** (eological)	INRY	-
	poreiona complexe et olocini.											
												_
	Daily Progress		ł	ard Strat	a		Соп	ment	5	Logged	by:	1
British Ge	Date Final Depth (m) Borebole Water 08/10/92 6.98 3.00	of: Casing 6.60	Depth 6.50-6.90	(m) _{olog} cal 1 h	Time Juicy				British	Geological	Survey	
	J Small Certailed Bample Sample & Auto Certailed Bample and Test Undershall UT00 Sample Koy Wate Sample	3 Standard Pen C Cone Panatus V Insitu Varre T PR Prematusionete K Permatality () Blows to driv	etration Tast itian Tast iast H Tast Tast Tast I (J100	S.P.T. ** N I C.P.T. 300m /200 For gi /25* Sentin N.P. No Pe	or full in penotiation ven pervetuation og bluvva only restration	Casing Re T.C.R. To S.C.R. So II.Q.U.Ro	maintain tery Case Run tel Core Recov éd Case Recov ok Quetty Des	edius my (%) my (%) gnation (*	t above basi Ground W 1→ First Weter 2→ Subsequer 	e of bore /ater r Strike w Water Strike www.Strike strike strike strike strike	hole unle Piezom Sent Piezom Sent Cover	<u>se stated</u> ater Seet Seit Seit Beet

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Sheet 1 Fig. 34

LOG for BOREHOLE No. 534

Location No. T. 4940 MIP - WIRRAL ROAD. SJ 37 SE 28 Sheet 1 of 1 Carried out for M.O.T. (G. Maunsell & Partners). 39024 71899 Date 25th, 26th and 27th April. 1967. Diameter 8° Casing to 36-6"

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		-			0			Inte of	Van to
	Description	Reduced	Legend	Sample	ft, in.	Thickness ft. in	Standard Penetration	test blor ~	lab test
				· ·			Depth Ne	a. of 114	1
	Ground Level (Ft. above N.D.)	+74.3	$\overline{\mathbf{x}}$	/	0 0	0-10	and Bi Penetration (N)	· ·
	brown sitty char topsoil with a	5.72.4	KXX	F. a	0 - 10		ft. in.		
	ITTIC TIME SAVIA CHIC SOURCES	: /3.4	<u>×</u>	- 1	•				
								0	Comp
	•			- 3				19	3A CB.R.
	Figure to Stipp Logur Silly		- , - .						
	rirm to stift orown silty	17	L.	E . 1		9-8			Comp
	CLAY with a trace of sound	61	<u>×</u>	⊢•		· -			CPR.
	and atrace of fine to med.		· · ·	F					
	gravel.								$ \rangle$
	ological Survey Rritish G	ological Survey	×	- 5		• British	eological Sulvey	24	MAG8)
			<u>.</u>						1112
		63.7		F	10-6				
			0	- 6					
				-					
			1, : -	Fmi	•				
			. •					40	
	-			E				1.0	
			1: .	E '					4
			0. "	- • 8					17
				E - 1					
			1. : • '	E	ł				1
			• • • •	-					
							19-6/2	0	h
		62	· · ·	Ľ٣			21-03	~	
	Medium dense to dense brown	4		- :		Distant.			11
	fine to medium SAND with	erogical Sulve)	·	F 10		BHIISN	22-0	31	11
	a trace of fine to medium		. ::	FT		06 -	23-6	-1	11
	aravel. Grey traces above		°. ·	E I		20-0			
	15						24-6 4	19)	Comp
			. i •	F 1 "			26-0	1	(+'
	Recoming very dense below		. •	E					CBR.
	32-6			E.		1	27-6		11
			1.	- • 12			109-011	5)	11
			••••	F.'			27-0	1	11
			0.	E L-			30-01		11
			1.	E • (3			31-6	9))
			•	- '			51 0		
			%	E I					
			·. •	Ε, Ι			34-6		
	plogical Survey British G	lological Survey	ſ. ··	- • 14		British	200-05	511	M.
			:::	E ! .			20-00	1	
	Wankly comented red fine	37. 7		- ¢15	36-6	1-0	37-03	% "	
	weaking certification The	20.7	تل نا ند	-•	37-6	Penetra	237-03	6	
	and meature SANDSTONE.	50.1				[10	
				E -					
	Water Level Observations.	· E	10	Eor	BOR	EHOLI	-		
	- 104 10 - 10 - H	-	1	F			r·		
÷	Date Time B.H. Casing Vepth			E					
5	vepin vepin To Water	•		E					
	25 APR 18 00 7 - 6 NIL DRY	1							
	26 APR 08:00 7.6 NUL ORY	I		F					
0	11. 100 18.00 21-00 24-1 25-0			F		l			
0	27402 00 00 00 00 00 00 00 00 00 00 00 00 0			E					
ų,	2700 08:00 30-0 34-6 35-0			-					
400	27APK 09.00 51-6 36-6 DRY	olonical Survey		F		British	Senionical Sciences		
0	, UIBITO	orogioar oditoj		=		onddi	ourogrear ordero)		
		L	L	–		L	I		
	Scale 1 in.=5 ft.								
			å s	P.T.	Tube or	Core Sampl	le ∆	Water S	mple

Bulk Sample

S.P.T. (Leng

(Length to scale)

LOG for BOREHOLE No. 535 Fig. 35 Location No. T. 4940 MIP- WIRRAL ROAD. SJ 37 SE 29 Sheet 1 of 1 Carried out for M.O.T. (G. Maun Sell and Partners). 39226 71593 Date 25th and 26th April. 1967. Diameter 8" Casing to 10'-0"

1	Description	Reduced	Legend	Sample	Depth ft. in.	Thickness ft. in.	Standard Penetration tes	No of	key to
	Ground Level (Fr. above ND.) Brown Silty CLAY TOPSOIL, with a little fine to medium Sand and	+ 102.9	××	•.1	• • 1-0	1-0	Depth No. of and Blows Penetration (N) ft. in.	04	
	Some roots		a.1.×1.1.1.	3				38	M.A. Comp CBR.
	Stiff to very stiff brown sitty CLAY with a trace of fine to medium sand and a trace of fine to andions manual	ological Survey 61 '	· · × · ·	•6		Britishi 19 - O Penetro	eological Supey Cteck	38	<u>М</u> , А, С, Б,
	Grey mottled about 5ft.		×	E 07	•			46	
				E0 8				42	-
		82·9		E I 9	20-0			48	
	Borehole Dry throoghout	logical Survey E	END	- - -	BORE	HOLE	eological _, Suney		
	· · · · · ·				-				
	•								
	clogical Survey British G	edogical Survey				British (bological Suney		
Soil Mechanics Ltd.									-
Copyright of	obgical Survey British G	eological Survey				British (Geological Survey		
	Scale 1 in.=5 ft. • Disturbed Sample	_1	+	5.P.T.	Tube or (Length	Core Sam to scale)	ple Δ	Water	Sample

C

LOG for BOREHOLE No. 536 Fig. 36

Location No. T. 4940 MID- WIRRAL ROAD. Carried out for M.O.T. (G. Maunsell and Partners). 39319 71451 Date 25th April. 1967 Diameter 8' No. Casing.

Г	Descrip	tion		Reduced	Legend	Sample	Depth ft, in.	Thickness	Standa	ard on test	No of blows	Key t
Br	Ground Level (Ft. abov own Silty CLAY ace of Savel	TOPSOIL, u	uitha e roots.	+104.8	~~~	E• 1	0 0 1-0	1-0	Depth and Penetration ft: in.	No. of Blows (N)	υ4	
-	•				X	3					40	M, A,
					×	E•4		• . •				
S	tiff very stif rey mottled	f brown Silty CL	and AY	ologi 6 G urvey	×	E s	· .	British (leological Su	vey	55	MAC
22 20	ith a trace ledium sand fine to med	of fine and at	e to vace wel					19-0 Penetr	arteol.		03	
va di	ery stiff at ense SANP at	10ft. m 18-19.	colium				•					
		•		· .	- ×						65	
	Medium dens Sand layers	s ort 18'-1	medium 9'		×	E • 9 E • 10	20-0		18-0 19-6	(19)		
R	CALSUNGY	Y THROUG	British Ge How T.				BOR	EHOLE	eological Su	z ney		
	ORLINOLL PIC					E						
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dogi				logical Survey				British (Geological Su	ney		
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:000ĝi				condical ani/o6)		Ē		- Briushi	sectogical Su	The second second		

LOG for BOREHOLE No. 537 Fig. 37 Location No. T.4940 MIP - WIRRAL ROAD. SJ 37 SE 31 Sheet 1 of 1 Carried out for M.O.T. (G. Maunsell and Partners). 39589 71239 Date 22nd and 24th April. 1967. Diameter 8' Casing to 25'-0"

	Reduced	land	Samala	Dep	th	Thickness	Standa	rd	No of	Key to
Description	Level: ft.	Legend	sample	ft.	in.	ft. in.	Penetratic	No. of	blows	lab tes
Ground Level (Ft. above N.D.) Brown clayey SILT TOPSOIL with a trate of Cing to medium	+63.3	\otimes	-•1	°	0	2-0	and Penetration ft. in.	Blows (N)	04	
Sand and some roots.	61.3	\mathbf{x}	E. 2	2-	0		1			ļ
Loose brown fine to medium sitty SAND.	a32	×.	3			3-6			25	Μ
Pense brown silly fine sand with a trace of time to medium gravel and some sub-rounded	57. 8 62	0 X 0. X 0. X 0. X 0.	4 4 5	5.	. 6	2-6	7-0	(9) (31/2	Ļ	M, A.
gical Survey British Geol	<i>5</i> 5∙ 3		Ę۲°	8-	. 0	British Ge	9-0	18	Ύ	L
Loose pale brown fine to med. SAND.	be '		É¢7			5-0	10-6	(8)		ſ
	50.3	× I	E 8	13-	0		13-0	(11)		
Shiff-very stiff brown sitty Sandy CLAY with a trace	Ы	- <u>x</u> .	Ē 🖌 🕫						48	M, N, F, 7
of fine to medium growel. Occasional sandstone		× · · ·	Ē			6-0				
gravel.	44.3	1 × 0 0: ×	E•"	19 -	0					
Dense brown silty SAND.	L.	×	E + 12			4-6	19-6 21-0	(43)	1	•
gical Survey British Geol	20 -	x.	Edis	-	,	British Ge	22-0 23-6	(44)		
Stiff red brown silty CLAY with atrace of finetenedium sand	59.8 bi	×. •:	- 0 14 - 0 15	23	-6	3-0	24-0	(40)	· ·	
Weak to medium hand yeard	36.8	X	EI 16	26	-6		27-0	21/	147	
fine grained SANDSTONE.	34.8		E is	28	-6	2 - O Penetrate	27-9 128-0 28-6	57/	ł	
	EN	Þ	EOF	в	or	EHOLE	.			
Borehole Dry throughout.										
ical Survey British Gani	tical Survey		E			British Gor	odical Surve			
. Usinari USU			E				2 - Sourt			
					j		.			
ical Survey British Ganil	vical Survey		F			British Geo	rogical Surve		11	
	Description Ground Level (F. show N.D.) Brown Claydd Strine to medium Sund and Sorne rosts. Loose brown fine to medium Sity GAND. Pense brown sity fine Sound with a trace of fine to medium struct and Sorre Sub-rounded Sobbles becoming olaydy at base. Loose pale brown fine to med. Shiff -very stiff brown sity Sandy CLAN with a trace of fine to medium gravel. Occasional Sandstone gravel. Pense brown sity SAND. Stiff red brown sity CLAY with atrace of finetomedium sound gravel Weak to medium hard red fine grained SANDSTONE. Borehole Dry throughout.	Description Results Level: R. Ground Level (R. shows ND) Brown Clay & Str TOPSOIL With a trace of time to medium Sing SAND. 463.3 Loose brown fine to medium Sing SAND. 432 Description 57.8 Jonse brown fine to medium Sing SAND. 57.8 Description 57.8 Jonse brown fine to medium Struct and Some Sub-rounded Cobbies becoming olaying at base. 57.3 Loose pale brown fine to medium Sandy CLAN with a trace of fine to medium growel. 50.3 Occasional Sandstone gravel. 50.3 Description 52.3 Shiff -very Stiff brown sitty Sandy CLAN with a trace of fine to medium growel. 50.3 Occasional Sandstone gravel. 44.3 Pense brown sitty SAND. 52.3 Stiff red brown sitty SAND. 54.8 Weak to medium hand read fine gravined SANDSTONE. 34.8 Boreholz Dry throughout. 54.8 Boreholz Dry throughout. EN	Description Reduced Legend Ground Level (Fe show N.D.) Brown Claukes Str TORSOLL With a trace of the to medium Sity SAND. 463.3 Loose brown fine to medium Sity SAND. 91.3 Loose brown fine to medium Sity SAND. 92.3 Description 57.8 Jobse brown fine to medium Sity SAND. 57.8 Loose pale brown fine to wedium Sandy CLAY with a trace of fine to medium gravel. 50.3 Loose pale brown fine to wed. Shift -very stiff brown sity Sandy CLAY with a trace of fine to medium gravel. 50.3 Stiff red brown sity SAND. 50.3 Stiff red brown sity SAND. 50.3 Stiff red brown sity SAND. 51.8 Baren and Same Sand Stiff red brown sity SAND. 51.8 Baren and Same Sand Stiff red brown sity SAND. 52.3 Stiff red brown sity SAND. 51.8 Baren and Same Sand Sand Sandstone gravel. 51.8 Weak to medium hard real fine grained SANDSTONE. 34.8 Borehole Dry throughout 54.8 Borehole Dry throughout 54.8	Description Reduced Level (R. above N.D.) Brown Clayby Strine to Mcdium Sund and Sorre roots. 463.3 Loose brown fine to medium Sity SAND. 43.3 Loose brown fine to medium Sity Sand. 57.8 Description 57.8 Striff - very Stiff brown fine to medium Sandy CLAY with a trace of fine to medium gravel. 57.3 Dose brown fine to medium Sity SAND. 57.8 Loose pale brown fine to medium Sandy CLAY with a trace of fine to medium gravel. 50.3 Decessional Sandstone gravel. 57.8 Pense brown silty SAND. 50.3 Stiff red brown silty SAND. 57.8 Stiff red brown silty SAND. 50.3 Barren Sand Sandstone gravel. 57.8 Pense brown silty SAND. 50.3 Stiff red brown silty SAND. 50.3 Stiff red brown silty SAND. 50.3 Barren Silty SAND. 50.3 Barren Silty SAND. 50.3 Barren Silty SAND. 50.3 Barren Stiff Pred brown silty SAND. 50.3 Barren Silty SAND. 50.3 Barren Silty SAND. 50.3 Barren Sand Sandstone gravel. 50.8 Stiff red brown silty SAND. 50.8 Barren Sand Sandstone gravel. 50.8 Barren Sand Sandstone gravel. 50.8 Barr	Description Reduce it. Level if. above NDJ Strougen Claubel String DOPSUL With a trace Sorre roots. 463.3 Loose brown fine to medium Sity SAND. 61.3 2 Description 57.8 4 Schuld and Sonre roots. 57.8 6 Loose brown fine to medium Sity SAND. 57.8 4 Description 56.3 6 Schiff - very Stiff brown sity Sandy CLAY with a trace of fine to medium gravel. 50.3 10 Description 50.3 10 13 Shiff - very Stiff brown sity Sandy CLAY with a trace of fine to medium gravel. 50.3 10 Description Sandy CLAY with a trace of fine to medium gravel. 12 12 Pense brown sity SAND. 12 12 Weak to medium hard read fine gravined SANDSTONE. 36.8 11 Borehole Dry throughout 13 26 Borehole Dry throughout 13	Description Reduce it. Level: it. Interest. Legent it. Level: it. Level: it. It. it. it. it. it. it. it. it. it. it. i	Description Reduced Level (F. show N.D.) Brown Claube Office to Medium Sity SAND. 463.3 (a).3 0 0 2 2 0 Sanad and Some roots. Gl. 3 2 0 3 3 3 Loose brown fine to medium sity SAND. 57.8 3 3 3 3 Perse brown situ, fine sond with a trace of the to medium share some sole brown fine to medium syncul and sole sole rounds 57.8 5 4 5 2 6 Dose pale brown fine to medium syncul and sole sole rounds 55.3 5 5 5 5 5 Loose pale brown fine to medium syncul CLAY with a trace of fine to medium syncul. 5 3 13 0 Dense brown silty SAND. 5 3 10 6 0 Stiff red brown silty SAND. 5 11 2 0 Weak to medium solation synaul fine grained SAND STONE. 3 3 3 0 Borehole Dry throughout 5 3 11 2 0 Stiff red brown silty CLAY with atrace of fine to medium hard red fine grained SAND STONE. 2 0 2 0 Borehole Dry throughout 5 12 18 12 12	DescriptionReduced Level: it.Largerd Level: it.Sample Level: it.Description It.Description Level: it.Ground Level (F: shore ND) Sunda anal Some roots.63.3-120 $\frac{1}{100}$ Sanda anal Some roots.61.3-2.2.07.0 $\frac{1}{100}$ Loose brown Silty Sano. a_{32} -15.0 $\frac{5}{100}$ $\frac{5}{100}$ Posse brown Silty Sano. a_{32} $\frac{1}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ Posse brown Silty Sano. 57.8 $\frac{1}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ Posse brown Silty Sano. 57.8 $\frac{1}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ $\frac{5}{100}$ Loose pale brown Pine to medium sandy CLAY with a trace of fine to medium gravel. $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Shiff red brown Silty Sand attrace of fine brown Silty CLAY with attrace of fine medium sand attrace of fine medium sand tank gravel $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Weak to medium hard real fine gravined SANDSTONE. $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Borehole Dry throughout. $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Stiff red brown Silty CLAY with attrace of fine medium sand attrace of fine medium sand $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Borehole Dry throughout. $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ $\frac{1}{100}$ Borehole Dry throughout.	DescriptionAdvact in termsMathematical productGround Level II, is about NDJ OCSULColspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"Sand avral Sorrie roots.Loose brown fine to mediumSitty Sand.Sitty Sand.Sitty Sand.Sitty Sand.Sitty Sand.Sorrie roots.Loose prown Sitty Sand.Sorrie roots.Loose paile brown Sitty Sand.Stiff or medium growel.Coc sitty Sand.Sorrie roots.Loose paile brown fine to wead.Sorrie roots.Loose paile brown Sitty Sand.Stiff or medium growel.Sorrie roots.Dense brown Sitty Sand.Stiff root medium growel.Sorrie roots.Loose paile brown sitty Sand.Stiff root medium growel.Sorrie roots.Dense brown sitty Sand.Stiff root medium growel.Sorrie roots.Sorrie roots.<	DescriptionReduct is treamed sample I_{n} min. I

Disturbed Sample

Bulk Sample

Tube or Core Sample
 (Length to scale)

∆ Water Sample

Sheet 1 Fig. 39

LOG for BOREHOLE No.539

Location No. T.4940 MID - WIRRAL ROAD. SJ 37 5 6 32 Sheet I of I Carried out for M.O.T. (G. Majunsell and Partners) 39897 71163 Date 25th and 26th April. 1967 Diameter 8° Casing to 25-0°

٢	Description	Reduced Level: ft.	Legend	Sample	Depth ft. in.	Thickness ft. in.	Standard Penetration	est blows	Key t lab te
	Ground Level (Ft. 2004 N.D.) Brown Silfy CLAY TOPSDIL with a little fine to med. SAND & Some round	+69. 4 68. 4	*		0 0 1 - 0	1,-0	Depth No and Bl Penetration () ft. in.	U4	M
			 	3			3-00	8) 3)	
ih Ged	ogical Survey British Ger	ogical Survey	×	- 5		British G	7-6	20)	
	Loose to medium dense brown fine to medium SAND with			E¢ <i>6</i>			10-0 11-6 (1	3)	M
	a trace of silt and occas- ional clay pieces above 5ft, and a trace of coarse	62	× .	Ē		24 - 0	12-6 14-0	12)	CB
	saind and a trace of fine to medium gravel below 20ft.			Ë † 8			16-6	9)	
				E \$9			18-0 19-0	13)	
ih Geol	ngical Survey British Ger	ological Survey	0 0			British G	22-0(15)	
	Weak to medium hard red brown weakly cemented fine grained SANPSTONE.	44 · 4 c 40 · 9			25-0 28-6	3-G penetrate	25-6 26-6 27-6 28-6	80/ 80/	
		Εn	D OF	100	REHOL	E	2		
Ih Geoli	Water in borehole after withdrawing casing. Overnigh water level dry.	Angical Survey	-			British G	e llogical Surver		
Mechanics Ltd.									
Copyright of Soil	egical Sunney British Gei	bloqical Survey		111111		British G	edogical Survey		

Disturbed Sample

 \bigcirc

0

A Bulk Sample

S.P.T.

Tube or Core Sample

∆ Water Sample

Fig. 40 LOG for BOREHOLE No. 540 Location No. T. 4940 MID - WIRRAL ROAD. SJ 375633 Sheet 1 of 1 Carried out for M.O.T. (G. Maunsell and Partners) 39954 71122 Date 24th and 25th April . 1967. Diameter 8" Consing to 20'

	Description		Reduced Level: ft.	Legend	Sample	Depth ft. in.	Thickness ft. in.	Standa Penetratio	ird on test	No of blows	Key to
	Ground Level (Fr. 200ve N.D.) Dark brown Silty CLAY wi a little Sand & Some roots. (To	th prsoil)	+72.6	×		0 0 1 - 0	1-0	Depth and Penetration ft. in.	No. of Blows (N)	04	
	Firm to stiff brown sittu Sandy CLAY with some coarse sand &a trace of to medium gravel.	fine	ы 68 · 4	1×1.6	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	4 - 3	3-3	•		33	M,A.
ish Ge	logical Survey		ological Survey		6		Britishi	Geological Sc	rvey	43	p.s.d.
	Medium dense to dense fine to medium SAND.	brown	62			٩	21-9 enetrate	11-0660 12-600 14-0066	(12) (19) (12)		CBR.
ish Ge	Nogical Survey	British G	ological Survey				British	18-0 20-0 21-6 21-6	(28) (33) (58)		M
	Real de Orenthamile	. ut	46·6	· · · · ·	- • 12	26-0		25-0 25-0 26-0	9%		
	Dorenole Dry Throught		EN	2	OF	BOR	EHOL	Ξ.			
ish Ge		British G	ological Surve				British	Geological S	rvey		
yright of Soil Mechanics Ltd.						•				×	
ŝ		British G	ological Surve				British	Geological S	rvey		
1	Scale 1 in.=5 ft.										

Disturbed Sample

C

Bulk Sample

Tube or Core Sample + (Length to scale)

∆ Water Sample



Bulk Sample

LOG for BOREHOLE No. 549 Fig. 49 Location No. T. 4940 MID - WIRRAL ROAD. 53375637 Sheet 1 of 1 Carried out for M.O.T. (a. Maunsell and Partners). 3985871166 Date 2nd June 1967. Diameter 8* Casing to 14ft.

	Description		Reduced Level: ft.	Legend	Sample	Dep ft.	in.	Thickness ft. in.	Standa Penetratio	on test	No of	Key t
Ground Level	(ft. above N.D.)		84.20	\bigotimes		0	•	-	Depth and Penetration ft. in.	No. of Blows (N)	4	
Firm red brown so with some	yellow gre andy Silty angular y	y and CLAY yravel.	م ر _ا	\bigotimes	3			10 - O			27	7 M, A.
nogical S (MADE ORIGINAL	GROUND Brown TOP) British Ga 'SOIL	74 · 2 · 41 73 · 2		- 4	10 - 11 -	00	Bhilish (1 — O	eological Sun	ey	43 -	Comp Sn3.1
Very stif CLAY with and med some fine	f red brown h layers of ium SAND and medium	n sandu f fine and n gravel	6,	•6		(F	9-6 enetror	13-6 15-0	(6)		
ological Survey		British Gar	62.7 Iogical Survey		8	20-	6	British I	19- 0 20-6 ediograf Sur	(6)		
Borehole	Dry thro	ughout.	END	OF	E Bof	REH	OL	E.				
•	4											
elogical Survey		British G o	ilogical Survey					British	ieological Su	iey		F
		-										
		British Geo	logical Survey					British	'eological Sua	iey		

Disturbed Sample

~~

C

C

Bulk Sample

• S.P.T.

Tube or Core Sample (Length to scale)

~

△ Water Sample

Sheet 1

THE INSTITUTE OF GEOLOGICAL SCIENCES

r			THE INSTITUTE OF GEOLOGICAL RECORD OF SHAFT, BOREHOLE O	SCIENCE R SECTION	S N			×
	NAME	OF SECTION MAWA No	RDEN CASTLE COLLIERY . I BOREHOLE		REGISTRA	ATION NU 6 NW/	MBER 31	
British Geolog	Com	runicated by Haw	arden Estate Office		NATIONA	L GRID R	EFERE	NCE
	Date	of sinking 1862	(7)		SURFACE	OR STAP	TING	EVEL
					1:50 000 N	AP CONF	m IDENT	A.O.D. IALITY
		GEOLOGICAL CLASSIFI-		THICKNESS	10% REDUCED		SC	ALE:
	1	CATION BY:	DESCRIPTION OF STRATA	STRATA (m)	(m, A.o.D)	DEPTH (m)		
	2 3 4			0.4		1-22	2 3 4	
	5 6 7						5 6 7	
British Geologi	8 9 1 0		British Geological Survey			British G	8 9 10	Burvey
	1 2 3		Blue Clinte + particles of COAL	0.49		10.85	1	
	4 5 6						4	
	7 8 9		Drift (1840m)			19.05	788	
	2.0		Loan and Sand	0.01		19.66	20	
	3							
	6 7		Strong Mari	3.92		27-58	6 7	
British Gonlook	9 30		Gravel	0.76		24-85 Dritich (3	9 30	a mov
onian ocoroge	2		printi ocological danky			Unitario	23	namej
	4 5 6						4 5 6	
	7 8 9		Strong Mart	10.06		38.40	7 8 9	
	4 (1 2		Werren ConL Trig	0.61 0.20		40.42 \$	1	-terminate (
	3 4 5		Light Metal Linstay	2.44		43.15	3	
	67		Sine Metal Grey Rock ?	0.30	1	46.05	6	
	9 5 0		Srey Strong Rock Blue Metal	0.91 1.22		4.8.90	9 5 (
British Geologi	2		Light Blue Metal Sing	1.83		63 0150 ()	23	urvey
	5						56	
	7 8 9		Strong Blue Metal	5.03		58.04	8	
	1 2		Linn and Wool Light Blue Metal Strong Bluck Bass	2.74		60.78 62.20 62.10	6 (1 2	
	3 4 5		COAL Warren	1.07		62.27 64.03	3 4 5	
	6 7 8	A S	Uber R Metal COML Warren Warren	1.68 0.58 0.61 0.46		65.71 66.29 66.80 29.26	6 7 8	
	9 70		COAL L That Non Man Piles Stora Warren Linn and Wool Sine Metal A	1.24 0.61 0.23 \$		68.50 69.11 69.34 70.31	4 9	(*************************************
	2		Milel Rook	0.76		71-4-9	2 3	
British Geologi	4 5 6		British Geological Survey			British G	4 5 6	urvey
	7 8 9		Strong Rock	0.23		39.30	89	
	1 2		Linstay	2.29		81-99	1	
	3 4 5	NACO	COAL BUR Cluster	1.40		83.90	3 4 5	1.2.84
	6 7 8		Dark Metal COALY Strong Warren	(-32 ⁰⁻¹³)		86.08 ¥	6 7 8	
	9 9 1	D	Linstay	2.59		90.22	1	
	23		Strong Linstay Strong Rock	2.13		92-35 93-67	2	
	56		Ritigh Contrained Orman	Q.81	1	Diffick O	5	Inter
	7 8 9		Dark Metal	3.20		97.69	7 8 9	
	1	120007.000	Duck Meral CORL Warren	0.46		100-58	1	1.00 Mar 11.00
	4		Blue Metal Black Bass	3.05		105-0	4	
	6 7 8		Strong binthe	2.00		108.01	6. 7 8	
	9		Strong Rock Linn and Wool	0.71		109.55		0
	2 3 4		Store Rect	2.44			2 3 4	
	6 7		Durk Metal	3.86 0.76 1.14		116.71	67	
	8 9 12	0	Strong Rock Strong Burr	2.08	k	118-90		alvey .
	1 2 7	George I.	Aurk Metal Black Bass	1.22		121-31	1	- 323 S
	45		Warren Biech Bass	0.84		123.98	4	
	6 7 8 6						7	
	9 13 1	0					9° E	o
	2 3 4						2 3 4	
	5 6 7						5677	
	89	+0						0
	1 2 2		British Geological Survey			British G		Scovey
	45							
	6 7 8							
		10		1				50

			Cont	ract Nan	ne I	_BA C	CS Trai	nsport ar	nd Stor	age l	Proje	ect Gro	ound In	ives	tigatio	າຣ	Locati	ion l	D		
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			Fuar	o Refere	nce	=1900	89	u										_	~ '_		
			Coor	dinates	m)	=3338	00 04 50 N	1366175	52 (Grou	nd F	levatio	n (m [Datu	m) 5	16	Sheet	1 0	f 1		
			Hole	Type		Sonic	Core Di	rillina		orou		lovanc		Julu	iiii) 0.	10	Status	<u> </u>		Draft	
			11010	1990		001110	COIC DI	linig	Fauir	mer	nt						otatat			Bran	
Depth From	Depth To (m)	Hole .	Type D	Date From	Date To	E	auipment	Core B	arrel	Core B	it [Drilling Cr	ew Load	ied Bv	Remark	3					
0.00	1.20	IF	2 1	1/04/2022	11/04/2022	Han	d excavated	4				AD	A	AD							
1.20	9.45	SN		2/04/2022	12/04/2022	Eijelk	MAX	KL.		PCD		TS, AF	N	//C							
				Progre	SS								Rotary	Det	tails				C	ore De	tails
Date	Time	<u> </u>	Hole Depth	Casing Dep	th Water Depth	Weath	er		Depth	Dept	h To	Flush	Type	Flus	sh Return	Flush Colou	Ir Run 1	Time	Depth	Depth To	Diameter (mm)
(dd/mm/yyyy 11/04/2022	2 13:45	i)	(m) 0.00	(m)	(m) Dry	Overca	ast, light win	d	1.20	3.C	00	Wa	ater		95	Brown	00:	nm) 15	1.20	(m) 3.00	100
11/04/2022 12/04/2022	2 15:30 2 07:30		1.20 1.20	0.00	Dry Dry	Rain			3.00 4.50	4.5	50 00	Wa Wa	ater		95 95	Brown Brown	00:	15 15	3.00 4.50	4.50 6.00	100 100
12/04/2022	2 18:00)	9.45	9.00	0.50				6.00 7.50	7.5	50 00	Wa Wa	ater ater		95 95	Brown Brown	00:	15 15	6.00 7.50	7.50 9.00	100 100
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						1			1												
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			H	ole and (Jasing				_												
Depth	To (m)	Hole	Diamete	er (mm)	Depth To (m)	Casing Di	ameter (mm)	_												
9.4	45		51		5.00			175													
		0	Chisell	ing / Slo	w Progre	SS															
Depth F	rom (m)	[Depth To	(m)	Duration (hh	:mm)	Tool /	Remark													
		W	ater S	trike			Water	r Added													
Strike At (m)	Rise To (m)	Time I	Elapsed	Casing Depth	(m) Depth Se	aled (m)	Depth From	Depth To	1												
		(ii			-		(11)	(11)	1												
									1												
									1												
	L	Wat	ter Stri	ike Rem	arks		·	1	1	-			G	ene	ral Rei	narks					
Groundwate	er not encour	itered o	during exe	cavation.	-		1	1. Prior to exc	avation, a	Cable	Avoida	ance Tool	(CAT) sur	rvey w	as carried	l out. An ins	pection p	it was	hand-dug	to 1.20m	depth and
							r	escanned us	ing the CA	AT to ch	neck fo	r services	. Services	s were	e not locat	ed.					
		10-	etallati	<u></u>						ne								Rad	fill		
Trans	Tip Depth /	Res	ponse Zon	e Response	Zone	n Deta		Top Deet's (*)		h e	Di	tor ()	There is			(m) Dr	1 To ()	Jack		oriol	Data
rype	Distance (m)	Top (m)	Base (n	i) Installatio	n Date	U	τορ Depin (m)	Dase Dep	ar (iii)	anet	a (mm)	iype		0.00	Ueptn 9.4	10 (III) 45	B	Bentonit	enal e	12/04/2022
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- Abbrevi	ations an	d resi	ults dat	a defined	in 'Explor	atory L	ocation I	Records K	leyshee	ts'											
Checked By		F	G			E	levation Dat	tum	Ordna	ance Da	atum			0	Grid Coord	linate Syste	m C	SGB			
Template: F	GSL/HBSI/F	GSL BH	H Summa	ary.hbt/Confi	g Fugro Rev5/	26/06/20)19/TS+AW										Print Dat	te		27/04/202	2

		(Contract Name	-	LBA C	CS ⁻	Frans	sport e	and Storage Project Ground Investigations	Location ID	1		
-fug	RI		Client		Eni Ul	K Lin	nited			IB 2)1 <i>[</i>	1 <u>9</u>	RH
		🛑 F	Fuaro Reference	F	F1900)89				╷╘╸╘┙╌	••	·~	
•		- c	Coordinates (m)	1	E3338	304.5	50 N3	6617!	5.52 Ground Elevation (m Datum) 5.16	Sheet 1 of	2		I
		ł	Hole Type	ŗ	Sonic	Core	e Drill	ling		Status	- Dr	raft	
	S	amp!	ling and In Situ		`~re R	<u>`````````````````````````````````````</u>		T	Strata Details				
Depth			Testing		0161.	e	ery	\perp					Backfill /
(m)	Туре	No.	Test Results	TCR (%)	(SCR) (%)	RQD (%)) lf (mm) Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)) Legend	Installation
0.00 - 0.10	D B	1	1	\vdash	1	\square	\vdash	+	(Possible) MADE GROUND. Dark brown slightly				
0.00 0.22	^L	5							subrounded fine to coarse of limestone.	.0			2
0.20 - 0.00		່ 2							[MADE GROUND] [SAND]				
0.30	ES	3 4							1	(0.80)			8
0.30	PID		< 0.1 ppm						1	(0.00)			2
-		6						'	1				
0.60 - 0.80	B	о 7							1				8
0.90		Q								0.80	4 36		<u> </u>
0.80 0.80 - 1.20	B	ъ 9							Firm and stiff grey mottled orange silty CLAY.	0.60	4.30	×	
0.90	TCon		2.60 W/m.K					1_		(0.40)			
- 1.00		10	2.10 W/m.ĸ					J - 1	1	(0.40)			
1.10 1.10	PID	îυ	< 0.1 ppm						1	1 20	2.06		
1.10 1.20	TCon P	11	3.30 W/m.K	\square	+	\square	1		Soft light grey mottled orangish brown slightly sandy	/ 1.20	3.90	×	
1.20 - 1.65		12	7 (2)					1	silty CLAY. Sand is fine.			×	
1.20 - 1.65	SPi		N = 7 (S)					7	1.20m to 1.50m; assumed zone of core loss.				
F I	'								1				
	_ '	40						7	1	(0.82)		$ \times -$	
1.70 - 1.80	D	18						-	1			×	
ľ	'							-	1			×	
	'								1			×	
	'							2 —	Plastic dark brown moderately strongly decomposed	d 2.02	3.14	site site	2
1.20 - 3.00 2 15 - 2.25		19		83	N/A	N/A	•	L 1	(H6) pseudofibrous PEAT with low fine fibres, no	' · · ·		5 316 S	
2.10								L	coarse fibres and low wood fragments (F1, κυ, wij).	•		a silla a	5
ł	'							- I	2.13m to 2.28m; soft light grey clay.	(0.66)		silis silis to silis ;	
-	/							-	1	(****.,		sile sile	
- 2.50 - 2.60	D	20						-'	1			s site s site site	3 4
ł	'							-	-			5 316 3 316 316	
ł	/							-	Soft light grey silty CLAY with pockets of peat	2.68	2.48	× ×	
	_ '	01						.'	(<30mm x 40mm x 40mm).	(0.32)		×	
2.85 - 3.00	0	21						-	[TIDAL FLAT DEPOSITS] [CLAY] 	(0.02)		×	
- 3.00 - 3.45	D	13			<u> </u>	–	4	3 —	Direction dork brown moderately decomposed (H5)	3.00	2.16	× ×	7
3.00 - 3.50 3 00 - 3.45	B SPT	22	0/450 (S)						 Plastic dark brown moderately accomposed () pseudofibrous PEAT with low fine fibres, low coarse 	' ا		6 316 3 316 316	8
3.20 - 3.30	D	23	0,400 (0)						fibres and low wood fragments (F1, R1,W1).			a sila s	8
ł	/											stite stite te stite i	
l	/								1	(0.81)		sile sile	-
L	'							-	1	N		la sura sita	4
l	/								3.56m to 3.68m; soft light grey clay.			s site s site site	8
l	/											- 10 - 10 - 10 - 10 - 10	
3.00 - 4.50	'			100	N/A	N/A]	3.81	1 35	stra sua la stita e	8
3 90 - 4.00		24							Very soft and soft slightly sandy slightly gravelly	0.01	1.00	E'	-
		£.						4 -	and subrounded fine and medium of mudstone and			'	
ſ	'									(0.49)		F'	
Í	/							'	[TIDAL FLAT DEPOSITS] [CLAY]			E'='	
Í	/							'		4 30	0.86	<u> </u>	
4.35 - 4.50	D	25						'	Stiff brown slightly sandy slightly gravelly CLAY. San	id 4.00	0.00	['	
150 / 05		14				_			of mudstone. sandstone and quartz.	e		<u></u> '	-
4.50 - 4.55	B	26			\top		1	'	[GLACIAL TILL DEPOSITS] [CLAY]			F'	
4.50 - 4.95	SPI		N = 12 (S)					'	1		1	上二	
t	/							'	1			+	
Ī	/							'	1	(1.12)		F	
		07							1			E- <u>-</u> -'	
– 5.00 - ວ. ວ ບ		21							Continued next page	<u> </u>			
Notes	<u> </u>			<u> </u>			<u> </u>		<u> </u>				
- Abbreviations	s and r	result	ts data defined on 'l	Notes	on Ex	(plora	tory P	ositior	ו Records'				
l													
l													
L													_
Template: FGSL/H	BSI/FGS	SL Rota	ary If.hbt/Config Fugro Re	v5/23/1'	2/2019/T	rS+AW			r	Print Date	27/	04/2022	

		C	Contract Name	I	LBA C	CS T	rans	oort a	nd Storage Project Ground Investigations	Location ID			
-fug	R		Client		Eni Uł	< Lim	ited			LB 2	21 4	19	BH
		F	ugro Reference		F1900	89					_	_	
•		C	Coordinates (m)		E3338	804.5	0 N36	6175	5.52 Ground Elevation (m Datum) 5.16	Sheet 2 of	2		
		ŀ	lole Type	!	Sonic	Core	Drilli	ng		Status	Dr	aft	1
Depth	S	ampli	ing and In Situ Testing	С	ore R	ecov	ery		Strata Details		1	1	Backfill /
(m)	Туре	No.	Test Results	TCF (%)	R SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
								-				<u> </u>	
								-				E	-
4.50 - 6.00 5.30 - 5.40	D	28		100	N/A	N/A		-				E	-
-								-	Orangish brown slightly gravelly SAND Sand is fine	5.42	-0.26		-
- 5.50 - 5.65	D	29						-	to coarse. Gravel is angular and subangular fine to				
								-	[GLACIAL TILL DEPOSITS] [CLAY]	(0.42)			
								-	Firm brown slightly sandy slightly gravelly CLAY.		-0.68	E	
- 6.00 - 6.45	D	15					-	6 —	coarse of mudstone, sandstone and quartz.)		E	-
6.00 - 6.45	SPI		N = 11 (S)					-	[GLACIAL TILL DEPOSITS] [CLAY]			E	-
- 6.20 - 7.00	В	30						-				<u> </u>	-
-								-				E	-
_												F	
								-				F	
6.00 7.50				100				-				F	
-				100	17/4	11/7		-				F	
								-				F	
- 7.00 - 7.30	С	31						7 —				F	
												F	
7.30 - 7.45	D	32						-				F	
-								-				F	
- 7.50 - 7.95 7.50 - 7.95	D	16	N = 11 (S)	-	-		-	-				F	
								-		(3.61)		F	
· 7.70 - 8.45	В	33										F	
-								-				F	
-								8 —				F	
-								-				F	
- 7.50 - 9.00				100	N/A	N/A		-				F	
												F	
8.45 - 8.75	С	34										F	
-								-				F	
875-880		35						-				F	
-		55						-				F	
		47						-				F	
9.00 - 9.45	SPT		N = 17 (S)									F	
-								-				F	
								-				F	
ŀ								-	End of Porcholo at 0.45 m	9.45	-4.29		
F								-					
								-					
-								-					
-								-					
Notes			1	1	1		1	1		1		1	<u>.</u>
- Abbreviations	and i	result	s data defined on 'N	Votes	on Ex	plorat	ory Po	osition	Records'				
Template: FGSL/HE	BSI/FGS	SL Rota	ry If.hbt/Config Fugro Rev	/5/23/1	2/2019/T	S+AW				Print Date	27/0	04/2022	

			Cont	tract Na	ne	LBA C	CS Tra	nsport an	d Stora	ge Pr	oject Gro	ound	d Inv	estig	gations	L	ocation	ID		
-6	IGD		Clier	nt		Eni Ul	K I imite	d									IR	21	50	ТР
			Fuar	o Refere	ence	F1900	089											. .	_00	
•			Cool	dinates	(m)	E3335	500.79 N	366269.	93 G	round	Elevatio	n (r	m Da	atum) 4.85		Sheet 1 d	of 1		
			Hole	Туре		Trial F	Pit								,	5	Status		Draft	
				21					Equipr	nent										
Depth From (m)	Depth To (m)	Hole	Туре	Date From	Date To	E	quipment	Core Ba	arrel C	ore Bit	Drilling Cre	ew L	Logged	By R	Remarks					
0.00	3.60	TI	P 1	29/10/2021	29/10/2021	Mach	ine excavat	ed:			MR, RB		MR							
						· ·	JOD 30X													
				Progr	ess						, I	Rota	ary D	Detai	ls			(Core De	tails
Date (dd/mm/vvvv	Time (hh:mm	1)	Hole Dept (m)	h Casing De	pth Water Depti	1 Weath	er		Depth From (m)	Depth To	P Flush	Туре	,	Flush F	Return Flu	sh Colour	Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
29/10/2021	11:00	,	0.00		3.40	Showe	rs			. /					,		, ,			
20/10/2021			0.00		0.10															
						1														
	•		Н	ole and	Casing															
Depth	To (m)	Hole	e Diamet	er (mm)	Depth To	(m)	Casing Di	ameter (mm)	1											
		(Chisel	ling / Sk	w Progre	\$5														
Depth F	rom (m)		Denth To	(m)	Duration (ht	:mm)	Tool	Remark												
Deput			Doparito	()	Bulation (in	,	10017	Remark	-											
		W	ater S	strike			Wate	r Added												
Strike At (m)	Rise To (m)	Time (m	Elapsed nins)	Casing Dept	h (m) Depth S	ealed (m)	Depth From (m)	(m)	-											
3.40	3.20		20																	
																		1		
		Wat	ter Str	ike Rem	narks								Ge	nera	l Rema	irks				
At 3.40m; gr	roundwater s	trike.						1. Prior to exc 2. Trial pit term	avation, a C	Cable Av	oidance Tool	(CAT)) surve	ey was	carried ou	t. Service	s were not lo	cated.		
								. mai pit tom		,	indpoor or pir o		011 0/10	arado						
		Ins	stallat	ion					Pip	е							Bac	kfill		
Туре	Tip Depth / Distance (m	Res	sponse Zor Top (m)	ne Response Base (Zone Installation	n Date	ID	Top Depth (m)	Base Depth	n (m) Dia	ameter (mm)	Ту	уре	Dep	th From (m)	Depth Te	o (m) I	Backfill Ma	terial	Date
	(//)				-										0.00	3.60)	Arising	s	29/10/2021
Notes									1							1				
- Abbrevi	ations and	d resi	ults da	ta define	d in 'Explor	atory I	ocation	Records K	evsheet	s'										
			ua		בגףוטו	y L			- , 511001	-										
Checked P.	,		ск.			-	levation D-	tum	Ordeca		m			0	d Coordin-	te Svetor	0000	3		
Templato: 5	GSI /HROI/F	291 01	H Summ	any hht/Cord			ulli	lordnan	ice Datu				Grid	a Coordina	ie system	Print Data	ر 	21/04/202	2	

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni l	JK Limited	LB	21	5	0	TΡ
		Fug	ro Reference	F190	0089			_	_	• • •
, v		Coo	rdinates (m)	E333	3500.79 N366269.93 Ground Elevation (m Datum) 4.85	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status	;	Draf	t	
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
-					TOPSOIL. Light grey friable CLAY. [TOPSOIL] [CLAY]	(0.20)				
0.20 - 0.30	B	3				(0.30)				
0.20 - 0.30	ES	1		· ·	Soft light brown slightly sandy CLAY. Sand is fine to coarse.	0.30	4.55			
0.20	B	5	< 0.1 ppm	-	[TIDAL FLAT DEPOSITS] [CLAY]					
- 0.40 - 0.50	D	4		-						
- 0.80 - 1.00	в	7				(1.00)				
- 0.90 - 1.00	D	6				(1.00)				
- 1.00	HVane		18 kPa (3 <i>kPa</i>)	1-				F		
1.00 1.00	HVane HVane		19 kPa (5 <i>kPa</i>) 19 kPa (5 <i>kPa</i>)	-						
-				-						
- 1.30 - 1.50	В	9		-	Soft blueish grev CLAY.	1.30	3.55			
- 1.40 - 1.50	D	8		· ·	[TIDAL FLAT DEPOSITS] [CLAY]	(0.30)				
- 1.50 1.50	HVane HVane		22 kPa (6 <i>kPa</i>) 22 kPa (6 <i>kPa</i>)	-		(0.00)				
1.50	HVane		22 kPa (6 <i>kPa</i>)	-	Black moderately decomposed pseudo-fibrous PEAT. Organic	1.60	3.25	e site s		
1 00 0 00		44		-	odour. [TIDAL FLAT DEPOSITS]			stila stila a stila s		
1.80 - 2.00	в	11				(0.50)		ssta ssta va ssta s		
- 1.90 - 2.00	U	10		2-				ssite ssite te ssite s		
						2.10	2.75	ste ste		
-					Soft and firm blueish grey CLAY. ITIDAL FLAT DEPOSITS1 ICLAY1					
2.30 - 2.50	в	13		-				F		
- 2.40 - 2.50	D	12				(0.60)				
- 2.50	HVane		36 kPa (<i>10 kPa</i>)	-						
2.50	Hvane HVane		40 kPa (<i>14 kPa</i>) 40 kPa (<i>14 kPa</i>)	-						
				· ·	Stiff blueish grey gravelly CLAY. Gravel is angular to subrounded	2.70	2.15	· ; ;		
- 2.80 - 3.00	В	15		-	fine to coarse of mudstone.			·		
- 2.90 - 3.00	D	14		-						
				3-		(0.70)		· · · · ·		
								· · · · ·	T	
- 3.40 - 3.50	D	16		-	Multicoloured sandy CRAVEL Sand is fine to coarse. Gravel is	3.40	1.45		\square	
_ 3.40 - 3.60	В	17		-	angular to rounded fine to coarse of mixed lithologies including	(0.20)				
				-	mudstone, quartzite, flint and granite.	3.60	1.25			
				-	End of Trial Pit / Trench at 3.60 m					
				·						
				4-						
				.						
-				-						
				-						
				· ·						
				-						
Notes		roc. 14	doto dofin! -	111-1	Pit Stability	Plan		0		
- ADDI EVIATION	is and l	esuits	ata delined on	INUTE	base on excavation		3.6	υm		
					below 3.60mbgl.	0.60 m				135°
Template: FGSL/HE	SI/FGSL T	rial Pit.hl	ot/Config Fugro Rev5/05/	12/2019	TS-AW	Print Dat	e	21/04/	2022	

			Cont	ract Nar	ne	LBA C	CS Tra	nsport an	ld Stora	ge Pro	oject Gro	und Inv	/esti	gations	L	ocation	ID		
-6	IGR		Clier	nt		Eni Ul	K Limite	d								IR	21	51	BH
			Fuar	o Refere	ence	F1900)89	-									<u> </u>		
			Coor	rdinates	(m)	F3332	26 34 1	J366612	20 G	round	Flevatio	n (m D	atur	n) 5.08	3	Sheet 1 o	of 1		
			Hole	Type	()	Cable	Percus	sion			Liorado			, 10.00		Status	<u> </u>	Draft	
			11010	1990		Cable	1 01000		Fauipn	nent						Statuo		Dian	
Depth From	Depth To (m)	Hole	Type	Date From	Date To	F	quipment	Core Ba	arrel Co	ore Bit	Drilling Cre	w Logge	d By	Remarks					
(m) 0.00	1.20	IF	2	24/11/2021	24/11/2021	Har	nd excavate	d			EA, KM, SI	D EA	۰,						
1.20	10.05	C	P 2	24/11/2021	25/11/2021	D	ando 3000				KM, SD	EA	1						
Date	Time		Hole Dent		ess oth Water Dent	h			Denth	Denth To	۲ 	kotary i	Deta	Return		Run Time	Denth	Depth To	etalis
(dd/mm/yyyy) (hh:mn	n)	(m)	(m)	(m)	Weath	er		From (m)	(m)	Flush	Туре	(%) Fl	ish Colour	(hh:mm)	From (m)	(m)	Diameter (mm)
24/11/2021	16:30		3.65	1.50	Dry	Fine	/												
25/11/2021 25/11/2021	1 07:30		3.65	1.50	Dry														
			H	ole and	Casing														
Depth	To (m)	Hole	Diamet	er (mm)	Depth To	(m)	Casing Di	iameter (mm)											
10	.05		250		10.05			250											
		(Chisel	lina / Slo	w Proare	ss	1												
Depth F	rom (m)		Depth To	(m)	Duration (ht	i:mm)	Tool	Remark											
				()															
		W	ater S	strike			Wate	r Added											
Strike At (m)	Rise To (m)	Time (m	Elapsed nins)	Casing Dept	h (m) Depth S	ealed (m)	Depth Fron (m)	n Depth To (m)]										
		,	,						1										
	l	\//~	tor Str	iko Pom	arks		L		1		1	Go	ner	al Rom	arke	1	I	I	L
Groundwate	er not encour	ntered of	during ex	cavation.				1. Prior to evo	avation a C	able Δ\/	pidance Tool I	CATI surv	evwe	s carried o	ut. An inere	ection nit was	s hand-duo	to 1 20m	and rescanned
			5.00				1	using the CAT	to check fo	r service	es. Services w	ere not loo	cated.	o oundu O		souon pit was	- nanu-uug		ana resoanneu
L																			
		Ins	stallat	ion					Pipe	e						Bac	kfill		
Туре	Tip Depth /	Res	ponse Zor	ne Response	Zone Installation	on Date	ID	Top Depth (m)	Base Depth	(m) Dia	meter (mm)	Туре	De	pth From (m) Depth To	o (m) E	Backfill Mat	terial	Date
		-	-r (m)	2830 (1	1				1					0.00	10.0	5	Bentoni	te	25/11/2021
Notes																			
- Abbrevi	ations an	d resi	ults da	ta defined	d in 'Explor	atory L	ocation	Records K	eysheets										
Checked By	,	c	ж			F	levation Da	tum	Ordnan	ce Datu	m		Gr	id Coordin	ate System	OSGE	3		
Template E	GSL/HRSI/F	GSI PI	H Summ	arv.hht/Confi	ia Fuaro Revis	/26/06/20)19/TS+Δ\/		Sidiali	Jaiul						Print Date	-	21/04/201	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni l	JK Limited	LB	21	53	LI	BH
		Fug	ro Reference	F190	0089					
•		Coo	rdinates (m)	E333	3226.34 N366612.20 Ground Elevation (m Datum) 5.08	Sheet	1 of 2			
		Hole	е Туре	Cabl	e Percussion	Status		Draf	t	
Samp	ling and	d In Si	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	DB	1		-	TOPSOIL. Grass over dark brown slightly sandy silty CLAY with	(0.20)	4.00			
0.25	D	3			Trequent rootiets (<2mm). Sand is line to coarse.	(0.30)	4.00			
0.25 - 0.50	D	4 5			Brown very clayey SAND. Sand is fine and medium.	0.50	4.58			
. 0.55 - 0.55 - 0.80	ES B	6 7		-	Light brown slightly gravelly slightly clayey SAND. Sand is fine to	(0.35)	4.00			
0.55	PID	8	< 0.1 ppm	1-	coarse. Gravel is subangular and subrounded fine and medium of	0.85	4.23			
0.90 - 1.20	В	9		:	quartzite.	1.20	3.88			
. 1.20 · 1.20 - 1.65	D	10 11		-	[TIDAL FLAT DEPOSITS] [SAND]	(0.35)				
- 1.20 - 1.65 -	SPT		N = 9 (S)	-	Sand is fine and medium. Gravel is fine.	1.55	3.53			
- 1.70 - 1.70 - 2.20	D B	12 13		-	[TIDAL FLAT DEPOSITS] [SAND]					
-				2	[TIDAL FLAT DEPOSITS] [SAND]					
- - 2.20 - 2.65	U	14	15/200 mm	-	Firm light grey sandy CLAY with frequent pockets (<5mm x 5mm)	(1.15)				
-				-	[TIDAL FLAT DEPOSITS] [CLAY]					
-	5	45		-		0.70	0.00			
2.70 - 3.10	B	16		-	2.65m to 2.70m; soft and firm with rare black organic material (<2mm x 5mm).	2.70	2.38	a sila s		
-				3	Plastic dark brownish grey clayey amorphous PEAT. Organic	(0.40)	1.00	sille sille 14 sille s		
3.20 - 3.65	D	17		-		3.10	1.90	E		
3.20 - 3.65	SPI		N = 15 (S)	-	Firm brown slightly sandy slightly gravelly CLAY. Sand is fine and					
3 70	П	18			mixed lithologies including flint, mudstone and coal.	(1.10)		F		
3.70 - 4.20	B	19		-	[GLACIAL TILL DEPOSITS] [CLAY]					
-				4				<u> </u>		
4.20 - 4.65	U#B	20	30/450 mm		Firm and stiff brown slightly sandy slightly gravelly CLAY. Sand is	4.20	0.88	F		
				-	fine to coarse. Gravel is subangular and subrounded fine to coarse			E		
. 470	П	21		-	of mixed lithologies including flint and mudstone.					
4.70 - 5.20	В	22		-				<u></u>		
-				5		(1.50)		F		
5.20 - 5.65 5 20 - 5 65	D SPT	23	N = 22 (S)	:	5.20m to 5.70m; firm and stiff brown clay.					
-	0			- 1				EE		
- 5.70	D	24		-		5.70	-0.62			
5.80 - 6.30	В	25		-	Sand is fine and medium. Gravel is subangular and subrounded			F		
				6-	fine to coarse of mixed lithologies including flint, mudstone, quartz			<u> </u>		
-				-	[GLACIAL TILL DEPOSITS] [CLAY]			L		
- 6.50 - 6.95	U#B	26	25/450 mm	-						
-				-				F		
				7-						
7 20	D	27		· -						
7.40 - 7.90	В	28		-				E		
				-				<u>⊢-</u>		
				-		(4.05)		F -		
- - 8.00 - 8.45	D	29		8-	At 8 00m: becoming sandy	(4.35)		E		
8.00 - 8.45	SPT		N = 16 (S)	-	, a cloon, boooning oundy.			L		
-				-				<u>⊢_</u> _		
8.60	D	30		-				F		
8.80 - 9.30	В	31		-						
ŀ				9-				E		
								<u> </u>		
-				_				F		
9.65 - 10.05	U#B	32	35/450 mm	-				E		
				-				E		
F				-	Continued next page	1				
Notes			•							
- Abbreviations	and res	sults da	ata defined on 'Note	es on E	Exploratory Position Records'					
Template: FGSL/HE	SI/FGSL	able Per	cussion.hbt/Config Fugro	Rev5/24	4/01/2020/TS+AW	Print Date	e	21/04/	2022	

		Cont	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fua	RŪ	Clier	nt	Eni l	JK Limited	LB	21	51	LI	BH
		Fugr	o Reference	F190	0089	•			_	
·		Cool	rdinates (m)	E333	3226.34 N366612.20 Ground Elevation (m Datum) 5.08	Sheet	2 of 2			
		Hole	Туре	Cabl	e Percussion	Status		Draf	[
Samp	ling and	d In Sit	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
				-	End of Borehole at 10.05 m	10.05	-4.97			
				-						
				-						
				-						
-				11						
				-						
				-						
				12						
				-						
				-						
				-						
-				13 -						
				-						
				-						
-				- 14 —						
				-						
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				15 —						
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-				-						
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				16 —						
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-				-						
				-						
				18						
				-						
-				-						
				-						
				19						
				-						
				:						
-				-						
				-						
-				-						
Notes			I	1				1		
- Abbreviations	and res	ults da	ta defined on 'Note	s on E	Exploratory Position Records'					
						-				
Template: FGSL/HB	SI/FGSL C	able Per	cussion.hbt/Config Fugro	Rev5/24	4/01/2020/TS+AW	Print Date	9	21/04/2	2022	

			Cont	tract Nar	ne	LBA (CCS Tra	nsport	and S	Storage	e Pro	ject Gro	ounc	d Inve	estigatio	ons	Loca	ition	ID		
-6	ICD		Clier	nt		Eni U	K I imite	d									IF	R	21	59	BH
			Fuar	o Refere	ence	E1900	189	,a									╎┖╍╴┖	_	<u> </u>	_00	
			Cool	rdinates	(m)	F3309	230 60 I	136678	0 00	Gro	und	Flevatio	on (r	n Da	tum) 4	7 01	Shee	et 1 o	of 1		
			Hole	Type	····/	Sonic	Core D	rillina	5.00				(I		/		Stati	JS	•	Draft	
			1.1010	.122				9	Eo	quipmo	ent							-			
Depth From	Depth To (m)	Hole -	Туре	Date From	Date To	E	Equipment	Core	Barrel	Core	Bit	Drilling Cr	rew L	_ogged	By Rema	'ks					
0.00	1.20	IF		26/10/2021	26/10/2021	Har	nd excavate	d XI		PC	·D	LT, JS, L	M	LT							
1.20	3.45			20/10/2021	21/10/202	Lijen	MAX				0	LIVI, 30	,		`						
				Progre	ess								Rota	ary D	etails				0	Core De	etails
Date (dd/mm/yyyy) (hh:mm	I)	Hole Dept (m)	th Casing Dep (m)	oth Water Dep (m)	^h Weath	er		D Fro	epth De om (m)	epth To (m)	Flush	п Туре	, I	Flush Return (%)	Flush Colo	ur Rur (hh	n Time n:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
26/10/2021 26/10/2021	13:00		0.00	6.00	Dry	Cloud	ý		1	1.20	1.50 3.00	Wa Wa	ater ater		0	Brown Brown	00	0:05 0:05	1.20 1.50	1.50 3.00	101 101
27/10/2021	07:30 13:30		6.00 9.45	6.00	1.70 Drv	Dry			3	3.00 1.50	4.50	Wa Wa	ater ater		0	Brown Brown	00	0:05	3.00 4.50	4.50	101 101
2171012021			0.10	0.00	5.9				6	6.00	7.50	Wa	ater		0	Brown	00	0:05	6.00	7.50	101
									ĺ í	.50	5.00		ater		0	BIOWII		0.00	7.50	5.00	101
	•		Н	ole and	Casing																
Depth	To (m)	Hole	Diamet	er (mm)	Depth To	(m)	Casing D	iameter (m	m)												
9.4	45		175		9.45			175													
		C	Chisel	ling / Slo	w Progre	ess															
Depth F	rom (m)	0	Depth To	(m)	Duration (h	n:mm)	Tool	/ Remark													
		Wa	ater S	Strike			Wate	r Adde													
Strike At (m)	Rise To (m)	(m	iins)	Casing Depth	n (m) Depth S	iealed (m)	(m)	Depui (m)													
		10/- 1	or Ci	iko D - ::	orka		l							<u> </u>	orel D	meric			1		
Groundwate	er not encoun	vvat itered c	uring ex	Ke Kem	aiks			1. Prior to	excavati	ion, a Cal	ole Avo	idance Tool		Ger	v was carri	ed out An inc	pection	pit wa	s hand-duo	1 to 1 20m	depth and
			J					rescanned 2. Inspecti	using th	ne CAT to mained st	check table di	for services	s. Serv	vices w	ere not loca	ated.		wd:	ana-uuy	, 1.20111	
									pic re												
		Ind	stallat	ion						Pine								Bac	:kfill		
Type	Tip Depth /	Res	ponse Zor	ne Response	Zone Installati	on Date	ID	Top Depth	m) Bas	se Depth (n	1) Dian	neter (mm)	T	vpe	Depth Fro	m (m) Depth	To (m)	F	Backfill Mat	erial	Date
75-	uistance (m)	<u>'</u>	iop (m)	Base (r	ny		-			1		,,	• • •		0.00) 9.	45	-	Bentonit	e	27/10/2021
Notes					I						1				1						
- Abbrevi	ations and	d resu	ults da	ta defined	l in 'Explo	ratory I	ocation	Records	Keys	heets'											
						,															
Checked By		С	K/JR			E	levation Da	itum	0	Ordnance	Datum	1			Grid Coo	rdinate Syste	em	OSGE	3		
Template: F	GSL/HBSI/FO	GSL BH	- Summ	ary.hbt/Confi	g Fugro Rev	5/26/06/2	019/TS+AW	1									Print D	ate		21/04/202	22

		(Contract Name	L	_BA C	CS T	Frans	sport a	and Storage Project Ground Investigations	Location ID	,		
-fug	RI		Client	E	Eni Ul	K Lirr	nited			LB 2	21 5	:9	BH
		F	-ugro Reference	F	-1900)89					•••	· –	
¥		C	Coordinates (m)	E	<u>=</u> 3309	330.6	0 N3	66780	0.00 Ground Elevation (m Datum) 47.01	Sheet 1 of	2		
		H	-lole Type	5	Sonic	Core) Drilli	ing		Status	Dra	aft	<u> </u>
Depth	Sa	ampl	ing and In Situ Testing	C	ore R	ecov	ery		Strata Details				Backfill /
(m)	Туре	No.	Test Results	TCR (%)	: SCR (%)	RQD (%)	lf (mm)) Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
0 10 - 0.30	В	1							TOPSOIL. Soft dark brown sandy CLAY. Sand is fin	e			
0.20 - 0.30	D	2							[TOPSOIL] [CLAY]	(0.30)			
0.20	HVan	-	53 kPa (<i>19 kPa</i>)							0.30	46.71		
. 0.20	HVan		55 kPa (<i>20 kPa</i>)						Stiff light brown mottled orange slightly gravely sandy CLAY. Sand is fine and medium. Gravel is		-	<u>F</u> _	
- 0.20	e HVan		58 kPa (<i>22 kPa</i>)					-	subangular and subrounded fine and medium of			\models =	
040-0.70	e B	3	· · ·						mixed lithologies including sandstone, mudstone and flint	id (0.50)			
0.40 - 0.10	HVan	Ŭ	68 kPa (<i>18 kPa</i>)						[GLACIAL TILL DEPOSITS] [CLAY]			F	
- 0.40	e HVan		71 kPa (<i>22 kPa</i>)						Office the second secon	0.80	46.21		-
0.40	е ч\/an		71 kPa (25 kPa)						Stiff light brown mottled grey and orange slignuy sandy dravelly CLAY. Sand is fine and medium.			· · · ·	
	e		14 Kra (20 Kra)					1 -	Gravel is subangular and subrounded fine and	(0.40)		· · ·	
0.40	TCon TCon		0.99 W/m.K 1.15 W/m.K						medium of mixed lithologies including sandstone, mudstone and flint.				
0.40	TCon	4	1.22 W/m.K		<u> </u>	<u> </u>	_		[GLACIAL TILL DEPOSITS] [CLAY]	1.20	45.81	· · · ·	
0.60 - 0.70	ES	5							Stiff light brown mottled grey and orange slightly			· · · · ·	
0.60 - 0.90 - 1.10	PID B	6	< 0.1 ppm	100	N/A	N/A			Gravel is subangular and subrounded fine and				
1.10 - 1.20	DB	7			<u> </u>	<u> </u>	_	-	medium of mixed lithologies including sandstone,			• • •	
1.20 - 1.65	SPT	Ŭ	N = 7 (S)						GLACIAL TILL DEPOSITS] [CLAY]			· · · ·	
1.20 - 1.50 - 1.50	TCon		0.61 W/m.K							(0.95)			
1.50	TCon		0.79 W/m.K						-			* * *	
1.00	1001		U.01 W/III.K						-				
L								2 -	4			· · · · ·	
2.10 - 2.15	D	9							-			· · · ·	
2.15 - 2.80	В	10							Loose light brown gravelly clayey SAND. Sand is fir	2.15	44.86		
1.50 - 3.00 -				100	N/A	N/A			to coarse. Gravel is subangular and subrounded fin	e			
									- mudstone and flint.	le,			-
- 2.50	TCon		1.84 W/m.K					-	[GLACIAL TILL DEPOSITS] [SAND]	(0.71)			-
2.50	TCon		1.95 W/m.K						-	X- /			-
2.00	1001.		2.07 W/m.ix						-				
- 2.80 - 2.86	D	11							-				
2.86 - 3.75	В	12							Stiff light brown mottled grey and orange slightly	2.86	44.15		
- 3.00 - 3.45	D	16			<u> </u>	<u> </u>	4	3 -	sandy gravelly CLAY. Sand is fine and medium.				
3.00 - 3.45	SPT		N = 33 (S)						Gravel is subangular and subrounded tine and medium of mixed lithologies including sandstone,				
									mudstone and flint.			* * * *	
									GLACIAL TILL DEPOSITS [CLAY] 3.25m to 3.30m; light brown gravelly sand. Sand is fine				
-									and medium. Gravel is subangular and subrounded fine			• • •	
- 3.50	TCon		1.32 W/m.K					-				· · · ·	
3.50	TCon		1.43 W/m.K						-				
0.00	1001.		1.7 1 W/m.ix						3.62m to 3.67m; light brown gravelly sand. Sand is fine and medium. Gravel is subangular and subrounded fine	(1.64)		* * *	
3.75 - 3.80 3.00 - 4.50	D	13		100	N/A	N/A			to coarse of sandstone and mudstone.				
3.80 - 4.45	В	14							-			· · · · ·	
F								4 -	4			· · · ·	
ŀ									-			· · · ·	
-									-				
									-				
									-				
4.45 - 4.50 - 4.50 - 4.95	D	15 17			<u> </u>	_	4	-	E' become lightly and y slightly grouply CLAV	4.50	42.51	• • • •	
4.50 - 5.20	В	20	1 - 40 (0)						 Firm brown slightly sandy slightly gravely CLAT. Sand is fine and medium. Gravel is subangular and 	i I		E	
4.50 - 4.50	TCon		1.17 W/m.K						subrounded fine to coarse of mixed lithologies			⊢	
4.50 - 4.50	TCon TCon		1.56 W/m.K 1.78 W/m.K						Including flint, sandstone and mudstone.			F_=_	
-									-			<u> </u> =	
-								-	Continued next page			<u> </u>	
1-1-0			<u> </u>	<u> </u>			<u> </u>	<u> </u>	Continued for page				
Notes	- and		t- data dafinad an "	Natao		loro	tone D	- aitior					
- ADDIEVIAUONA	3 di lu i	esun		NOLES		βισιαι	OIYE	OSILION	I Records				
Template: EGSL/H	BSI/EGS	L Rota	arv If hbt/Config Eugro Re	v5/23/1:	2/2019/7	S+AW				Print Date	21/()4/2022	

		C	Contract Name	l	_BA C	CS T	rans	oort a	nd Storage Project Ground Investigations	Location	ID		
fug	R		Client	1	Eni Uł	< Lim	ited			LB_	_21_	59_	BH
		F	Fugro Reference		=1900 =3300	89 80 6	0 N34	36780	0.0 Ground Elevation (m Datum) 47.01	Sheet 2		_	
		ŀ	Hole Type		Sonic	Core	Drilli	ng		Status		Draft	
	Sa	ampl	ing and In Situ	c	ore R	ecov	ery		Strata Details				
Depth (m)			Test	тов		POD	, It	Denth		Depť	h L L		Backfill / Installation
,	Туре	No.	Results	(%)	(%)	(%)	(mm)	(m)	Strata Descriptions	(Thickne (m)	(m Datu	m) Legend	
-									-				
5.20 - 5.30 4 50 - 6 00	D	21		100	N/A	N/A			-			E	
5.30 - 6.00	В	23											
-								-					
									-				
												F	
												F	
- 6.00 - 6.45	D	18						6 -	-			F	
6.00 - 6.70 6.00 - 6.45	B SPT	24	N = 11 (S)						-			E- <u>-</u> -	
									-				
-								-	10mm) of coal.				
	_												
6.70 - 6.80 6.00 - 7.50	D	25		100	N/A	N/A						F	
6.80 - 7.50 -	в	26							-			E	_
-								7 —	-	(4.95	5)		
									-				
-									-				
									_			F	
- 7.50 - 8.20 7.50 - 7.95	B SPT	27	N = 13 (S)	<u> </u>				-	7.50m to 8.00m; soft (drilling disturbed by SPT).			F	
												E	
									-			E- <u>-</u> -	
-									-			<u> </u>	
-								8 -	-			<u> </u>	
- 8.20 - 8.30	D	28							-				
7.50 - 9.00 8.30 - 9.00	в	29		100	N/A	N/A			_				-
									-			E	_
-													
-												F	
- - 0.00 - 0.45	П	30						م				F	
9.00 - 9.45	SPT	50	N = 16 (S)						-			E	
									-				
									-				
-								-	End of Borehole at 9.45 m	9.45	5 37.56		
									-				
									-				
[
-								-	-				
Notes			1	1			1		1				L
- Abbreviations	and I	result	s data defined on 'N	Votes	on Ex	plorat	ory Po	ositior	Records'				
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			Cont	ract Nar	ne	LBA C	CS Tra	nsport ar	nd Stora	ge Pr	oject Gr	ound In	vestiga	ations	L	ocation	ID		
-6	IGP		Clien	t		Eni Ul	K I imite	d							-	IR	21	59	CPT
			Fuar	D Refere	ence	F1900)89	u							- '		<u> </u>	.00_	
•			Coor	dinates	(m)	E3309	34.96 N	366792.	25 G	round	d Elevati	on (m D	atum)	46.33	− s	Sheet 1 d	of 1		
			Hole	Туре	· /	Inspe	ction Pit					,	,		s	Status		Draft	
									Equipr	nent									
Depth From (m)	Depth To (m)	Hole -	Type D	Date From	Date To	E	quipment	Core B	arrel C	ore Bit	Drilling C	rew Logge	ed By Re	emarks					
0.00	1.20	IF	° 2	6/10/2021	26/10/2021	Har	d excavate	d			EA, CS, I	MW E	A						
				Progre	ess						-	Rotary	Details	S			(Core D	etails
Date (dd/mm/yyyy) Time	I)	Hole Depth (m)	Casing Dep (m)	pth Water Dept (m)	^h Weath	er		Depth From (m)	Depth T (m)	^o Flus	h Type	Flush Re (%)	Flush C	olour	Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
26/10/2021 26/10/2021	09:30		0.00 1.20		Dry Dry	Cloudy	/												
																	1		
																	1		
																	1		
																	1		
			Ho	ole and	Casing														
Depth	To (m)	Hole	Diamete	er (mm)	Depth To	(m)	Casing Di	ameter (mm)											
		C	Chisell	ing / Slo	w Progre	SS													
Depth F	rom (m)	0	Depth To	(m)	Duration (hr	n:mm)	Tool /	Remark											
									_										
		Wa	ater S	trike			Wate	r Added											
Strike At (m)	Rise To (m)	(m	nins)	Casing Depth	n (m) Depth S	ealed (m)	(m)	(m)	4								1		
																	1		
																	1		
		144					L					~	<u> </u>				1		
Groundwate	er not encoun	vvat itered c	during exe	cavation.	arks			1. Prior to evo	avation a C	Cable 4	oidance Too	Ge	eneral	rtemarks	inspe	ction nit way	s hand-du	a to 1 20m	depth and
			0 2.4					rescanned us	ing the CAT	to chec	k for service	s. Services	were not	located.	mape	ouon pit wa	ะ กลกฉ-นน(, w 1.∠UIII	sopurand
		Inc	atallati						Din							Pag	kfill		
Type	Tip Depth /	Res	ponse Zon	e Response	Zone Installation	on Date		Top Denth (m)	Base Der#		ameter (mm)	Type	Denth	From (m)	nth To		Backfill Mo	terial	Date
. 160	Distance (m)	<u>'</u>	l'op (m)	Base (r	n)				Dopu	, Di)	1340	Sebu	0.00	1.20		Arising	s	26/10/2021
Notes						I			1	(1
- Abbrevi	ations and	d resi	ults dat	a definer	in 'Explor	atorv I	ocation	Records K	evsheet	s'									
									.,										
Checked Bv	,	J	R			F	levation Da	tum	Ordnan	ice Dati	im		Grid	Coordinate Sv	/stem	OSGE	3		
Template: F	GSL/HBSI/F	 GSL B⊦	I Summa	ary.hbt/Confi	g Fugro Rev5	/26/06/20)19/TS+AW		- Crandi						PI	rint Date		21/04/20	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clier	nt	Eni l	JK Limited		21	59	С	PT
		Fugi	o Reference	F190	089]·			-	
·		Coo	rdinates (m)	E330	934.96 N366792.25 Ground Elevation (m Datum) 46.33	Sheet	1 of 1			
		Hole	туре	Inspe	ection Pit	Status		Draft		
Samp	ling and	d In Si	tu Testing		Strata Details			1	Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
- 0.10	D	1		-	TOPSOIL. Grass over firm dark brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of flint and quartzite.	(0.25)				
- 0.30 0.35 0.35	D HVane HVane	2	68 kPa (22 <i>kPa</i>) 72 kPa (24 <i>kPa</i>) 76 kPa (16 kPa)	-	Firm orangish brown sandy CLAY. Sand is fine and medium. [GLACIAL TILL DEPOSITS] [CLAY]	(0.30)	46.08			
- 0.60 -	D	3	10 KFa (10 KFa)	-	Light brown SAND. Sand is fine and medium. [GLACIAL TILL DEPOSITS] [SAND]	0.55	45.78			
-				- 1-		(0.65)				
-				-	End of Inspection Pit at 1.20 m	1.20	45.13			
-				-						
-				-						
_				2-						
-				-						
-				-						
-				-						
-				3-						
-				-						
-				-						
-				-						
-				4						
-				-						
-				-						
-				-						
-				_						
Notes					Pit Stahility	Plan				
- Abbreviation	is and r	esults	data defined on	'Note	s on Exploratory Position Records' Stable		0.4	0 m		
	- 21.041		2011/04 011			0.42 m]	290°
Template: FGSL/HE	SI/FGSL T	rial Pit.ht	ot/Config Fugro Rev5/05/	12/2019/	TS-AW	Print Dat	9	21/04/2	2022	



Standard PSD ISO Output.xlsm - Rev 7

			Con	tract Nar	ne	LBA C	CCS Tra	insp	ort an	d Stor	rage	Pro	ject Gro	ounc	d Inv	esti	gation	s	Loca	ation	ID		
-6	ICD		Clie	nt		Eni U	K I imite	ed												R	21	60	RН
		_	Fug	ro Refere	ence	F1900)89	-											ا حد	_	- ' -	_00	
			Con	rdinates	(m)	E3306	583.47 M	N366	6880 4	47	Grou	und	Elevatio	on (r	m Da	atum	ו) <u>5</u> 1	.68	She	et 1 a	of 1		
			Hole	Type	\···/	Sonic	Core D	rillin	iq		2.00			(1			., 51		Stat	us		Draft	
			1.1910						3	Eaui	ome	nt											
Depth From	Depth To (m)	Hole 1	Туре	Date From	Date To	E	Equipment		Core Ba	urrel	Core I	Bit	Drilling Cre	ew L	Logged	By F	Remarks						
0.00	1.20	IP		20/10/2021	20/10/2021	Har	nd excavate	ed XI			PCC	,	LT, JS, LN	и	LT	Þ							
1.20	20.00	014		21/10/2021	23/10/2021	Lijen	MAX				I OL	ĺ	LIVI, JO										
				Progre	ess	I				Г [′]			F	Rota	ary D	Deta	ils				(Core De	etails
Date (dd/mm/vvvv) (hh:mm	1) H	Hole Dep	th Casing De	oth Water Dept	^h Weath	er			Depth From (m	Dep	oth To m)	Flush	Туре	e	Flush	Return	Iush Colou	ır Ru	n Time h:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
20/10/2021	13:30	,, ,	0.00	()	Dry	Rainin	g Wet			1.20	3.	.00	Wa	iter		(2	Brown	0	0:02	1.20	3.00	101 101
21/10/2021	07:30		1.20	0.00	Dry 3.60	in stou	,			4.50	6.	.00	Wa	iter		(Brown	0	0:05	4.50	6.00	101
22/10/2021	08:05		15.00	15.00	3.80					7.50	9.	.00	Wa	iter		Ċ		Brown	0	0:05	7.50	9.00	101
25/10/2021	05:00		18.00	15.00	1.70					10.50	12	2.00	Wa	iter		(Brown	0	0:05	10.50	12.00	101
25/10/2021	10.00	, 	25.50	18.00	1.70					13.50	15	5.00	Wa	iter		(Brown	0	0:05	13.50	15.00	101
										15.00	16	5.50 5.00	Wa	iter		(Brown	0	0:10	16.50	16.50	101
										18.00 19.50	19 21	.50 .00	Wa	iter		(5	Brown	0	0:05	18.00 19.50	19.50 21.00	101
										21.00 22.50	22 24	.50	Wa Wa	iter		(Brown Brown	0	10:05 10:05	21.00 22.50	22.50 24.00	101 101
										24.00	25	0.50	Wa	iter		(J	Brown	0	10:05	24.00	25.50	101
			F	lole and	Casing																		
Depth	To (m)	Hole	Diame	ter (mm)	Depth To	(m)	Casing D	iamet	er (mm)														
25.	50		175		25.50			175															
		C	Chise	lling / Slo	w Progre	SS	1																
Depth F	rom (m)	0	Depth To	o (m)	Duration (ht	n:mm)	Tool	/ Rem	lark														
	- I	Wa	ater S	STIKE			VVate	n Ad															
Strike At (m)	кıse To (m)	(m	iins)	Casing Dept	n (m) Depth S	ealed (m)	(m)	-	(m)														
		10/~*	or C+	 rike Dom	arko		<u> </u>								6	nor		harke				<u> </u>	
Groundwate	r not encoun	vvat ntered d	during e	xcavation.	ains			1. Pric	or to exca	avation	a Cabl	e Avoi	dance Tool	(CAT	Gel Surve			out. An ins	pection	pit wa	is hand-du	to 1.20m	depth and
			-					rescar 2. Insi	nned usi	ng the C	AT to c	heck t	for services.	. Serv	vices w	vere n	ot locate	d.		F		,	-partana
										all	- 510		5										
		Inc	stallat	tion						P	ine									Bac	kfill		
Type	Tip Depth /	Resp	ponse Zo	ne Response	Zone Installatio	on Date	ID	Top D	Depth (m)	Base De	pth (m)	Diam	eter (mm)	T	Type	Der	pth From (m) Depth	To (m)		Backfill Ma	terial	Date
75.0	Uistance (m)		iop (m)	Base (r	1)		-					+			<i>// -</i>	-	0.00	25	.50		Bentoni	te	26/10/2021
Notes																							
- Abbrevi	ations and	d resi	ults d≈	ata definer	l in 'Explor	atorv I	ocation	Reco	ords K	evsher	ets'												
, 201041	alono all		uc			Story L			514510	5,5110													
Checked By		C	ж			F	levation Da	atum		Ordn	iance r	Datum				Gri	d Coord	nate Svste	m	OSGE	В		
Template: F	GSL/HBSI/F	GSL BH	- Summ	ary.hbt/Confi	g Fugro Rev5	/26/06/20	019/TS+AW	V				- autri					2 00010		Print D)ate		21/04/20	22

		C	Contract Name	L	BAC	CS T	ransp	oort a	nd Storage Project Ground Investigations	Locatio	on ID			
-fug	R		Client	E	Eni Uk	(Lim	ited			LB	2	21 F	50	BH
		F	ugro Reference	F	-1900	89						· · _ `	_	
•		C	Coordinates (m)	E	E3306	83.4	7 N36	6880	0.47 Ground Elevation (m Datum) 51.68	Sheet '	1 of 6	3		
		F	lole Type		Sonic	Core	Drilli	ng		Status		Dr	aft	
Depth	Sa	ampl	ing and In Situ Testing	с	ore R	ecove	əry		Strata Details					Backfill /
(m)	Туре	No.	Test Results	TCR (%)	8 SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	De (Thick (r	epth kness) m)	Level (m Datum)	Legen	Installation
0.00 - 0.30	В	1							TOPSOIL. Soft light brown sandy CLAY. Sand is find	e	-			
								-	and medium.	(0.	.30)			
- 0.20 - 0.30	D	2						-				=		
								-	Soft and firm light brown sandy CLAY. Sand is fine		.30	51.38		~
0.50 0.60	F 0	2						-	I AND MEDIUM. [OUTWASH GLACIO-FLUVIAL DEPOSITS] [CLAY]	(0.	.20)	51.10		
0.50 - 0.80	B	3 4							Orangish light brown clayey SAND. Sand is fine to		.50	51.16		
0.50	PID TCon		0.1 ppm 1.19 W/m.K						COARSE. [OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]	1				
0.50 - 0.50	TCon TCon		1.49 W/m.K 1.74 W/m.K					-						
0.60 - 0.70	DB	5						-		(0.	.70)			
-		'						1						
- 1.10 - 1.20	D	6						-						
- 1.20 - 1.50	в	10						-	Loose locally medium dense light brown mottled	1.	.20	50.48		-
1.20 - 1.65 1.20 - 1.65	D SPT	8	N = 6 (S)					-	orange slightly clayey SAND with rare subangular					
-								-	fine coal fragments. Sand is fine and medium.	1				÷
-								_		1				
-								-						i.
								-						
-								-						
								-						
- 2.00 - 2.50	В	11						2 —						
- 1.20 - 3.00				100	N/A	N/A		-						
-								-						
- 250-255		12												-
2.00 - 2.00		12						_						
								-						
								-						
								-						2
- 3.00 - 3.45	D	9						3 —	2.00m to 3.45m; modium donso					
3.00 - 3.45	SPT		N = 16 (S)					-	3.00m to 3.43m, medium dense.					
								-						
								-						÷
								-						
- 3.50 - 4.00	в	13						_						
ŀ								-						
3.00 - 4.50				100	N/A	N/A		-						
								-						
								-						2
4.00 - 4.05	ט	14						4						
- 4.50 - 4.95	SPT		N = 5 (S)		1			_						
								-						
								-						
								-						
ŀ								-						
- 5.00 - 5.50	в	16						_	Continued next page	_				
Notes		1		I	1		I					1	I	1
- Abbreviations	and r	esult	s data defined on 'N	lotes	on Ex	plorat	ory Po	osition	Records'					
Template: FGSL/HE	SI/FGS	L Rota	ry If.hbt/Config Fugro Rev	5/23/12	2/2019/T	S+AW				Print Date		21/0	04/2022	

		C	Contract Name	I	BAC	CS T	rans	port a	nd Storage Project Ground Investigations	Locatio	n ID		
-fug	RI		Client	E	Eni Uł	< Lim	ited			LB	21	60	BH
		F	ugro Reference	F	-1900	89				- -			
•		C	Coordinates (m)	E	E3306	83.4	7 N36	66880	0.47 Ground Elevation (m Datum) 51.68	Sheet 2	2 of 6		
		F	lole Type		Sonic	Core	Drilli	ng		Status		Draft	
Depth	Sa	ampli	ing and In Situ Testing	С	ore R	ecove	əry		Strata Details				Backfill /
(m)	Туре	No.	Test Results	TCF (%)	SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	Dep (Thick (m	pth iness) n) (m	Level Datum)	Installation
4.50 - 6.00 -				100	N/A	N/A							
- 5.50 - 5.55 - -	D	17						-		(9.3	30)		
- 6.00. 6.45		10						-		(***			•
6.00 - 6.45 -	SPT	10	N = 8 (S)					- 0					· · · ·
- 6.50 - 7.00 -	в	19						-					· • • •
6.00 - 7.50				100	N/A	N/A							•
— 7.00 - 7.05 -	D	20						7					-
- - - 7.50 - 7.95 - 7.50 - 7.95	D SPT	21	N = 7 (S)					-	7.50m to 7.68m; assumed zone of core loss				· · · ·
- - - 8.00 - 8.50 -	в	22						- - 8					
7.50 - 9.00				88	N/A	N/A		-					
- 8.50 - 8.55 - -	D	23						-					
- - 9.00 - 9.45 9.00 - 9.45 -	D SPT	24	N = 27 (S)					9 —	9.00m to 9.45m; medium dense.				
- 9.50 - 10.00 -	в	25						-					
9.00 - 10.50				100	N/A	N/A		-					
—10.00 - 10.05	D	26						-	Continued next page				
Notes - Abbreviations	and i	results	s data defined on 'N	lotes	on Ex	plorate	ory Po	osition	Records'				<u> </u>
remplate: FGSL/HE	SI/FGS	L Rotar	ry If.hbt/Config Fugro Rev	5/23/12	2/2019/T	S+AW				Print Date		21/04/2022	

		(Contract Name	l	BA C	CS T	rans	port e	and Storage Project Ground Investigations	Locatic	on ID			
-fug	R		Client		Eni Ul	K Lim	nited			LB	: 2	21 6	i0 /	\mathbf{BH}'
		F	Fuaro Reference	F		.)89			,			·'_`	/ ~	
•		C	Coordinates (m)	F	-3306	∂83.4	7 N3/	66881	0 47 Ground Elevation (m Datum) 51.68	Sheet	3 of (6		ŀ
		ŀ	Hole Type	ç	Ronic	Core	Drilli	ina		Status		Dr	aft	
	l s	ampl	ling and In Situ							Cicic	—		<u></u>	
Depth (m)					ore R		əry	<u> </u>	Strata Details				T	Backfill / Installation
(111)	Туре	No.	Results	ТСК (%)	SCK (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	(Thic	epth kness) (m)	Level (m Datum)	Legend	
- - - 10.50 - 10.84 -	SPT		50/195 mm (S)				-	-	Stiff and very stiff greyish light brown slightly sandy gravelly CLAY. Sand fine and medium. Gravel is subangular and subrounded fine to coarse of mixer lithologies including sandstone, mudstone, flint and coal	1(0.50	41.18		
- 	в	28						11 —	[PENNINE MIDDLE COAL MEASURES FORMATION] [CLAY]					
10.50 - 12.00 - - - 11.50 - 11.55	D	29		100	N/A	N/A		-	-					
- - - - - 12.00 - 12.45 - 12.00 - 12.45 -	D SPT	27	N = 23 (S)				-	- - 12 —	-					
- - 12.50 - 13.00 - - 12.00 - 13.50	в	30		100	N/A	N/A		_ 	-					
- 13.00 - 13.05	D	31			1.0	15		- 13 — -	-	(5	5.60)			
- 13.50 - 13.95 13.50 - 13.95 - - - - - - 14.00 - 14.50	D SPT B	35	N = 36 (S)											
13.50 - 15.00				100	N/A	N/A			-					
- - 14.50 - 14.55 - -	D	33						-	-					
- 15 00 - 15 45			N = 33 (S)					- -			ļ			
-15.00 - 15.45	551		N = 33 (3)				1		Continued next page			'		
Notes - Abbreviations	s and r	result	s data defined on 'N	Votes	on Ex	plorate	ory Pc	osition	, Records'					
Template: FGSL/HF	BSI/FGS	L Rota	ry If.hbt/Config Fugro Rev	/5/23/12	2/2019/T	S+AW				Print Date	1	21/0	4/2022	

		(Contract Name	I	LBA C	CS T	rans	port a	and Storage Project Ground Investigations	Location	iD		
-fug	R	.	Client		Eni U'	K Lim	nited			LB	21 (30 I	BH
		T F	Fugro Reference	F	F1900	089	<u> </u>]		/ · · _ ·	··	
•		(Coordinates (m)	F	E330f	ô83.4 [°]	7 N3(66880	0.47 Ground Elevation (m Datum) 51.68	Sheet 4 c	of 6		
		ŀ	Hole Type	ç	Sonic	Core	Drilli	ing		Status	Dr	raft	
Depth	S	ampl	ing and In Situ Testing	C	ore R	lecov	ery		Strata Details				Backfill /
(m)	Туре	≯ No.	Test Results	TCR (%)	2 SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	Depth (Thicknes (m)	ss) Level (m Datum)) Legend	Installation
		$\left \right $		+	+	+		+	15.00m to 15.20m; assumed zone of core loss.		+	· · · · ·	
Í													
Í													
ĺ]				
_								_					
-									1				
ĺ													
15.00 - 16.50				87	N/A	N/A]			<u> </u>	
[16 -					
16 10 - 16 40	В	36						10	1		35 58		
10.10 - 10.12		00					Γ]	Stiff dark grey gravelly CLAY. Gravel is, subangular of	of	00.00		
									subangular black coal fragments (<5mm x 5mm x				
16 40 - 16.50	ם ו	37							10mm). Highly weathered.			<u> </u>	
- 16 50 - 16 95		34							FORMATION] [CLAY]	(0.80)			
16.50 - 16.91	SPT	J-,	50/260 mm (S)	Γ	T	Γ	INCA		At 16.10m; 1 No. fragment (20mm x 30mm x 50mm) of subcongular strong brown ironstone.	(0.00,			
์ 16.10 - 16.9บ									16.32m to 16.35m; thin bed of stiff brown clay.			* · · ·	
									16.50m to 16.90m; soft (drilling aisturbea by או די ג.				
10.00 17.20		38							1	16.90	24 78		
- 10.90 - 17.20	Б	30						17-	Very weak and weak black COAL. Recovered as not	n 10.00	34.10		
-								17	20mm x 20mm). Slightly weathered.				
									[PENNINE MIDDLE COAL MEASURES	10.00			
16.90 - 17.52 16.50 - 18.00				100	N/A	N/A	NI	-	FORMATION]	(0.62)	1		
10.00								-	1				
r -								-	1				
-							<u> </u>		Firm and stiff grey and light grey gravelly CLAY.	17.52	34.16	· · · · · ·	
- 17.60 - 17.85	С	39						-	Gravel is angular to subrounded of extremely weak				
								-	fragments (<10mm x 10mm x 25mm) or light grey				
- 17.52 - 18.17							NA	-	IPENNINE MIDDLE COAL MEASURES	(0.65)	<u>, </u>		
17.85 - 17.95	D	40						-	FORMATION] [CLAY]				
-				\vdash	+	+-	{	18 —	1			• • • • • •	
·								-	-	10.47			
ŀ							\vdash	1 -	Strong black carbonaceous SHALE. Recovered as	10.17	33.01		
								-	non intact angular to subrounded tragments (nm v 40mm) with frequent very soft grey clay.	x			
. 18.17 - 18.60							NI	-	 Slightly weathered. 	(0.43))		
-								-					
ŀ							\vdash		FORMATION] [MUDSTONE]	18.60	33.08		
10.00 10.50				100					extremely weak and very weak fragments (<5mm x	IC			
18.00 - าษ.อบ -				100	N/A	N/A			5mm x 10mm) of light grey mudstone. Highly				
18.92 - 19.26	c	41							I IPENNINE MIDDLE COAL MEASURES				
								19 —	FORMATION] [CLAY]				
18.60 - 19.50 -							NA		-			* <u>*</u> * <u>*</u>	
									-	(1.20))		
. 19.26 - 19.30	D	42							-				
ŀ									-				
-					<u> </u>	<u> </u>	_		- to some to the some assumed zone of onre loss				
									19.50m to 19.80m; assumed zone or core ross.				
19.50 - 19.80 -							NR						
l									D. B Mathematics	19.80	31.88		
l									Extremely weak and very weak light grey MIDSTONE Highly fractured producing non intact				
L								_					
									Continued next page			<u> </u>	
Notes		а	· • • • • • •		Ξ.		-						
- Abbreviations	s and r	result	.s data defined on m	Notes	on Ex	plorate	ory Po	osition	Records'				
Tomplate: EGSL/H		CI Rotr	If hht/Config Fugro Re		2/2010/	TC+VW			,	Drint Date	21/	104/2022	
Template: FGGL/11/	221/201	JL KULP	afy It.nbt/Coniig Fugio Nev	15/23/12	2/2019/1	'2+4M			1	Print Date	2 1/1	J4/2022	

		•	Contract Name	L	.BA C	CS T	rans	port a	nd Storage Project Ground Investigations	Locati	ion ID			
-fug	R		Client	E	Eni Uł	< Lim	ited			LB	3 2	21 (60	BH
		Ī	Fugro Reference	F	1900	89					_	_	_	
•		(Coordinates (m)	E	3306	83.4	7 N36	66880	0.47 Ground Elevation (m Datum) 51.68	Sheet	5 of 6	6		
		Ī	Hole Type	S	Sonic	Core	Drilli	ng	· · ·	Status	\$	D	raft	
Depth	S	amp	ling and In Situ Testing	C	ore R	ecov	ery		Strata Details					Backfill /
(m)	Туре	No.	Test Results	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions	C (Thi	Depth ickness) (m)	Level (m Datum) Legend	Installation
- - 19.80 - 20.60 19.50 - 21.00 - 20.26 - 20.35 -	с	45		80	N/A	N/A	NI	-	core. Recovered as angular and subangular fragments (<10mm x 10mm x 25mm) of extremely weak and very weak light grey mudstone with occasional subangular fragments (<15mm x 20mm 20mm) of strong brown ironstone with frequent firm grey clay. Fractures undetermined. Fracture spacin undetermined. IPENNINE MIDDLE COAL MEASURES	x ⁽⁽	0.80)			
20.60 - 20.70 20.70 - 20.89 20.60 - 21.10	D C	43 44					NA		FORMATION] [MUDSTONE] 19.80m to 19.90m; rare fragments (<20mm x 30mm x 30mm) of subangular strong black shale. 20.26m to 20.35m; 1 No. subangular cobble (60mm x 75mm x 90mm) of strong brown ironstone. 20.35m to 20.60m; fractures are possibly inclined 0-30 degrees, possibly very closely spaced, planar, smooth, tight to patielly core (<20.60m) of firm are used with	2	20.60 0.50)	31.08		
- 21.10 - 21.28 - 21.28 - 21.33 21.10 - 21.63	C D	46 47						21	Firm and stiff light grey gravelly CLAY. Gravel is angular and subangular fine to coarse of extremely and very weak fragments (<10mm x 15mm x 30mm of light grey mudstone . Highly weathered. [PENNINE MIDDLE COAL MEASURES ECOMMINENTION ICLAY]	2	1.10 0.53)	30.58	*	
- 21.63 - 21.80 21.00 - 22.50				70	41	35	- 530 NA	-	Very weak light grey brecciated fine grained SANDSTONE within a matrix of soft to firm light gre clay with occasional quartz veins, with occasional black coal veins. Partially weathered. Fractures undetermined. Fracture spacing undetermined.	y 2	1.63	30.05		•
21.80 - 21.88 21.88 - 22.05							- 80		[PENNINE MIDDLE COAL MEASURES FORMATION] Grey extremely weak to very weak MUDSTONE.					
- - - 22.05 - 22.50							NA	-	Recovered as clayey GRAVEL. Gravel is angular a subangular fine to coarse of very weak grey fine grained sandstone and extremely weak to very wea grey mudstone fragments (<10mm x 20mm x 20mm Highly weathered. Possible breccia fault zone.	nd Ik 1).				
-									[PENNINE MIDDLE COAL MEASURES FORMATION] [MUDSTONE] 21.80m to 21.88m; thin bed of very weak grey fine grained sandstone. 22.05m to 22.50m; assumed zone of core loss.					
- 22.50 - 22.88 -		10					NI	-						
22.88 - 22.94 22.88 - 22.94 23.00 - 23.40	В	48					- - 60	23 —	22.88m to 22.94m; thin bed of very weak grey fine grained sandstone.					
22.50 - 24.00 -				97	4	0		-		(3	3.14)			
- 22.94 - 24.16 - -							NI	-						
							-	24 —	23.95m to 24.00m; assumed zone of core loss.					
. 24.18 - 24.28 . 24.16 - 24.40	С	50					60 - - 110		24.16m to 24.18m; micro faulting (<15mm) displacement of quartz vein. 24.16m to 24.40m; medium bed of grey fine grained sandstone with occasional 45-70 degree quartz veins.					
- . 24.40 - 24.77							NI	-						
24.00 - 25.50 —				100	16	16		-	Firm grey gravelly CLAY. Gravel is angular and subangular fine and medium extremely weak and very weak fragments (<10mm x 10mm x 15mm) of Continued next page	2	4.77	26.91		
Notes - Abbreviations	and i	resul	ts data defined on 'h	Notes	on Ex	plorat s+aw	ory Po	osition	Records'	Print Date	e	21	/04/2022	

		С	Contract Name	L	.BA C	CS TI	ransp	oort a	nd Storage Project Ground Investigations	Loc	cation ID			
-fug	R		lient	E	Eni Uk	(Limi	ted				B 2	21 6	0	BH
		F	ugro Reference	F	1900	89					_	_	_	
v		С	coordinates (m)	E	3306	83.47	7 N36	6880	Ground Elevation (m Datum) 51.68	Sh	eet 6 of 6	6		
		H	lole Type	5	Sonic	Core	Drilli	ng		Sta	itus	Dra	aft	
Depth	Sa	ampli	ng and In Situ Testing	С	ore Re	ecove	ery		Strata Details					Backfill /
(m)	Туре	No.	Test Results	TCR (%)	SCR (%)	RQD (%)	lf (mm)	Depth (m)	Strata Descriptions		Depth (Thickness) (m)	Level (m Datum)	Legend	Installation
									grey mudstone . Highly weathered.				• <u>•</u> ••	
24.77 - 25.50	~	51					NA	-	[PENNINE MIDDLE COAL MEASURES FORMATION] [CLAY]		(0.73)			
- 23.16 - 23.44	C	51						-						
25.44 - 25.50	D	52									25 50	26.18		
								_	End of Borehole at 25.50 m		20.00	20.10		
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		Fugro R	Reference	> F	-190089				┤ ╘╵ _⁴			ויט		
•		Coordin	ates (m)	E	330683.4	7 N36688	80.47	Ground Elevation (m Datum) 51.68	Sheet 1 of	6				
		Hole Ty	pe		Discontinui	ty Log			Status		Draft			
					Dis	continuit	y Details	i de la constante de			Discontin Informat	uity ion		
Depth (m)	Туре	Dip (°)	Aperture (mm)	Aperture Observatio	e Medium Scale Roughness	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend		
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		Contrac	t Name	LBA CCS Transport and Storage Project Ground Investigations					Location	ID		
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		Coordin	ates (m)	E	E330683.4	7 N3668	80.47	Ground Elevation (m Datum) 51.68	Sheet 2 d	of 6		
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		,			Dis	continuit	y Details				Discontir Informat	iuity ion
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•		Coordin	ates (m)		E330683.	47 N3668	80.47	Ground Elevation (m Datum) 51.68	Sheet 3 of	6		
		Hole Ty	pe		Discontin	uity Log			Status		Draft	
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Depth (m)	Туре	Dip (°)	Aperture (mm)	Apertu Observat	re tion Roughnes	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend
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•		Coordin	ates (m)		E33	30683.47	7 N36688	80.47	Ground Elevation (m Datum) 51.68	Sheet 4	of 6		
		Hole Ty	pe		Dis	continuit	ty Log			Status		Draft	
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Depth (m)	Туре	Dip (°)	Aperture (mm)	Apert Observ	ure ation	Medium Scale Roughness	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discontinuity Log	Legend
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		Contract Name LBA CCS Transport and Storage Project Ground Investigations Location ID												
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•		Coordin	ates (m)		E33068	3.47	N36688	80.47	Ground Elevation (m Datum) 51.68	Sheet 5 of	6			
		Hole Ty	ре		Disconti	nuity	/ Log			Status		Drat	ft	
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Depth (m)	Туре	Dip (°)	Aperture (mm)	Aperta Observa	ure Sca ation Rough	m S F ess	Small Scale Roughness	Set Reference	Remarks		Depth (m)	Discon Lo	itinuity g	Legend
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		Contract Name LBA CCS Transport and Storage Project Ground Investigations						Locatio	n ID			
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		Fuaro R	eference	ا	E190089	litou			⊣∟∩_		_00_	ייים-
•		Coordin	ates (m)		E330683 4	7 N3668	80 47	Ground Elevation (m Datum) 51.68	Sheet 6	of 6		
		Hole Tv	be		Discontinui	tv Loa			Status	0.0	Draft	
					Dis	continuit	y Details	i de la companya de l			Discontir Informat	nuity tion
Depth	Туре	Dip	Aperture	Apertur Observat	re Medium Scale	Small Scale Roughness	Set Reference	Remarks		Deptr (m)	Discontinuity Log	Legend
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- Abbreviations	and resu	nts data d	etined on	Notes	on Explorat	ory Positi	on Record	15				
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rompiate. rGOL/HB	UN GOL DIS	Some nully. ND		10 1/eV3/	10/02/2019/10				r mit Date		2 1/04/2022	

			Conti	ract Nar	ne	LBA C	CS Tra	nsport ar	nd Stora	ge Pi	roject Gr	ound Inv	vestiga	tions	Loca	ation	ID		
-6	IGD		Clien	t		Eni UK Limited LB 21 60 CPT													
			Fuar	Refere	ence	F1900)89								┤┗━╹		- '	00_	
			Coor	dinates	(m)	E3306	689.72 N	N366872.	38 G	roun	d Elevati	ion (m D	atum)	51.40	She	et 1 c	of 1		
			Hole	Type	()	Inspe	ction Pit						<u>a.a</u>	00	Stat	JS		Draft	
			-	71					Eauipr	nent									
Depth From	Depth To (m)	Hole 1	Гуре С	Date From	Date To	E	quipment	Core B	arrel C	ore Bit	Drilling C	rew Logge	ed By Ren	narks					
0.00	1.20	IP	2	5/10/2021	25/10/2021	Har	id excavate	d			EA, CS,	MW E	A						
				Progre	ess							Rotary	Details				0	Core De	etails
Date (dd/mm/yyyy) (hh:mm	i) H	Hole Depth (m)	Casing Dep (m)	pth Water Dept (m)	¹ Weath	er		Depth From (m)	Depth T (m)	o Flus	sh Type	Flush Ret	Irn Flush Cole	our Ru	n Time h:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
25/10/2021	13:45	,	0.00		Dry	Cloudy	/			. ,					,	,			
20/10/2021			1.20		5.9														
			Но	ble and	Casing				-										
Depth	To (m)	Hole	Diamete	er (mm)	Depth To	(m)	Casing Di	iameter (mm)											
		C	Chisell	ina / Sla	w Proare	SS													
Depth F	rom (m)	0	Depth To	(m)	Duration (hh	:mm)	Tool /	Remark											
		Wa	ater St	trike			Wate	r Added	1										
Strike At (m)	Rise To (m)	Time E	Elapsed ins)	Casing Depth	n (m) Depth S	ealed (m)	Depth From	Depth To	1										
		(iii	,				()	()	1										
		Wat	er Stri	ke Rem	arks		·				-1	Ge	eneral f	Remarks					
Groundwate	er not encoun	tered d	luring exc	cavation.			·	1. Prior to exc	avation, a (Cable Av	voidance Too	ol (CAT) surv	/ey was ca	rried out. An ir	spection	pit was	s hand-dug	j to 1.20m	depth and
							1	escanned us	ing the CAT	ເບ cheo	IUI SEIVICE	5. SELVICES	were not le	Joaled.					
		Ins	stallati	on					Pip	е						Bac	kfill		
Туре	Tip Depth / Distance (m)	Res	ponse Zon Top (m)	e Response Base (r	Zone n) Installatio	on Date	ID	Top Depth (m)	Base Dept	n (m) D	iameter (mm)	Туре	Depth I	From (m) Dept	h To (m)	E	Backfill Mat	terial	Date
													0	.00 1	1.20		Arisings	5	25/10/2021
Notes				•	· · · ·	1													
- Abbrevi	ations and	d resu	ults dat	a defined	in 'Explor	atory L	ocation	Records K	eysheet	5'									
Checked By	,	JI	R			E	levation Da	tum	Ordnar	ice Dati	ım		Grid C	oordinate Sys	tem	OSGB	3		
Template: F	GSL/HBSI/F	GSL B⊦	l Summa	ry.hbt/Confi	g Fugro Rev5	/26/06/20)19/TS+AW								Print D	ate		21/04/20	22

		Con	tract Name	LBA CCS Transport and Storage Project Ground Investigations							
-fug	RO	Clier	nt	Eni l	JK Limited	LB	21	60	С	PT	
		Fugi	o Reference	F190	0089	•		-	-		
Ť		Coo	rdinates (m)	E330	0689.72 N366872.38 Ground Elevation (m Datum) 51.40	Sheet	1 of 1				
		Hole	туре	Insp	ection Pit	Status		Drat			
Samp	ling and	d In Si	tu Testing		Strata Details			1	Grour	ndwater	
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation	
(m)	Type	No.	Test Results	Deptm (m) 	Strata Descriptions TOPSOIL. Grass over firm dark brown sandy slightly gravelly SILT. Sand is fine to coarse of quartize and film. TOPSOIL [SILT] Light brown SAND. Sand is fine and medium. [GLACIAL TILL DEPOSITS] [SAND] 0.20m to 0.30m; brown silty sand. Sand is fine and medium. End of Inspection Pit at 1.20 m	(Thickness) (0.20) 0.20 (1.00) 1.20	51.20		Water Strike	Backfil / Installation	
-				-							
-				_							
Notes			I		Pit Stability	Plan					
Abbroviation	ne and -	COCUL+-	data dofined an	Note	PIL Stability	rian		0 m			
 Appreviation 	is and r	esults	aata defined on	Note	s on Exploratory Position Records' Fairly stable		0.4	0 m			
						0.25 m] →	30°	
Template: FGSL/HE	SI/FGSL T	rial Pit.ht	ot/Config Fugro Rev5/05/1	2/2019/	TS-AW	Print Dat	e	21/04/2	2022		





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LABORATORY TEST CERTIFICATE Determination of Particle Size Distribution

BS EN ISO 17892-4:2016 Clauses 5.2 and 5.4

Project Reference	F190089			Location ID	LB_21_60_BH
Project Name	LBA CCS Transpor	rt and Storage Project Ground Inve	estigations	Depth Top [m]	14.00
Specimen Description	Brown slightly gra	avelly slightly sandy CLAY		Sample Type	В
Specimen Reference		Specimen Depth [m]		Sample Reference	32
		1			



Particle Size [mm]

Sieving	9	Sedimenta	ation
Particle Size [mm]	Passing [%]	Particle Size [mm]	Passing [%]
125	100	0.0200	46
90.0	100	0.00600	34
75.0	100	0.00200	25
63.0	100		
37.5	100		
20.0	100		
10.0	98		
6.30	97		
3.35	96		
2.00	95		
1.18	94		
0.630	93		
0.300	88		
0.212	83		
0.150	77		
0.0630	62		

Dry Mass of Sample [g]1552Particle Density2.70[Mg/m³]assumed

Sample Proportions	Dry Mass [%]
Very coarse	0.0
Gravel	5.5
Sand	32.1
Silt	37.0
Clay	25.4

Grading Analysis	
D100 [mm]	20
D60 [mm]	0.0531
D30 [mm]	0.00355
D10 [mm]	-
Coefficient of	Not applicable
Uniformity	Not applicable
Coefficient of Curvature	Not applicable

Issue Date	04/02/2022	Certificate Reference		Authorised by	alcocka						
Client	Eni UK Limited			Authorised Date	04/02/2022						
Remarks:											
Fugro GeoServices Ltd. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW											
Testing was performed at the Fugro GeoServices Ltd laboratory at the address shown above. Results relate only to the sample tested,											
having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated otherwise the sample was tested in the condition it was received at the laboratory.											

Standard PSD ISO Output.xlsm - Rev 8

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			Cont	tract Nar	ne l	_BA C	CS Trai	nsport an	d Stora	ge Pro	oject Gro	und Inv	vest	tigations	s	Locatio	n ID		
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			Fugr	o Refere	ence I	=1900	89											_00	
			Cool	rdinates	(m) E	E3301	66.77 N	I366961.4	45 G	round	Elevatio	n (m D	atu	m) 75.	63	Sheet 1	of 1		
			Hole	туре	(Cable	Percus	sion	I			-				Status		Draft	
									Equipr	nent									
Depth From (m)	Depth To (m)	Hole	Туре	Date From	Date To	E	quipment	Core Ba	rrel C	ore Bit	Drilling Cre	w Logge	ed By	Remarks					
0.00 1.20	1.20 20.00	IF CI	P ·	16/02/2022 16/02/2022	16/02/2022 25/02/2022	Han	d excavated ando 3000	ł			HT, KM, SI KM, SD) Н ⁻ НТ,	T JL						
-				Progre	ess						- F	Rotary	Det	ails			(Core De	etails
Date (dd/mm/yyyy	(hh:mn	1)	Hole Dept (m)	th Casing De (m)	pth Water Depth (m)	Weath	er		Depth From (m)	Depth To (m)	Flush	Гуре	Flus	h Return (%)	lush Colou	r Run Tim (hh:mm	e Depth) From (m)	Depth To (m)	Diameter (mm)
16/02/2022 16/02/2022	2 07:30)	0.00 5.65	6.00	Dry	windy	vercast dry	and very											
17/02/2022	2 07:30)	5.80 11.75	11.75	5.40 6.20														
21/02/2022	2 07:30		11.75	11.75	6.10														
23/02/2022	2 17:30		12.53	12.00	5.50														
24/02/2022	2 07:30)	13.85	18.00	4.10 6.40	Fine													
25/02/2022	2 07:30)	18.95 20.00	18.00	3.10 3.10	Fine/w	indy, rain												
						1													
						1													
						1													
					Cooing														
Depth	To (m)	Hole			Depth To (m)	Casing Di	ameter (mm)	-										
13	.85	TIOIC	250		13.85	,		250	-										
20	.00		200		20.00		2	200											
			Chisel	ling / Slo	w Progre	22													
Depth F	rom (m)		Depth To	(m)	Duration (hh	:mm)	Tool /	Remark											
	()			. ,		,													
		W	ater S	Strike			Water	Added											
Strike At (m)	Rise To (m)	Time I	Elapsed	Casing Dept	n (m) Depth Se	aled (m)	Depth From (m)	Depth To (m)											
	· · · ·	(a						()	1										
		Wat	ter Str	rike Rem	arks							Ge	ener	ral Rem	arks	·			
Groundwate	er not encour	ntered o	during ex	cavation.			1	Prior to exca	avation, a (Cable Ave	oidance Tool (CAT) surv	/ey wa	as carried o	out. An insp	pection pit v	vas hand-du	g to 1.20m	depth and
							ľ	_ seal mod usi	0AI			20.11000							
		Ins	stallat	ion	_				Pip	e					_	Ba	ackfill		
Туре	I Ip Depth / Distance (m) Res	ponse Zor Top (m)	ne Kesponse Base (r	Zone Installatio	n Date	ID 1	Top Depth (m)	Base Depth	n (m) Dia	ameter (mm)	Туре	D	epth From (r	n) Depth	To (m)	Backfill Ma	iterial	Date
GMP	10.00		3.50	10.00	28/02/2	2022	1	3.50	3.50		50 50	Slotted		-0.50	3.5	50	Bentoni	te	28/02/2022 28/02/2022
														3.50	20.0	00	Bentoni	ite	28/02/2022 28/02/2022
Niet-																			
	ations -	d r	ulte -	to d-f		oten : !	ooctic - '		ove=										
- Applevi	auons an	urest	ມແຣ ua			atory L		COURS K	eysneet	5									
Checked P	,	-	ĸ			F	levation De	tum	Ordnor	ice Datim	m			arid Coordin	nate Sveter	m 100	GB		
Template: F	GSL/HBSI/F	GSL RF	- Summ	ary.hbt/Confi	a Fuaro Rev5/	26/06/20)19/TS+AW	urii		JUE D'AIUI			G		iate oyster	Print Date	00	27/04/201	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clier	nt	Eni I	JK Limited	[⊣] l B	21	63	2	RH
		Fug	ro Reference	F190	0089	⊣∟┙		_0.	_ '	
•		Coo	rdinates (m)	E330	0166.77 N366961.45 Ground Elevation (m Datum) 75.63	Sheet	1 of 3			
		Hole	э Туре	Cabl	e Percussion	Status	;	Draf	t	
Samp	ling and	d In Si	itu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10 - 0.30	В	3		<u> </u>	MADE GROUND. Dark brown gravelly clayey SAND with frequent					
0.20 - 0.30 0.20 - 0.30 0.20	ES PID	∠ 1	0.3 ppm		substone, mudstone, brick, concrete, chert and possibly	(0.80)				
0.70 - 0.80	DES	5		-	quartzite. [MADE GROUND] [SAND]	0.80	74.83			
0.70	PID	-	0.5 ppm	1-	MADE GROUND. Dark pinkish grey gravelly clayey SAND with	(0.20)	74.63			
0.80 - 1.00	B D	6 7		:	to subrounded fine to coarse of mixed lithologies including	1.00 (0.20)	74 43			
1.10 - 1.20	B	9		-	sandstone, concrete and mudstone. Cobbles (65mm x 80mm x	1.20	00			
1.10 - 1.20	PID	δ	1.0 ppm	-	85mm) are angular and subangular cuboid rough to smooth of concrete					
1.20 - 1.65	D	10	N = 20 (S)	-	[MADE GROUND] [SAND]	1				
1.70 - 1.90	ES	11	N - 20 (0)	-	MADE GROUND. Dark greyish brown gravelly slightly peaty	(1.60)				
- 1.70 - 2.00	PID D	12	3.5 ppm	2-	fine to coarse. Gravel is subangular and subrounded fine to coarse	(1.60)				
2.20 - 2.40	ES	14			of mixed lithologies including brick, concrete, sandstone,					
- 2.20 - 2.05 - 2.20 - 2.65	SPT	13	N = 10 (S)	-					1	
2.20	PID		5.8 ppm		MADE GROUND. Medium dense dark brown slightly gravelly					
2.80	ES PID	15	1.5 ppm	-	slightly clayey SAND. Sand is fine to coarse. Gravel is subangular	2.80	72.83	\$\$\$\$\$		
2.90	D	16	1.0 ppm	3 -	and subrounded time to coarse or mixed infrologies including sandstone, mudstone, concrete, brick and chert.	1				
2.90 - 3.20 3.20 - 3.65	B D	17 18		-	[MADE GROUND] [SAND]					
3.20 - 3.65	SPT		N = 8 (S)	-	2.20m to 2.65m; loose.	(1.10)				
-				-	Sand is fine to coarse. Gravel is subangular and subrounded fine					
- 3.80	D	19			to coarse of mixed lithologies including sandstone and possibly					
3.80 - 4.20	В	20		4	quartzite. IOUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND] //	3.90	71.73			
4 20 - 4.65	п	21		-	Loose dark brown slightly gravelly SAND. Sand is fine to coarse.					
4.20 - 4.65	SPT	21	N = 8 (S)	-	Gravel is subrounded and rounded fine and medium of sandstone.					
-				-	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]					
4.70	D	22								
4.70 - 5.20	В	23								
-				5		(2.30)				
5.20 - 5.65	D	24	N = 10 (S)	-					.	
J.∠U - J.UJ	551		N = 10(3)	-						$ \cdot \cdot$
-				-						
5.80	D	25		-						
-				6 -						
6.20	D	26				6.20	69.43			
6.30 - 6.75	B	27		-	Medium dense dark orangish brown very gravelly SAND. Sand is fine to coarse, predominantly coarse. Gravel is subangular to	· ·				
6.30 - 6.75	SPI		N = 20 (C)	-	rounded fine to coarse of mixed lithologies including sandstone,	(0.60)				
6.00		20		-	granite, quartz, slate and siltstone.	2.00				
6.80 - 7.30	B	28 29			[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]	6.80	68.83			
-				7-	content. Sand is fine to coarse, predominantly coarse. Gravel is					
- 7.30 - 7.75	в	31		:	subangular to rounded fine to coarse of mixed lithologies including					
7.30 - 7.75	D	30			sandstone, granite, quartz siltstone and slate. Cobbles (<80mm x				1	
7.30 - 7.75	SPT		N = 7 (C)	-	lithologies including slate and granite.					
7.80	D	32		-	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [GRAVEL]					
- 7.80 - 8.30 	В	33		8-		(2.40)				
				-						
- 8.30 - 8.75 8.30 - 8.75	B	35 34		-						
8.30 - 8.75	SPT	54	N = 7 (C)	.					1	
0 00		26								
8.80 - 9.20	B	30		-						
-				9-						$ \cdot = \langle \cdot $
- 9.30 - 9.75	D	38		.	Medium dense becoming very dense dark orangish brown slightly	9.20	66.43			
9.30 - 9.75	SPT		N = 15 (S)	1 2	gravely SAND. Sand is fine to coarse, predominantly coarse.					
				-	medium of mixed lithologies including sandstone, guartz, granite					
9.80	D	39		-	and siltstone.					ŀ. ⊢∶
9.80 - 10.30	в	40		-	Continued next page	-				⊢©∸
Netes				<u> </u>				<u> </u>		
Notes										
- Abbreviations	s and res	sults da	ata defined on 'Note	es on E	Exploratory Position Records'					

Print Date

27/04/2022

Template: FGSL/HBSI/FGSL Cable Percussion.hbt/Config Fugro Rev5/24/01/2020/TS+AW

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni l	JK Limited	LB	21	63	3	BH
		Fug	ro Reference	F190	0089			_	_	
		Coo	ordinates (m)	E330	0166.77 N366961.45 Ground Elevation (m Datum) 75.63	Sheet	2 of 3	Duref		
		HOIE	етуре	Cab	e Percussion	Status		Draf		
Samp	ling and	d In Si	itu Testing	_	Strata Details	1	1	1	Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
-				-	[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND] 9.80m to 10.30m; sand is predominantly fine and medium.					
- 10.30 - 10.75 - 10.30 - 10.75	D SPT	41	N = 16 (S)	-						
-				-		(3.00)				
- 10.80 - 10.80 - 11.30	D B	42 43				(0.00)				
- -				11-						
- 11.30 - 11.75 - 11.30 - 11.74	B SPT	44	50/295 mm (S)		From 11.30m; very dense.					
-				-						
- 11.80 - 11.80 - 12.20	D B	45 46		-						
-		47		12 -		12.20	63.43			
12.20 - 12.53	SPT	47	50/180 mm (S)	-	Very stiff dark brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to rounded fine to coarse,	12.20	03.43	L		
- 12.60	D	48		-	predominantly fine and medium of mixed lithologies including			L		
12.60 - 13.00 -	в	49			[PENNINE MIDDLE COAL MEASURES FORMATION] [CLAY]	(1.10)		<u> </u>		
-				13 -				<u> </u>		
13.30 - 13.85	D SPT	50	N = 3 (S)	-	Very loose dark brown slightly gravelly SAND. Sand is fine. Gravel	13.30	62.33			
-	011			-	is subangular to rounded fine of mixed lithologies including siltstone and sandstone.					
- - 13.90	п	51		-	[PENNINE MIDDLE COAL MEASURES FORMATION] [SAND]	(1 20)				
	В	52		14 -	13.90m to 14.00m; locally gravel is angular of coal. Sand is fine and medium predominantly fine.	(1.20)				
-										
- 14.50 - 14.95	D SPT	53	N = 19 (S)	-	Medium dense brown SAND. Sand is fine and medium.	14.50	61.13			
	0			-	[PENNINE MIDDLE COAL MEASURES FORMATION] [SAND]	(0.60)				
- - 15.10	D	54		15 -		15.10	60.53			
15.10 - 15.50	В	55			Gravel is subangular to rounded fine of mixed lithologies including	(0.40)				
- 15.50 - 15.95	D SPT	56	N = 18 (S)	-	∣ siltstone and sandstone. ∖ [PENNINE MIDDLE COAL MEASURES FORMATION] [SAND] /	15.50	60.13			
-	011			-	Medium dense brown slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of coal					
- - 16.10	D	57		16 -		(1.00)				
16.10 - 16.50	В	58		-						
- 16.50 - 16.89	D	59	50/235 mm (S)	-	Very dense brown SAND. Sand is fine and medium.	16.50	59.13			
-	011		50/200 min (0)		[PENNINE MIDDLE COAL MEASURES FORMATION] [SAND]	(0.00)				
- 17 10	п	60		17 -		(0.80)				
17.30	D	61		-	Vary stiff brown slightly grovally CLAV. Croyal is angular to	17.30	58.33	<u>.</u>		
- 17.50 - 17.95	D	62	50/205 mm (S)	-	subrounded fine and medium of coal, sandstone and limestone.			<u> </u>		
- - -	351		50/295 mm (S)	-						
-				18 -				<u> </u>		
· 18.30	D	63				(1.80)		[
- - 18.50 - 18.95	U#B	64	35/0 mm	-				<u> </u>		
								E		
- 10.10	п	65		19 —		10 10	56 53			
19.10 - 19.50	В	66			Very stiff slightly gravelly slightly sandy CLAY. Sand is fine and medium. Gravel is angular to subrounded fine and medium of coal	(0.40)	00.00			
- 19.50 - 19.71	D	67	E0/200 (0)	-	and occasional sandstone fragments.	19.50	56.13			
19.00 - 19.71 -	571		50/200 mm (S)		Very dense slightly gravelly silty SAND. Sand is fine to coarse.	(0.50)				
-				-	Continued next page	20.00	55.63			
Notes	I		1	1			1	1	I	
- Abbreviations	and res	sults da	ata defined on 'No	tes on E	Exploratory Position Records'					
Template: FGSL/HE	3SI/FGSL (Cable Pe	rcussion.hbt/Config Fug	ro Rev5/2	4/01/2020/TS+AW	Print Dat	9	27/04/2	2022	

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locatio	on ID			
-fug	RU	Clier	nt	Eni l	JK Limited	LR	21	6	3	BH
		Fugr	o Reference	F190	0089	 - 0.			-	
•		Coo	rdinates (m)	E330	0166.77 N366961.45 Ground Elevation (m Datum) 75.63	Sheet	3 of 3			
		Hole	Туре	Cab	le Percussion	Status		Draf	t	
Samp	ling and	d In Si	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
				-	[PENNINE MIDDLE COAL MEASURES FORMATION] [SAND]	. /				
				:	End of Borehole at 20.00 m					
-				-						
				-						
-				-						
-				21 -						
-				-						
-				-						
-										
-				- 22 -						
				:						
				-						
-				23 -						
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-				24 —						
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•				26 -						
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-				27						
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-				28 -						
				-						
				-						
				-						
				-						
				29 -						
[.						
-				-						
				-						
				_						
Notes										
 Abbreviations 	and res	ults da	ta defined on 'Note	s on E	Exploratory Position Records'					
Tomplate: ECOL #10		able Dr	aussian hht/Caafa Eu	Boy F /O	4/04/2020/TS+AM	Drint Dr. 1		27/04/	2022	
remplate: FGSL/HB	SI/FGSL C	able Per	cussion.nbt/Config Fugro	Rev5/2	4/01/2020/1S+AW	Print Date)	27/04/2	2022	

			Cont	ract Nar	ne l	LBA C	CS Tra	insport a	nd Stora	age F	Project	Grour	nd Inv	/esti	gatior	าร	Locati	ion II	D		
-fiu	IGR		Clier	nt		Eni Ul	K Limite	ed									I B	8 5	21	65	BH
			Fugr	o Refere	ence	F1900)89											_			
			Coor	dinates	(m) [E3298	399.82 I	N367060	.50 0	Grou	nd Elev	vation	(m D	atun	n) 80	0.05	Sheet	t 1 of	1		
			Hole	Туре	(Cable	Percus	sion									Status	s		Draft	
									Equip	mer	nt										
Depth From (m)	Depth To (m)	Hole	Type I	Date From	Date To	E	quipment	Core E	Barrel (Core Bi	t Drilli	ing Crew	Logge	d By	Remark	5					
0.00 1.20	1.20 21.57		IP 3 CP 3	30/11/2021 30/11/2021	30/11/2021 08/12/2021	Han	id excavate ando 3000	ed			EA, K	KM, SD M, SD	EA EA	4							
				Progre	ess							Ro	otary I	Deta	ails				C	ore De	etails
Date (dd/mm/yyyy) (hh:mr	n)	Hole Dept (m)	h Casing Dep (m)	pth Water Depth (m)	Weath	er		Depth From (m)	Depth (m	n To)	Flush Ty	ре	Flush (Return %)	Flush Colou	Ir Run 1 (hh:n	Time mm)	Depth From (m)	Depth To (m)	Diameter (mm)
30/11/2021 30/11/2021	07:30)	0.00 6.95	0.00 6.00	Dry Dry	Cloudy	/														
01/12/2021 01/12/2021	07:30)	6.95 8.45	6.00 8.50	Dry 7.10	Fine															
02/12/2021 02/12/2021	07:30)	8.45 14.45	8.00 14.00	7.20 Dry	Rain															
03/12/2021 03/12/2021	07:30)	14.45 15.45	14.00 14.50	7.30 Drv	Slight s	showers														
06/12/2021 06/12/2021	07:30)	15.45 17.45	14.50 14.50	5.30 6.00																
07/12/2021	07:30)	17.45	17.00	5.60 5.60																
08/12/2021	07:30		20.45	20.00	5.70																
00/12/2021	10.00		21.07	20.00	0.70																
		1	Н	ole and	Casing																
Depth	To (m)	Hol	le Diamete	er (mm)	Depth To (m)	Casing D	iameter (mm)												
21.	57		250		21.57			250													
			Chisel	ling / Slo	w Progre	SS															
Depth F	rom (m)		Depth To	(m)	Duration (hh	:mm)	Tool	/ Remark													
		_ N	/ater S	trike			Wate	r Added													
Strike At (m)	Rise To (m)	Time (I	e Elapsed mins)	Casing Depth	n (m) Depth Se	ealed (m)	Depth Fror (m)	n Depth To (m)													
10.20	8.00		20	10.00					1												
		Wa	ter Str	ike Rem	arks				-				Ge	enera	al Rer	narks					
Groundwate	er not encou	ntered	during ex	cavation.				1. Prior to ex	cavation, a	Cable	Avoidance	e Tool (CA	AT) surv	ey wa	s carried	l out. An ins	pection p	it was I	hand-dug	to 1.20m	depth and
								. socarnicu u			2011101 30										
		In	stallati	ion					Pip	be							E	Back	fill		
Туре	Tip Depth / Distance (m) Re	sponse Zor Top (m)	ne Response Base (r	Zone n) Installatio	n Date	ID	Top Depth (m) Base Dep	th (m)	Diameter (r	mm)	Туре	De	pth From	(m) Depth	To (m)	Ba	ackfill Mat	erial	Date
															0.00	21.	57		Bentonit	e	08/12/2021
Notes																					
- Abbrevi	ations an	d res	sults dat	ta defined	in 'Explor	atory L	ocation	Records I	Keyshee	ts'											
Checked By			СК			E	levation Da	atum	Ordna	nce Da	atum			Gr	id Coord	linate Syste	m C	DSGB			
Template: F	GSL/HBSI/F	GSL B	3H Summa	ary.hbt/Confi	g Fugro Rev5/	26/06/20)19/TS+AW	/									Print Dat	te		21/04/202	2

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni l	JK Limited		21	6'	5	RH
		Fug	ro Reference	F190	0089		_~ +	_0.	_	
•		Coo	rdinates (m)	E329	0899.82 N367060.50 Ground Elevation (m Datum) 80.05	Sheet	1 of 3			
		Hole	е Туре	Cab	e Percussion	Status		Draf	t	
Samp	ling an	d In Si	itu Testing		Strata Details	÷		÷	Grou	ndwater
Depth	Туре	No.	Test Results	Depth	Strata Descriptions	Depth (Thickness)	Level (m Datum)	Legend	Water	Backfill / Installation
0.10	D	1		()	TOPSOIL. Firm dark brown slightly gravelly sandy CLAY. Sand is	(m)				
- 0.10 - 0.30 - 0.30	B HVane	2	118 kPa (<i>32 kPa</i>)		fine to coarse. Gravel is subangular and subrounded fine to coarse	(0.30)	79 75			
0.30	HVane		122 kPa (22 kPa)	-	TOPSOIL] [CLAY]	0.00				
0.30	D	3	132 KPa (20 KPa)		At 0.10m; ceramic fragment (<5mm x 15mm x 25mm).	(0.00)		<u> </u>		
- 0.35 - 0.60 - 0.60	B ES	4 5		-	coarse. Gravel is subangular and subrounded fine to coarse of	(0.90)				
0.60	PID		< 0.1 ppm	1-	mixed lithologies including flint, sandstone, quartzite and coal.					
0.60	HVane		114 kPa (<i>18 kPa</i>)		0.65m to 1.20m; firm.	1.20	78.85			
. 0.60 - 0.70	HVane D	6	98 kPa (<i>20 kPa</i>)	-	0.90m to 1.10m; becoming gravelly with low cobble content. Cobbles (<65mm x 70mm x 110mm) are subangular and subrounded of weak					
0.70 - 1.00	В	7			sandstone.	(0.80)				
1.20 - 1.65	D	9			medium. Gravel is subangular and subrounded fine to coarse of					
- 1.20 - 1.65 - 1.70	SPT D	10	N = 19 (S)	2-	mixed lithologies including flint, sandstone, mudstone and rare	2.00	78.05			
1.70 - 2.00	B	11 12			COAI. [GLACIAL TILL DEPOSITS] [CLAY]			·····		
2.20 - 2.65	SPT	12	N = 20 (C)	-	Brown sandy gravelly CLAY. Sand is fine and medium. Gravel is	(0.80)				
- - 2.70	D	13			including flint, mudstone and sandstone.					
2.80 - 3.20	В	14			[GLACIĂL TILL DEPOSITS] [CLAY]	2.80	77.25	× ×		
-				3-	sandstone.			× × ,>		
- 3.20 - 3.65 - 3.20 - 3.65	D SPT	15	N = 6 (S)	-	Loose to medium dense brown slightly gravelly silty SAND. Sand			××``		
-	0			-	coarse of mixed lithologies including flint, quartz and sandstone.			×××,		
. 3.70	D	16			[OUTWASH GLACIO-FLUVIAL DEPOSITS] [SAND]			Î×_×		
3.70 - 4.20	В	17		-				× ×		
-				4				× ×		
- 4.20 - 4.65 - 4.20 - 4.65	D SPT	18	N = 8 (S)	-				× × ·		
_				-				× × ,		
• 4.70	D	19						××``		
4.70 - 5.20	В	20						×××,		
-	_			5				×,×		
- 5.20 - 5.65 5.20 - 5.65	D SPT	21	N = 4 (S)					× ×		
-				-				× ×		
5.70	D	22		-		(5.80)		× × ×		
5.80 - 6.30	В	23		-				××		
-				- 0				××^,		
				-				×××,		
6.50 - 6.95	D	24		-				Â×_×		
0.50 - 0.95	571		N = 4 (5)					× ×		
-				7				× ×		
7 20	п	25						× × ×		
7.30 - 7.80	B	26		-	7.20m to 7.30m; dark brown.			x × j		
-								××^,		
								×××,		
- 8.00 - 8.45	D	27		8-				×××	I	
8.00 - 8.45	SPT		N = 18 (S)		8.00m to 8.45m; medium dense, gravelly.			× ×		
- -				-				× ×		
-				-		8.60	71.45	× × >		
- 8.80	D	28		-	subangular and subrounded fine to coarse. Gravel is					
8.90 - 9.40	В	29		9	including sandstone, flint and quartz.	(0.90)				
-				-	[OUTWASH GLACIO-FLOVIAL DEPOSITS] [GRAVEL]	(0.50)				
						<u> </u>				
- 9.50 - 9.95 9.50 - 9.95	D SPT	30	N = 19 (S)	-	Medium dense brown slightly gravelly SAND. Sand is fine to	9.50	70.55			
-				-	mixed lithologies including sandstone, flint, mudstone, guartz and					
-				-	Continued next page					
Notes	1		1	1				1		L
- Abbreviation	s and res	sults da	ata defined on 'Note	es on F	Exploratory Position Records'					
Template: FGSL/HI	BSI/FGSL (Cable Pe	rcussion.hbt/Config Fugro	Rev5/24	4/01/2020/TS+AW	Print Date	9	21/04/	2022	

		Cor	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fiig	PO	Clie	•nt	Eni	LIK Limited		21	6	5 1	RH
		Fug	In Reference	F19	0089	- L U.		v.	י_ר	DIII
		Cor	vidinates (m)	=32	0800 82 N367060 50 Ground Elevation (m Datum) 80 05		2 of 3			
		Hol	e Type	Cab		Status		Draf		
			s Type	040	I FEICUSSION	Olalus		Diai	÷—	
Samp	ling and	d In Si	itu Testing	<u> </u>	Strata Details		, 		Groun	ıdwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
10.20		31	T			T	Ĺ.	7	: 🛛 🛛	
10.20		32		.	9.50m to 9.95m; with clay laminations.					
- 10.40 - 10.80		JZ		-					1	
		Í			-				1	
		Í.			1				1 1	
	D SPT	33	N = AQ(S)	11 —	At 11.00m; driller notes; large cobble removed from SPT spoon.	(0.00)			4	
11.00 - 11.40	3F1	Í	N - 49 (3)	· ·	-	(3.30)			1	
		Í			-				4	
- 11.60	D	34			-				1 1	
11.80 - 12.20	в	35							1	
11.00 1	-			12 -	. 11.80m to 12.20m; with rare fragments of coal.				1	
F	_			×۲	-				4	
12.20 - 12.65 12.20 - 12.65	SPT	36	N = 19 (S)		-				1	
		Í	N 10(0)	-					1	
F '		Í		.	-				1	
f		Í			Off have alightly grouply condy CLAV Sond is find to coorse	12.80	67.25			
· 12.90		37	70/350 mm	13 -	Still brown slightly gravely sandy OLAT. Sand is line to coarse.				4	
13.00 - 13.43		30	70/300 mm	· · ·	lithologies, including flint, mudstone and sandstone.				1	
É '		Í		.	[GLACIAL TILL DEPOSITS] [CLAY]				1	
- 13.50		39		-	12.80m to 13.40m; clayey.	(1.30)			4	
13.60 - 14.00	В	40		· ·					1	
f '		Í			-				1	
-14.00 - 14.45		41		14 -	4				1	
14.00 - 14.50	В	42		.	Dense brown SAND with pockets of brown slightly gravelly sandy	14.10	65.95		1	
14.00 - 14.45	SPT	Í	N = 36 (S)		clay. Sand is fine and medium.	(0.40)			1	
Ĺ		Í			[GLACIAL TILL DEPOSITS] [SAND]	14.50	65.55		4	
14.60	D	43		-	Stiff brown slightly gravely sandy CLAY. Sand is tine and medium.		-		4	
14.60 - 15.00		44			lithologies including mudstone. flint and sandstone.					
- 	U	45	60/300 mm	15 -	- [GLACIAL TILL DEPOSITS] [CLAY]				1	
t '		Í				(1.40)			1	
f '		Í			-	(1.40)				
- - 15.50	D	46		-	-				1	
15.50 - 15.90	В	47		-					1	
ł		Í				15.90	64 15		4	
-16.00 - 16.33	D	48		16 -	Very dense brown SAND. Sand is fine and medium.	10.80	04.15		1	
16.00 - 16.33	SPT	Í	50/180 mm (S)	-	[GLACIAL TILL DEPOSITS] [SAND]	(0.55)			1	
ł '		Í			-				1 1	
- 16.50	D	49		-	Stiff brown slightly gravelly sandy CLAY. Sand is fine and medium.	- 16.45	63.60		1	
16.50 - 16.90	В	50			Gravel is subangular and subrounded fine to coarse of mixed				1	
t '		Í		-	lithologies including flint, mudstone and coal.				1	
-17.00 - 17.45	U#B	51	80/0 mm	17 —		(1.15)			4	
ŧ '		Í			-			<u> </u>	1	
t '		Í							1	
17.60		51		-		17.60	62 45		1	
17.60 - 18.00	B	52			Very dense brown silty SAND. Sand is fine and medium.	11.00	02.40	. × , ×	1	
Ľ '		Í			[GLACIAL TILL DEPOSITS] [SAND]			×××	1	
18.00 - 18.37		53	50/215 mm (S)	18 —				××,>	×	
10.00 - 10.00	551	Í	50/213 11111 (3)	.	-			×××	i I	
f		I			-			×××	1	
- 18.50 - 19.60 - 18.90	D	54 55						×, ×, >	1	
10.00 - 10.90		55		· ·	-	(2.40)		××		
E		I			-	(2.40)		x x	1	
	D SPT	56	N = 49 (S)	19	From 19.00m; dense.			×××	1	
10.00 10.10		Í	N - 40 (0)					× × 5	×	
f in the last					-			×××	1	
- 19.50 - 19.50 - 19.90		57 58		-	-			×××	1	
	-			-				× × >	1	
20.00 20.45		50		<u>·</u>		20.00	SO 05	××、	×	
20.00 - 20.43	SPT	59	N = 42 (S)	-	Continued next page	20.00	00.05		1	
Notes	<u> </u>		· ·			<u></u>				
- Abbreviation:	s and re	sults d	ata defined on 'Not	es on !	Evoloratory Position Records'					
- / 001 0 1 0 1 0 1 0) una	Juno a.		55 5						
1										
L										
Template: FCSI /U/	DEL/ECEL (Coble Dr	rougeion hht/Config Eugr	o Rev5/	24/01/2020/TS+AW	Print Dat	e	21/04/	/2022	

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
fua	RO	Clier	nt	Eni l	JK Limited	LB	21	65	5	BH
		Fugi	o Reference	F190	0089				_	
·		Coo	rdinates (m)	E329	0899.82 N367060.50 Ground Elevation (m Datum) 80.05	Sheet	3 of 3			
		Hole	Гуре	Cabl	e Percussion	Status		Draf	1	
Samp	oling and	d In Si	tu Testing		Strata Details		[1	Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
Depth (m) 20.50 20.60 - 21.00 -21.00 - 21.04 21.30 - 21.57 21.30 - 21.57	Type D B SPT D SPT	No.	Test Results 50/5 mm (S) 50/235 mm (S)	Depth (m)	Strata Descriptions Stiff brown slightly gravelly sandy CLAY. Sand is fine and medium. Gravel is subangular and subrounded fine to coarse of mixed lithologies including flint, mudstone, quartzite, sandstone and coal. [GLACIAL TILL DEPOSITS] [CLAY] End of Borehole at 21.57 m	(1.57) 21.57	58.48		Water Strike	Backfill / Installation
Notes - Abbreviations	s and res	sults da	ta defined on 'Note	s on E	Exploratory Position Records'					
remplate: FGSL/HE	SSI/FGSL C	able Per	cussion.hbt/Config Fugro	Rev5/2	4/01/2020/TS+AW	Print Date	e	21/04/2	2022	

			Cont	ract Nar	ne	LBA CCS Transport and Storage Project Ground Investiga							/estigation	ons	Locatio	on ID		
-6	IGR		Clien	ıt		Eni U	K Limite	d							IR	21	65	CPT
			Fuar	o Refere	ence	F1900)89	-									_00_	
•			Coor	dinates	(m)	E3299	00.01 N	1367060.	28 Gr	round	Elevati	on (m D	atum) 8	0.02	Sheet	1 of 1		
			Hole	Туре	· /	Inspe	ction Pit						,		Status		Draft	
				2.					Equipm	nent								
Depth From (m)	Depth To (m)	Hole	Туре [Date From	Date To	E	Equipment	Core Ba	arrel Co	re Bit	Drilling C	rew Logge	d By Rema	ks				
0.00	1.20	IF	2	7/10/2021	27/10/2021	Har	nd excavate	d			LT, MW,	CS LT						
				Progre	ess							Rotary I	Details				Core D	etails
Date (dd/mm/vvvv) (hh:mm	1)	Hole Depth (m)	n Casing Dep	pth Water Dept (m)	^h Weath	er		Depth From (m)	Depth To (m)	Flus	h Type	Flush Return (%)	Flush Colou	ur Run Tir (hh:mr	me Depth m) From (m	Depth To	Diameter (mm)
27/10/2021	13:00	ĺ	0.00		Dry	Cloudy	/			()						, , ,	, , ,	
21/10/2021	10.40		1.20		Diy													
			H	ole and	Casing													
Depth	To (m)	Hole	Hole Diameter (mm) Depth To (m) Casing Diameter (mm)															
		(Chisell	ing / Slo	w Progre	ess												
Depth F	rom (m)	[Depth To	(m)	Duration (hi	n:mm)	Tool /	/ Remark										
		W	ater S	trike			Wate	r Added	1									
Strike At (m)	Rise To (m)	Time (m	Elapsed nins)	Casing Depth	h (m) Depth S	ealed (m)	Depth From (m)	n Depth To (m)										
		Wat	ter Str	ike Rem	arks							Ge	eneral Re	emarks				
Groundwate	er not encoun	ntered of	during ex	cavation.				1. Prior to exc rescanned us	avation, a C	able Avo	idance Too	ol (CAT) surv	ey was carri	ed out. An ins	pection pit	was hand-du	ug to 1.20m	depth and
							ľ	usi	5 ON			5 003 1						
		Ins	stallati	on					Pipe	9					В	ackfill		
Туре	Tip Depth / Distance (m)	Res	ponse Zon Top (m)	e Response Base (r	Zone m) Installati	on Date	ID	Top Depth (m)	Base Depth	(m) Dia	meter (mm)	Туре	Depth Fro	m (m) Depth	To (m)	Backfill M	aterial	Date
Notes				1	I				1	1		1	1	1				
- Abbrevi	ations and	d resi	ults dat	a defined	d in 'Exploi	atory L	ocation	Records K	eysheets									
						,												
Checked Bv	,	J	IR			E	levation Da	itum	Ordnand	ce Datur	n		Grid Coo	rdinate Syste	m Os	SGB		
Template: F	GSL/HBSI/F	GSL BI	H Summa	ary.hbt/Confi	ig Fugro Rev5	/26/06/20	019/TS+AW	1						-,	Print Date	•	21/04/20	22

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RU	Clier	nt	Eni l	JK Limited	LB	21	65	С	PT
		Fugr	ro Reference	F190	089	_ •		-	_	
v		Coo	rdinates (m)	E329	900.01 N367060.28 Ground Elevation (m Datum) 80.02	Sheet	1 of 1			
		Hole	туре	Inspe	ection Pit	Status	;	Draft		
Samp	ling and	d In Si	tu Testing		Strata Details		-		Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					TOPSOIL. Soft dark brown sandy CLAY. Sand is fine and medium.					
- 0.20 - 0.30	D	1				(0.30)				
-				-	Chiff annuals light brown alighthy annually group live OLAV. Cond is fina	0.30	79.72			
-				-	and medium. Gravel is subangular and subrounded fine to coarse			· · · ·		
- 0.50 - 0.60	D	2		-	of mixed lithologies including sandstone, mudstone and flint.					
-				-						
				-		(0.90)				
-				-		()				
-								· · · · ·		
				1-						
				_		1.20	78.82	· · · · ·		
				-	End of inspection Pit at 1.20 m					
-				-						
-				-						
-				-						
-				-						
_				2-						
-				-						
				-						
				-						
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				-						
						_				
Notes		••		IN 1	Pit Stability	Plan				
- Abbreviatior	ns and i	results	aata defined on	Note	s on Exploratory Position Records'		0.3	0 m		
						0.30 m				120°
]	
Template: FGSL/HE	SI/FGSL T	rial Pit.hb	ot/Config Fugro Rev5/05/1	2/2019/	TS-AW	Print Dat	e	21/04/2	2022	

1	Institute of Geological Sciences		6-in or 1:10 000 M:	p Registration
	RECORD OF SHAFT OR BOREHOLE		SJ 27 SE	/177
Name and Number o	f Shaft or Bonchole ADBROOK HALL FARM (BOREHOLE NO 13)	ritish Ge	National Grivelogical Survey	d Reference
For whom made	BGS		SJ 2545	7072
	FLINT DELYN			
Exact site (reference	e to a fixed point on 1-in or 1:50 000 Map)	I-i New	n or 1:50 000 Series Map No.	Enter 'C' i Confidentia
	To investigate drift deposits	-	108	
Purpose for which m	aae			
Ground level at shaf	relative to 0.D. <u>~ 57.00</u> m. If not ground level give 0.D. of beg	inning of bo	aft.	m.
Made by	Norwest Holst	Date o	f sinking	
Information from	Brillish Geological Sumer	Exami	ned byM	Smith
Geological	Billish Ger Description of Strata	Brilish Ge	Thickness	Depth
Made ground	Reddish brown clayou cond with conscious	مندر المر الم		
	pebbles			
	variegated = fill		5.0	5.0
Boulder clay	Dark reddish brown boulder clay with lens	es of		
-	clayey sand and gravel		12.10	17.10
	Borenoie terminated due to difficult			
ritish Geological Survey	British Scalogical Contay	British G	ological Suniay	
	•			

.

.hat) Institute of Geological Sciences RECORD OF SHAFT OR BOREHOLE		6-in or 1:10 000	Map Registrat				
	· · · · · · · · · · · · · · · · · · ·		SJ 27 S	W/249				
Name and Number of	Shaft or Borehole Y-MYNYDD (BOREHOLE NO 8)	British Geol	National G	rid Reference				
	BGS		SJ /249	5 7057				
For whom made	FLÎNT MOUNTAIN DELVN		-					
Exact site (reference	to a fixed point on Lin or 1:10 000 Map		-in or 1:50 000 v Series Map No.	Enter Confid				
900 m M	NE of chapel in Flint Mt		108					
Purpose for which ma	de Investigation of drift deposits							
Ground level at shaft	elative to 0.Dm. If not ground level give 0.D. of bee	inning of sh	aft					
Made by	Norwest Holst	Date	of sinking 3.	m. 12.86				
Information from	British Geological Survey	British Geol	ogical Survey M	Smith				
	• • • •							
Ceological	British Geningcol Superg	British Geol	Thickness	Den				
Geological Classification	Billish Generation Description of Strata	British Geol	Thickness mettes	Dept metre				
Geological Classification Head	Description of Strata Thin cover of slope wash comprising dark b	British Geol rown	Thickness mettes	Dept metro				
Gestoncal Classification Head	Description of Strata Thin cover of slope wash comprising dark b silty clay	British Geol FOWN	Thickness metres	Dept metre 0.3				
Geological Classification Head Boulder clay	Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff	British Geel rown silty	Thickness mettes 0.3	Dept metra 0.3				
Geological Classification Head Boulder clay	Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles	British Geo rown silty	Thickness metres 0.3 5.1	Dept metro 0.3 5.4				
Geological Classification Head Boulder clay	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles	British Geel rown silty	Thickness metres 0.3 5.1	Dept metro 0.3 5.4				
Geological Classification Head Boulder clay - Sands & gravel	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted class access/arddich brown	British Geek rown silty n into	Thickness metres 0.3 5.1	Dept metta 0.3 5.4				
Geological Classification Head Boulder clay - Sands & gravel	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown san	British Geek rown silty n into ds	Thickness metres 0.3 5.1 4.1	Dept metre 0.3 5.4 9.5				
Geological Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and grayels passing	Britsh Geek rown silty n into ds	Thickness metres 0.3 5.1 4.1	Dept metre 0.3 5.4 9.5				
Geological Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and gravels passing rapidly into firm boulder clay	British Gent rown silty n into is 3	Thickness metres 0.3 5.1 4.1	Dept metro 0.3 5.4 9.5				
Geological Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and gravels passing rapidly into firm boulder clay	Britsh Gert rown silty n into is s	Thickness metres 0.3 5.1 4.1	Dept mette 0.3 5.4 9.5				
Geological Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff i clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and gravels passing rapidly into firm boulder clay Borehole terminated at obstruction	Brish Geo rown silty n into ds s	Thickness mettes 0.3 5.1 4.1 1.7	Dept mette 0.3 5.4 9.5				
Geological Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff i clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and gravels passing rapidly into firm boulder clay Borehole terminated at obstruction	Brish Geo rown silty n into ds 3	Thickness mettes 0.3 5.1 4.1 1.7	Dept mette 0.3 5.4 9.5				
Geologicaj Classification Head Boulder clay Sands & gravel Boulder clay	Description of Strata Description of Strata Thin cover of slope wash comprising dark b silty clay Dark reddish brown clayey sands and stiff of clays with abundant pebbles and cobbles Dark reddish brown clayey sand passing down well sorted clean orange/reddish brown sand Dark brown clayey sands and gravels passing rapidly into firm boulder clay Borehole terminated at obstruction	Brish Gee rown silty a into ds s	Thickness mettes 0.3 5.1 4.1 1.7	Dept metre 0.3 9.5 11.2				

			Contract Name LBA CCS Transport and Storage Project Ground Investigations									ns	Locatio	on ID							
-6	IGP		Client	t		Eni U	K Limite	d									I R	21	1 8	22	TP
		-	Fuarc	Refere	ence	F190	089												'_`		- • •
			Coord	dinates	(m)	E325	269.20	N370034.	25 0	Groun	d Elevat	ion	(m D	atu	m) 89	9.75	Sheet '	1 of 1			
			Hole	Туре	()	Trial F	Pit								,		Status		Dr	aft	
									Equip	men	t										
Depth From (m)	Depth To (m)	Hole	Type D	ate From	Date To		Equipment	Core Ba	arrel (Core Bit	Drilling (Crew	Logge	ed By	Remark	s					
0.00	2.00	TI	P 18	8/10/2021	18/10/202	1 Mach	ine excavat	ed :			MR, F	RB	MF	R							
							30D 30X														
				Progr	ess							Ro	otary I	Deta	ails				Core	e Det	ails
Date (dd/mm/www	Time) 	Hole Depth	Casing De	pth Water De	^{pth} Weath	ier		Depth From (m)	Depth (m)	To Flue	sh Ty	pe	Flus	h Return	Flush Colou	Ir Run Tin	ne Depi	th Dep	th To C	iameter (mm)
18/10/2021	15:00	·)	0.00	()	Dry				110111(11)	(,					(70)		(.,	(, (.	,	
10/10/2021	10.00		2.00		Diy																
			Нс	le and	Casing																
Depth	To (m)	Hole	Diamete		Depth T	n (m)	Casing D	iameter (mm)													
Dopui	,		Diamoto	. ()	Bopart	5 ()	outing D														
		(Chiselli	ing / Slo	ow Progr	ess	1														
Depth F	rom (m)	0	Depth To ((m)	Duration (nh:mm)	Tool	/ Remark													
		W	ater St	rike			Wate	r Added													
Strike At (m)	Rise To (m)	Time I (m	Elapsed hins)	Casing Dept	h (m) Depth	Sealed (m)	Depth From (m)	n Depth To (m)	1	Ì											
		(.1	,						1	Ì											
										Ì											
										Ì											
		Wat	ter Stri	ke Rem	narks		-		ı	1			Ge	ener	al Re	marks					
Groundwate	er not encoun	itered of	during exc	avation.				1. Prior to exc	avation, a	Cable A	voidance To	ol (C/	AT) surv	/ey wa	as carrie	d out. Servic	es were no	t located.			
								 Trial pit rem Trial pit term 	ained uns ninated fol	table du lowing c	ring excavat	ion. de B	on exca	vatio	n below :	2.00m.					
										-											
		Inc	stallati	on					D:-								P	ackfill			
Tunc	Tip Depth /	Res	ponse Zone	e Response	Zone	tion Data		Top Dopth ()	FI)iametor / `	1	Time	-	enth E	(m) De-#		Boolder	Matariat		Data
iype	Distance (m)		Top (m)	Base (m) mstalla	aon Date	U	ob Debru (III)	Dase Dep	(II) L	samster (mm)	+	rype	-	0.00	2.0	00	Aris	ings		18/10/2021
Notes																					
- Abbrevi	ations and	d resi	ults data	a define	d in 'Explo	oratory	ocation	Records K	eyshee	ts'											
Checked By		J	R			E	Elevation Da	itum	Ordna	nce Dat	um			G	rid Coor	dinate Syste	m OS	GB			
Checked By JR Ele Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/26/06/20							019/TS+AW	1									Print Date		21/0)4/2022	

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	ion ID				
-fua	RU	Clie	nt	Eni l	JK Limited	LB	21	8	2	TΡ	
		Fug	ro Reference	F190			—	—		•	
		Coo	rdinates (m)	E325	Difference	Sheet	1 of 1	Draf	+		
			- туре	mai		Jolalus	,	Diai			
Samp	ling and	d In Si	tu Testing		Strata Details	1	1	1	Grou	ndwater	
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation	
-				_	Firm and stiff dark grey friable CLAY.						
0.20 - 0.30	В	3		-	0.00m to 0.30m; clay too friable for a hand vane.	(0.30)		<u> </u>			
0.20 - 0.30	ES BID	2		-	Firm and stiff light brown friable slightly gravelly sandy CLAY with	0.30	89.45				
0.30 - 0.50	B	5	< 0.1 ppm	-	low cobble and low boulder content. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of guartzite and sandstone.	(0, 40)					
- 0.40 - 0.50	D	4			Cobbles (100m x 150mm x 150mm) are angular to subrounded	(0.40)					
				-	250mm x 270mm) are angular to subrounded and medium strong.	0.70	89.05		-		
- 0.80 - 1.00	В	7		-	0.30m to 0.70m; clay too friable for a hand vane.						
- 0.90 - 1.00	D	6		-	[GLACIAL TILL DEPOSITS] [SAND]						
				1-	0.80m to 1.00m; very clayey.						
				-							
- 1.30 - 1.50	В	9		-		(1.30)					
- 1.40 - 1.50	D	8		-							
				-							
- 1.80 - 2.00	В	11		-							
- 1.90 - 2.00	D	10		2		2.00	97 75				
-				-	End of Trial Pit / Trench at 2.00 m	2.00	07.75				
				-							
				-							
-				-							
				-							
				-							
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				-							
-				-							
Notes	is and i	Peulto	data defined on	'Noto	Pit Stability	Plan					
	is anu i	coults	ala denned ON	NOLE	excavation below		2.8	2.00 m			
					2.00mbgl.	0.60 m				90°	
Template: FGSL/HBSI/FGSL Trial Pit.hbt/Config Fugro Rev5/05/12			ot/Config Fuero Rev5/05/	12/2010/	TS-AW	Print Dat	e	29/04/	2022		
	3361					Dat		_0/04/			

LABORATORY TEST CERTIFICATE Determination of Particle Size Distribution

BS EN ISO 17892-4:2016 Clauses 5.2 and 5.4

		BS EN ISO ITOSE 4.E010 Clauses	5.E ana 5.4		1105
Project Reference	F190089		Location ID	LB_21_82_TP	
Project Name	LBA CCS Transpor	rt and Storage Project Ground Inve	estigations	Depth Top [m]	0.80
Specimen Description	Brown slightly gra	avelly very silty SAND		Sample Type	В
Specimen Reference		Specimen Depth [m]		Sample Reference	7



Particle Size [mm]

Sieving]	Sedimenta	ation
Particle Size [mm]	Passing [%]	Particle Size [mm]	Passing [%]
125	100	0.0200	8
90.0	100	0.00600	6
75.0	100	0.00200	4
63.0	100		
37.5	100		
20.0	100		
10.0	100		
6.30	100		
3.35	100		
2.00	100		
1.18	100		
0.630	100		
0.300	99		
0.212	99		
0.150	88		
0.0630	20		

Dry Mass of Sample [g]	1154
Particle Density	2.70
[Mg/m³]	assumed

Sample Proportions	Dry Mass [%]
Very coarse	0.0
Gravel	0.2
Sand	79.5
Silt	16.1
Clay	4.2

Grading Analysis	
D100 [mm]	6.3
D60 [mm]	0.105
D30 [mm]	0.0713
D10 [mm]	0.0239
Coefficient of	4.4
Uniformity	4.4
Coefficient of Curvature	2

Issue Date	21/12/2021	Certificate Reference		Authorised by	lindsayc					
Client	Eni UK Limited			Authorised Date	21/12/2021					
Remarks:										
Fugro GeoServices Ltd. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW										
Testing was performed at the Fugro GeoServices Ltd laboratory at the address shown above. Results relate only to the sample tested, having been authorised by persons qualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated										

otherwise the sample was tested in the condition it was received at the laboratory. Standard PSD ISO Output.xlsm - Rev 7 1483

			Contract Name LBA CCS Transport and Storage Project Ground Investigation									ns	Locatio	n ID					
-6.	IGP		Client			Eni Ul	K L imite	d								IR	21	83F	х тр
			Fuaro	Refere	ence	F1900	089									LD.		-002	
•			Coord	linates	(m)	E3250	84.85 N	370415.	57 G	round	d Elevatio	on (m	Datu	ım) 7	3.25	Sheet ?	1 of 1		
L			Hole	Гуре		Trial F	Pit									Status		Draft	
									Equipr	nent									
Depth From (m)	Depth To (m)	Hole T	Type D	ate From	Date To	E	quipment	Core Ba	arrel C	ore Bit	Drilling Cr	ew Log	ged By	y Remar	s				
0.00	4.50	TP	P 12	/10/2021	12/10/2021	Machi	ne excavate JCB 3CX	ed :			MR, RE	3	MR						
																	1		
Data	Timo		Jolo Donth	Progre	ess				Dopth	Donth T		Rotary	/ De	tails		Dup Tim	Donth	Core De	etails
(dd/mm/yyyy)) (hh:mm))	(m)	(m)	(m)	¹ Weath	er		From (m)	(m)	Flush	туре	Fiu	(%)	Flush Colou	ir (hh:mm	n) From (m)) (m)	Diameter (mm)
12/10/2021	16:30		4.50		Dry	DIIZZIO													
			Ho	le and	Casing				-										
Depth	To (m)	Hole	Diameter	(mm)	Depth To	(m)	Casing Dia	ameter (mm)											
			N · · · · ·	(0)					-										
	1	C	hiselli	ng / Slo	w Progre	SS			-										
Depth F	rom (m)	D	epth To (m)	Duration (hr	i:mm)	Tool /	Remark											
		14/-	ator Ot	rike			\A/ete	Added											
Strike At ()	Rise To (m)	VV2 Time E	lapsed		h (m) Dc-# 0	aalad ('	Depth From	Depth To											
SUINE AL (M)	1 USE 10 (III)	(mi	ins)	casing Depti	Deptn S	careu (M)	(m)	(m)											
		Wat	er Stril	ke Rem	arks		Γ	1				C.	Jene	ral Re	marks				
At 4.50m; w	ater seepage	was of	bserved.				1	. Prior to exc	avation, a (Cable Av	voidance Tool	(CAT) su	urvey v	vas carrie	d out. Servic	es were no	t located.		
							2	2. Trial pit rem	ained stabl	e during	excavation.								
		Ins	stallatio	on					Pip	е						Ba	ackfill		
Туре	Tip Depth / Distance (m)	Resp	oonse Zone	Response Base (r	Zone n) Installatio	on Date	ID	Top Depth (m)	Base Depti	ı (m) Di	ameter (mm)	Туре		Depth Fror	n (m) Depth	To (m)	Backfill Ma	aterial	Date
		1	1/		<u> </u>									0.00	4.5	50	Arising	js	12/10/2021
Notes		-			-	I				1					1				
- Abbrevi	ations and	l resu	ilts data	a defined	d in 'Explor	atory L	ocation F	Records K	eysheet	5'									
Checked By	,	JF	R/CK			E	levation Dat	tum	Ordnar	ce Datu	im		-	Grid Coo	dinate Syste	m OS	GB		
Checked By JR/CK Elevation Datum Ordnance Datum Grid Coordinate System Template: FGSL/HBSI/FGSL BH Summary.hbt/Config Fugro Rev5/26/06/2019/TS+AW Print								Print Date		21/04/20	22								

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fua	RO	Clie	nt	Eni	UK Limited	LB	21	83	В	ТΡ
		Fug	ro Reference	F19	0089					
Ť		Coo	rdinates (m)	E32	5084.85 N370415.57 Ground Elevation (m Datum) 73.25	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status	5	Draf	t	
Samp	oling an	d In Si	itu Testing		Strata Details		1	1	Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
-					TOPSOIL. Soft friable reddish brown slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of quartzite. [TOPSOIL] [CLAY]	(0.30)				
					Firm and stiff brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite and mudstone.	0.30	72.95			
- 0.70	HVane		65 kPa (6 <i>5 kPa</i>)			(0.60)				
- 0.90 - 1.00 0.90 - 1.00 -	B D	2 1		1	Firm and stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite, mudstone and flint. [GLACIAL TILL DEPOSITS] [CLAY]	0.90	72.35			
- • 1.40 - 1.50 1.40 - 1.50 -	B D	4 3		- -	1.40m to 1.80m; grey mottling with decomposed rootlet fragments.					
- 1.80 - 1.90 - 2.00 - 1.90 - 2.00 	HVane B D	6 5	95 kPa (9 <i>5 kPa</i>)	2	1.90m to 2.00m; slightly gravelly slightly sandy clay. Below 2.00m; clay becomes dry and friable.	(1.90)				
2.40 - 2.50 2.40 - 2.50 -	B D	8 7		- -						
- 2.90 - 3.00 2.90 - 3.00 -	B D	10 9		3-	Friable stiff reddish brown gravelly CLAY. Gravel is angular to rounded fine to coarse of quartzite and mudstone. [GLACIAL TILL DEPOSITS] [CLAY] 2.90m to 3.00m; slightly gravelly sandy clay. Sand is fine to coarse.	2.80	70.45			
- 3.40 - 3.50 3.40 - 3.50 -	B D	12 11		-		(1.70)				
- 3.90 - 4.00 3.90 - 4.00 -	D	14 13		4						
4.40 - 4.50 4.40 - 4.50 - -	D	16 15			End of Trial Pit / Trench at 4.50 m	4.50	68.75			
						<u> </u>				
Notes					Pit Stability	Plan				
- Abbreviatio	ns and	results	s data defined on	'Note	es on Exploratory Position Records' Stable	0.60 m	3.4	0 m]→	45°
Template: FGSL/H	BSI/FGSL	rial Pit.h	bt/Config Fugro Rev5/05/	12/2019	/TS-AW	Print Dat	е	29/04/2	2022	



			Contract Name LBA CCS Transport and Storage Project Ground Investigation									tions	L	ocation	ID					
-6	ICD		Clien	nt	F	-ni I II	< L imite	d									IR	21	88	ВH
			Fuar		nce F		180	u								'	LD_	'	_00	_011
			Coor	dinates	(m) F	3251	84 86 N	370845	85 G	nunc	d Elevatio	n (r	m Da	atum)	54 04		Sheet 1	of 1		
			Hole	Type		Cable	Percus	sion		ound	Liovan	<u>, </u>		atani)	01.01		Status		Draft	
				.)po		Jubio			Fauipn	nent							luiuo		Diait	
Depth From	Depth To (m)	Hole 1	Туре [Date From	Date To	E	quipment	Core Ba	arrel Co	re Bit	Drilling Cr	rew L	Logged	By Ren	narks					
0.00	1.20	IP		12/10/2021	12/10/2021	Han	d excavate	Ч			EA, TQ, S	SW	EA							
1.20	14.00	01		12/10/2021	13/10/2021		ando 5000				10,00	·	LA							
				Progre	ess	1						Rota	ary D	Details				(Core De	etails
Date (dd/mm/vvvv) (hh:mm	I)	Hole Depti (m)	h Casing Dep	oth Water Depth (m)	Weath	er		Depth From (m)	Depth To (m)	• Flush	п Туре		Flush Retu (%)	^{irn} Flush (Colour	Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
12/10/2021	08:00	,	0.00	10.00	Dry	Light s	howers			()				()			(()	
13/10/2021	08:00		10.39	6.10	8.20	Fine														
13/10/2021	10.00		14.00	0.10	13.50	i ilie														
			Ц.		Casing				-											
Depth	To (m)	Hole	Diamete		Depth To (m)	Casing Di	ameter (mm)	-											
14.	00	TIOle	200		14.00	11)		200	-											
			hicol	ling / Slo		20			-											
Depth E	rom (m)			(m)	Duration (hh:		Tool	Remark	-											
Deptill	ioin (iii)			(11)	Duration (nn.)	10017	Keinark	-											
		W:	ater S	trike			Wate	r Added	-											
Strike At (m)	Rise To (m)	Time E	Elapsed	Casing Depth	1 (m) Denth Se	aled (m)	Depth From	Depth To												
		(m	iii1S)		, , par de	- (,	(m)	(m)	1											
		Wat	er Str	ike Rem	arks		I	1	1		1		Ger	neral F	Remark	s	I		1	
Groundwate	er not encoun	itered d	during ex	cavation.	-			1. Prior to exc	avation, a C	able Av	oidance Tool	(CAT) surve	y was ca	rried out. A	n inspe	ection pit wa	is hand-dug	g to 1.20m	depth and
							1	escanned usi 2. Inspection p	ng the CAT bit remained	to chec stable	k for services during excav	s. Servation.	vices w	ere not lo	ocated.					
		Ins	stallati	ion					Pipe	•							Bad	ckfill		
Туре	Tip Depth / Distance (m)	Res	ponse Zon Top (m)	ne Response .	Zone Installation	n Date	ID	Top Depth (m)	Base Depth	(m) Dia	ameter (mm)	T	уре	Depth F	rom (m) D	epth To	o (m)	Backfill Ma	terial	Date
	(.11)		/											0.	00	14.00	D I	Bentonit	te	15/10/2021
Notes				1	1				1											
- Abbrevi	ations and	d resu	ults dat	ta defined	l in 'Explora	atory L	ocation I	Records K	eysheets											
						-			-											
Checked By	,	s	AF			E	levation Da	tum	Ordnand	ce Datu	ım			Grid C	oordinate S	System	OSG	В		
Template: F	GSL/HBSI/FO	- Summa										P	rint Date		21/04/202	22				

		Contract Name		LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
fugro		Client		Eni l	JK Limited		21	88	B	BH
		Fugro Reference		F190	089				_	
•		Coo	ordinates (m)	E325	54.04 Ground Elevation (m Datum)	Sheet	1 of 2			
		Hole	е Туре	Cabl	e Percussion	Status		Draf	t	
Samp	ling and	d In Si	itu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
0.10	D	1		-	TOPSOIL. Grass over soft dark brown slightly sandy CLAY with	(0.20)				
0.10 - 0.20	D	3		-	frequent rootlets (<1mm-2mm). Sand is fine to coarse.	(0.20)	53.84			
0.45	D B	5 6		-	Firm brown slightly sandy slightly gravelly CLAY. Sand is fine and	0.40	53.04	F]	
0.45	HVane	Ū	130 kPa (<i>34 kPa</i>)	-	flint and guartzite.	(0.40)	52.24			
0.45	HVane		146 kPa (<i>40 kPa</i>)	1_	[GLACIAL TILL DEPOSITS] [CLAY]	(0.40)	55.24			
. 0.60 . 0.60	ES PID	7	< 0.1 ppm		cobble content. Sand is fine and medium. Gravel is subangular	1 20	52 84			
- 0.80 - 0.80 - 1.10	D B	8 9		-	and subrounded fine to coarse of quartzite, flint and rare quartz.		02.01	F		
1.20 - 1.65	D	10	N = 0.(S)	-	[GLACIAL TILL DEPOSITS] [CLAY]			E		
1.70 - 2.25	B	11	N - 9 (3)	-	Firm and stiff reddish brown locally yellowish brown and greenish			<u> </u>		
2.00	D	12		2 -	subangular and subrounded fine to coarse of mixed lithologies	(1.40)				
2.25 - 2.60	в	14		-	Including flint, mudstone and quartzite.			F		
2.25 - 2.60	UT#	13	100/0 mm	-	Stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is			E		
					fine and medium. Gravel is subangular and subrounded fine to coarse of mixed lithologies including guartzite. flint, mudstone and	2.60	51.44			
2.80 - 3.20	B	16 15	100/0 mm	-	rare quartz.			E		
- 2.00 - 3.20	01#	15		3-	[GLACIAL TILL DEPOSITS] [CLAY] 2.30m to 2.50m; light brown clayey sand. Sand is fine and medium.			L		
- 3.20 - 3.65 - 3.20 - 3.65	D SPT	17	N = 32 (S)	-	2.50m to 2.60m; becoming brown.			<u> </u>		
-				-	gravelly CLAY. Sand is fine and medium. Gravel is subangular and			E		
· 3.70 - 4.30	в	18		-	subrounded fine to coarse of quartzite, flint and rare quartz. [GLACIAL TILL DEPOSITS] [CLAY]			E		
-				-	3.70m to 4.30m; slightly gravelly sandy clay.					
- 4.10	D	19		4-				F		
4.30 - 4.75	D	20	N 07 (0)					E		
4.30 - 4.75	501		N = 37 (S)	-				E E		
- - 4.80 - 5.30	в	21						E		
- 5.00	D	22		5				L		
-				-				F -		
- 5.30 - 5.75 - 5.30 - 5.75	D SPT	23	N = 35 (S)	-				E		
-				-				<u>L</u> -		
								<u> </u>		
- 6.00 - 7.00	В	24		6 -	6.00m to 6.20m; 1 No. subangular cobble (95mm x 190mm x 190mm) of					
-				-	quartzite.			F		
				-						
- -				-				<u>E</u>		
- 6.80 -	D	25		-				<u> </u>		
- 7.00 - 7.41 7.00 - 7.41	D SPT	26	50/256 mm (S)	7-				L		
-				-				<u> </u>		
								E		
- 7.70 - 8.10 -	В	27						<u> </u>		
-				8-				L		
								<u></u>		
8.30	D	28				(11.40)		F		
8.60 - 9.03	D	29	50/075					F		
8.60 - 9.02	SPT		150/275 mm (S)					<u> </u> = _		
-				9				<u> </u>		
- 9.20 - 9.60 -	В	30						E	1	
-								<u>⊢−</u> −	1	
-		~ /						F		
9.80		31						<u> </u>		
10.00 - 10.39	SPT	52	50/240 mm (S)		Continued next page					
Notes										
- Abbreviations	s and res	sults da	ata defined on 'Note	es on E	xploratory Position Records'					
Template: FCSI /UI	BSI/FGSI (able Po	rcussion bbt/Config Euge	Rev5/2	U/01/2020/TS+AW	Print Det	•	21/0/1	2022	
rempidte. rGSL/HI	JOINTOOL	Javie Pêl	Gassion.nbt/Colling Fugro	5 1.ev3/24		1 ninc Date	-	∠ 1/04/.	2022	

Tugro		Contract Name		LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID				
		Clier	Client Fugro Reference		JK Limited	LB	_21	_88	3 _	BH	
		Fugi									
		Hole	Type	E32: Cab	Percussion	Status	2 01 2	Draf	aft		
Samp	ling and	d In Si	tu Testina		Strata Details				Grour	ndwater	
Depth				Denth		Depth			Mater		
(m)	Туре	No.	Test Results	(m)	Strata Descriptions	(Thickness) (m)	Level (m Datum)	Legend	vvater Strike	Backfill / Installation	
-				-				<u> </u>			
-	_			-				==			
- 10.60 - 11.10 - -	в	33									
-				11 -				F			
- - 11.30	D	34		-				E			
- - 11.50 - 11.90 - 11.50 - 11.00	D	35	50/245 mm (S)	-	11.50m to 12.80m; brown and reddish brown.			E- <u>-</u> -			
-	351		50/245 mm (5)	-				<u> </u>			
- - - 12.10 - 12.60	в	36		12 -				<u> </u>			
-											
-				-				<u> </u>			
- 12.80	D	37						<u> </u>			
13.00 - 13.38 13.00 - 13.38	D SPT	38	50/225 mm (S)	13 -				<u> </u>			
-				-							
- 13.50 - 14.00 -	В	39		-							
								F			
-				14	End of Borehole at 14.00 m	14.00	40.03				
-											
-				45							
				-							
				-							
-				16							
				-							
-				-							
-											
				17							
-											
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Notes	and rec	ulte da	ta defined on 'Note	s on E	Exploratory Position Records'						
		ans ua		.a un E							
	0.00			D		D · · -					
Template: FGSL/HE	SSI/FGSL C	Cable Per	cussion.hbt/Config Fugro	Rev5/2	4/01/2020/TS+AW	Print Date	9	21/04/2	2022		





-fugeo			Contr	act Nar	ne	LBA CCS Transport and Storage Project Ground Investigations								is L	Location ID				
			Client			Eni Ul	K Limite	d								R	21	89	TP
		-	Fugro	Refere	ence	F1900)89	-									- ' -	_00	-''
Coordina			linates	(m)				G	round	Elevatio	n (m [Datun	n)	s	Sheet 1 d				
			Hole ⁻	Гуре	. ,	Trial F	Pit							S	Status Preliminary				
									Equipn	nent									
Depth From (m)	Depth To (m)	Hole T	ype D	ate From	Date To	E	quipment	Core Ba	arrel Co	ore Bit	Drilling Cre	w Logg	ged By	Remarks	;				
0.00	2.80	TP	13	/10/2021	13/10/2021	Machi	ne excavate JCB 3CX	ed :			MR, RB	N	ИR						
				Progre	ess						F	Rotary	Deta	ails			0	Core De	etails
Date (dd/mm/yyyy) (hh:mm) H	ole Depth (m)	Casing De (m)	pth Water Dept (m)	¹ Weath	er		Depth From (m)	Depth To (m)	Flush	Туре	Flush (Return %)	Flush Colour	Run Time (hh:mm)	Depth From (m)	Depth To (m)	Diameter (mm)
13/10/2021 13/10/2021	14:30		0.00 2.80		Dry Dry	Overca	ast												
				 	0														
Durth	T. ()			ie and	Casing	(
Depth	10 (m)	Hole	Diameter	(mm)	Depth to	(m)	Casing Di	ameter (mm)											
			le ! e .e 10!																
D	()	<u> </u>	niseili	ng / Sic	w Progre	SS	.	D l.											
Depth F	rom (m)	D	eptn Io (m)	Duration (nr	i:mm)	1001/	Remark											
		14/-					10/-4	- A -l -ll											
	Di	Time El	ller St lapsed	пке	()		Depth From	Depth To											
этпке At (m)	Rise IO (m)	(mir	ns)	asing Deptl	(m) Depth S	ealed (m)	(m)	(m)											
		\M/at/	ar Ctril	a Dom	arks		LT					~		al Por	narke		1		
Groundwate	r not encoun	tered du	uring exc	avation.				1. Prior to exc	avation. a C	able Av	pidance Tool (CAT) sur	rvey wa	s carried	out. A trial pit	t was hand-o	dug to 2.80	m depth ar	nd rescanned
							L	using the CAT 2. Trial pit rem	to check fo ained stable	r service e durina	es. Services w	vere not l	ocated.	-		-			
							ŝ	3. CBR test ca 4. Trial pit term	rried out at	0.50m. 80m du	Results prese	ented sep ucket refi	oarately.	verv stiff	clay with mu	dstone prese	ent.		
										uu	5.6360 Di			y 5un	,				
Im - 4 - 11 - 41							Dine								Poolefill				
Type Tip Depth / Re		Resp	Stallation sponse Zone Response Zone		Zone Installation	on Date		Top Depth (m)	Base Denth	FIPE		neter (mm) Turos		Depth From (rr) Dr "		(m) 0a0	Backfill Motorial		Date
. 162	Distance (m)	T	op (m)	Base (r	n)					,, Die		1,169		0.00	2.80		Arising	3	13/10/2021
Net																			
Notes	atio	1 m	الم ا	ما د 1	lin 150 l	-t ·		Deerst 11		,									
- Apprevi	ations and	ı resu	iis data	a aetineo	i in Exploi	atory L	ocation I	Records K	eysneets	i									
0								·····					1-	11.0		0			
Checked By			K/UK	v hb+/0 ··· 7	a Europe Divis	E	ievation Da	tum	Ordnan	ce Datu	n		Gr	d Coord	inate System	USGE	5	20/40/000	

	Contract Name		LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID									
-fugra	Client		Eni	UK Limited		21	8	9	ТΡ						
	Fugro Reference		F19	0089		_~ +	_0								
•	Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1									
			Trial	Pit / Trench	Status	Status Prel			v						
		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			otatae				,						
Sampling and In Situ Testing				Strata Details		1		Grou	ndwater						
(m) Type	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation						
- 0.20 - 0.30 B 0.20 - 0.30 D 0.20 - 0.30 ES - 0.40 - 0.50 B 0.40 - 0.50 HVane - 0.50 HVane - 0.90 - 1.00 B 0.90 - 1.00 D 1.00 HVane - 1.30 - 1.50 B	3 2 1 5 4 7 6 9	45 kPa (<i>65 kPa</i>) 50 kPa (<i>62 kPa</i>)	- - - - - - - - - - - - - - - - - - -	TOPSOIL. Soft friable slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of quartzite. [TOPSOIL] [CLAY] Firm and stiff reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular to rounded fine to coarse of quartzite, flint, mudstone and sandstone. [GLACIAL TILL DEPOSITS] [CLAY]	(0.30) - 0.30 (1.00)										
- 1.40 - 1.50 D - 1.40 - 1.50 D 	9 8 11 10 13 12		2	Stiff friable reddish brown mottled grey gravelly CLAY with low cobble content. Gravel is angular to rounded fine to coarse of quartzite, flint and mudstone. Cobbles are angular to subrounded mudstone and quartzite. [GLACIAL TILL DEPOSITS] [CLAY]	(1.50)										
2.70 - 2.80 B 2.70 - 2.80 D	15 14			End of Trial Pit / Trench at 2.80 m	2.80										
Notes - Abbreviations and re	esults	data defined on	'Note	Pit Stability es on Exploratory Position Records' Stable	Plan 0.60 m	3.5	0 m	180°							
Template: FGSL/HBSI/FGSL Tr	ial Pit.hl	ot/Config Fugro Rev5/05/	2/2019	/TS-AW	Print Dat	60 m									
Contract Name					LBA CCS Transport and Storage Project Ground Inves							Locatio	on ID		
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-6.	IG	RO	Client		Eni UK	Limited						I R	21	89	ΤР
			Fuaro Refe	rence	F19008	39								_00.	-''
			Coordinate	s (m)			Groun	d Elevation (m	n Datu	um)		Sheet	1 of 1		
			Hole Type	. ,	Trial Pit	t					:	Status		Prelimi	nary
						Standard Penet	ration T	est Results							-
Test Dept	h (m)	Test Ty	pe Self We Penetration	(mm) Test I	Result			Total Penetration (mm)	Hamn Nu	mer Serial umber	Energy R	atio (%)	Casing Depth	(m) Wate	r Depth (m)
			Penetration		Vesuit			(mm)	N	umber i		au (<i>/</i> 0)			
Test Deeth	In	Situ Va	ne Test Res	ults	- la - d	In Situ Hand Pe	netrom	eter Results		Volatile H	leadspa	ce Testi	ng by Photoi	onisation	Detector
Test Depth (m) 0.50 1.00	Test [*] HVz HVz	Fype Und sh ine	listurbed Undrain(Re) 45.00 50.00	Residual Und Shear Strength 65.00 62.00	(kPa)	Test Depth (m)	Undisturb	ed Undrained Shear St (kPa)	rrength	Test	Depth (<u>'m)</u>	PID	Result (j	opm)
- Abbrev		s and re	esults data o	lefined on	'Notes c	on Exploratory Positi	on Reco	ords'			T.	Drint D. (20/40/000	
rempiate: F0		5// 33L 3F	- Gunnary.nbt/C	oning rugio Re	-5/ 10/02/20	10/10						unit Dale		20110/2021	

LABORATORY TEST CERTIFICATE Determination of Particle Size Distribution

BS EN ISO 17892-4:2016 Clauses 5.2 and 5.4

Project Reference	F190089			Location ID	LB_21_89_TP							
Project Name	LBA CCS Transpor	t and Storage Project Ground Inve	Depth Top [m]	2.30								
Specimen Description	Brown slightly gra	velly sandy CLAY		Sample Type	В							
Specimen Reference		Specimen Depth [m]		Sample Reference	13							



Particle Size [mm]

Sieving	9	Sedimentation					
Particle Size [mm]	Passing [%]	Particle Size [mm]	Passing [%]				
125	100	0.0200	34				
90.0	100	0.00600	24				
75.0	100	0.00200	18				
63.0	100						
37.5	100						
20.0	99						
10.0	90						
6.30	88						
2 25	96						
2.00	85						
1.18	84						
0.630	82						
0.300	72						
0.212	65						
0.150	57						
0.0630	43						

Dry Mass of Sample [g]	3259
Particle Density	2.70
[Mg/m³]	assumed

1483

Sample Proportions	Dry Mass [%]
Very coarse	0.0
Gravel	14.7
Sand	41.9
Silt	25.1
Clay	18.3

Grading Analysis	
D100 [mm]	37.5
D60 [mm]	0.169
D30 [mm]	0.0118
D10 [mm]	-
Coefficient of	Not applicable
Uniformity	Not applicable
Coefficient of Curvature	Not applicable

Page 1 of 1

Issue Date	21/12/2021	Certificate Reference		Authorised by	lindsayc						
Client	Eni UK Limited	21/12/2021									
Remarks:											
Fugro GeoServices Ltd. Unit 43, Number One Industrial Estate, Medomsley Road, Consett, DH8 6TW											
Testing was performed at the Fugro GeoServices Ltd laboratory at the address shown above. Results relate only to the sample tested,											
having been authorised by persons gualified to do so. Opinions and interpretations are outside the scope of accreditation. Unless stated											

otherwise the sample was tested in the condition it was received at the laboratory. Standard PSD ISO Output.xlsm - Rev 7

-		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	Location ID			
-fug	RO	Clie	nt	Eni l	JK Limited	LB	21	30	3	TP
		Fug	ro Reference	F190	0089				-	• • •
•		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status		Preli	mina	ry
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
- 0.10 - 0.20 -	D	1		-	TOPSOIL. Grass over dark brown slightly gravelly clayey SAND with roots (<5mm x 450mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone. limestone and flint.	(0.40)				
- 0.30 - 0.40 -	В	2		-	[TOPSOIL] [SAND]	0.40				
- 0.50 - 0.60 0.50 - 0.70 - 0.90	ES PID B	3	0.2 ppm	-	is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, quartzite and granite.					
- 100	D	5		-		(0.80)				
- 1.00 - - - 1.40 - 1.50	В	6			Firm and stiff yellowish brown and grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including	1.20		× ×		
- 1.40 - 1.40 . 1.40 1.60 - 1.70 -	HVane HVane HVane D	7	84 kPa (<i>40 kPa</i>) 86 kPa (<i>48 kPa</i>) 92 kPa (<i>56 kPa</i>)		sandstone and limestone.			× × ×		
- 1.90 - 1.90 - 1.90 -	HVane HVane HVane		102 kPa (58 <i>kPa</i>) 108 kPa (58 <i>kPa</i>) 92 kPa (52 <i>kPa</i>)	2-		(1.50)				
- 2.20 - 2.30 -	D	8		-				× ×		
- 2.40 - 2.50 - -	В	9		-				× ×× ××		
				-	End of Trial Pit / Trench at 2.70 m	2.70		<u>× </u>		
				3-						
-				-						
-				-						
-				4						
-				-						
-				-						
				-						
_				-						
Notes			1	I	Pit Stability	Plan	1			
- Abbreviatior	ns and i	results	data defined on	'Note	s on Exploratory Position Records'	0.55 m	1.3	0 m	 	
Template: FGSL/HE	SI/FGSL T	rial Pit.hl	bt/Config Fugro Rev5/05/1	12/2019/	TS-AW	Print Date	e	04/03/2	2022	

		Con	Contract Name		CCS Transport and Storage Project Ground Investigations	Locati	Location ID			
-fug	RO	Clie	nt	Eni I	JK Limited	LB	21	30	4	ТΡ
		Fug	ro Reference	F190	0089				•—	· • •
¥		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	÷ Туре	Trial	Pit / Trench	Status	;	Preli	minar	у.
Samp	ling and	d In Si	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
- • 0.20 - 0.30 -	D	1		-	TOPSOIL. Grass over dark brown slightly gravelly clayey SAND with abundant roots (<5mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, limestone and flint. [TOPSOIL] [SAND]	(0.40)				
- 0.40 - 0.50 - 0.50 0.50 - 0.60 - 0.70 - 0.70 - 0.80	B ES PID B D	2 3 4 5	0.2 ppm		Brown yellowish grey slightly gravelly clayey to very clayey SAND. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies of sandstone, quartzite and granite.	0.40 (0.50)				
- 0.90 - 1.00 0.90 - 0.90 - 0.90 0.90	B HVane HVane HVane	6	150 kPa (<i>48 kPa</i>) 150 kPa (<i>58 kPa</i>) 150 kPa (<i>52 kPa</i>)	1-	Firm and stiff brown yellow and grey slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone	0.90		× ×		
• 1.20 - 1.30 • 1.40 1.40	D HVane HVane	7	148 kPa (60 kPa) 150 kPa (58 kPa)	-	and limestone.	(0.80)				
- 1.40	HVane		150 kPa (66 kPa)		End of Trial Pit / Trench at 1.70 m	1.70		×		
					Pit Stability	Plan				
- Abbreviatior	וs and ז	results	, data defined on	'Note	s on Exploratory Position Records'	0.25 m	1.2	0 m] →	
Template: FGSL/HE	BSI/FGSL T	Frial Pit.h	ot/Config Fugro Rev5/05/	12/2019/	TS-AW	Print Date		04/03/2	2022	

	Contract Name		LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID				
-fug	RO	Clie	nt	Eni l	JK Limited		21	30	5	ΤР
		Fug	ro Reference	F190	0089			_00	<u> </u>	•••
•		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status	;	Preli	mina	ry
Samp	ling an	d In Si	itu Testing		Strata Details				Grou	ndwater
Depth	Туре	No.	Test Results	Depth	Strata Descriptions	Depth (Thickness)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
(11)				()	TOPSOIL Grass over dark brown slightly gravelly clay SAND with	(m)	(= ===)			
- • 0.20 - 0.30 -	D	1		. .	roots (<5mm x 400mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, limestone and flint. [TOPSOIL] [SAND]	(0.40)				
- 0.40 - 0.50 -	В	2		-	Brown grey yellowish slightly gravelly clayey to very clayey SAND. Sand is fine to coarse. Gravel is subangular and subrounded fine	0.40				
- 0.60 - 0.70 0.60	ES PID	3	0.2 ppm		granite.	(0.40)				
- 0.80 - 0.90 - 0.90 - 0.90 - 0.90 . 1.00 - 1.10	D HVane HVane HVane B	4	150 kPa (66 kPa) 150 kPa (68 kPa) 150 kPa (72 kPa)	- 1 -	Firm and stiff light brown mottled light grey and yellow slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mudstone and occasionally sandstone.	- 0.80				
1 40 1 50		6		-		(1.20)		<u> </u>		
- 1.50 - 1.50 - 1.50 - 1.50 - 1.60 - 1.80	HVane HVane HVane B	7	150 kPa (56 <i>kPa</i>) 150 kPa (60 <i>kPa</i>) 150 kPa (62 <i>kPa</i>)	-		(1.20)				
- 200 - 210	р	8		2-		2 00				
- 2.00 - 2.10		0		ļ ² .	Light brown grey and dark brown sandy clayey locally very clayey GRAVEL with low cobble and boulder content. Sand is fine to	2.00				
· 2.20 - 2.30 · ·	B	9		- - -	coarse. Gravel is subangular and subrounded fine to coarse of mudstone and occasionally sandstone. Cobbles (<50mm x 50mm x 150mm) are subangular of sandstone and mudstone. Boulders (<300mm) are subrounded of sandstone.	(0.70)				
					End of Trial Dit / Transh at 2.70 m	2.70		••••••		
- - - - - - - - - - - - - - - - - - -				3	End of Trial Pit / Trench at 2.70 m	- 2.70				
Notes				16.1	Pit Stability	Plan		_		
- Abbreviatio	ns and	results	data defined on	'Note	s on Exploratory Position Records' Stable	0.55 m	1.1	5 m]_ .	
Template: FGSL/HI	BSI/FGSL 1	Frial Pit.h	bt/Config Fugro Rev5/05/	12/2019	TS-AW	Print Dat	e	04/03/2	2022	

		Con	Contract Name LBA CCS Transport and Storage Project Ground Investigations							
-fug	RO	Clier	 nt	Eni l	JK Limited	IB	21	30	6	ТΡ
		Fug	ro Reference	F190	089			_00	<u> </u>	••
•		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	э Туре	Trial	Pit / Trench	Status		Preli	minaı	ry
Samp	ling and	d In Si	tu Testing		Strata Details				Grour	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
$\begin{array}{c} \text{Deptil}\\ (\text{m}) \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	Type B D B D B B	No.	0.2 ppm	Depth (m) 	Strata Descriptions TOPSOIL. Grass over dark brown slightly sandy slightly gravelly CLAY with roots (<3mm x 150mm). Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies of sandstone, limestone, quartitle and granite. TOPSOIL]CLAY] MADE GROUND. COBBLES are subrounded of sandstone and limestone placed on tarram (old access to field). MADE GROUND] COBBLES] Brown slightly gravelly clayey SAND. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, limestone and granite. Brown slightly gravelly clayey SAND with medium cobble and boulder content. Sand is fine to coarse. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, limestone and granite. Cobbles are subangular and subrounded of mixed lithologies including sandstone, granite and limestone. Boulders (<400mm) are subangular and subrounded of mixed lithologies including limestone, granite and sandstone.	(1.00) (1.00) (0.20) (0.20) (0.30) (0.60) (0.60) (1.00) (1.00)	Level (m Datum)		Water Strike	Backfil / Installation
-										
Notes			<u> </u>		Pit Stahility	Plan				
- Abbreviation		reculto	a data defined on	'Noto	s on Exploratory Position Records' Stable	riali		5 m		
	is and f	esulis	vata delined on	INULG	S ON EXPIDIATORY POSITION RECORDS STADIE	0.55 m	1.4	o m]	
Template: FGSL/HE	3SI/FGSL T	rial Pit.ht	bt/Config Fugro Rev5/05/1	12/2019/	TS-AW	Print Date	e	04/03/2	2022	

	Contract Name		LBA	CCS Transport and Storage Project Ground Investigations	Locati	Location ID				
-fug	RO	Clie	nt	Eni	UK Limited		21	30	7	TP
		Fug	ro Reference	F19	0089	'			_	•
Ť		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status	;	Preli	mina	ry
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
Depth (m) 0.10 - 0.20 0.10 - 0.30 0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.70 - 0.80 0.80 - 1.00 - 1.00 - 1.10 - 1.20 - 1.50 - 1.80 - 1.90 - 1.90 - 2.10 - - - - - - - - - - - - -	Type D B D ES PID HVane HVane D B D B B	No.	0.2 ppm 100 kPa (40 kPa) 114 kPa (34 kPa) 98 kPa (38 kPa)	Depth (m) 	Strata Descriptions TOPSOIL. Dark brown slightly sandy slightly gravelly CLAY with abundant rootlets. Sand is fine and medium. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone and mudstone. [TOPSOIL] [CLAY] Stiff dark brown slightly sandy slightly gravelly CLAY with abundant rootlets. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of mixed lithologies including sandstone, quarz and mudstone. Dark orangish brown slightly clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine and medium of quarz fint and slate. Firm slightly gravelly sandy SILT. Sand is fine to coarse mainly fine. Gravel is angular to rounded fine or ounded fine and medium of sandstone limestone quartz mudstone and slate. Orange slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine of sandstone limestone and mudstone. 2.00m to 2.10m; 1 No boulder (300mm x 400mm x 500mm) triangular of limestone. End of Trial Pit / Trench at 2.10 m	Depth (Thickness) (0.30) 0.30 (0.40) 0.70 (0.30) 1.00 (0.80) 1.80 (0.30) 2.10	Level (m Datum)		Water Strike	Backfill /
						E.				
Notes					Pit Stability	Plan				
 Abbreviatior 	ns and i	results	s data defined on	'Note	es on Exploratory Position Records' Stable		1.0	0 m		
						1.00 m] →	270°
Template: FGSI /HF	SI/FGSI T	rial Pit h	bt/Config Fugro Rev5/05/	12/2010	/TS-AW	Print Dat	8	04/03/	2022	
		nai r IU(II	as soring i ugio rievo/05/	. 2,2019		I''''' Dat	~	54/03/2		

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clie	nt	Eni	UK Limited		21	30	7	TP
		Fug	ro Reference	F19	0089	'			_	•
Ť		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	е Туре	Trial	Pit / Trench	Status	;	Preli	mina	ry
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
Depth (m) - 0.10 - 0.20 0.10 - 0.30 - 0.40 - 0.50 0.40 - 0.50 0.40 - 0.50 0.50 - 0.50 - 0.50 - 0.50 - 1.00 - 1.10 - 1.20 - 1.50 - 1.80 - 1.90 - 1.90 - 2.10 	Type D B B D ES PID HVane HVane D B D B B	No. 1 2 5 4 3 6 7 8 9 10 11	0.2 ppm 100 kPa (40 kPa) 114 kPa (34 kPa) 98 kPa (38 kPa)	Depth (m) 	Strata Descriptions TOPSOIL. Dark brown slightly sandy slightly gravelly CLAY with abundant rootlets. Sand is fine and medium. Gravel is subangular and subrounded fine to coarse of mixed lithologies including sandstone, quartz and mudstone. TOPSOIL [CLAY] Stiff dark brown slightly sandy slightly gravelly CLAY with abundant rootlets. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of mixed lithologies including sandstone, quartz and mudstone. Dark orangish brown slightly clayey SAND and GRAVEL. Sand is fine to coarse. Gravel is angular to subrounded fine and medium of quartz finit and slate. Firm slightly gravelly sandy SILT. Sand is fine to coarse mainly fine. Gravel is angular to rounded fine or ounded fine and medium of sandstone limestone quartz mudstone and slate. Orange slightly gravelly SAND. Sand is fine to coarse. Gravel is angular to rounded fine of sandstone limestone and mudstone. 2.00m to 2.10m; 1 No boulder (300mm x 400mm x 500mm) triangular of limestone. End of Trial Pit / Trench at 2.10 m	Depth (Thickness) (0.30) 0.30 (0.40) 0.70 (0.30) 1.00 (0.80) 1.80 (0.30) 2.10	Level (m Datum)		Water Strike	Backfil / Installation
Notos						Diam				
Notes					Pit Stability	Plan				
- Abbreviatior	ns and i	results	data defined on	'Note	es on Exploratory Position Records' Stable		1.0	0 m	7	
						1.00 m				270°
Template: FGSL/HE	BSI/FGSL T	rial Pit.hl	bt/Config Fugro Rev5/05/	12/2019	/TS-AW	Print Date	e	04/03/2	2022	
			5 5							

		Con	tract Name	LBA	CCS Transport and Storage Project Ground Investigations	Locati	on ID			
-fug	RO	Clier	nt	Eni l	JK Limited	LB	21	30	8	TP
		Fugi	ro Reference	F190	0089]·			-	
v		Coo	rdinates (m)		Ground Elevation (m Datum)	Sheet	1 of 1			
		Hole	э Туре	Trial	Pit / Trench	Status		Preli	mina	у
Samp	ling and	d In Si	tu Testing		Strata Details				Grou	ndwater
Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
Samp Depth (m) - 0.10 - 0.20 0.10 - 0.30 - 0.30 - 0.40 - 0.40 - 0.60 0.40 - 0.60 0.40 - 0.60 0.40 - 0.60 - 1.40 - 1.60 - 1.40 - 1.60 - 1.40 - 1.60 	Ing and Type D B B S PID HVane HVane HVane	4 In Si No. 1 2 3 5 4	tu Testing Test Results 0.3 ppm 150 kPa (30 kPa) 150 kPa (35 kPa) 150 kPa (40 kPa)	Depth (m) 	Strata Descriptions ToPSOIL, Dark brown slightly sandy slightly gravelly CLAY, with abundant rootlets. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of mixed lithologies including sandstone, mudstone and quartz. Very stiff dark brown slightly sandy slightly gravelly CLAY. Sand is fine and medium. Gravel is subangular to rounded fine to coarse of mixed lithologies including sandstone, mudstone and quartz. End of Trial Ptt / Trench at 1.60 m	Depth (Thickness) (0.30) 0.30 (1.30) 1.60	Level (m Datum)	Legend	Groun	ndwater Backfil/ Installation
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- 0.60 - 0.80 0.60 - 0.80 - 0.60 - 0.60 - 0.60 -	B D HVane HVane HVane	5 4	58 kPa (<i>10 kPa</i>) 65 kPa (<i>8 kPa</i>) 72 kPa (<i>8 kPa</i>)							
- 1.20 - 1.30 1.20 - 1.50 -	D B	6 7				(2.00)				
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		Hole	туре	Trial	Pit / Trench	Status		Preli	mina	ry
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Depth (m)	Туре	No.	Test Results	Depth (m)	Strata Descriptions	Depth (Thickness) (m)	Level (m Datum)	Legend	Water Strike	Backfill / Installation
					TOPSOIL. Grass over dark brown slightly gravelly silty SAND with					
- 0.10 - 0.15 0.10 - 0.50	D B	1 2		-	frequent rootlets. Sand is fine to coarse. Gravel is subrounded and rounded fine to coarse of limestone	(0.30)				
				-	[TOPSOIL] [CLAY]					
				-	Brown slightly gravelly SAND with low cobble content. Locally silty.	0.30			1	
0.50	50	0		-	to coarse of limestone. Cobbles (<20mm x 55mm x 60mm) are					
- 0.50 0.50	PID	3	< 0.1 ppm	_	subangular and subrounded fine to coarse of limestone.	(0, 60)				XX
-				-	0.50m to 0.90m; boulders (200mm x 300mm x 400mm) are of limestone.	(0.60)				
						0.00				
- 100 - 105	П	1		1-	Brown gravelly clayey SAND with medium cobble and boulder	0.90				
1.00 - 1.50	В	5		Ι'.	fine to coarse of limestone and rarely slate. Cobbles (<30mm x					
				_	55mm x 60mm) are fine to coarse subangular to rounded of					
				-	are of limestone.					XX
				-	0.90m to 2.00m; locally gravelly sandy clay.					XX
- 1.50 - 1.55	D	6		_		(1.10)				
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CONSULTATIONS

Vincent, Tom

From:	GREENWOOD, Ben
Sent:	03 December 2021 11:04
То:	Morgan, Emily
Cc:	Corless, Natalie; Greslow, Mike; Peter, Lara; Franklin-Losardo, Declan; Meynell,
	Gareth, MORGETROTD, Catherine
Subject:	RE: HyNet - Mineral Resource Assessment

Hi Emily,

Please see below the repose in red to your questions from our the minerals policy officer (Catherine Morgetroyd).

- The pipeline trench would be approximately 1.2m deep and approximately 1.0m wide (an easement of up to 25m will be place upon the finished pipeline). The trench would need to be refilled with a granular material and therefore the extraction of sand/gravel only to be replaced with sand / gravel seems like a waste of resources. I agree that extraction of sand/gravel along the route of the trench to replace with sand/gravel from elsewhere wouldn't be a sensible approach and it would be better to use the existing sand/gravel on site. However, the pipeline may also sterilise sections of the Mineral Safeguarding Area (MSA) either side of the trench. The Mineral Resource Assessment (MRA) could consider whether it would be possible to extract the sand/gravel from these areas and use it along other sections of the pipeline trench, to avoid importing sand and gravel from further away.
- The area to the south of Thornton Green Farm is within an area where there is a high volume of streams and other surface water features. The presence of a high groundwater table would make extraction difficult and additional assessment would need undertaking on; the feasibility, how de-watering would work, the impact of de-watering on the local water table, the potential to affect the nearby Gowy landfill and the potential to affect (undermine) the adjacent M56. Further details / evidence of this could be provided as part of the MRA to justify why prior extraction is not viable in this specific location. Sand extraction in the Cheshire area often uses dredging, so further investigation would be required to assess if it is possible in this location and the potential impacts and associated costs.
- In the area north of Caughall the presence of clay within the Alluvium would likely make it impracticable and not economically viable to process such a small volume of material to remove the sand and gravel from the clay. Where has the evidence of clay within the alluvium been taken from? Further details / evidence of this could be provided as part of the MRA to justify why prior extraction is not viable in this specific location. Would the material in this area be suitable for use as fill within the pipeline trench to avoid the need to import sand and gravel from further away?

Regards

Ben

From: Morgan, Emily	>		
Sent: 29 November 2021 16:44			
To: GREENWOOD, Ben		>	
Cc: Corless, Natalie			

Subject: RE: HyNet - Mineral Resource Assessment

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Thanks Ben

That is really helpful – they were the maps I was looking for but could not find.

I will await the comment from the policy team but it looks like we'll need an assessment based on your comments.

Kind regards

Emily



Subject: RE: HyNet - Mineral Resource Assessment

Hi Emily,

Thank you for your query. I will pass on your below questions to our policy team for comment.

Having already reviewed the mineral safeguarding matters with our policy team I can provide the following detail in respect the locations of mineral safeguarding areas in relation to the indicated pipeline route.

The first map shows the M 1 allocations, which are all to the east of the borough and don't overlap with the pipeline route at all. Clearer PDF maps of the M 1 sites are available at page 246-249 in the SD2 Submission policies map, which is available online at: <u>Cheshire West and Chester Council - Submission - Local Plan (Part Two) Land Allocations and Detailed Policies</u>

The second map shows the sand and gravel mineral safeguarding area (mapped as ENV 9 in the Local Plan (Part One) and also covered by policy M 2 in the Local Plan (Part Two)) and there are several areas where the pipeline route crosses the mineral safeguarding area. As such, for these areas it would be necessary to show how the application meets at least one of the criteria in policy M 2 and a mineral resource assessment may be required in order to do this. One of the affected mineral safeguarding areas already has the M56 running through it and another has the canal going through it, which will already have affected part of the resource and additional impacts resulting from the pipeline could mean that the whole of those safeguarded areas was sterilised. This will need to be considered in any mineral resource assessment.





Please note the maps are screenshots and can't be published in any format due to Ordnance Survey licensing issues. You can however view the local plan policy maps here: <u>Local Plan (cheshirewestandchester.gov.uk)</u> (in the map if you press t it will clear all layers then in options you can just add local plan part 1 layer and you can see all the MSAs in brown hatch as above.

I hope this is of assistance

Regards



Subject: HyNet - Mineral Resource Assessment

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Hi Ben

I am contacting you are the case officer for HyNet but I understand you may need to send this onto the Mineral Planning Officer at Chester and Cheshire West (CCW).

I am working on the Land and Soils section of the HyNet DCO application and am getting in touch regarding the Mineral Resources which are within the CCW boundary (I will email Flintshire County Council separately regarding resources in their jurisdiction).

I have reviewed the local CCW planning policy. In DM56 – Mineral Safeguarding Areas (MSAs) (text attached) it sets out CCWs requirements regarding mineral resourcing and planning. If it has been interpreted correctly then WSP would need to consider the potential for sand and gravel extraction only from any MSAs.

It states the MSAs are shown on the local policies map however I cannot seem to find them, it does however mention that all sand and gravel deposits as shown on the BGS mineral resource maps are MSAs. I have created a map (attached) which shows the current proposed route against the deposits shown on BGS mineral resource map.

I note the following:

- A 1km section of the pipeline would intercept 800m of sub-alluvial deposits (measured from east to west) (shown as Blown Sand on the BGS online viewer) to the south of Thornton Green Farm.
- The pipeline would intercept a 50m wide section of sub-alluvial deposits (shown as Alluvium clay, silt and sand) to the north of Caughall.

Given the following points I do not think that prior extraction is feasible for such small areas of potential resource, however it would be good to hear your thoughts:

- The pipeline trench would be approximately 1.2m deep and approximately 1.0m wide (an easement of up to 25m will be place upon the finished pipeline). The trench would need to be refilled with a granular material and therefore the extraction of sand/gravel only to be replaced with sand / gravel seems like a waste of resources.
- The area to the south of Thornton Green Farm is within an area where there is a high volume of streams and other surface water features. The presence of a high groundwater table would make extraction difficult and additional assessment would need undertaking on; the feasibility, how de-watering would

work, the impact of de-watering on the local water table, the potential to affect the nearby Gowy landfill and the potential to affect (undermine) the adjacent M56.

 \geq In the area north of Caughall the presence of clay within the Alluvium would likely make it impracticable and not economically viable to process such a small volume of material to remove the sand and gravel from the clay.

I would welcome your comments on the above and I am happy to arrange a meeting (if required) to discuss any of the points raised.

Kind regards

Emily



Principal Consultant, Ground and Water MSc, BSc (Hons), CGeol, EurGeol, FGS

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Vincent, Tom

From:	Hannah Parish
Sent:	08 December 2021 16:15
То:	Morgan, Emily
Cc:	Meynell, Gareth; Corless, Natalie; Greslow, Mike; Peter, Lara; Franklin-Losardo,
	Declan; Gary Nancarrow
Subject:	RE: Flintshire County Council HyNet Mineral Resources
Attachments:	HyNet DCO EIA Scoping Consultation Response FCC 30.06.21 Final.pdf

Emily,

RE: Flintshire County Council HyNet Mineral Resources

Further to your email of 29 November I can offer the following comments which I hope are of assistance.

As you have noted, the proposed route of the pipeline would transect; brick clay, primary shallow coal reserves, glaciofluvial deposits and secondary shallow coal. However, the mineral resource that would be affected by the pipeline and any required easement may already be sterilised by existing built development when applying an appropriate buffer zone, or the size of the resource plot maybe uneconomic to work due to the present of existing infrastructure and or development.

I think a good starting point would be to consider and quantify what mineral resource is already sterilised by existing built development, applying the appropriate buffer zone also considering other existing development such as powerlines, pipelines, roads, and considering the size of the resource plot. This sterilised mineral could be effectively discounting or sieved out from the mineral resource assessment.

The mineral resources assessment could then focus on the unconstrained mineral resource that would be sterilised by virtue of the pipeline itself and the required easement. The assessment should also take in to account any wider sterilisation that the proposal would result either side of the pipeline and easement, if the pipeline route transects a larger section of unconstrained mineral of economic importance.

With regards to coal deposits, as you have stated, the primary coal and secondary coal deposits are unlikely to be intercepted by the trenching due to the depth of the bedrock below the surface in this location. However, the pipeline and easement would introduce an element of sterilisation of this resource, and a sterilisation of a wider resource even if the pipeline lies above the bedrock and does not intercept it. That's said, PPW11 and the emerging LDP no longer requires coal to be safeguarded, whilst the adopted UDP requires coal to be safeguarded. It could be argued that PPW11 and the policy position carries more weight than the UDP (should it remain adopted at the time of the inquiry) to justify excluding coal out of the minerals resources assessment. Furthermore, it may be the case that the coal resource may already have been sieved out of the assessment as it may already be sterilised by existing built development.

Should there be unconstrained and unsterilised Clay deposits, the current adopted UDP seeks to safeguard clay resources therefore should be included in the assessment as the LDP may not be adopted at the time of the inquiry. As with coal, sterilisation of unconstrained clay as a direct result of the pipeline trench and easement, and any wider indirect sterilisation that the proposal would result in should be included in the assessment.

With regards to unconstrained/unsterilised sand and gravel deposits, this should also be included in the minerals resource assessment. Whilst I note that the trench would be infilled with any excavated sand and gravel which is welcomed, the linear nature of the pipeline may also result in sterilising a much wider area within the mineral safeguarding area than just the development itself, either side of the trench and easement. Therefore the mineral resource assessment should also take into account any indirect wider sterilisation that would result should the trench and easement intersect larger blocks of unconstrained mineral resource which may result in future extraction being economically unviable.

The mineral resource assessment should also considered the possibility of prior extraction of sand and gravel resource either side of the pipe trench and easement which could be used along other sections of the pipe that does not interact with sand thus avoiding importation of sand and gravel in the bedding of the pipeline.

The Council's consultation response to the DCO Scoping Request is attached and includes a section on Mineral Safeguarding which may also be of some assistance. Please come back to me if you seek any further clarification.

Kind Regards/Cofion Cynnes Hannah Parish

Senior Minerals and Waste Planning Officer | Uwch Swyddog Cynllunio Mwynau a Gwastraff North Wales Minerals and Waste Planning Service | Gwasanaeth Cynllunio Mwynau a Gwastraff Gogledd Cymru

Planning, Environment & Economy | Cynllunio, Amgylchedd ac Economi Flintshire County Council | Cyngor Sir y Fflint



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I am currently working from home



From: Morgan, Emily
Sent: 29 November 2021 16:51
To: Gary Nancarrow

Subject: Flintshire County Council HyNet Mineral Resources

Hi Gary and Hannah,

I have been passed your details in order to discuss the Mineral Resources within the Flintshire County Council (FCC) jurisdiction as part of the HyNet application (I have sent a separate email to Chester and Cheshire West).

I have prepared the attached plan which shows the current approximate pipeline route against the BGS mineral resources map. I note the pipeline transects; brick clay, primary shallow coal reserves, glaciofluvial deposits and secondary shallow coal.

The pipeline within Flintshire would involve the excavation of an approximately 1m wide and 1.2m deep trench that would then be backfilled. An easement of up to 25m would be in place at the surface.

Coal Deposits

The pipeline would intercept primary and secondary coal deposits based on the map. However, BGS online geology viewer indicates that superficial deposits overlay the coal bedrock deposits and given the shallow nature of the trenching the pipeline installation is unlikely to intercept the bedrock.

It is understood from the attached Flintshire Local Development Plan Background Paper 4 Minerals (labelled as FCC_Minerals) that safeguarding of coal is no longer a requirement.

"PPW10 states that safeguarding of coal is no longer required, Policy EN23 does not require the submission of a prior extraction assessment for sites underlain by coal. The requirement for developers to address risks arising from past coal mining in Policy DM1 would secure prior extraction on sites underlain by coal where it is an appropriate means of remediation."

N.B. The risks from past coal mining works are being picked up separately by EniProgetti.

Glaciofluvial Deposits and Brick Clay

The brick clay deposits appear to correspond to the extent of the Etruria formation (overlain by Glacial Till) and the glaciofluvial deposits appear to correspond with superficial glaciofluvial deposits on the geological mapping. As with the coal it is unlikely the pipeline trench would excavate into the Etruria bedrock through the Till deposits. However it is noted that the pipeline trench would excavate through areas of Glaciofluvial deposits. I note these are Category 1 resources within the guidance attached.

I would point out that extraction of sand/gravel from glaciofluvial deposits would result in the infilling of the area with sand/gravel.

Given the attached information and the above notes I would welcome your comments and the requirements for a formal mineral resource assessment on all or some of the proposed pipeline?

I am happy to discuss and if you think a phone call would be easier just let me know.

Kind regards

Emily



Emily Morgan

Principal Consultant, Ground and Water MSc, BSc (Hons), CGeol, EurGeol, FGS



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Deellir na fydd unrhyw safbwyntiau, na chynghorion, na

chasgliadau nac unrhyw wybodaeth arall yn y neges hon,

nad ydynt yn berthnasol i waith swyddogol

Cyngor Sir y Fflint, yn cael eu cynnig na'u cadarnhau ganddo

nac ar ei ran, ac felly ni fydd Cyngor Sir y Fflint yn derbyn

unrhyw gyfrifoldeb am y rhannau hynny o'r neges.

Vincent, Tom

From:	Sharp, Jon (Bradford) GBR
Sent:	16 May 2022 09:58
То:	Vincent, Tom
Subject:	RE: Minerals Resource Assessment as part of pipeline scheme - consultation
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Tom, responses attached from our lands and geology departments, a number of issues raised, you may have answers to some of the points raised, please advise any further questions Kind Regards

Jon

The grading results provided suggest a poor quality deposit that probably isn't worth the planning difficulties. About 5 of the 40 or so gradings look good but a further drilling exercise would be required to determine if the good quality areas are extensive enough to make the site a worthwhile prospect.

Of the area highlighted is looks like approx. 22ha of land is mapped as glaciofluvial sand and gravel assuming a thickness of 8m there may be up to some 2.5Mt of sand and gravel (logs provided indicate predominantly sand). A site investigation would likely find thinning of the deposit at the margins and some poor quality material that would significantly reduce this figure. Also worth noting the presence of coal within the deposit as would be expected given the proximity to the coal measures strata.

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From land and planning perspectives, I would say the site presents significant obstacles to mineral working as detailed below.

Built Constraints

- The site is split east/west by Shotton Lane. Shotton Lane itself is a single track road and thus unsuitable for HGV's. From a desk top review it's hard to see how you could access the site.
- Everything east of Shotton Lane looks to be constrained by a combination of the railway to the north east and housing to the south and east.
- The site is within 5km of Hawarden airfield (to the east) and therefore will be subject to airport safeguarding bird strike risks from water based restoration would be a potential issue.

Ecological Constraints

- To the west of Shotton Lane, the land is adjacent to the Deeside and Buckley Special Area of Conservation for Great Crested Newts and the Connah's Quay Ponds and Woodland SSSI.
- To the south west is Ewloe Castle, a grade 2 listed building and therefore landscape and heritage asset setting will be significant issues.

Land Use Constraints

• The SAC and SSSI also form part of Wepre County Park and the land to the west of Shotton Lane is crisscrossed by a network of footpaths which link in to the castle and park. itself. The same land also appears to be crossed by a network of power lines.

In summary, from a desk top lands and planning review, the site would appear to present significant design, operational, amenity and environmental challenges and would need to hold a significant reserve to justify considering further.

Jon Sharp Regional Technical Manager Aggregates and Asphalt Hanson North, Central and MQP

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From: Vincent, Tom <Thomas.Vincent@wsp.com>
Sent: 09 May 2022 15:48
To: Sharp, Jon (Bradford) GBR <Jon.Sharp@hanson.biz>
Subject: RE: Minerals Resource Assessment as part of pipeline scheme - consultation

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Hi Jon,

Thanks for this! Unfortunately all of the information that I have on the mineral deposits were attached to the previous email I sent over. As the ground investigation did not specifically target Mineral Deposits, our records don't actually capture the information from the area that I sent over to you.

I hope the information I did send can be of some use though, and can provide some sort of basis to form an opinion as to whether the mineral resources here appear economically / commercially viable for extraction prior to development.

Kind regards, Tom

wsp

Dr Thomas Vincent Assistant Geo-Environmental Consultant, Ground and Water BSc (Hons), FGS

WSP, The Mailbox Level 2 100 Wharfside Street Birmingham B1 1RT

Confidential

From: Sharp, Jon (Bradford) GBR Sent: 09 May 2022 10:26 To: Vincent, Tom Subject: RE: Minerals Resource Assessment as part of pipeline scheme - consultation

Hi Tom, I have shared internally, a couple of questions from me – have any gradings been carried out on the boreholes? Also have any mechanical, chemical or physical properties been reported on the aggregate? Thanks

Jon

Regional Technical Manager Aggregates and Asphalt Hanson North. Central and MQP

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From: Vincent, Tom Sent: 09 May 2022 09:18 To: Sharp, Jon (Bradford) GBR Subject: RE: Minerals Resource Assessment as part of pipeline scheme - consultation

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Hi Jon,

Much appreciated. Thanks as well for taking the time to talk to me over the phone as well!

Kind regards, Tom



Dr Thomas Vincent

Assistant Geo-Environmental Consultant, Ground and Water BSc (Hons), FGS

WSP, The Mailbox Level 2 100 Wharfside Street Birmingham B1 1RT

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Hi Tom, thanks for this, I will have a look hopefully today and get back to you with our thoughts All the best

Jon

Jon Sharp Regional Technical Manager Aggregates and Asphalt Hanson North, Central and MQP

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From: Vincent, Tom Sent: 06 May 2022 10:53 To: Sharp, Jon (Bradford) GBR Subject: Minerals Resource Assessment as part of pipeline scheme - consultation

External Email - Please use proper judgment and caution when opening attachments, clicking links, or responding. Report suspicious emails with SPAM PHISH button.

Hi Jon,

Thanks for getting back to me earlier – great to chat to you.

A little bit of context to refresh you. WSP are involved in the design of a pipeline scheme which spans from Flintshire to Liverpool. The proposed route of the pipeline intersects several Mineral Safeguarding Areas and as a result, a minerals resource assessment is as part of the planning process. As part of the assessment we must consider whether the minerals intersected by the pipeline are economically viable enough to warrant extraction prior to the development, rather than being 'sterilised' by the development.

The primary area I have identified within a mineral safeguarding area which has not already been sterilised by existing development is located north of Ewloe Green. Details include:

- 46ha of undeveloped land adjacent a SSSI and within a green barrier zone
- Pipeline will truncate 7ha of the Mineral Safeguarding Area
- Deposits identified as glaciofluvial sand & gravels, but GI suggests glacial till
- BGS borehole records indicate that an opencast may previously have been situated there this may have compromised minerals already?
- Logs suggest that the deposits include sandy gravelly clays, slightly gravelly silty sands, and sand and gravel.

I have attached a figure of the area I am referring to, as well as logs taken from within the mineral safeguarding area (marked by red squares on the figure). I have also taken particle size info from the preliminary ground investigation report. If you have time to give your informal opinion as to whether these deposits may warrant extraction prior to development, that would be extremely helpful.

Please let me know if you have any further questions!

Kind regards, Tom

vsp

Dr Thomas Vincent

Assistant Geo-Environmental Consultant, Ground and Water BSc (Hons), FGS



Level 2 100 Wharfside Street Birmingham B1 1RT

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